ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Master Thesis Economics & Business – Financial economics

Title: The prominent club deal discount

Name Student: Bart Mabelis

Student ID Number: 454544

Supervisor: Gangaram-Panday, Y.S.

Second Assessor: Pfeil, C.S.

Date Final Version: August 27th 2020

Abstract: We study differential pricing in prominent PE firm club deal LBOs, using a sample of completed LBOs of large US targets between 2000 and 2019. The study confirms the existence of the PE club deal discount, but find that the largest abnormal gains are concentrated amongst prominent clubs, acquirers that are composed of at least 2 prominent PE firms; a prominent PE club deal discount. Prominent club targets realize 10% to 20% lower deal related abnormal return or roughly 100% lower deal premiums compared to non-prominent club targets, targets of acquirers that are composed of 1 prominent PE firm and at least 1 non-prominent PE firm. These results are robust to target size, Tobin's Q, past performance, institutional ownership, riskiness, efficiency and time fixed effects. We find that prominent clubs experience significantly lower levels of takeover competition throughout the entire bidding process compared to non-prominent clubs and find little support for alternative explanations for the PE prominent club deal discount based on financing credibility, capital constraints and diversification. It is, however, possible that unobservable factors drive PE firms to form clubs.

Table of contents

1. Introduction

Private Equity (PE) fundraising had been relatively limited at the start of the 21st century, but gained popularity in the years thereafter, as reported in the Preqin database. Right before the financial crisis, in 2007, the total amount of capital raised by PE funds peaked at over 400 billion US dollar, a multiple of a handful of years earlier. The crisis had a large impact on the capital that was being committed to PE funds, in 2010 only 179 billion US dollar was allocated to the PE market. In the following years, however, confidence in PE funds reignited and caused a record amount of capital to be committed to PE funds. From 2017 to 2019 over 600 billion US dollar was raised each year by PE funds. In the entire Mergers and Acquisitions (M&A) market, PE deals represented about 10% of the total number of deals completed in 2019 (Bain & Company, 2019). Measured by total deal value, Bain reports that PE deals even represented up to 15% of deal value in the total M&A market. This significant increase of popularity calls for a deeper understanding of the PE market and its business model, how do PE funds operate?

First and foremost, PE funds buy companies with the aim to sell them on the short to medium term (often 3-5 years), whereas other (public) buyout fund types often buy companies to keep them for a longer or indefinite amount of time. After buying a new portfolio company, it is the aim that the new owner improves current operations and, thus, increases firm value. A big advantage of selling portfolio companies after a relatively short amount of time is that the largest gains from operating improvements are concentrated shortly after the changes in operations have been made (Barber & Goold, 2007). A buying-to-keep strategy will, therefore, cause diluted final returns from the operating improvements compared to a buying-to-sell strategy implemented by PE funds.

Secondly, PE firms often use an acquisition technique called a Leveraged Buyout ('LBO'). The premise of an LBO is that a target is acquired using a minimum amount of equity and a maximum amount of debt. A big advantage of a high degree of debt financing is that operating profits can be decreased by paying interest and, therefore, minimizing the taxable income. Such a tax shield will decrease the amount of capital that unnecessarily leaves the company. Additionally, the obligation to pay down the debt portion of the financing decreases free cash flows. A reduction of free cash flow is argued in the literature to reduce agency costs and provides stronger managerial incentives, thus, improving firm value (Jensen, 1986).

These advantages of PE deals provide several reasons for an investor to allocate their capital to PE funds. This seems to be a good decision given the fact that PE funds, on average, outperform the S&P

500 index before fees. However, after fees PE funds underperform public investment benchmarks. PE funds are often rewarded according to the '2 and 20' payment scheme. This means that 2% of all assets under management is paid as a fee plus 20% of all profits above a minimum rate of return for investors (the 'hurdle rate'). This begs the question why some investors still prefer PE funds over public firm investments. One reason is that compensation contracts are opaque, so investors simply get fooled (Phalippou, 2009). This conception, that PE funds profit due to target shareholder and PE investor expropriation, has been studied several times in the economic literature (Muller & Panunzi, 2004; Perry & Williams, 1994).

Other criticism focuses on a specific type of LBO activity, a PE club deal. A club deal is a transaction type in which 2 or more PE firms jointly acquire a target company. The main concern about these club deals is that a cooperative alliance reduces the number of potential bidders, leading to less aggressive bidding during the bidding process (Graham & Marshall, 1989; McAfee & McMillan, 1992). One study on the bidding process focusses on the effects of a lack of competition on the premiums received by target shareholders (Aktas et al., 2010). More specifically, this study focusses on takeovers that occur after one-on-one negotiations, which suggests a concerning lack of competition. They find that the existence of potential but latent competition increases the premiums paid in an acquisition. Furthermore, the connection between reduced competition and lower deal prices is strongly substantiated in both the regulatory economics literature and the auction literature (Cramton & Schwartz, 2000; Graham & Marshall, 1989; Hendricks & Porter, 1992; Marquez & Singh, 2009). The findings of all these studies combined provide a socially important question: Do PE firms collude to knowingly depress sales prices or is such a cooperative alliance made for other, benign reasons?

Classical theories provide several benign reasons to motivate club formation, such as capital constraints, diversification, financing credibility and favourable debt terms. There are, on the other hand, also examples of practices that point towards collusion as the motivation to form clubs. A well-known example is the case of Dahl versus Bain Capital Partners. In March 2015, a series of settlement payments totalling $590.5 million US dollars was approved by a US district judge. These settlements, obtained from PE firms Bain Capital Partners, Goldman Sachs, The Blackstone Group, Kohlberg Kravis Roberts & Co., TPG Capital, Carlyle and Silver Lake, were paid to former shareholders of target firms that were acquired by these PE firms. The case that was made against the firms involved claims that these PE firms colluded to suppress competition in numerous LBOs, most of those being club deals (*Dahl v. Bain Capital Partners LLC*, 2015). The main problem with the question whether clubs are being formed with good or bad intentions or a mixture of both, is that it is not possible for an outsider to prove the nature of those intentions. Neither is it possible to determine whether the altered distribution of welfare due to clubbing is socially beneficial. Additionally, it is not possible to prove a

causal effect between club deals and premiums paid to target shareholders, because of the lack of an instrumental variable for club formation (Bailey, 2007). It is, however, possible to study the magnitude of the price reduction that could be caused by the formation of clubs, verify whether the formation of clubs has significant impact on the level of competition and explore the explanatory power of alternative, benign reasons to form clubs. The main research question of this study will, therefore, be:

How big is the Private Equity club deal discount, what are possible explanations for such a discount and with what intentions do PE firms form clubs?

The formation of consortiums to acquire targets has been going on for decades. One of the first investment strategies that has been studied in this context is Venture Capital ('VC') syndication. One study finds that VC syndication is associated with lower acquisition prices, but is unable to distinguish between good and bad intentions to form a syndicate (Hochberg et al., 2007). A different study found that sharing the risks involved with buying firms is one of the reasons why venture capitalists cooperate in the acquisitions of targets (Brander et al., 2002). Lastly, multiple studies found that VC firms often form syndicates with other VC firms that are of similar prominence (Du, 2009; Lerner, 1994).

In an LBO context, there are 2 main papers that focus on a PE club deal discount. The first paper to be published on this topic is Officer et al. (2010). This paper shows that the acquisition premiums paid to target shareholders are roughly 40% lower in club deals than in sole-sponsored LBO deals when focussing on acquisitions by prominent PE firms in the 1984-2007 period. Furthermore, they do not find evidence in favour of benign explanations for the existence of the PE club deal discount. Secondly, there is the paper from Boone & Mulherin (2011) which finds similar results to Officer et al. (2010) in the short term, using a 2003-2007 sample. In the long term, however, they claim that the PE club deal discount does not exist, meaning that the short term differences are caused by differences in the acquisition process. Their conclusions on the long term effects of club deals are based on evidence obtained through Cumulative Abnormal Return ('CAR') analysis over a long period of time. CARs, however, are shown in the economic literature to be an unreliable measure of long term effects (Lyon et al., 1999). Officer et al. (2010) on the other hand provide both short and long term evidence on the existence of the PE club deal discount, using the more appropriate event related abnormal return measures, CAR for short term performance and Buy-And-Hold Abnormal Returns ('BHAR') for long term performance. The first hypothesis will, therefore, be:

Club deal discount hypothesis: Club deal target shareholders receive significantly lower deal premiums compared to sole-sponsored PE target shareholders.

Another difference between the 2 papers on club deals in an LBO context is found in the conclusions that are reached on the effect of club formation on the level of takeover competition. Boone & Mulherin (2011) concluded that there are no differences in the level of takeover competition between the bidding processes of club deals and sole-sponsored PE deals. Officer et al. (2010), on the other hand, did not find any evidence in favour of benign reasons to engage in club deal activity, implying that competition differences are potentially associated with lower deal premiums.

The mechanism through which club formation can lead to reduced sales prices is explained in Officer et al. (2010). If 2 or more potentially interested parties form an alliance, the number of interested parties decreases by at least 1. According to the auction literature, a lower amount of interested parties leads to less aggressive bidding, resulting in lower deal premiums (Graham & Marshall, 1989; McAfee & McMillan, 1992). The effect of a decrease in the number of potentially interested parties is even larger in the takeover of a big target, because the number of acquirers that are capable of funding such a deal is relatively limited compared to the takeover of a smaller target. The concerns about club formation are, therefore, even more persistent for deals with relatively large target firms. Furthermore, Officer et al. (2010) state that concerns about club formation in the media are mainly focused on transactions by the largest and most prominent PE firms, because those are more likely to have the market power to significantly reduce competition and, thus, deal premiums by forming clubs.

In an attempt to truly understand the possible association between club formation and the level of takeover competition, we should more closely examine the definition of a club deal as introduced in Officer et al. (2010) and replicated in several sections in Boone & Mulherin (2011). The original definition categorizes a deal as a club deal if at least 1 of the acquirers is labelled as prominent, which we will call an Officer club from now on. This means that collaborations of 1 prominent and 1 non-prominent PE firm are also labelled as a club. The theoretical explanation of the mechanism through which PE firms can significantly reduce competition by forming clubs, as proposed in Officer et al. (2010), explained that more prominent PE firms are more likely to reduce competition by forming clubs, due to their potentially larger market power compared to less prominent PE firms. For that reason, it can be expected that the market power of a club is even bigger when the club is composed of 2 more prominent PE firms compared to a club that is composed of 1 prominent and 1 non-prominent PE firm. Making a clear distinction between clubs with at exactly 1 prominent PE firm ('non-prominent clubs') and clubs with at least 2 prominent PE firms ('prominent clubs') could help in understanding the relation between deal premiums and the level of takeover competition. The next hypotheses will, therefore, be:

Prominent club deal discount hypothesis: Prominent club deal target shareholders receive significantly lower deal premiums compared to non-prominent club deal target shareholders.

Competition hypothesis: There is a significantly higher level of takeover competition in the bidding process of a deal where a non-prominent club is the winning bidder compared to deals where a prominent club is the winning bidder.

Given the fact that it is statistically impossible to prove a causal link between club formation and deal premiums, we should consider alternative reasons that could possibly explain differences in those deal premiums. In this study, we focus on 2 main factors that could have explanatory power for the relation between deal premiums and acquirer types. Firstly, we consider whether deal prices could differ, because the different acquirer types might target different types of firms. If it is the case that the targets of the acquirer groups differ, this could provide a logical rationale for why deal premiums differ. Secondly, we verify whether the financing credibility of the offers differ between acquirer types. If it is the case that a certain type of acquirer is able to commit a significantly larger fraction of the required funding needed to complete the transaction at the time of the proposal, targets might be more inclined to accept lower deal premiums. By accepting more financially secure offers, targets minimize the risk of committing to a deal that eventually does not take place. This is especially important, because abnormal returns after a termination announcement have been found to be around -10% (Ruback, 1988).

The last part of our research question considers the intentions with which PE firms choose to form clubs. Thus far, we considered competitive effects as a reason to initiate a deal syndicate. If this is the sole reason why consortiums are being formed, this could be seen as collusion with the intention to depress sales prices. Such intentions would be a reason for regulatory institutions to intervene in the PE club deal market. Classical theories of deal syndication, however, describe a number of benign motivations to engage in club deal activity. In an attempt to find out whether prominent PE firms form clubs with good or bad intentions or a mixture of both, we will study 2 of those benign motivations to form deal syndicates.

Firstly, we verify whether capital constraints could motivate PE firms to search for third parties to join their proposal in order to raise the necessary amount of debt and equity commitment to finance the bid. This is an example of a benign motivation to form a club, because a deal would impossibly be completed if a single PE firm was unable to source the required amount of financing on its own. Finding a suitable partner to join during the bidding process is, therefore, crucial to complete a deal under such circumstances. Consequently, diversification motives might explain the desire to form clubs. If certain targets are sufficiently large or risky, a PE firm might not want to carry those risks on their own

and search for a partner to share those risks with. This can be seen as a benign motivation to form an alliance, because an excessively risky or difficult to value target firm would likely not be acquired by a single PE firm due to the large uncertainty that is connected to the deal.

In this study, we try to provide evidence on the existence of the PE (prominent) club deal discount, its explanations and the nature of the intentions behind the formation of clubs. Such an analysis adds to the differential pricing literature in several aspects. Firstly, we provide a better understanding in the differential pricing between PE bidders and other acquirer types (Bargeron et al., 2008). Additionally, this study looks in more detail to the group of firms that were found to experience a PE club deal discount in earlier work (Officer et al., 2010), and studies whether the discount is concentrated amongst acquirers with multiple prominent PE firms. Social and academic focus regarding the effects of club deals have mainly been on the largest most prominent PE firms, because they are most likely to reduce competition by syndicating. New insight on where a PE club deal discount is concentrated can, therefore, help regulatory institutions focus on deals that are most likely to be motivated by collusive intentions. For those reasons, the main sample in this study contains completed LBO deals of publicly traded US targets between January 1st 2000 and December 31st 2019 with a deal value of at least 100 million US dollar that are conducted by prominent PE firms.

The first finding of this study is that Officer club targets experience abnormal returns around the deal announcement that are 4.1 to 8.6 percentage points lower than targets of sole-sponsored prominent PE deals, depending on the returns measure and event window. A different way to describe those results is that Officer club target shareholders receive 20% to 47% lower deal premiums compared to shareholders of sole-sponsored PE targets. These results from univariate analysis hold up in a multivariate analysis, providing evidence that the PE club deal discount is robust to year fixed effects and controls for the target's size, Tobin's Q, efficiency, prior performance and institutional ownership. Additionally, the PE club deal discount is more pronounced for targets with a low degree of institutional ownership, suggesting that institutions are more capable of negotiating a fair price. To add robustness to this study, the results on the PE club deal discount are confirmed in a matching analysis and in regressions using deal multiples as a measure of acquisition prices.

Consequently, we find that the abnormal returns around the deal announcement for prominent club targets are 10.4 to 19.6 percentage points lower than those for non-prominent club targets, depending on the returns measure and event window. The difference in deal premiums provides an even more striking view, prominent club target shareholders receive 99% to 112% lower deal premiums than non-prominent club target shareholders. Additionally, we do not find any significant abnormal return differences between non-prominent clubs deals and sole-sponsored prominent PE

LBOs. The abnormal return difference between prominent and non-prominent club deals around the deal announcement remains apparent in regression analyses, but decreases slightly compared to the univariate difference. Based on our regression analyses the difference in deal premium is between 7.8 and 12.1 percentage points, depending on the returns measure and event window. This shows that target and deal characteristics partially explain the existence of the PE prominent club deal discount. Contrary to the results on the PE club deal discount, institutional ownership is not found to have an incremental effect on the return differences between prominent and non-prominent club deals. Furthermore, these results are confirmed using a matching analysis instead of a regression analysis.

To study the effects of club formations on the level of takeover competition and verify if the PE (prominent) club deal discount can be explained by competitive effects, we consider 5 different measures of takeover competition. These measures proxy competition throughout the entire bidding process. None of these 5 measures significantly differ for the bidding processes of Officer clubs and sole-sponsored prominent PE deals. For the bidding processes of prominent and non-prominent club deals, however, we find for 4 out of 5 measures that there is significantly less competition in prominent club deals. Additionally, we find that the level of competition differs in only 1 out of 5 measures between non-prominent club deals and sole-sponsored prominent PE deals. These results are confirmed in an analysis that uses a Heckman correction to account for possible selection bias for the formation of clubs. Consequently, we use the Mahalanobis distance to test whether the combined information from the 5 measures provides evidence that there are competitive differences. The test that uses the Mahalanobis distance to test for differences is the Hotelling T-square test. The results from this test show that the level of takeover competition in prominent club deals is significantly lower than in non-prominent club deals. Furthermore, there are no significant differences in competition between the bidding processes of Officer club deals and sole-sponsored prominent PE deals, and non-prominent club deals and sole-sponsored prominent PE deals. Additionally, an extra set of Hotelling T-squared tests that excludes the most noisy measure of competition confirms the conclusions.

The last possible explanation for the existence of the PE (prominent) club deal discount we study, is financing credibility. It might be the case that certain types of acquirers propose more credible offers, making targets more inclined to accept such offers. The financing credibility is measured through the committed financing as a fraction of the total required financing and through the percentage of equity financing. Our results do not provide any evidence in favour of financing credibility as an explanation for the PE (prominent) club deal discount.

Given the fact that we cannot directly prove whether clubs are formed with the aim to reduce competition or that competition is reduced as a consequence of benign reasons to form clubs, we test whether there is evidence in favour of benign motivations to syndicate. We consider 2 classical theories that are based on capital constraints and risk sharing. Our results indicate that Officer clubs and prominent clubs target firms that are significantly larger than single PE firms and non-prominent clubs do, respectively. This could be an indication that target size is a reason for PE firms to syndicate. Closer examination of the sample, however, shows that in only 36.1% of the prominent club deals, the target is larger than the largest target any of the PE firms involved acquired on their own in the 4 years surrounding the announcement date. For Officer clubs this figure is 29.1%. Furthermore, the frequency at which capital constraints could be a motivation to syndicate does not significantly differ between prominent and non-prominent club deals. It, therefore, seems unlikely that capital constraints motivate prominent PE firms to form clubs. The evidence on risk sharing motives is convincing. From the 7 different measures of target firm risk, we only found 1 to be significantly differing between prominent and non-prominent targets. None of the measures differed between Officer club targets and targets of sole-sponsored prominent PE deals. Club formation does, therefore, not seem to be motivated by diversification motives.

The remainder of this study will be structured as follows. Section 2 discusses the collection of the data of the main sample and discusses summary statistics. Section 3 analyzes the deal announcement related return effects. Section 4 adds robustness to our conclusions by studying club deal effects through accounting multiples. Section 5 studies the effect of club formation on the level of takeover competition. Section 6 checks whether differences in target characteristics can explain event related returns. Section 7 reports the results on financing credibility and benign motivations. Section 8 concludes.

2. Sample

To obtain the sample, we start of in the Platinum database from Thomson's Financial Securities Data Company ('SDC'). Starting with all the mergers and acquisitions available in the database, we filter the sample based on the announcement date of the deals. Deals are only included if they were announced between January 1st 2000 and December 31st 2019. We only consider completed deals, measured through a deal date effective before December 31st 2019. Furthermore, the deal should be a majority acquisition with a value of at least $100 million. Lastly, to make sure there are no significant effects on the results due to exchange rate fluctuations, we only consider deals with US targets. This first selection of data leaves us with 16,429 deals.

This research studies stock returns, the targets should therefore be publicly traded companies. To verify this, we consult the Centre for Research in Security Prices ('CRSP') database. A target is deemed public if they have a stock price reported in CRSP at least once in the seven days before the announcement date. Subsequently, we perform a check on deal status by establishing the delisting date of all targets. The deal is definitively ruled as completed if the delisting date is within one year of the announcement date. After these steps, 3,262 deals remain and make up the sample of completed acquisitions with US publicly traded targets.

To identify which acquisitions are LBOs and which deals involve a prominent firm as acquirer, several steps have to be taken. The most obvious method to identify which of the remaining deals are LBOs is by using the 'going private' flag from the SDC. However, it is unclear which criteria are used by the SDC to qualify a deal as 'going private'. This problem has earlier been described in Officer et al. (2010). They found that some deals that received the 'going private' qualification were in fact management buyouts or corporate-led buyouts that did not involve PE firms. Furthermore, some acquisitions from PE firms were excluded from the qualification. Their investigation concluded that this method provides a 20% error in distinguishing LBOs from other deal-types (Officer et al., 2010).

For that reason, an alternative method is required. We check every deal summary in the SDC database to verify whether a prominent PE firm was involved in the deal as an acquirer. To do this, a list of prominent PE firms that suits the market of LBOs is essential. Such a list was compiled in Officer et al. (2010) for the 1984-2007 period. In this study, that same list will be used to identify prominent PE firms in the overlapping period, 2000-2007. This list consists of the firms mentioned in the Private Equity International ('PEI') 50, in-house PE units of large investment banks and several historically prominent PE firms that are less active now. It is, however, not deemed suitable to use this same list for the 2007-2019 period, because the US public-to-private market has developed significantly since 2007. This is illustrated by the top 50 of the PEI 300 (PEI extended their list to 300 firms in 2008) which has shown a large transformation since 2007 (Markham, 2018). For that reason the PEI 300 from 2019 will be taken as starting point to compile the list of prominent PE firms for the 2007-2019 period. Consequently, to determine the smallest PE firm that can be deemed prominent, the market power of the marginal PE firm (Summit Partners) from the 2000-2007 list is calculated. This is proxied by calculating what percentage of the total money raised in the PE market, was raised by Summit Partners in the last 5 years of the subsample (2003-2007). The data required to calculate this was found in the Preqin database. The smallest firm that raised at least the same relative amount in the 2015-2019 period will be the marginal prominent firm for the 2007-2019 list. Through this method we establish that the top 57 of the PEI 300 2019 will be deemed as a prominent PE firm. To complete the 2007-

2019 prominent PE firm list, we add the in-house PE units of Merrill Lynch, Morgan Stanley, and JP Morgan conform Officer et al. (2010).

To determine if one of the prominent PE firms was the acquirer in a deal, SDC deal synopses are used. If a prominent PE is the only acquirer, the deal is named a 'Sole sponsored prominent PE deal'. If there is at least 1 more PE firm besides a prominent one as acquirer, the deal is named an 'Officer club deal'. If at least 2 PE firms are named as acquirer and only 1 of them is prominent, the deal is named a 'Non-prominent club deal'. If at least 2 prominent PE firms are mentioned as acquirer, the deal is named a 'Prominent club deal'. This method provides us with a sample of 242 prominent PE deals, where 147 are sole sponsored deals and 95 are club deals. From those 95 club deals, 46 are prominent club deals and 49 are non-prominent club deals.

Table 1 shows the breakdown of the sample by year and prominent PE deal type, which are: prominent club, non-prominent club, Officer club and sole sponsored prominent PE deal. Looking at the full sample, several merger waves can be identified. Firstly, the tail of the fifth wave at the end of the 1990s is visible in the data through the high amount of LBOs in 2000, followed by a sharp decline in the 2 subsequent years. The deal intensity increases again in the years leading up to the financial crisis of 2007, followed by a decrease in LBO activity in 2008 (the sixth wave). Following the dip in activity after the financial crisis, deal intensity started to increase again and remained relatively stable for the remainder of the sample.

When looking at the prominent PE firm subsamples, similar trends can be distilled. The end of the fifth merger wave is less visible, but the peak before the financial crisis and the relatively stable number of LBOs thereafter becomes quiet clear. It is, however, interesting to see that the relative amount of prominent club deals to non-prominent club deals is much lower during the financial crisis period (2007-2009) than the full sample average. During the crisis years 31% of the club deals was made by a prominent club, whereas 48% is in the full sample. A similar result can be found when studying the relative amount of prominent club deals and sole sponsored LBOs. 14% of this subsample consists of prominent club deals, whereas 24% does over the entire period. This suggests that there is a tendency away from prominent clubbing during a period of economic crisis.

Table 2 Panel A shows the frequency with which the prominent PE firms made deals in the 2000-2019 period. TPG made the most deals in the sample with 26, of which 17 are prominent club deals. After TPG, Apollo Management made the most deals with 25, almost all their deals, however, are sole-sponsored deals. Unsurprisingly, the firms that have been a prominent firm for the entire sample period dominate the top of the Table 2 Panel A ranking. The most active PE's that have been prominent

for only a part of the sample period are Thoma Bravo and Vista Equity Partners with 14 and 11 deals, respectively.

Table 2 Panel B shows the number of times prominent PE firms worked together on prominent club deals. An interesting finding from this table is that 6 out of 8 deals that Leonard & Green Partners made are a prominent club deal with TPG as partner. Furthermore, we can see that firms that are ranked relatively high in the PEI rankings, cooperate relatively often. Examples of this are the frequent clubbing of TPG with Silver Lake Partners and Bain Capital with Kohlberg Kravis Roberts. This finding shows that even within the prominent club deal subsample the bigger firms prefer to work with each other, prefacing the importance of making the distinction between prominent and non-prominent clubs.

***Table 1**:* Sample breakdown by year and acquirer type. Reported is the distribution of the number of deals for a sample of acquisitions of public US targets. The time classification is based on the announcement date of the deal. PE deals are identified through a text search of the SDC deal summary. Prominent PE's are firms in the PEI 50 2007 for the deals between 2000 and 2007, and the top 57 from the PEI 300 2019 for the deals between 2008 and 2019. For the full period, the in-house PE units of several large investment banks are added. If the deal summary reports 1 single prominent PE firm as acquirer, the deal is defined as sole-sponsored. If multiple PE firms are listed as acquirer and only 1 is prominent, the deal is defined as non-prominent club. If multiple PE firms are listed as acquirer and at least 2 are prominent, the deal is defined as prominent club. Officer-club refers to a deal with multiple PE firms as acquirer and at least 1 is prominent, conform Officer et al. (2010). Total deal value is the sum of the transaction values within 1 year excluded assumed liabilities by SDC in millions ($).

Year	All Deals		Deals by Prominent PE							
			Prominent Club		Non-prominent Club		Officer-Club		Sole-PE	
	Number of Deals	Total Deal Value	Number of Deals	Total Deal Value	Number of Deals	Total Deal Value	Number of Deals	Total Deal Value	Number of Deals	Total Deal Value
2000	330	944295.0	2	19104.6	1	149.3	3	19253.9	3	2689.3
2001	187	324583.4	0	0.0	0	0.0	0	0.0	1	1995.0
2002	111	152129.9	0	0.0	3	2800.5	3	2800.5	2	913.8
2003	143	222819.7	0	0.0	0	0.0	0	0.0	2	560.6
2004	163	369970.9	5	13949.6	0	0.0	5	13949.6	5	6219.7
2005	204	528337.6	5	24745.9	4	3771.8	9	28517.7	10	10331.4
2006	252	753664.0	13	166004.2	7	32804.7	20	198808.8	18	69041.5
2007	258	610185.5	4	73173.0	8	13508.8	12	86681.8	21	81660.0
2008	115	328758.6	0	0.0	3	4646.4	3	4646.4	3	2481.7
2009	90	294831.9	1	4038.0	0	0.0	1	4038.0	6	1840.4
2010	163	258223.0	3	6453.3	3	6430.4	6	12883.7	8	11610.5
2011	142	353778.8	3	9247.3	5	8171.5	8	17418.8	10	7063.7
2012	134	198078.8	2	1576.3	2	2335.6	4	3911.9	4	2738.7
2013	128	251207.7	1	6710.1	2	21738.7	3	28448.8	8	9275.0
2014	141	552552.2	1	8440.6	1	3307.0	2	11747.6	5	8246.3
2015	173	907504.4	3	11054.0	2	5655.8	5	16709.9	5	4147.1
2016	168	671007.1	0	0.0	6	13873.3	6	13873.3	13	16625.8
2017	143	468086.2	2	1716.8	1	915.8	3	2632.6	10	19596.0
2018	135	524774.7	0	0.0	1	2544.5	1	2544.5	6	11194.1
2019	82	403868.0	1	11930.6	0	0.0	1	11930.6	7	12632.7
Total	3262	9118657.3	46	358144.2	49	122654.1	95	480798.24	147	280863.2

Table 2: Completed LBOs by prominent PE firms: number of deals and cross-participation. Panel A reports the number of deals by the PE by deal type if the total number of deals is at least 2. Panel B reports the number of times prominent PE firms worked together in a prominent club, for firms that participated in at least 2 prominent club deals.

Panel A: Number of Deals

Rank	PEI 50 (2007)	PEI 300 (2019)	Name of PE firm	Total deals	Prominent club deals	Non-prominent club deals	Sole-sponsored PE deals
1	12	5	TPG	26	17	3	6
2	9	12	Apollo Management	25	1	5	19
3	1	4	The Blackstone Group	22	6	4	12
4	11	16	Hellman & Friedman	16	4	4	8
5	8	…	Thoma Bravo	14	3	3	8
6	2	1	The Carlyle Group	13	7	0	6
7	38	3	Goldman Sachs Principal Investment Area	13	8	3	2
8	3	2	Kohlberg Kravis Roberts	12	9	2	1
9	6	8	Bain Capital	11	6	1	4
10	14	…	Vista Equity Partners	11	1	0	10
11	20	19	Silver Lake Partners	10	6	2	2
12	30	31	Leonard Green & Partners	8	7	1	0
13	5	14	Warburg Pincus	7	3	0	4
14	…	42	Welsh, Carson, Anderson & Stowe	7	2	0	5
15	15	7	Apax	6	0	2	4
16	…	9	Providence Equity Partners	6	6	0	0
17	46	44	GTCR Golder Rauner	6	2	0	4
18	18	6	Permira	5	1	2	2
19	…	30	Thomas H. Lee Partners	5	3	1	1
20	…	32	Madison Dearborn Partners	5	1	2	2
21	…	…	Morgan Stanley	5	2	0	3
22	27	…	Fortress Investment Group	4	0	1	3
23	41	…	Sycamore Partners	4	0	0	4
24	55	…	H.I.G. Capital	4	0	0	4
25	…	20	Teachers' Private Capital	3	0	3	0
26	29	26	BC Partners	3	1	0	2
27	33	25	Onex	3	1	0	2
28	34	…	Cerberus Capital Management	3	0	2	1
29	17	47	Claytin, Dubilier & Rice	3	1	0	2
30	32	…	American Securities	3	0	1	2
31	40	…	Quantum Energy Partners	3	0	0	3
32	4	10	CVC	2	1	0	1
33	7	21	EQT Partners	2	0	0	2
34	27	…	Genstar Capital	2	0	1	1
35	36	…	Ardian	2	2	0	0
36	37	…	New Mountain Capital	2	0	0	2
37	43	…	L Catterton	2	0	1	1
38	53	…	Pamplona Capital Management	2	0	0	2
39	…	…	Merill Lynch	2	1	1	0
40	…	…	JP Morgan (including Chase Capital Partners)	2	2	0	0

Panel B: Cross- Participation matrix

	TPG	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Leonard Green & Partners (1)	6	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
Silver Lake Partners (2)	4	0	…	…	…	…	…	…	…	…	…	…	…	…	…	…
Kohlberg Kravis Roberts (3)	2	0	1	…	…	…	…	…	…	…	…	…	…	…	…	…
Goldman Sachs (4)	2	0	1	1	…	…	…	…	…	…	…	…	…	…	…	…
Providence Equity Partners (5)	2	0	0	1	0	…	…	…	…	…	…	…	…	…	…	…
Bain Capital (6)	1	0	0	3	0	0	…	…	…	…	…	…	…	…	…	…
Blackstone (7)	1	0	1	2	2	0	2	…	…	…	…	…	…	…	…	…
Hellman & Friedman (8)	1	0	0	1	0	0	0	2	…	…	…	…	…	…	…	…
The Carlyle Group(9)	0	0	0	1	1	2	0	1	1	…	…	…	…	…	…	…
Morgan Stanley (10)	1	0	0	1	1	0	0	0	0	0	…	…	…	…	…	…
Warburg Pincus (11)	1	1	1	0	1	0	0	0	0	0	0	…	…	…	…	…
JP Morgan (12)	0	0	0	0	1	0	0	0	0	0	0	1	…	…	…	…
Thomas H Lee Partners (13)	1	0	0	0	1	1	1	0	0	0	0	1	1	…	…	…
Thoma Bravo (14)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	…	…
GTCR Golder Rauner (15)	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	…
Welsh, Carson, Anderson & Stowe	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

3. Target returns

To study the effect of clubbing in LBO deals, target stock returns around the announcement of the takeover are studied. To add robustness to the results, several different return types will be considered. The return types that will be calculated are: raw returns, BHARs and CARs. These returns will be calculated over different time intervals. Firstly, we calculate the runup returns over the (-42,-1) interval where day 0 is the announcement date. Secondly, the markup period (0,+126) is considered (or till the delisting date, whichever occurs first). Thirdly, the premium period is studied, which is the interval that covers both the runup and the markup period (-42,+126). Lastly, the 3 day period around the announcement day (-1,+1) will be evaluated for the raw returns and CARs. This period will be studied, because it is a commonly studied interval in the event study methodology and, therefore, enhances the comparability with other studies. Since a buy-and-hold strategy is usually associated with long term investing, the 3 day period will not be considered for the BHARs. Studying a 3 day period would, for that reason, not provide results that have real world implications. Even though BHARs are considered to be the more appropriate return measure compared to CAR when evaluating long-run effects, given the fact that BHARs better reflect real world long term investing strategies, long-run CARs are still studied to maintain a great level of comparability to other studies.

To calculate the BHAR, the following formula will be used:

$$BHAR_i = \left(\prod_{t=1}^{T}(1 + R_{i,t})\right) - \left(\prod_{t=1}^{T}(1 + R_m)\right)$$

Where: $\left(\prod_{t=1}^{T}(1 + R_{i,t})\right)$ is the compound return over the considered period for the target.

$(\prod_{t=1}^{T}(1 + R_m))$ is the compound return over the considered period for the CRSP value-weighted market index (including dividend distributions).

To calculate the CAR, the following formula is used:

$$CAR_i = \sum_{t=1}^{T}(r_{i,t} - (\tilde{\alpha}_i + \tilde{\beta}_i r_{mt})$$

Where: $r_{i,t}$ is the return of target i at day t.

r_{mt} is the return of the CRSP value-weighted market index (including dividend distributions) on day t.

$\tilde{\alpha}_i$ and $\tilde{\beta}_i$ are estimated market-model coefficients using daily returns over the (-379,-127) period for target i.

Table 3 reports the mean and median target percentage returns by bidder type in Panel A and the differences in returns in Panel B. When looking at the differences in raw returns, there are several remarkable findings. Firstly, prominent club targets experience significantly higher returns in the runup period and insignificantly differing returns in the premium period compared to both non-prominent clubs and sole sponsored LBOs. This finding would be evidence against the theory about the existence of a PE prominent club deal discount. It should however be noted that a relatively larger part of the sole-PE and non-prominent club deals were announced during the financial crisis compared to prominent club deals. Because of this crisis, the target returns are systematically lower for the sole-PE and non-prominent club deals. For this reason, comparing these respective groups based on raw returns does not provide robust information about the existence of a PE (prominent) club deal discount. Furthermore, the differences between Officer club deal targets and sole-sponsored targets in the runup period are insignificant. The CTR3, markup period and premium period all show a significant negative coefficient, meaning that shareholders of Officer club targets receive significantly less value than shareholders of sole-sponsored PE targets. These findings are conform the results in Officer et al. (2010), but do not give strong evidence in favour of a club deal discount given the fact that the financial crisis is incorporated in the dataset and raw returns are studied.

To reach more robust conclusions about the existence of the PE club deal discount the CAR and BHAR should be considered, because they evaluate performance in excess of the market conditions at the time. To start, the results from Officer et al. (2010) can be confirmed with the differences between Officer club targets and sole-PE targets. The differences are significantly negative for both CAR and BHAR in all time intervals except the runup period. Officer club targets realize around 4% to 5% lower abnormal returns compared to targets of sole-sponsored prominent LBOs. When properly dividing the Officer club sample in a prominent and non-prominent subsample, interesting differences appear. Interestingly, the return differences between prominent club targets and non-prominent club targets show a similar pattern as described before. All the differences are significantly negative for both the CAR and the BHAR except for the runup period. On average, prominent club target shareholders receive about 13% lower abnormal returns than non-prominent club target shareholders when measured over the premium period. This difference increases to around 19% when considering the markup period. Moreover, the returns of non-prominent club targets and sole-sponsored PE targets do not significantly differ from each other for all time intervals and for both CARs and BHARs. These findings provide evidence in favour of the theory that clubs only have sufficient power to drive down prices when the clubs are composed of at least 2 prominent firms. However, we do not yet have enough evidence to definitively rule on the club deal discount and prominent club deal discount hypothesis and more evidence is required.

Table 3: Target percentage returns by bidder type. Panel A reports the average (median in brackets) returns for different type of acquirers. As described in the legend of Table 1. Runup is the compound return for the trading days (-42,-1). Where day 0 represents the announcement day. Markup is the compound returns for the trading days (0,+126) or the period (0,delisting date), based on which of the 2 is the shortest period. Premium is the compound return over the full (-42,+126) period. Buy-and-Hold abnormal returns (BHAR) are the target compound return minus the CRSP value-weighted market index (including dividend distributions). Cumulative abnormal returns (CAR) are the sum of the daily raw market-model residuals of the target where the market-model baseline is estimated over the (-379,-127) period given there are at least 100 data points for the baseline estimate available in CRSP. Panel B reports the differences in returns between bidder groups where ***,** and * represent whether the differences between the subsample returns significantly differ from 0 at the 1%, 5% and 10% level, respectively.

Panel A: Returns by bidder type				
	Prominent Club	Non-prominent Club	Sole-sponsored PE	Officer-Club
Raw Returns				
Runup	16.12	4.19	7.65	9.81
	[16.53]	[3.29]	[5.66]	[9.33]
CR3	11.43	20.41	22.41	15.64
	[9.86]	[14.55]	[19.42]	[12.08]
Markup	13.92	22.48	25.10	18.45
	[12.89]	[17.49]	[20.81]	[14.05]
Premium	31.42	25.8	33.17	28.45
	[31.28]	[22.15]	[30.40]	[28.15]
Number of Observations	46	49	147	95
Buy-and-Hold Abnormal Returns				
Runup BHAR	10.06	4.75	3.68	7.25
	[7.04]	[1.60]	[1.50]	[6.45]
Markup BHAR	3.34	22.91	22.25	13.69
	[5.92]	[18.81]	[20.91]	[11.79]
Premium BHAR	11.84	25.06	23.84	18.83
	[14.16]	[25.71]	[25.77]	[20.15]
Number of Observations	46	49	147	95
Cumulative Abnormal Returns				
Runup CAR	9.69	4.87	3.74	7.14
	[7.31]	[2.07]	[2.77]	[6.46]
CAR3	10.28	20.71	22.00	15.79
	[10.91]	[14.67]	[19.66]	[12.39]
Markup CAR	4.35	23.59	22.69	14.52
	[5.96]	[18.69]	[20.45]	[11.71]
Premium CAR	13.49	26.8	24.71	20.53
	[16.31]	[24.82]	[25.38]	[19.12]
Number of Observations	46	49	147	95

Table 3 *(continued)*
Panel B: Return differences between bidder types

	Prominent Club — Non-prominent Club	Non-prominent Club — Sole-sponsored PE	Officer-Club — Sole-sponsored PE
Raw Returns			
Runup	11.93***	-3.46	2.16
	[13.24]***	[-2.37]	[3.67]
CR3	-8.98**	-2.00	-6.77**
	[-4.69]**	[-4.87]	[-7.34]***
Markup	-8.56***	-2.62	-6.65**
	[-4.60]*	[-3.32]	[-6.76]**
Premium	5.62	-7.37***	-4.72*
	[9.13]*	[-8.25]	[-2.25]
Buy-and-Hold Abnormal Returns			
Runup BHAR	5.31	1.07	3.57
	[5.44]	[0.10]	[4.95]
Markup BHAR	-19.57***	0.66	-8.56***
	[-12.89]***	[-2.10]	[-9.12]***
Premium BHAR	-13.22**	1.22	-5.01*
	[-11.55]*	[-0.06]	[-5.62]*
Cumulative Abnormal Returns			
Runup CAR	4.82	1.13	3.40
	[5.24]	[-0.70]	[3.69]
CAR3	-10.43***	-1.29	-6.21**
	[-3.76]**	[-4.99]	[-7.27]***
Markup CAR	-19.24***	0.90	-8.17**
	[-12.73]***	[-1.76]	[-8.74]***
Premium CAR	-13.31***	-2.09	-4.18*
	[-8.51]**	[-0.56]	[-6.26]*

4. Multiples analysis

Thus far, this study has focussed on stock returns to determine the premium paid in a transaction. Such a method to establish the effect of an event is common in M&A research. Private equity studies, however, often do not have the possibility to implement such method, because data commonly includes transactions with private targets. For that reason, accounting multiples are regularly studied to determine the effects of takeovers. The biggest drawback of using accounting data is that there is a relatively large degree of noise in such data, especially compared to stock return data. This noise exists for several reasons, such as: differences in accounting rules, manager's accounting choices and forecast errors (Kieso et al., 2019). Furthermore, multiples analyses often suffer from omitted variable bias and lack an appropriate benchmark to formally compare abnormal deviations (Boone & Mulherin, 2011).

This paper does not have to depend on multiples analysis, because it studies deals with publicly traded targets. Nevertheless, stock price based analysis makes some assumptions that could influence the results. It does not, for example, take into account possible pre-deal stock misvaluations. Such a market inefficiency can cause distorted results in a stock price analysis, but not in a multiples analysis, because multiples are not effected by stock market sentiment. Secondly, the stock return method requires a measurement window to forecast expected market performance during the event period. The selection of such a measurement window is arbitrary and could bias the results. Lastly, implementing a multiples analysis adds robustness to this paper and increases comparability with the private equity literature. For those reasons, transaction multiples are studied in the following way.

The method that is implemented is based on the 'comparable industry transaction method' (Kaplan & Ruback, 1995). Consequently, we consider transaction multiples that are defined as enterprise value divided by total annual sales or EBITDA. Data for EBITDA and sales are taken from Compustat for the fiscal year directly preceding the announcement date. Previous literature proposes a plethora of ways to establish the enterprise value, each of those having advantages and disadvantages. For that reason, 4 different ways to calculate this value are used:

(1) $Deal\ value\ excluding\ assumed\ liabilities + total\ debt - cash$

(2) $Market\ capitalization\ at\ the\ delisting\ date + total\ debt - cash$

(3) $(Delisting\ stock\ price$
$* number\ of\ shares\ outstanding\ at\ the\ start\ of\ the\ runup\ period)$
$+ total\ debt - cash$

$$(4)\ (Price\ paid\ to\ acquire\ each\ share \\ * number\ of\ shares\ outstanding\ at\ the\ start\ of\ the\ runup\ period) \\ + total\ debt - cash$$

The differences between the 4 measures of enterprise value arise through alternative ways of calculating the market capitalization. Formulas 1 and 4 are based on deal prices from the SDC Thomson One database, whereas formulas 2 and 3 rely on CRSP data. The data on cash and total debt is measured in the fiscal year directly preceding the announcement date and is obtained through Compustat. Cash is often used by PE firms to pay a target's liabilities immediately after the acquisition (Kaplan & Stein, 1993). Subtracting cash from the market capitalization will, therefore, be a closer proxy for the value that a PE firm actually pays for, as represented by the real assets and operations. Additionally, it ensures that systematic differences in cash holdings by target firms of different acquirer types, do not influence the results (Pinkowitz et al., 2012). Ultimately, observations with a negative numerator (total annual sales or EBITDA) or negative denominator (enterprise value) are excluded and the multiples are separately winsorized at the 5% level to account for extreme values.

The discount on the transaction is calculated similarly to the method implemented in previous studies (Officer, 2007). For every PE deal in the sample, we find a matching portfolio of non-PE deals from the full sample and determine the average of the transaction multiples of the matching portfolio. Firstly, a non-PE deal is added to a portfolio if its announcement date lies within a 3 calendar year window centred around the announcement of the corresponding PE deal. In other words, the non-PE deal qualifies for a portfolio if the year of the deal is equal, 1 smaller or 1 bigger than the year of the PE deal. Secondly, the target firms of the PE and non-PE deal need to be operating in the same industry, measured through matching 2-digit SIC codes. The discount is then calculated as the percent difference between the average portfolio multiple and the PE deal transaction multiple. Importantly, this means that a negative discount corresponds to a deal where the PE target had a lower deal multiple compared to a non-PE target. A more negative difference should, therefore, be interpreted as a higher acquisition discount or a lower deal premium. To test whether these discounts significantly differ between different types of acquirers, they are used as the dependent variable in an Ordinary Least Squares ('OLS') regression analysis. The independent variables will be an acquirer type dummy and a control for target size. The regression equation will be:

$$Transaction\ multiple_i = \alpha + \beta_1 Acquirer\ type_i + \beta_2 LN(size_i) + \varepsilon$$

As mentioned earlier, the discount will be calculated in 4 different ways. The regression will be estimated with the average of those 4 values as the dependent variable. The results of the regression analysis can be found in table 9.

Panel A of table 9 reports the results of the regression analysis with the club deal dummy as the most important variable. The first column represents discounts using the EV/sales multiple and the second column uses EV/EBITDA multiples to calculate the discount. The club deal dummy shows that the difference in target transaction multiples for Officer club acquirers is significantly lower compared to the difference in target deal multiples for sole-sponsored prominent PE deals. The PE club deal discount based on transaction multiples is estimated at -10.3% to -16.2%, keeping all else equal. The magnitude of this effect is slightly larger than what is found in the stock price based method in table 8. This could be, because the multiples based regression model uses fewer independent variables than the stock price based regression models. The choice of model in the multiples based analysis is based on prior literature on this topic (Officer et al., 2010).

Panel B of table 9 reports the results of the regression analysis with the prominent club deal dummy as the most important variable. The coefficient of the dummy is negative for both the regressions, but is insignificant. Also the absolute level of the deal premium appears to be lower in the multiple analysis compared to the stock return based analysis, keeping all else equal. Those results seem conflicting, but can be explained by several factors. Firstly, the number of observations is extremely low due to the relatively small sample of club deals, the lack of comparable non-PE deals and missing Compustat data for some target firms. Secondly, multiple based analysis faces a significant amount of noise in the data, making differences more complicated to statistically prove (Officer, 2007). Such noise is also shown in the relatively low R-squared of the models in table 9.

All in all, the PE club deal discount can be found through both stock return and multiples based analysis of deal premiums. The evidence on the PE prominent club deal discount proves its existence in stock return based analysis, but is inconclusive in multiples based analysis due to the lack of relevant data and significant noise in the existing data.

Table 9: This table reports multivariate regression analysis with company performance measured through accounting multiples. The dependent variables are takeover discounts for PE sponsored deals based on the enterprise multiples: EV/sales and EV/EBITDA. The takeover discount represents the percent difference between a deal multiple of a PE deal and the average multiple of an equal weighted portfolio of deals that are not sponsored by a PE firm. If this discount is negative, the deal multiple of the PE deal is smaller than the deal multiple of the matched non-PE portfolio. Enterprise value is calculated using 4 different formulas and the dependent variable in the regressions is the average of the EV/sales and EV/EBITDA multiples, using those 4 different enterprise values. The matching portfolios contain all non-PE deals that are announced within a 3 year window from the announcement date and have the same 2-digit SIC code as the corresponding PE deal. All explanatory variables are defined in earlier tables. Standard errors are clustered by year and account for heteroscedasticity. T-values are in brackets and ***,** and * represent whether the coefficients are significant at the 1%, 5% and 10% level, respectively.

Panel A: Club deal discount regressions based on full PE sample		
Discount based on:	EV/sales	EV/EBITDA
Club deal	-16.24**	-10.30**
	[-2.11]	[-1.99]
Ln (size)	5.51	14.28***
	[-0.54]	[-3.73]
Constant	-3.85	-2.94
	[-1.25]	[-1.01]
Observations	110	98
R-squared	0.00	0.13
p-Value	0.441	0.000

Panel B: Prominent club deal discount regression based on club deal sample		
Discount based on:	EV/sales	EV/EBITDA
Prominent club	-1.50	-6.37
	[-0.21]	[-1.21]
Ln (size)	3.07	11.91
	[0.25]	[0.46]
Constant	-7.47	-2.11
	[-0.43]	[-0.09]
Observations	36	34
R-squared	0.00	0.04
p-Value	0.968	0.032

5. Takeover competition

5.1 Takeover competition data

One of the possible reasons that a PE club deal discount can exist, according to prior literature, is a difference in the level of takeover competition between different types of acquirers. Forming clubs to acquire a target arithmetically reduces the number of potentially interested parties and causes less aggressive bidding, according to models in the auction literature (Graham & Marshall, 1989; McAfee & McMillan, 1992). More informative, however, would be whether the formation of clubs also discourages parties unrelated to the club to participate in the bidding process. Such a reduction in takeover competition can depress prices in an auction for a target company, which hurts the interests of the target shareholders. The connection between reduced competition and lower deal prices is strongly substantiated in both the regulatory economics literature and the auction literature (Cramton & Schwartz, 2000; Graham & Marshall, 1989; Hendricks & Porter, 1992; Marquez & Singh, 2009). Additionally, another study on the bidding process focusses on the effects of a lack of competition on the premiums received by target shareholders (Aktas et al., 2010). More specifically, this study focusses on takeovers that occur after one-on-one negotiations, which suggests a concerning lack of competition. They find that the existence of potential but latent competition increases the premiums paid in an acquisition.

The results of Officer et al. (2010) imply that club bidding by Officer clubs could be associated with a significantly lower level of takeover competition. The main problem of the definition of an Officer club, however, is that it consists of both clubs of 2 or more prominent PE firms (prominent club) and clubs of at most 1 prominent PE firm (non-prominent club). The market power of the PE firms in a prominent club is potentially significantly larger than the market power of the PE firms in a non-prominent club, possibly explaining a prominent club's capability to meaningfully reduce competition and, thus, deal premiums.

There are several methods to proxy the level of takeover competition. The 2 most relevant methods for this study are those implemented in Officer et al. (2010) and Boone & Mulherin (2011). Using their method, Officer et al. (2010) provide results that imply a potential association between reduced competition and depressed sale prices. Boone & Mulherin (2011), however, use a different method and do not find evidence for such a relation. Furthermore, the Officer et al. (2010) method focusses on post-announcement competition, whereas Boone & Mulherin (2011) use measures that account for the entire bidding process. For that reason the method of Boone & Mulherin (2011) will be used in this study.

To test the effect of prominent club formation on takeover competition additional data is required. This data is obtained through SEC EDGAR documents. From these documents 5 measures of competition that were first used in Boone & Mulherin (2007) are obtained. These measures are: contact, confidential, indication of interest, private and public. Contact is the number of potential bidders with whom the target and its investment bank were in contact. Confidential is the number of parties that signed a confidentiality agreement and received confidential information about the target. Indication of interest is the number of potential bidders that made a non-binding offer for the target firm. Private represents the number of parties that submitted a private, binding offer for the target. Public is the number of bidders that submitted a formal offer that was reported in the financial media.

These 5 measures reflect the level of takeover competition throughout the entire bidding process and have their advantages and disadvantages as a proxy for takeover competition. Contact, for example, can include firms that are not actually able or willing to submit a competitive offer, because contacting a target is almost costless. Firms that continue in the process to signing confidentiality agreements and further do incur substantial costs through hiring legal advisors and investment banks. For that reason contact could be seen as a noisy measure of competition. A high number of contacted parties does, however, decrease the probability that a possible acquirer remains latent which could increase competition. Such advantages and disadvantages are apparent for each measure of competition and, therefore, we will not make a strong claim about the relative importance of the 5 proxies for takeover competition.

An example that further clarifies the construction of the variables is the acquisition of SumTotal. In the DEFM14A statement, filed on June 23rd 2009, we find that the target and its investment bank (Royal Bank of Canada) contacted 50 possible acquirers. Of those 50 parties, 14 signed confidentiality agreements and 4 submitted a non-binding indication of interest. 2 of those submitted a binding private offer and both of those bidders (Accel-KKR club and Vista Equity) submitted a public offer. Eventually, Vista Equity submitted the most favourable offer and acquired SumTotal.

Furthermore, SEC documents are used to determine at what stage in the bidding process the consortiums are formed. This is important, because the competitive effects of prominent clubs can only be expected once such a consortium is involved in the bidding process. We find that in 35 of the 45 (78%) prominent club deals, the winning consortium is formed in the contact or confidential stage. For the non-prominent club sample, 36 out of the 47 (77%) clubs are formed in the contact or confidential stage. These findings are consistent with practitioners statements that clubs are most often formed in early stages of negotiations (Schwartzman, 2006).

Table 5 reports the average level of takeover competition for several subsamples. Firstly, 236 of the 242 prominent PE deals had SEC EDGAR available to obtain competition data from. On average, targets or their investment banks contacted approximately 35 possible acquirers. About 12 of those signed, on average, confidentiality agreements and roughly 5 submitted non-binding indications of interest. Ultimately, 1.5 and 1.1 binding private and public offers are submitted on average, respectively. Furthermore, in the Officer club subsample, average levels of competition are similar to the values reported in Boone & Mulherin (2011) for comparable deals in the 2003-2007 period. Lastly, the level of takeover competition is lower for all 5 measures in the prominent club subsample compared to the non-prominent club subsample. This is a first indication that the target stock return differences could exist because of differences in the level of takeover competition, but further analysis is required to reach more robust conclusions.

Table 5: *Takeover competition. This table reports the average level of takeover competition through different 5 measures. The values of the measures are reported for the full PE sample and the 3 subsamples within the full PE sample. Contact is the average number of possible acquirer with which the target was in contact. Confidential is the average number of possible acquirers that signed a confidentiality agreement. Indication of interest is the average number of firms that submitted a non-binding offer for the target. Private is the average number of firms that submitted a binding private offer for the target. Public is the average number of firms that submitted an offer that was reported in the financial media.*

Measure of competition	Full prominent PE sample (N=236)	Prominent Club (N=45)	Non-prominent Club (N=47)	Officer Club (N=92)	Sole-PE (N=144)
Contact	35.41	27.20	39.28	33.37	36.72
Confidential	12.49	9.93	13.36	11.68	13.00
Indication of interest	4.68	3.53	5.32	4.45	4.83
Private	1.51	1.42	1.64	1.53	1.50
Public	1.13	1.07	1.26	1.16	1.10

5.2 *Takeover competition analysis*

To formally estimate the relation between the level of takeover competition and acquirer type, OLS regressions will be run. The regression equation that will be used is identical to the one used in Boone & Mulherin (2011):

$$Measure\ of\ Competition_i = \alpha + \beta_1 Acquirer\ Type_i + \beta_2 Target\ Size_i + \varepsilon_i$$

Where: $Measure\ of\ Competition$ is the natural logarithm of 1 of the 5 measures of competition.

$Acquirer\ Type$ is, depending on the relation that will be tested, a dummy or categorical variable. The possible acquirer types are: Officer club, Prominent club and Non-prominent club.

$Target\ Size$ is a control variable that represents the natural logarithm of the equity value of the target 64 days before the announcement date.

Panel A of Table 6 reports the results of the regression analysis on the prominent PE sample with an Officer club dummy. This dummy equals 1 if the acquiring party is a club with at least 1 prominent PE firm and equals 0 if the acquirer is a single prominent PE firm. The coefficients of the Officer club variable are insignificant with all 5 measures of takeover competition as dependent variable. This means that it can be concluded that there is no significant difference in competition between Officer clubs and sole-sponsored PE deals, consistent with the results from Boone & Mulherin (2011). Furthermore, the insignificant differences between Officer clubs and sole-sponsored PE deals match with the results on the event related abnormal returns around the announcement date of the acquisition.

Panel B of Table 6 reports the results of the regression analysis on the club deal sample with a prominent club dummy. This dummy equals 1 if the acquirer is a club of at least 2 prominent PE firms and equals 0 if the acquirer is a club with 1 prominent PE firm and at least 1 non-prominent PE firm. The dummy, therefore, reflects the difference in competition between prominent and non-prominent clubs. For 4 of the 5 measures of competition the prominent club dummy is significant, only the number of private binding offers does not significantly differ. 3 of those coefficients are significant at the 5% level and 1 is significant at the 1% level. All the coefficients are negative and, thus, imply that prominent clubs experience less competition during the takeover process compared to non-prominent clubs, keeping all else equal. These results are consistent with the abnormal return results from table 3, which is an indication that a reduction in competition for prominent clubs is an important component in the lower premiums paid by those clubs compared to non-prominent clubs.

Additionally, the regressions from panel B are replicated, controlling for the stage in the bidding process when the clubs are being formed. This control entails excluding a deal from a regression if in the corresponding stage of the bidding process the club was not yet formed. This way the competitive effects of a prominent club can be tested in a more isolated environment. These results are reported in Table 6 panel C and show an identical pattern to the results reported in panel B. Furthermore, the analysis treats the formation of (prominent) clubs as an exogenous variable. It could, however, be the case that the formation of clubs is influenced by target characteristics such as size, information complexity or past performance. For this reason we repeat our analyses and include a Heckman correction to account for a possible selection bias in the formation of (prominent) clubs (Heckman, 1979). The results of this analysis are reported in Appendix A and do not qualitatively differ from the results in panel A and B of table 6. Additionally, the coefficient of the inverted Mills ratio coefficient is

insignificant in all regressions which means that our analysis does not suffer from a selection bias for the formation of (prominent) clubs.

Lastly, panel D of Table 6 reports the results of the regression analysis on the prominent PE sample with both the prominent club and the non-prominent club dummies. The results from table 3 showed that there is no significant abnormal return difference between non-prominent club deals and sole-sponsored PE deals. This comparison for the competition results is reflected through the non-prominent club dummy in panel D. The coefficient of the non-prominent club dummy is insignificant for 3 of the 5 measures of takeover competition. 1 of the measures is significant at the 10% and 1 at the 5% level. Overall, these results do not provide convincing results that there is a difference in competition between the non-prominent club and sole-sponsored PE deals, keeping all else equal.

The evidence from panels A, B, C and D compares the level of takeover competition between 2 different groups of acquirers separately for the 5 measures of competition. These analyses, to summarize, show that competitive variation is present between the bidding processes of prominent and non-prominent club deals in 4 out of 5 competition measures, but not between the bidding processes of Officer club and sole-sponsored prominent PE deals. Furthermore, the difference in the level of competition is insignificant in the majority of competition measures for the bidding processes of non-prominent club and sole-sponsored prominent PE deals. Given the fact that the competition difference between prominent and non-prominent club deals is not significant for all measures when univariately comparing the measures, a multivariate test is run.

The test that will be used to multivariately test the level of competition between different groups of acquirers is the Hotelling T-square test (Hotelling, 1931). This test uses the Mahalanobis distance of the competition measures to determine whether the overall competition in the entire bidding process, as proxied by the 5 measures, significantly differs between the deals made by the different acquirer groups. The Mahalanobis distance could be seen as the distance of an observation to the centre of a (multivariate) dataset and, therefore, can be used to test total competition differences from multiple measures (Mahalanobis, 1936). The formula of the Hotelling T-square test is:

$$Hotelling\ T^2 = (\overline{x_1} - \overline{x_2})^T \left[S\left(\frac{1}{n_1} + \frac{1}{n_2}\right)\right]^{-1} (\overline{x_1} - \overline{x_2})$$

Where: $\overline{x_1}$ and $\overline{x_2}$ are the sample means.

$n_1$and n_2 are the number of observations in the sample.

S is the pooled covariance matrix of $\overline{x_1}$ and $\overline{x_2}$.

Given the fact that the sample that will be tested is relatively small, the critical values for the test will be stablished according to an F-distribution. To calculate the F-statistic from the Hotelling T-squared value the following formula will be used:

$$F = \frac{n-k}{k(n-1)} T^2 \sim F(k, n-k)$$

Where: $n = n_1 + n_2 - 1$

k is the number of variables used in the calculation of the Hotelling T-squared test.

The results of the Hotelling T-squared tests are reported in Table 6 Panel E. These results confirm the findings from panels A, B, C and D. The average level of competition throughout the entire bidding process is significantly different in deals where a prominent club is the acquirer compared to deals where a non-prominent club is the acquirer. Furthermore, the level of competition does not significantly differ in deals where Officer clubs are the acquirer compared to sole-sponsored prominent PE deals and in non-prominent club deals compared to sole-sponsored prominent PE deals. Additionally, the same tests are performed when excluding contact as a measure of competition, because it has been argued to be a relatively noisy measure of takeover competition. The results of these analyses are reported in Table 6 Panel F. These results do not qualitatively differ from those reported in Panel E.

All in all, the results from table 6 show similar patterns as obtained from the event study results of table 3 in both direction and significance. It can, therefore, be concluded that the competition results and the event study results are consistent. This finding provides evidence that reduced competition could play an important role in explaining the PE prominent club deal discount. We will, therefore, not reject the competition hypothesis. It is, however, difficult to provide causal evidence on the relation between the level of takeover competition and the premiums received by target shareholders due to the absence of a good instrumental variable for club formation (Bailey, 2007). But even if such an instrument was present it would be impossible to distinguish whether clubs are being formed to reduce competition and depress prices or that competition is reduced because clubs are being formed and, thus, less interested competitors remain. This lack of causal evidence calls for further research into possible explanatory characteristics that complement the competition hypothesis and provide a more complete understanding of the PE prominent club deal discount.

Table 6: *Regression analysis of takeover competition. The table reports regression analysis for several subsamples with the 5 measures of takeover competition as dependent variable. Panel A and D contain the full prominent PE sample, Panel B and C contain the club deal sample. Contact is the natural logarithm of the number of possible acquirers with which the target was in contact. Confidential is the natural logarithm of the number of possible acquirers that signed a confidentiality agreement. Indication of interest is the natural logarithm of the number of firms that submitted a non-binding offer for the target. Private is the natural logarithm of the number of firms that submitted a binding private offer for the target. Public is the natural logarithm of the number of firms that submitted an offer that was reported in the financial media. Officer Club is a dummy variable that equals 1 if the acquirer is a club containing at least 1 prominent PE firm. Target Size is the natural logarithm of the equity value of the target 64 days prior to the announcement date. Prominent Club is a dummy variable that equals 1 if the acquirer is a club of at least 2 prominent PE firm. Non-prominent Club is a dummy variable that equals 1 if the acquirer is a club that contains exactly 1 prominent PE firm and at least 1 non-prominent PE firm. Panels E and F report the results of the Hotelling T-squared test that compares means of groups based on multiple characteristics of an observation. Panel E uses all 5 measures of competition to compare the respective acquirer groups. Panel F excludes contact as a measure of takeover competition, because this variable contains significant noise. Standard errors are robust and P-values are reported in brackets and ***, ** and * represents significance at the 1%, 5% and 10% level, respectively.*

Variable	Contact	Confidential	Indication of interest	Private	Public
Panel A: Prominent PE sample; effect of an Officer Club					
Intercept	3.842***	2.411***	2.199***	0.755**	0.271
	(0.000)	(0.000)	(0.000)	(0.022)	(0.205)
Officer Club	0.038	0.018	-0.004	0.044	0.051
	(0.765)	(0.874)	(0.967)	(0.443)	(0.160)
Target Size	-0.046	-0.017	-0.066*	-0.033	-0.015
	(0.376)	(0.722)	(0.086)	(0.166)	(0.345)
Adjusted R^2	0.003	0.001	0.013	0.009	0.012
Model p-value	0.675	0.937	0.215	0.345	0.348
Observations	236	236	236	236	236
Panel B: Club deal sample; effect of a Prominent Club					
Intercept	2.347***	2.055**	2.743***	0.361	0.345
	(0.006)	(0.026)	(0.001)	(0.431)	(0.319)
Prominent Club	-0.567***	-0.337**	-0.406**	-0.149	-0.120**
	(0.001)	(0.039)	(0.011)	(0.127)	(0.040)
Target size	0.121*	0.045	-0.062	0.013	-0.004
	(0.054)	(0.503)	(0.295)	(0.701)	(0.877)
Adjusted R^2	0.106	0.044	0.123	0.026	0.057
Model p-value	0.004	0.116	0.003	0.301	0.071
Observations	92	92	92	92	92
Panel C: Club deal sample; effect of a Prominent Club; Stage of club formation control					
Intercept	0.687	1.718	2.229***	0.243	0.225
	(0.471)	(0.121)	(0.009)	(0.615)	(0.529)
Prominent Club	-0.741***	-0.347*	-0.453***	-0.140	-0.120**
	(0.002)	(0.080)	(0.006)	(0.160)	(0.040)
Target Size	0.204***	0.042	-0.053	0.011	-0.004
	(0.003)	(0.591)	(0.381)	(0.764)	(0.877)
Adjusted R^2	0.086	0.022	0.103	0.004	0.035
Model p-value	0.001	0.209	0.002	0.352	0.071
Observations	54	71	89	91	92

Panel D: PE sample; effect of a Non-prominent club

Intercept	3.401***	2.100***	1.732***	0.642*	0.146
	(0.000)	(0.002)	(0.002)	(0.064)	(0.504)
Non-prominent Club	0.216	0.144	0.185*	0.090	0.102**
	(0.111)	(0.280)	(0.096)	(0.214)	(0.042)
Prominent Club	-0.200	-0.150	-0.256*	-0.016	-0.016
	(0.233)	(0.281)	(0.055)	(0.830)	(0.657)
Target Size	-0.013	0.006	-0.032	-0.025	-0.006
	(0.813)	(0.894)	(0.422)	(0.325)	(0.727)
Adjusted R^2	0.022	0.011	0.044	0.015	0.035
Model p-value	0.069	0.298	0.008	0.316	0.136
Observations	236	236	236	236	236

Panel E: Hotelling T-squared test based on all 5 measures of competition

	Prominent Club vs. Non Prominent Club	Officer Club vs. Sole-sponsored	Non-prominent Clubs vs. Sole-sponsored
Hotelling T-squared	28.19	2.18	9.23
F-statistic	5.39	0.43	1.83
p-value	0.000***	0.829	0.114

Panel F: Hotelling T-squared test based on 4 measures of competition (excluding contact)

	Prominent Club – Non Prominent Club	Officer Club – Sole-sponsored	Non-prominent Clubs – Sole-sponsored
Hotelling T-squared	19.65	2.16	7.92
F-statistic	4.75	0.53	1.95
p-value	0.002***	0.712	0.104

6. Target differences

6.1 *Univariate analysis*

An additional reason that could explain the existence of the (prominent) PE club deal discount, is that different types of acquirers might target different types of firms. To empirically test whether such differences between targets exist and whether they influence the price that is paid in a transaction, several characteristics are studied. The possible characteristics that will be studied are variables that have been found in the differential pricing literature to be important in explaining differences in target shareholder gains (Boone & Mulherin, 2011). An important remark to make is that such an analysis cannot provide a full explanation for the club deal discount, because we can only test observable firm characteristics. It can, however, help us further understand what aspects of a target contribute to the observed differences in deal premiums.

The first possible difference we consider, is a difference in target size. Target size is calculated as the number of common shares outstanding times the stock price at close 43 days prior to the deal announcement from CRSP. This moment in time is chosen, because it is the last day before the runup period starts. It is, therefore, assumed to be the closest possible day to the announcement day that does not yet suffer any bias due to the deal announcement. Interestingly, table 7 shows that targets in Officer club deals are significantly larger than targets in sole-sponsored deals in both means and medians. Additionally, targets in prominent club deals are shown to be significantly larger than non-prominent club targets in both means and medians. This finding is particularly noteworthy, because the existing literature shows that premiums are generally lower when the target firm is relatively large (Officer, 2003; Schwert, 1996). This finding is consistent with the theory that private equity firms form clubs to acquire larger, more riskier firms.

The second variable that is analysed is the industry-adjusted Tobin's Q. The formula used to calculate the Tobin's Q has previously been defined in Kaplan & Zingales (1997):

$$Q = \frac{Book\ value\ assets + market\ value\ common\ equity - (book\ value\ common\ equity + balance\ sheet\ deffered\ taxes)}{Book\ value\ assets}$$

The firm specific Q is adjusted by subtracting the median Q ratio of all firms with the same 2-digit Standard Industrial Classification (SIC) code in the same year. A low industry-adjusted Tobin's Q means that a target is undervalued by the market relative to companies that operate in the same sector. Such an undervaluation could provide incentive to acquire such a firm, because there could be more opportunities to create value compared to high Q firms. Such efficiency improvements are especially attainable when a low Q can be linked to agency problems within a firm (Lang et al., 1989). The results in table 7 show that there is no significant difference in means between Officer club targets and sole-

sponsored prominent PE deal targets for industry-adjusted Tobin's Q. However, prominent club targets have a higher Q ratio than non-prominent club targets, measured through either means or medians. This finding provides a possible explanation for the premium differences, since a higher Q could reflect a low degree of operating inefficiencies and, thus, a lesser scope to create value.

The third variable is EBITDA/assets and measures operating efficiency. The measure shows how much revenue is made per unit of assets available. This measure is noisy when comparing different industries, due to the fact that some industries require a relatively high amount of assets. Therefore, an industry-year adjustment is performed, using the same method as for Tobin's Q. The difference in EBITDA/assets is insignificant for targets of sole-sponsored deals and Officer club deals. The difference between prominent and non-prominent club target, on the other hand, is significant for both means and medians. More specifically, prominent club deal targets have a significantly higher industry-adjusted EBITDA/assets than non-prominent club targets. This finding is consistent with the comparison of Q ratios. Non-prominent clubs seem to target more inefficient firms with a greater scope to create value.

Additionally, a measure of pre-deal leverage is studied. The measure is calculated as the book value of total debt from Compustat divided by the sum of the book value of total debt and the market value of equity. For both means and medians the 2 respective differences in pre-deal target leverage are insignificant.

Nextly, the level of institutional ownership is considered as a possible explanatory factor for the differences in premiums paid by acquirers. Institutional owners could have the time, incentive and skill to obtain a high price for their shares and, therefore, increase the deal premium. The data on institutional ownership is taken from Thomson-Reuters 13F Holdings database which provides institutional common stock holdings and transaction data. The measure of institutional ownership is calculated as the fraction of total outstanding stock that is owned by all institutions. To mitigate the effect of the deal announcement, the level of institutional ownership is calculated in the calendar quarter preceding the announcement date. Table 7 shows that the level of institutional ownership insignificantly differs between prominent and non-prominent club targets. Officer club targets, however, are for a significantly larger part owned by institutions than targets of sole-sponsored PE deals. This finding is conform the results on target size, the subsample with significantly larger targets is for a relatively larger part owned by institutions.

Furthermore, we consider 2 measures of pre-deal performance, prior 12-month return (prior 12-month buy-and-hold return) and prior 12-month buy-and-hold abnormal return. These variables are measured over the 12 months preceding the start of the runup period (trading days -294 to -43 relative

to the deal announcement). It could be the case that some type of acquirers buy relatively better performing targets which could influence the level of the deal premium. The results in table 7 show that there is no significant difference between the pre-deal performance of targets in Officer club and sole-sponsored prominent PE deals in neither means or medians. The difference between prominent and non-prominent club targets is only just significant when measured through means. This difference is not significant when measured through medians, suggesting that the difference could be driven by outliers.

Lastly, we compare the target firms based on their pre-deal risk level, measured by the prior 12 months daily return volatility. We find that targets in sole-sponsored LBOs have significantly more volatile stock returns compared to targets of Officer clubs in both means and medians. The difference between prominent and non-prominent club targets, on the other hand, is insignificant.

To conclude the univariate analysis, we found that target size, industry-adjusted Q, industry-adjusted EBITDA/assets, institutional Ownership and prior 12-month return volatility vary for the targets of different acquirer groups. They could, therefore, play a role in why the PE (prominent) club deal discount exists. To further test the robustness of the PE (prominent) club deal discount to the univariately studied variables, multivariate analyses with the earlier stated factors will be performed.

Table 7: This table reports averages (medians) for several target characteristics, by acquirer type. The third row of every variable reports the number of observations. Size is the targets market capitalization on day the before the runup period (-43 days relative to the announcement date), measured in billions of US dollars. Industry-adjusted Q is the target's Q-ratio minus the median Q of all companies that share the same 2-digit SIC code in the same year. The formula for Q is defined in Kaplan & Zingales, 1997. All accounting data is from Compustat from the fiscal year before the announcement date. Industry-adjusted EBITDA/assets is the target's EBITDA/assets minus the median EBITDA/assets of all companies that share the same 2-digit SIC code in the same year. Debt/(Debt+Equity) is the book value of the target's total debt divided by the sum of the target's book value of total debt and the target's market capitalization 43 days before the announcement date. Book value of total debt is calculated as Compustat annual data item #34 plus Compustat annual data item #9. Institutional ownership is the fraction of the target's total shares outstanding that is owned by institutions as reported in the Thomson-Reuters 13F database and measured in the quarter prior to the bid announcement, in percent. Prior 12-month return is the compound return over the target's stock in the year before the runup period (-294 to -43 days relative to the announcement date). Prior 12-month BHAR is the prior 12-month return minus the return over the CRSP value-weighted index over the same period, in percent. Prior 12-month return volatility is the standard error of the target's daily percent return in the year preceding the runup period. ***,** and * represent whether the differences between the subsample means (medians) significantly differ from 0 at the 1%, 5% and 10% level, respectively.

					Differences	
	Officer Club	Sole-sponsored	Prominent Club	Non-prominent Club	Officer Club – Sole-Sponsored	Prominent Club – Non-prominent Club
Size ($ billion)	3.34	1.28	4.91	1.86	2.06***	3.05***
	[2.02]	[0.73]	[3.05]	[1.00]	[1.29]***	[2.05]***
	95	147	46	49		
Industry-adjusted Q	0.13	-0.01	0.34	-0.05	0.14	0.39**
	[0.03]	[-0.14]	[0.23]	[-0.10]	[0.17]**	[0.33]**
	82	132	38	44		
Industry-adjusted EBITDA/assets	0.06	0.06	0.08	0.03	-0.01	0.05**
	[0.04]	[0.04]	[0.05]	[0.02]	[0.00]	[0.03]**
	82	132	39	43		
Debt/(debt+equity)	0.31	0.29	0.25	0.35	0.01	-0.10
	[0.29]	[0.29]	[0.29]	[0.29]	[0.00]	[0.00]
	85	140	40	45		
Institutional Ownership	0.78	0.73	0.78	0.79	0.05*	-0.01
	[0.84]	[0.79]	[0.83]	[0.85]	[0.05]*	[-0.01]
	94	141	46	48		
Prior 12-month return	9.76	9.38	18.67	1.39	0.38	17.28*
	[5.01]	[2.36]	[9.61]	[-0.75]	[2.65]	[10.36]
	95	147	46	49		
Prior 12-month BHAR	-2.59	-1.36	4.59	-9.33	-1.23	13.92*
	[-7.88]	[-10.13]	[-3.98]	[-9.50]	[2.25]	[5.52]
	95	147	46	49		
Prior 12-month return volatility	2.27	2.68	2.13	2.39	-0.41***	-0.26
	[2.07]	[2.34]	[1.93]	[2.18]	[-0.27]**	[-0.25]
	95	147	46	49		

6.2 Multivariate analysis

To have a more comprehensive understanding of the robustness of the PE (prominent) club deal discount with regards to the variables that were studied in our univariate analysis on deal premiums, several regressions will be estimated. The dependent variables in these regressions are: CARs in the 3 day period around the announcement date ('CAR3'), buy-and-hold abnormal markup and buy-and-hold abnormal premium. These return measures cover the full event related period as defined in section 3. The runup period is not considered separately, because, firstly, the returns in the runup period did not show any significant differences between different acquirer groups (Table 3). Secondly, the direct relation between the return level and the deal announcement is less salient in the period preceding the deal announcement which makes the runup period a more noisy measure of differential pricing. Thirdly, those 3 measures of target performance have been used in earlier literatures, which adds to the comparability of our results (Officer et al., 2010). Furthermore, these return measures with their corresponding event window lengths are suitable to study both short term (CAR3) and long term (BHAR markup and premium) effects of the takeover announcement.

The base models are an OLS regression with a return measure as dependent variable and all the variables from the univariate analysis as the independent variables. Most importantly, a dummy variable that distinguishes the 2 respective acquirer types will be added in each regression. For the variable target size we will use the natural logarithm to stay consistent with prior literature. All other variables have been discussed in earlier sections. To check whether the independent variable in the regression suffer from multicollinearity, a correlation matrix is constructed. This matrix shows that the correlation between the independent variables is generally low, so no further action is required. Finally, we include year fixed effects, cluster standard errors by year and use robust standard errors to account for heteroscedasticity in the data.

Panel A of table 8 reports the results of the regressions on the club deal sample with a prominent club deal dummy. This dummy equals 1 if the acquirer is composed of at least 2 prominent PE firms and equals 0 if the acquirer is a club with exactly 1 prominent PE firm. The first 3 columns report the baseline regression analyses. The prominent club deal coefficients are insignificantly negative for all 3 measures of stock performance. This could mean that the PE prominent club deal discount that was established in the univariate analysis is caused by differences in observable target characteristics. However, due to the relatively small sample size, there is the possibility of overfitting the model. An overfit model can result in misleading p-values, regression coefficients and R-squared measures (Babyak, 2004). We will, therefore, use the Akaike Information Criterion (AIC) to determine the optimal combination of independent variables.

Columns 4, 5 and 6 report the results of the model that was found to be the best fitting model according to the AIC-values. The model is the same as in columns 1, 2 and 3, except for the fact that the variables debt/(debt+equity), prior 12-month volatility and prior 12-month return are excluded. The coefficient of the prominent club deal dummy is significantly negative for the CAR3 and the markup BHAR measures. The coefficient in column 6 is insignificantly negative, which can be explained by the relatively high degree of noise in the runup period. Overall, the PE prominent club deal discount differs from -7.8% to -12.1% according to these regression models, keeping all else equal. This confirms that the PE prominent club deal discount from the univariate analysis is robust in a multivariate setting with controls for target size, target risk, target efficiency and year fixed effects. Furthermore, the slightly lower level of the PE prominent club deal discount indicates that the effect is partially caused by differences in target firms.

The results of the regressions on the difference between Officer clubs and sole-sponsored deals are reported in table 8 panel B. The first 3 columns report the most basic regression analyses where the club deal variable equals 1 if the acquirer is composed of multiple PE firms with at least 1 being prominent and 0 if the acquirer is a single prominent PE firm. The coefficient of the club deal coefficient is significantly negative with CAR3 as dependent variable, but insignificant when using markup and premium BHAR. This could is, similarly to the models in panel A, be caused by the use of an excessive amount of explanatory variables. A more suitable model will, therefore, be formed according to the AIC-values of the models. These results are reported in columns 4, 5 and 6. Similarly to panel A, the most optimal model is obtained when removing debt/(debt+equity), prior 12-month volatility and prior 12-month return from the model. The club deal coefficient in these models is significantly negative and differ from -4.1% to -7.9%, keeping all else equal. This confirms that the PE club deal discount from the univariate analysis is robust in a multivariate setting with controls for target size, target risk, target efficiency and year fixed effects.

Panel C of table 8 reports the results of the regressions including institutional ownership as an independent variable. The theory behind this variable states that a high level of institutional ownership would decrease the probability that a target accepts a relatively low offer. Institutions, supposedly, have the abilities and incentives to receive fair bids during negotiations (Officer et al., 2010). A high level of institutional ownership would, therefore, lead to a higher deal premium. The effect of institutional ownership would be mitigated if a bidding process is competitive, because the incremental effect of high institutional ownership decreases in such a process. For that reason, it can be hypothesised that a relatively high level of institutional ownership leads to higher deal premiums in deals with Officer clubs and prominent clubs as acquirer compared to sole-sponsored and non-prominent acquirers, respectively (Boone & Mulherin, 2011).

Panel C of table 8 reports the results of the best fitting regression models with the addition of an interaction term between the acquirer type dummy and the level of institutional ownership. Columns 1, 2 and 3 report the results of the regressions on the club deal sample with the prominent club dummy as acquirer type identifier. The coefficient for the prominent club dummy is negative and significant for all measures of returns except the noisy measure premium BHAR and varies between -6.8% and -11.9%, keeping all else equal. The interaction between the prominent club dummy and the level of institutional ownership is insignificant in all 3 regressions suggesting that the level of institutional ownership does not seem to be a reason for the differences in deal premium paid to target shareholders in prominent and non-prominent club deals. The institutional ownership variable on itself is positive and significant in all 3 regression analyses. This means that for both prominent and non-prominent club deals a higher level of institutional ownership is associated with a higher deal premium. A possible explanation for this is that higher quality targets have a bigger fraction of their outstanding shares owned by institutions.

The significantly negative club deal coefficients in columns 4, 5 and 6 show that the PE club deal discount is robust to adding the institutional ownership interaction as a variable. The coefficient of the club deal dummy varies from -19.5% to -24.7%, keeping all else equal. The interaction between the club deal dummy and institutional ownership is significantly positive for 2 out of 3 return measures. This means that the club deal discount decreases as the level of institutional ownership increases. The insignificant coefficients for the institutional variable on its own shows that its effect is concentrated among the Officer club targets and that there is no incremental effect of institutional ownership on event related returns when the acquirer is a sole PE firm.

One of the main drawbacks of the measures of competition that we studied, is that is not possible to test the multivariate version in a regression analysis, because the Mahalanobis distance describes the separation between the multivariate sample average and the observation. Therefore, it finds multivariate extreme values and gives all those extremes a large positive value. Consequently, to directly test the relation between the level of competition and the premiums paid, an alternative measure is required. Previous literature proposed pre-bid competition as an appropriate competition measure to test in a multivariate setting. This variable is an indicator that is set to 1 if there was a bid in the 6 months prior to the announcement of the winning bid (Officer et al., 2010). Panel D of Table 8 shows the results of the regressions with the pre-bid competition measure separately added as independent variable and in an interaction term with an acquirer identifying dummy. The first 3 columns include a prominent club dummy and the last 3 columns include an Officer club dummy.

The coefficients of the competition variable on its own show a counterintuitive pattern, most of them are significantly negative. This would mean that an increase in competition is associated with a lower deal premium, keeping all else equal. It can however be explained by the fact that a previous bid conveyed information to the market about a possible takeover, which could motivate investors to buy the target firm's stock. As a result, the surprise factor of the winning bid to the market is smaller, resulting in smaller return differences during the event window. In other words, the effect of the takeover is already slightly priced in when there is a bid preceding the winning bid (Officer, 2003). The coefficient of the interaction between the prominent club dummy and the measure of competition, however, is positive and significant. This shows that a higher level of competition is associated with higher premiums in deals of prominent clubs compared to deals of non-prominent clubs, keeping all else equal. This could be a sign that the additional discount that prominent club bidders receive compared to non-prominent club bidders is a surprise for the market. This shows that the PE prominent club deal discount is not being consumed by shareholders, but is an extra source of profit for the acquiring parties. This finding once again exhibits the importance of the question whether clubs are being formed with the aim of expropriating shareholders or for other, benign, reasons, or a mixture of both. Additionally, this difference as found between prominent and non-prominent club deals is not found in the comparison of Officer club deals and sole-sponsored prominent PE deals.

Panel E of table 8 reports the (prominent) club treatment effects from a propensity score matching analysis. In this analysis, the propensity scores are calculated using a probit model with the controls of Panels A and B and year fixed effects as independent variables. Furthermore, a kernel estimator is used to perform the analysis. This has as advantage that the matches are weighted, based on how close the match is. A matching analysis essentially tests the same relation between acquirer type and deal premiums, but its assumptions slightly differ from regression analysis. Its advantages over OLS regressions specifically are that it controls for selection on observables and on observably heterogeneous impacts and that it is a non-parametric test, so it does not require a specific form for the outcome equation. On the other hand, OLS regressions are more efficient if correctly specified (Sianesi, 2010). For those reasons, a matching analysis provides this study with additional robustness. The results in the first column of table 8 panel D show significantly negative club deal discounts when measured through the CAR3 and the markup BHAR. The discount is insignificantly negative for the premium BHAR, which could be explained by the noisiness of the runup period. Furthermore, the magnitude of the club deal discount is slightly smaller than the discount as measured in the multivariate regression analyses in panel B. The second column of table 8 panel E reports the results for the PE prominent club deal discount. The results are similar to those in the first column, the coefficient for the CAR3 and markup BHAR measures are significantly negative and the premium BHAR

measure is insignificantly negative. Additionally, the size of the PE prominent club deal discount using matching analysis is comparable to its size when using regression analysis.

All in all, this multivariate analysis shows that the PE (prominent) club deal discount is robust to controls for target size, target risk, target efficiency and year fixed effects. Based on these findings, we do not have evidence to reject the club deal discount and prominent club deal discount hypotheses. Furthermore, the level of institutional ownership could provide a partial explanation for the difference in premiums paid by sole sponsors and Officer clubs. This explanation, however, does not appear to hold for the differences in premiums paid between prominent and non-prominent clubs. Additionally, the results of the competitive effects of club formation on the deal premium calls for more research into the intentions of prominent PE firms to form clubs. For that reason, more research is required to verify whether there are benign reasons that can explain the PE (prominent) club deal discount that complement the explanation that the competition hypothesis provided.

Table 8: This table reports the results of the multivariate regressions explaining target returns. The dependent variables are: CAR3, markup BHAR and premium BHAR, reported in percent. The independent variables have been described in previous tables. All regressions contain year fixed effects, clustered standard error by year and heteroscedasticity robust standard errors. Panel A reports the results for the regressions on the club deal sample. Panel B reports the results of the regressions on the full prominent PE sample. Panel C reports regression results on the club deal sample in the first 3 columns and on the full prominent PE sample in the last 3 columns, including an institutional ownership interaction with the respective acquirer dummy (prominent club dummy in the first 3 columns and club deal dummy in the last 3 columns). Panel D reports regression results on the club deal sample in the first 3 columns and on the full prominent PE sample in the last 3 columns, including a pre-bid competition indicator that is set to 1 if there was a competing bid in the 6 months prior to the winning bid. Panel E reports the (prominent) club treatment effects from kernel propensity-score matching where the propensity scores are calculated using a probit model for (prominent) club formation with the controls from panels A and B and year fixed effects. T-values are in brackets and ***,** and * represent whether the coefficients are significant at the 1%, 5% and 10% level, respectively.

Panel A: Multivariate regressions explaining target returns on the club deal sample						
	CAR3	Markup BHAR	Premium BHAR	CAR3	Markup BHAR	Premium BHAR
Prominent club	-4.14	-5.11	-2.48	-9.51**	-12.06***	-7.82
	[-1.09]	[-1.05]	[-0.39]	[-2.17]	[-3.14]	[-1.55]
Ln(size)	-5.39*	-4.99	-2.58	-5.91**	-5.88**	-4.18
	[-1.77]	[-1.37]	[-0.77]	[-2.40]	[-2.12]	[1.45]
Industry-adjusted Q	-2.83	-4.38	-10.56**	-3.86*	-6.17*	-10.79**
	[-1.29]	[1.55]	[-2.55]	[-1.76]	[-1.86]	[3.06]
Industry-adjusted EBITDA/assets	41.75*	52.81**	41.81**	39.88	44.99	38.05
	[1.68]	[2.16]	[2.06]	[1.58]	[1.62]	[1.58]
Debt(debt+equity)	0.54	3.65	4.08			
	[0.14]	[0.64]	[0.47]			
Prior 12-month volatility	1.85	1.88	4.30			
	[0.35]	[0.30]	[0.70]			
Prior 12-month return	-0.03	0.50*	0.18			

	[-0.13]	[1.76]	[0.41]			
Prior 12-month BHAR	-0.07	-0.69**	-0.45	-0.11	-0.21*	-0.29**
	[-0.35]	[-2.50]	[-0.96]	[-1.50]	[1.90]	[-2.02]
Institutional Ownership	22.84**	15.21	-7.26	21.26***	6.70	8.00
	[2.47]	[1.30]	[-0.52]	[2.81]	[0.66]	[0.68]
Constant	-6.65	-11.30	8.66	-0.31	9.76	14.09*
	[-0.37]	[-0.51]	[0.42]	[-0.06]	[1.11]	[1.82]
Observations	69	69	69	70	70	70
R-squared	0.22	0.28	0.29	0.22	0.27	0.26
Adjusted R-squared	0.22	0.24	0.25	0.24	0.24	0.30

Panel B: Multivariate regressions explaining target returns on the full PE sample

	CAR3	Markup BHAR	Premium BHAR	CAR3	Markup BHAR	Premium BHAR
Club deal	-3.91*	-4.27	0.65	-4.16*	-7.90**	-5.38**
	[-1.73]	[-1.29]	[0.17]	[-1.77]	[-2.15]	[-2.09]
Ln(size)	-6.27***	-8.06***	-6.36**	-6.99***	-8.89***	-7.03*
	[-4.46]	[-3.45]	[-2.54]	[-5.19]	[5.42]	[-1.91]
Industry-adjusted Q	0.53	-1.12	-4.67**	0.71	-1.24	-4.47**
	[0.31]	[-0.62]	[-2.15]	[0.48]	[0.78]	[-2.17]
Industry-adjusted EBITDA/assets	10.72	16.96*	15.93	7.65	15.05	15.95
	[1.11]	[1.71]	[0.99]	[0.81]	[1.41]	[0.97]
Debt(debt+equity)	-1.72	-0.30	-1.97			
	[-0.32]	[-0.05]	[-0.33]			
Prior 12-month volatility	2.29	2.74	2.35			
	[0.88]	[0.68]	[0.51]			
Prior 12-month return	-0.23*	0.07	0.28			
	[-1.73]	[0.27]	[0.84]			
Prior 12-month BHAR	0.17	-0.27	-0.66**	-0.07**	-0.21***	-0.37***
	[1.24]	[1.06]	[-2.12]	[-2.45]	[-4.38]	[-4.25]
Institutional Ownership	9.88**	4.38	-3.47	9.94*	2.88	-5.00
	[1.99]	[0.93]	[-0.35]	[1.91]	[0.69]	[-0.64]
Constant	10.16	7.91	15.84	12.37***	13.49***	24.28***
	[1.58]	[0.75]	[0.97]	[3.21]	[4.28]	[4.13]
Observations	178	178	178	178	178	178
R-squared	0.25	0.34	0.37	0.25	0.33	0.37
Adjusted R-squared	0.19	0.25	0.27	0.2	0.25	0.28

Panel C: Best fitting regression models including institutional ownership interaction term

	CAR3	Markup BHAR	Premium BHAR	CAR3	Markup BHAR	Premium BHAR
Prominent club (columns 1,2,3)	-9.12**	-11.91***	-6.83	-23.50*	-24.66**	-19.51**
Club deal (columns 4,5,6)	[-2.30]	[-2.85]	[-1.30]	[-1.71]	[-2.16]	[-2.05]
Ln(size)	-6.15**	-6.55***	-4.72	-6.67***	-8.57***	-6.75***
	[-2.34]	[-2.91]	[-1.49]	[-4.58]	[-5.36]	[-3.53]
Industry-adjusted Q	-3.94*	-6.45*	-11.02***	0.33	-1.59	-5.34**
	[-1.76]	[-1.86]	[-2.91]	[0.18]	[-0.81]	[-2.42]
Industry-adjusted EBITDA/assets	39.69	44.46	37.61	9.42	16.96	17.34

	[1.58]	[1.64]	[1.52]	[0.92]	[1.48]	[1.04]
Prior 12-month BHAR	-0.12	-0.23**	-0.30**	-0.07**	-0.20***	-0.37
	[-1.47]	[-2.00]	[-2.12]	[-2.26]	[-4.25]	[-1.33]
Institutional Ownership	28.94**	28.40**	19.93*	3.64	4.57	14.00
	[2.00]	[2.03]	[1.83]	[0.46]	[0.65]	[1.33]
Prominent club * Institutional	-16.34	-16.16	-18.16	20.97	25.95*	26.39**
ownership	[-0.52]	[-0.73]	[-1.32]	[1.57]	[1.88]	[2.11]
Constant	-6.69	-8.24	9.21	18.32**	22.66***	23.27***
	[-0.47]	[-0.68]	[0.64]	[1.99]	[3.18]	[3.23]
Observations	70	70	70	178	178	178
R-squared	0.20	0.27	0.25	0.25	0.34	0.39
Adjusted R-squared	0.25	0.28	0.28	0.19	0.25	0.28

Panel D: Best fitting regression models including competition measure interaction term

	CAR3	Markup BHAR	Premium BHAR	CAR3	Markup BHAR	Premium BHAR
Prominent club (columns 1,2,3)	-8.27*	-9.08**	-8.91**	-6.09**	-5.41**	-7.62**
Club deal (columns 4,5,6)	[-1.83]	[-2.12]	[-1.99]	[-2.08]	[-2.03]	[-2.19]
Ln(size)	-5.24**	-5.15*	-3.70	-6.19***	-8.56***	-6.61***
	[-2.02]	[-1.87]	[-1.19]	[-4.92]	[-4.88]	[-3.11]
Industry-adjusted Q	-1.99	-5.03*	-11.60***	0.27	-1.27	-4.06**
	[-1.20]	[-1.68]	[-3.76]	[0.18]	[-0.81]	[-2.02]
Industry-adjusted EBITDA/assets	-9.48	22.67	32.12	12.68	13.34	13.01
	[0.47]	[1.22]	[1.69]	[1.23]	[1.22]	[0.75]
Prior 12-month BHAR	-0.14**	-0.22**	-0.28**	0.06**	-0.21***	-0.37***
	[-2.15]	[-2.38]	[-2.13]	[-2.16]	[-5.00]	[-4.52]
Pre-bid competition	-8.89**	-13.35***	1.43	-6.37*	-12.63***	0.93
	[-2.15]	[-3.16]	[0.71]	[1.82]	[-2.92]	[0.42]
Prominent club * Pre-bid	6.59**	17.91***	9.86**	0.23	1.87	-1.61
competition	[2.01]	[3.07]	[2.28]	[0.22]	[0.66]	[-0.61]
Constant	21.50***	18.30	27.76***	27.37***	18.15***	11.79
	[2.74]	[1.40]	[3.02]	[5.95]	[2.77]	[1.41]
Observations	70	70	70	182	182	182
R-squared	0.25	0.26	0.24	0.26	0.33	0.38
Adjusted R-squared	0.28	0.29	0.28	0.18	0.25	0.26

Panel E: Estimated treatment effect from propensity score matching analysis of (prominent) club effects

	Club deal effect	Prominent club effect
CAR 3	-8.32***	-8.08*
	[-2.99]	[-1.79]
Markup BHAR	-10.51***	-12.66***
	[-2.77]	[-2.40]
Premium BHAR	-5.11	-6.37
	[-1.09]	[-1.04]

7. Financing credibility & Benign motivations

7.1 Financing credibility

Another possible explanation for the PE (prominent) club deal discount is a difference in financing credibility. It could be the case that prominent clubs present targets offers that provide more certainty about the club's capability of funding the transaction than non-prominent clubs. If the target is provided with more certainty about the probability that the transaction will take place, it could be inclined to accept a lower offer price.

To study this, we further read proxy statements to verify whether there are differences in the credibility of offers. These proxy statements are accessed through the SEC EDGAR database. From the proxy statements we collect information on 2 different measures of financing credibility. Firstly, we establish what amount of funding is required to fund the entire transaction and how much of those funds is already formally committed at the moment that the proxy statement is released. Secondly, we measure what fraction of the total committed funding is composed of equity commitments. It could be hypothesized that prominent PE firms should be able to obtain more debt financing, because the reputation of multiple prominent PE firms are attached to the deal. A relatively high fraction of equity financing could, therefore, be seen as a less credible offer.

Panel D of table 10 shows what fraction of the total required funding is already committed at the moment that the proxy statement was released. For prominent club deals 100.1% of the funds required to cover all costs of the transaction are committed, according to their respective proxy statements. For non-prominent club deals this is 100.0%. The difference between these groups is statistically indistinguishable and, therefore, suggests no difference in financing credibility. Additionally, the fraction of deals where the committed money is smaller than the required funding is slightly higher for non-prominent club deals (35.7%) compared to prominent club deals (21.2%). The difference, however, is not significant, possibly due to the small sample size. Furthermore, the results on the differences between Officer clubs and sole-sponsored prominent PE deals are similar. Officer clubs, on average, have 100.0% of the required funds committed, compared to 101.7% for sole-sponsored prominent PE deals. 27.9% of the Officer club deals is not yet fully financed at the release of the proxy statements compared to 22.1% of sole-sponsored prominent PE deals. Both the differences between Officer club and sole-sponsored prominent PE deals are insignificant.

Panel E of table 10 shows what fraction of the deals made by the different acquirer types is equity financed. Prominent clubs have an average of 32.9% of their deals financed by equity compared to 39.2% for non-prominent clubs. The difference is significant at the 10% significance level and is also

when considering medians. This shows that there is some evidence in favour of the hypothesis that prominent clubs are able to obtain a higher amount of debt financing than non-prominent clubs, because the reputation of multiple PE firms is attached to the deal. This effect is not found when studying the differences between Officer club and sole-sponsored prominent PE deals. Officer club deal are financed by, on average, 35.6% equity which insignificantly differs from the 34.5% for sole-sponsored prominent PE deals.

To conclude, the financial credibility of offers by different acquirer types is seemingly no strong explanation for differences in deal premiums. Prominent club offers are composed of slightly more debt than non-prominent club offers. This could be a first indication that prominent clubs are being perceived as less risky by debt providers and, therefore, are more credible acquirers than non-prominent clubs. This evidence, however, is weak and is not supported by the analysis of the total committed funding compared to the total required funding. Furthermore, the differences between Officer club and sole-sponsored prominent PE deals are insignificant in both analyses. We therefore conclude that the financial credibility of the offers is not a suitable explanation for the PE (prominent) club deal discount.

7.2 Capital constraints

Since competitive effects of club formation can both be due to good and bad intentions of PE firms or a mixture of both, we should study whether there are motivations that can solely be seen as benign. One possible benign reason to engage in (prominent) clubbing activities is capital constraints. If a single firm is unable to raise enough funding to finance a particular deal, it could attempt to join forces with a third party to close the deal nonetheless. It should, therefore, be studied whether capital constraint can empirically be found as a reason to form clubs.

Table 7 shows that Officer club targets are significantly larger than non-prominent club targets, which could be an indication that capital constraints make the formation of a club more likely. Tables 8 and 9, on the other hand, show that the PE (prominent) club deal discount is robust to a target size control. For that reason, capital constraints are unlikely to provide a full explanation for the lower deal premiums, but could still provide a partial explanation.

The empirical study of the capital constraints motivation is based on Boone & Mulherin (2011). The question that they try to answer is: How many club deals are large enough that the private equity firms involved likely could not have acquired the target without pooling resources (Boone & Mulherin, 2011, p. 236)? To study this we check whether any of the PE firms in a club deal made a PE deal in a 5 year window centered on the announcement date that was larger than the corresponding club deal.

Where deal size is calculated according to formula (1) for enterprise value from section 6. If the club deal is larger than any sole-sponsored PE deal by any of the club members during the test period, capital constraints could have been the motivation to form the club.

Table 10 panel C demonstrates that only 23 of 79 (29.1%) Officer club deals could be motivated by capital constraints. For prominent and non-prominent clubs, those percentages are 36.1% and 21.1%, respectively. Furthermore, if the last 2 years of the sample, which lack a full comparison window, are excluded from the analysis, the percentage of club formations that could be motivated by capital constraints remains relatively unchanged. The frequency where capital constraints are possibly a factor in club formation insignificantly differs between prominent and non-prominent clubs. Additionally, the abnormal returns of deals where the club could be formed for capital constraints reasons do not significantly differ from deals that do not qualify as motivated by capital constraints, for all club types. It can, therefore, be concluded that capital constraints seem unlikely to be a motivation for PE firms to engage in club deal activity.

7.3 Risk sharing

Secondly, sharing the risks involved in the acquisition of a target could provide a benign reason to engage in (prominent) clubbing. If this would be the case, we would expect to find that sole-sponsored prominent PE and non-prominent club deal targets are significantly less risky than Officer club and prominent club deal targets, respectively. Table 7 showed that, on average, Officer clubs acquire targets with significantly lower return volatility compared to prominent PE firms that operate on their own, measured over the year directly preceding the deal announcement. This measure of risk was not found to differ between prominent and non-prominent club deal targets. Return volatility is, however, just 1 way of measuring the risks involved in the acquisition of a target. To provide more conclusive and direct findings on the importance of risk in the formation of clubs, additional measures of risk will be studied.

Information asymmetry surrounding the target will be the first measure of risk we will investigate as a measure of target risk. If there is a high level of information asymmetry, it will be more difficult to value a target. We proxy for information asymmetries through analyst forecast errors from the Institutional Brokers Estimate System ('IBES'). We calculate several measures for forecast errors of the 1 year ahead Earnings Per Share ('EPS') estimation for the fiscal year directly preceding the deal announcement. To ensure that a forecast is supported by a sufficient number of analysts, observations with less than 3 analysts are excluded (Chang & Palepu, 2000; Coën et al., 2009). Furthermore, the data is corrected for outliers by removing forecasted EPS changes in excess of 100% (Capstaff et al., 1998). The measures of forecast errors that will be studied are:

$$Absolute\ Forecast\ Error\ ('AFE') = \frac{Actual\ EPS - Median\ Forecasted\ EPS}{|Actual\ EPS|}$$

$$Mean\ Absolute\ Deviation\ ('MAD') = \frac{\sum|Actual\ EPS - Median\ Forecasted\ EPS|}{Number\ of\ Observations}$$

$$Mean\ Square\ Error\ ('MSE') = \frac{\sum(Actual\ EPS - Median\ Forecasted\ EPS)^2}{Number\ of\ Observations}$$

$$Mean\ Absolute\ Percentage\ Error\ ('MAPE') = \frac{\sum\left(\frac{Actual\ EPS - Median\ Forecasted\ EPS}{Actual\ EPS}\right)}{Number\ of\ Observation} \times 100\%$$

Both measures based on mean and median forecasts are evaluated for robustness, even though the choice between those 2 types of measures does not qualitatively influence the results (Coën et al., 2009).

The values for the 4 different measures of forecast errors are reported in panel E of table 10. The differences between Officer club targets and sole-sponsored prominent PE targets are not visible through the MAD and MSE measures. The AFE and MAPE measures do differ slightly, but the differences are insignificant. For prominent and non-prominent club targets, the values for the AFE, MAD and MSE are similar, but the values for the MAPE seem to differ. The differences are, however, not significant.

An additional measure of target risk is target complexity. If a company operates in multiple sectors, there are fewer comparable firms to determine the value of the target. Thus an increased target complexity can be seen as increased acquisition risk. For that reason, we will investigate whether there are differences in the amount of business segments that are reported in the Compustat segment files for the fiscal year directly preceding the deal announcement. The results of this analysis is reported in panel E of table 10. 2.16 segments are, on average, reported for Officer club targets compared to 2.17 for targets of single prominent PE firms. For prominent club targets an average of 2.24 business segments is reported compared to 2.10 for non-prominent club deal targets. The difference between targets of Officer clubs and single prominent PE firms and the difference between targets of prominent and non-prominent clubs are insignificant.

Lastly, we study a measure of operating risk. To proxy for operating risk the volatility of EBITDA/assets is investigated. A largely volatile capability to create value from its assets could reflect uncertainty about the target's operations and, therefore, uncertainty about its value. Specifically, the measure is defined as the volatility of EBITDA/assets for a period of up to 10 years preceding the announcement date, with a minimum of 5 years of available data in Compustat. The results are reported in panel C of table 10. Officer clubs targets empirically show an EBITDA/assets volatility of 6.28%, which

insignificantly differs from the 7.05% for targets of sole-sponsored prominent PE deals. Furthermore, the operating risk measure is 5.13% for prominent clubs and 7.21% for non-prominent clubs, which is an insignificant difference as well.

All in all, we studied several components of acquisition risk and only found a significant difference between prominent and non-prominent club deal targets for the prior 12-month return volatility. None of the other measures, however, showed any significant results for both the differences between Officer club and sole-sponsored targets, and prominent and non-prominent club deal targets. Additionally, unreported regression analyses shows that the studied measures of risk have an insignificant effect on the level of the deal premiums. We, therefore, conclude that sharing the risks involved in acquiring their targets is not found to be a convincing reason to form clubs.

Table 10: This table reports the results on the analyses on financing credibility, capital constraints and risk sharing theories. Panel A shows what percentage of the total required funding to complete the deal is committed at the moment the definitive proxy statement is issued to the shareholders. Additionally, it reports the number of times that the committed funds are more, less or exactly the amount needed to cover all costs involved in the acquisition. Panel B shows what percentage of the total committed financing is composed of equity commitments. The data for the results in panels A and B are retrieved from the SEC EDGAR database. Panel C and D report the number of times the size of a club deal exceeds the deal size of the largest sole-sponsored PE deal by any of the club members in a 5 year window [-2,2 Y] centered on the club deal announcement. Panel C includes the entire sample, whereas panel D excludes the last 2 years to ensure all deals have a full 5 year test period. Data on the LBOs made by the PE firms are retrieved from the ThomsonOne and Preqin databases. Panel E reports, by acquirer type, the measures of several risk characteristics of the target firms. MAE, MAD, MSE and MAPE are measures of information asymmetry surrounding the target measured through analyst forecast error from the IBES database. Number of segments is the number of segments reported in the Compustat segments database. Operating risk is proxied by the volatility of EBITDA/assets for up to 10 years prior to the announcement date (minimum of 5 years), as reported in Compustat.

Panel A: Total financing committed as a percentage of the total financing needed				
	Officer club	Sole-sponsored	Prominent Club	Non-prominent Club
Mean	100.0	101.7	100.1	100.0
Median	100.0	100.0	100.0	100.0
Under	17	17	7	10
Over	22	25	12	10
Equal	22	35	14	8
N	61	77	33	28
Panel B: Equity commitments as a percentage of the total amount of committed financing				
	Officer club	Sole-sponsored	Prominent Club	Non-prominent Club
Mean	35.6	34.5	32.9	39.2
Median	34.1	32.8	30.7	39.1
N	72	84	36	36
Panel C: Number of times and percentage that enterprise value exceeds largest deal in 5 year window (2000-2018) exceeds largest deal in 5 year window (2000-2020)				
	Officer club		Prominent Club	Non-prominent Club
Number of observations	23		13	10
Percentage	29.1		36.1	23.3
Panel D: Number of times and percentage that enterprise value exceeds largest deal in 5 year window (2000-2018)				
	Officer club		Prominent Club	Non-prominent Club
Number of observations	22		12	10
Percentage	28.6		34.3	23.8
Panel E: Target risk measures by acquirer type				
	Officer club	Sole-sponsored	Prominent Club	Non-prominent Club
Median Absolute Forecast Error (MAE)	0.09	0.12	0.08	0.10
Mean Absolute Deviation (MAD)	0.13	0.13	0.12	0.13
Mean Square Error (MSE)	0.04	0.04	0.03	0.05
Mean Absolute Percentage Error (MAPE)	11.21	13.60	9.74	12.27
Number of segments	2.16	2.17	2.24	2.10
Operating risk	6.28	7.05	5.13	7.21

8. Conclusion

This paper shows that Officer clubs pay significantly lower acquisition premiums than prominent PE firms that operate on their own; a PE club deal discount. Targets of Officer clubs realize 4% to 5% lower event related abnormal returns and 20% to 47% lower deal premiums compared to targets of sole-sponsored prominent LBOs. We find that this effect is concentrated amongst prominent clubs, acquirers that are composed of at least 2 prominent PE firms; a PE prominent club deal discount. These prominent clubs pay significantly lower deal premiums than non-prominent clubs, acquirers that are composed of 1 prominent PE firm and at least 1 non-prominent PE firm. This difference is large and significant, the differences in target abnormal returns are 10% to 20% and the deal premiums for prominent clubs are about 100% lower than those paid by non-prominent clubs. These findings are robust to controls for target size, Tobin's Q, past performance, institutional ownership, riskiness, efficiency and time fixed effects. The main conclusions are based on stock return analyses, but are robust to transaction multiples as measure of deal pricing.

We also find that there are significant differences in the level of competition in the bidding processes of prominent and non-prominent clubs. These differences are conform our results on deal premiums, prominent clubs experience significantly less competition throughout the entire bidding process compared to non-prominent clubs. Another explanation based on the financing credibility of offers by different acquirer types was not proven through our data. Additionally, we did not find any evidence on benign motivations to form clubs based on capital constraints or diversification. This being said, it could be the case that clubs are formed for unobservable reasons, but as researchers we can only study factors that are observable for outsiders. This could particularly be an issue, because there is no instrumental variable to definitively prove a causal link between deal pricing and club formation. It is, therefore, not feasible for an outsider to determine whether PE firms cooperate with the intention of depressing sale prices or that an unobservable benign reason motivates PE firms to syndicate, with lower deal premiums as a result. Our results do, however, show that regulatory institutions that are concerned about shareholder expropriation through collusive efforts of PE firms should focus their investigation on deals that involve prominent clubs.

This paper does not study the social welfare effects of the altered welfare distribution due to club deal activity. It could be the case the expertise brought into target companies by PE firms is of such value that overall social welfare could increase. Earlier studies have shown that PE activity can have a significantly positive effect on total social welfare (Gurung & Lerner, 2008). It has, however, not yet been studied whether (prominent) clubs as acquiring party have an effect on the total social welfare. This could be an interesting avenue for future research.

Bibliography

Aktas, N., de Bodt, E., & Roll, R. (2010). Negotiations under the threat of an auction. *Journal of Financial Economics*, *98*(2), 241–255.

Babyak, M. A. (2004). What You See May Not Be What You Get: A Brief, Nontechnical Introduction to Overfitting in Regression-Type Models. *Psychosomatic Medicine*, *66*(3), 411–421.

Bailey, E. (2007). Are private equity consortia anticompetitive? The economics of club bidding. *The Antitrust Source*, *6*(4), 1–8.

Bain & Company. (2019). *Global Private Equity Report 2019*.

Barber, F., & Goold, M. (2007). The strategic secret of private equity. *Harvard Business Review*, 53–61.

Bargeron, L. L., Schlingemann, F. P., Stulz, R. M., & Zutter, C. J. (2008). Why do private acquirers pay so little compared to public acquirers? *Journal of Financial Economics*, *89*(3), 375–390.

Boone, A. L., & Mulherin, J. H. (2011). Do private equity consortiums facilitate collusion in takeover bidding? *Journal of Corporate Finance*, *17*(5), 1475–1495.

Brander, J. A., Amit, R., & Antweiler, W. (2002). Venture-capital syndication: Improved venture selection vs. The value-added hypothesis. *Journal of Economics & Management Strategy*, *11*(3), 423–452.

Capstaff, J., Paudyal, K., & Rees, W. (1998). Analysts' forecasts of German firms' earnings: A comparative analysis. *Journal of International Financial Management and Accounting*, *9*(2), 83–116.

Chang, J. J., & Palepu, K. G. (2000). Analyst activity around the world. *Working Paper (Wharton School and Harvard Business School)*.

Coën, A., Desfleurs, A., & L'Her, J.-F. (2009). International Evidence on the Relative Importance of the Determinantsof Earnings Forecast Accuracy. *Journal of Economics and Business*, *61*(6), 453–471.

Cramton, P., & Schwartz, J. (2000). Collusive bidding: Lessons from the FCC spectrum auctions. *Journal of Regulatory Economics*, *17*, 229–252.

Du, Q. (2009). Birds of a feather or celebrating differences? The formation and impact of venture capital syndication. *SSRN*.

Graham, D., & Marshall, R. (1989). Collusive bidder behavior at single-object second-price and english auctions. *Journal of Political Economy*, *95*, 1217–1239.

Gurung, A., & Lerner, J. (2008). The Global Economic Impact of Private Equity Report. *World Economic Forum*.

Dahl v. Bain Capital Partners LLC, (UNITED STATES DISTRICT COURT DISTRICT OF MASSACHUSETTS March 2015).

Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica*, *47*, 153–161.

Hendricks, K., & Porter, R. (1992). Joint bidding in federal OCS auctions. *American Economic Review*, *82*, 506–511.

Hochberg, Y. V., Ljungqvist, A., & Lu, Y. (2007). Whom you know matters: Venture capital networks and investment performance. *The Journal of Finance*, *62*(1), 251–301.

Hotelling, H. (1931). The economics of exhaustive resources. *Journal of Political Economy*, *39*(2), 137–175.

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review*, *76*(5), 323–329.

Kaplan, S. N., & Ruback, R. S. (1995). *The valuation of cash flow forecasts: An epirical analysis. 50*(4), 1059–1093.

Kaplan, S. N., & Stein, J. C. (1993). The evolution of buyout pricing and financial structure in the 1980s. *The Quarterly Journal of Economics*, *108*(2), 313–357.

Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2019). *Intermediate accounting* (3rd ed., Vol. 2). Wiley.

Lang, L. H., Stulz, R. M., & Ralph, A. (1989). Managerial Performance, Tobin's Q and the Gains from Successful Tender Offers. *Journal of Financial Economics*, *24*, 137–154.

Lerner, J. (1994). The syndication of venture capital investments. *Finanacial Management*, 16–27.

Lyon, J. D., Barber, B. M., & Tsai, C. L. (1999). Improved methods for tests of long-run abnormal stock returns. *The Journal of Finance*, *54*(1), 165–201.

Mahalanobis, P. C. (1936). On the generalized distance in statistics. *National Institute of Science of India*.

Markham, I. (2018, May 3). *Risers and faller over a decade of the PEI 300*. https://www.privateequityinternational.com/risers-fallers-decade-pei-300/

Marquez, S., & Singh, R. (2009). The economics of club bidding in private equity. *Boston University*.

McAfee, R. P., & McMillan, J. (1992). Bidding rings. *Journal of Economics & Management Strategy*, *2*, 449–482.

Muller, H. M., & Panunzi, F. (2004). Tender Offers and Leverage. *The Quarterly Journal of Economics*, *119*(4), 1217–1248.

Officer, M. S. (2003). Termination fees in mergers and acquisitions. *Journal of Financial Economics*, *69*(3), 431–467.

Officer, M. S. (2007). The price of corporate loquidity: Acquisition discounts for unlisted targets. *Journal of Financial Economics*, *83*(3), 571–598.

Officer, M. S., Ozbas, O., & Sensoy, B. A. (2010). Club deals in leveraged buyouts. *Journal of Financial Economics*, *98*, 214–240.

Perry, S. E., & Williams, T. H. (1994). Earnings management preceding management buyout offers. *Journal of Accounting and Economics*, *18*(2), 157–179.

Phalippou, L. (2009). Beware of Venturing into Private Equity. *Journal of Economic Perspectives*, *23*(1), 147–166.

Pinkowitz, L., Stulz, R. M., & Williamson, R. (2012). Multinationals and the high cash holdings puzzle. *National Bureau of Economic Research*, *No. w18120*.

Ruback, R. S. (1988). Do target shareholders lose in unsuccessful control contests? *Corporate Takeovers: Causes and Consequences*, 137–156.

Schwartzman, E. (2006). What it takes to make a consortium work. *Financial Law Review*, *25*, 99–102.

Schwert, G. W. (1996). Markup pricing in mergers and acquisitions. *Journal of Financial Economics*, *41*(2), 153–192.

Sianesi, B. (2010, June 25). *An introduction to matching methods for causal inteference and their implementation in Stata*. https://www.stata.com/meeting/germany10/germany10_sianesi.pdf

Appendix A: *Competition analysis with Heckman correction to correct for possible selection bias. Panel A reports the results of the probit regressions that a target is acquired by a club. The first column reports results for the prominent club sample and the second column reports results for the Officer club sample. The independent variable are target size is the natural logarithm of the equity value of the target firm 64 days before the deal announcement. Return standard deviation is the standard deviation of the raw returns of the target's stock in the period 1 year to 64 days before the deal announcement. Number of segments is the number of segments that the target operates in, reported the year before the deal announcement in Compustat. Panel B and C report the regression analyses analysis for several subsamples with the 5 measures of takeover competition as dependent variable including a Heckman correction. Standard errors are robust and P-values are reported in brackets and ***, ** and * represents significance at the 1%, 5% and 10% level, respectively.*

Variable	Coefficient (Prominent club)	Coefficient (Officer club)
Panel A: Probit regression of the likelihood a target firm is acquired by a (prominent) club		
Intercept	-6.475***	-4.507***
	(0.001)	(0.002)
Target size	0.431***	0.312***
	(0.000)	(0.001)
Return standard	-0.011	-0.034
deviation	(0.961)	(0.754)
Number of segments	0.131	-0.009
	(0.434)	(0.923)
Likelihood ratio χ^2	11.23	15.48
p-value of χ^2	0.010	0.002
Pseudo-R^2	0.11	0.06
Number of observations	73	196

Variable	Contact	Confidential	Indication of interest	Private	Public
Panel B: Prominent PE sample; effect of an Officer Club with Heckman correction					
Intercept	2.730	-2.878	3.682	-1.741	-1.525
	(0.769)	(0.699)	(0.499)	(0.569)	(0.424)
Officer Club	0.081	0.110	0.098	0.052	0.038
	(0.550)	(0.358)	(0.353)	(0.422)	(0.323)
Target Size	0.010	0.272	-0.141	0.105	0.081
	(0.984)	(0.507)	(0.640)	(0.535)	(0.441)
Inverted Mills ratio	0.313	1.273	-0.447	0.599	0.457
	(0.888)	(0.473)	(0.729)	(0.414)	(0.314)
Adjusted R^2	0.059	0.015	0.095	0.002	0.049
Model p-value	0.767	0.695	0.642	0.523	0.431
Observations	196	196	196	196	196
Panel C: Club deal sample; effect of a Prominent Club with Heckman correction					
Intercept	6.014	1.312	11.307***	-1.025	-2.573**
	(0.155)	(0.744)	(0.001)	(0.691)	(0.045)
Prominent Club	-0.515***	-0.335**	-0.360**	-0.147	-0.110*
	(0.007)	(0.045)	(0.033)	(0.193)	(0.091)
Target Size	-0.139	0.066	-0.573***	0.091	0.156**
	(0.573)	(0.775)	(0.004)	(0.547)	(0.044)
Inverted Mills ratio	-0.628	0.141	-0.884	0.180	0.287
	(0.461)	(0.865)	(0.358)	(0.727)	(0.128)
Adjusted R^2	0.001	0.002	0.001	0.004	0.006
Model p-value	0.055	0.508	0.015	0.550	0.040
Observations	72	72	72	72	72