Double Degree - Master of Science in Finance

Università Commerciale Luigi Bocconi
& Stockholm School of Economics

Private Equity Club Deals:
Reasons for Club Formation and its Impact on Pricing

Part 1: A global perspective with evidence from the U.S. and Europe

Part 2: A European perspective with evidence from the Nordics

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Master of Science Thesis in Finance

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Part 1: A global perspective with evidence from the U.S. and Europe

Abstract: The thesis examines the motivating drivers for private equity firms to form a club in which they team up with other private equity firms to jointly acquire a company and the impact of club deals on pricing compared to single-sponsored deals. To this end, a sample of 3,628 private equity transactions in the U.S. and Europe announced between 1996 and 2021 is analysed. In particular, we focus on motivational and pricing differences between public-to-private and private-to-private deals, between U.S. and European transactions as well as between transactions sponsored by prominent private equity players, i.e., sponsors who potentially have the capabilities and market power to effectively impact the takeover price during the bidding process, and their non-prominent counterparts. The results show that capital constraints, deal complexity, weak creditor rights, and target firm risk increase the likelihood that private equity firms will jointly acquire a firm. In addition, 2006 and 2014 represent important structural gaps in the decision to form clubs. This suggests that investigations by the U.S. Department of Justice and lawsuits filed against private equity firms for collusive behaviour influenced the decision to club together. By analysing a subsample of 1,809 transactions with available EBITDA multiples, we find evidence of a general club deal discount: Transactions with multiple private equity buyers are priced lower than similar transactions with only one private equity buyer. The club deal discount is especially pronounced for public-to-private transactions and disappears in private-to-private transactions. This finding provides evidence in support of the hypothesis that concentrated ownership can mitigate the club deal discount and extends previous research finding that higher institutional ownership of listed target firms has similar effects on pricing.

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1. Introduction

1.1. Topic of the thesis

The private equity industry is amid its third boom period after the upcoming of high-yield bonds supported the first emergence of leveraged buyouts (LBOs) in the 1980s and after the golden era of mega buyouts preceding the financial crisis of 2008.

In detail, global deal volume doubled in 2021 and exceeded the $1tn mark for the first time, surpassing the old record from 2006 by more than $300bn. With new highs in global dry powder of $3.4tn, exit volume of buyouts around $1tn – beating the old record by 84% – and the second-best year ever in terms of buyout fundraising, 2021 marks the peak of the private equity industry so far. Interestingly, the main driver why is deal size: The average transaction size increased by 57% and exceeded the $1bn threshold for the very first time (Bain & Company, 2022).

Closely related to this is the comeback of club deals – investments in which multiple private equity firms syndicate to jointly acquire a target firm. Club deals peaked before the financial crisis representing more than 70% of the capital invested in buyouts with a transaction size over $1bn in 2005. While in the four years preceding, 40% of all LBOs in the U.S. were club deals, the popularity of such deals has subsequently declined sharply. In 2018, club deals represented only 20% of LBOs in the U.S. and 17% in Europe (Fernyhough & Klees, 2018).

The U.S. Department of Justice (DOJ) started an inquiry in 2006 investigating potential collusion among the biggest private equity firms in the United States. Moreover, shareholders of eight portfolio companies accused the financial investors to collaborate during bidding processes rather than to compete against each other leading to anti-competitive behaviour and ultimately lower purchase prices (Braithwaite, 2014; Sender, 2014). While the DOJ inquiry was not further pursued, the collusion lawsuit was only settled in 2014 with Bain Capital, Blackstone, The Carlyle Group,

Goldman Sachs, KKR, Silver Lake and TPG paying $590.5m (Canada, 2014). A general slowdown in the private equity market after the financial crisis, a push from limited partners for co-investments, and prominent club deal bankruptcies rendered club deals unpopular from the perspective of both limited partners and target companies (Dowd, 2021). A telling example of this development was General Electric's auction for the sale of its plastics division in 2007, when the firm had private equity bidders sign an agreement that they could not discuss club formation without its consent (Kranhold & Smith, 2007). Furthermore, some of the major pre-financial crisis club deals such as the buyouts of Energy Future Holdings for $45bn, Caesars Entertainment for $28bn, and Toys R Us for $6.6bn filed for bankruptcy between 2014 and 2017, casting doubt on the performance and advantages of club deals (McElhaney, 2021).

However, club deals made a fulminant comeback in 2021: The $34bn buyout of Medline by Hellman & Friedman, Blackstone and Carlyle marks the largest club deal since the financial crisis. Additionally, private equity firms have teamed up for several other acquisitions, including those of Ellucian, Autostrade per l'Italia, Zooplus, Miller Insurance Services, Nielsen, and Signature Aviation (Lewis, 2021; McElhaney, 2021). As a result, private equity firms were responsible for 19% of the global M&A activity in 2021, the highest level since 2006 – the era of the last club deal wave (Bain & Company, 2022). One possible reasons for the comeback of club deals might be that the Covid-19 pandemic caused many traditional debt lenders to pull out of financing private equity-backed acquisitions. As a result, buyouts required larger equity stakes, which in turn needed several private equity firms. In addition, club deals should enable private equity firms to buy larger and riskier targets and deploy their capital more quickly by pooling it. This would prove particularly handy as the private equity industry has plenty of dry powder waiting to be invested (Dowd, 2021).

1.2. Positioning within relevant literature

Based on this renewing trend, this research thesis takes a novel look at the formation and pricing of club deals. Thereby, it offers new insights and significant contributions to the current research frontier which is only focused on U.S. public-to-private club deals.

The academic discussion about club deals revolves around whether private equity firms form a consortium during the bidding process for a target company to reduce competition and thus pay a lower purchase price, or whether other, more benign reasons lead to the formation of a club. This discussion arose in the wake of the DOJ investigation and the class action lawsuits that accused private equity firms of this very behaviour. In short, the debate relates to whether clubbing results from collusion to reduce the purchase price or whether clubbing leads to more competition.

Most research in the private equity field focuses on buyouts in general without distinguishing between single-sponsored and club deals. As of now, the related research which focuses on private equity club deals from an empirical point of view consists mainly of two papers: Officer et al. (2010) analyse 201 LBOs of U.S. publicly traded targets with a deal value greater than $100m between January 1984 and September 2007 completed by the 50 largest, so-called prominent, private equity firms. They find that target shareholders receive 40% lower premiums in club deals compared to sole-sponsored LBOs. Such club deal discounts are predominantly concentrated before 2006. Moreover, both sales and EBITDA multiples are significantly lower in club deals prior to the DOJ investigation in 2006. These results are clearly in favour of the collusion argument pointed out above. Contrary results, however, have been published by Boone & Mulherin (2011) who also analysed whether joint bidding by private equity consortiums facilitates collusion in M&A processes. They analyse a sample of 870 public-to-private transactions in the U.S. from 2003 to 2007. Their results suggest that private equity consortiums are associated with significantly greater levels of takeover competition than other types of bidders. They do also not find

any evidence that consortiums formed by prominent private equity firms have any negative effects on either takeover competition or target returns.

Both Officer et al. (2010) and Boone & Mulherin (2011) note that their sample consists exclusively of public-to-private transactions and that if one considered private-to-private transactions as well, the conclusions could be different. Furthermore, the two studies focus only on acquisitions of U.S. based targets and the impact of the DOJ investigation in 2006. The main contribution of the following research thesis is the use of a comprehensive sample consisting of 3,628 public and private transactions from both the U.S. and Europe from 1996 until 2021. First, the longer time horizon enables to investigate the long-term aftermath of the DOJ investigation in terms of pricing as well as the effects of the lawsuit settlements in 2014. Are private equity firms less inclined to collude to avoid a second lawsuit post-2014 or do they feel that collusive behaviour is less in the public eye anymore after the lawsuits have been settled? Second, the inclusion of European based targets allows for geographical cross-comparisons enabling a deeper understanding of any potential club deal discount and when private equity firms choose to team up to acquire a target firm jointly. Additionally, further insights whether the DOJ investigation in the U.S. and the lawsuits together with their settlements had any cross-impact on European club formation and pricing. Third, the fact that not only public-to-private deals but also private-to-private deals are analysed gives a more comprehensive and detailed insight into the overall private equity market since private transactions account for most deals in the industry. Relatedly, we test an outlined claim by Officer et al. (2010) who find that institutional ownership mitigates the club deal discount for public targets. They argue that based on their finding on public targets, club deals for private targets should not lead to lower prices as private firms tend to have concentrated owners.

In conclusion, the thesis aims to answer two broader questions: What motivates the formation of clubs and are club deals priced differently than single private equity deals? Furthermore, the thesis analyses whether

private ownership can mitigate any club deal discount and whether there are any geographical differences between the U.S. and Europe, especially before and after the public media attention of club deals in the U.S. following the DOJ investigation.

The thesis thereby contributes significantly to the current research by providing novel evidence on club deals for European and private targets and by offering new insights into the research debate between the collusion and competition hypothesis around private equity club deals.

1.3. Structure of the thesis

The thesis is divided into six chapters and is organized as follows. The second chapter examines the relevant literature on club deal pricing based on auction theory and motivations for club formation after a short recap on the private equity model. Chapter 3 provides an overview of the data collection criteria and the characteristics of the analysed sample. Chapter 4 defines the empirical methodology used, while Chapter 5 presents the results obtained followed by a critical discussion of the findings and its contribution to the current research frontier in Chapter 6. Finally, the last chapter summarizes the main results, points out certain limitations of the thesis and proposes future research topics.

2. Review of relevant literature

The following chapter provides an overview of the relevant literature on private equity club deals. First, the advantages of the private equity model in general are described. Then, we turn towards common criticism on the model and in particular to criticism on private equity cub deals. Thereby, the classical auction theory is used to provide a fundamental understanding of anti-competition drivers during auctions and the theoretical groundings of the collusion and competition hypothesis. Finally, empirical evidence on club deal pricing and benign reasons usually cited in syndication theory are presented in more detail. For the motivating factors in club formation, we thereby turn to the venture capital (VC) industry, as research on this topic is more advanced in this industry compared to the private equity industry. During the literature review, the hypotheses that underlie the thesis are developed.

2.1. Private equity governance and value creation

Jensen (1989) early on identified private equity as a superior corporate governance form to publicly listed firms, as concentrated ownership, management equity incentives, and active monitoring foster strong and efficient corporate governance and value creation. Since then, research on private equity has revolved primarily around the impact of private equity ownership on targets' performance and the performance of private equity firms in a risk-return context compared to other asset classes.

Most academic research confirms Jensen's ideas that the private equity business model has a positive effect for both target firms and limited partners. Private equity-backed companies show for example increased profitability (Kaplan, 1989; Kaplan & Strömberg, 2009) and productivity (Lichtenberger & Siegel, 1990; Davis et al., 2014), more efficient investments in innovation (Lerner et al., 2011), better business and managerial practices (Bernstein & Sheen, 2016; Bloom et al., 2015) and provide safer workplaces (Cohn et al., 2021). Additionally, Fracassi et al. (2022) find that sales of private equity-backed consumer retail stores

increase significantly due to new product launches and geographical expansion. On an economy level, Bernstein et al. (2017) show that sectors with higher private equity involvement in terms of invested funds experience higher growth in both employment and productivity.

However, there is also criticism of the private equity model, primarily from politicians and other investors describing private equity firms as "*a plague of locusts*" (Espinoza et al., 2019) and their portfolio firms as "*a piece of merchandise*" (Berkshire Hathaway Inc., 2015, p. 32) by accusing them of major layoffs, cost cutting, and over-leverage. Davis et al. (2014) analyse 3,200 U.S. target firms from 1980 to 2005 and find that private equity buyouts lead to larger employment losses in existing operations and factories, but also to higher greenfield job creation. Regarding financial engineering, Axelson et al. (2013) find that deal leverage in private equity transactions is mainly driven by credit conditions suggesting that financing decisions might not be optimal for target firms, but rather defined by how much debt private equity firms can access. This in turn leads to excessive leverage which is linked to overpayment in transactions and lower fund returns for investors. However, Hotchkiss et al. (2021) show that private equity-owned firms are better in managing high level of debt and financial distress in case of restructuring or bankruptcies. In terms of performance on a fund level, some researchers report that private equity funds are not able to outperform the S&P 500 on a risk-adjusted basis after fees (Phalippou & Gottschalg, 2009; Kaplan & Schoar, 2005). These findings are countered by Harris et al. (2014) as well as Brown et al. (2020) stating a 3%, respectively 4%, annual overperformance of buyout funds compared to the S&P500. Overall, empirical findings suggest that private equity firms can deliver superior returns to their investors and create more value in their portfolio firms compared to non private equity-owned firms in terms of governance, financial, and operational engineering.

While the aforementioned criticisms have been raised since the beginning of the first private equity wave in the 1980s, a more recent topic of

discussion emerged during the second wave and continues to this day: Do private equity firms collude during auctions for acquisitions? The debate started in 2006 after the DOJ started an informal inquiry about auction practices of private equity consortiums. Concerns include that private equity firms team up during an auction rather than bid against each other, thereby reducing the returns for shareholders. Plus, there might be collusion between firms on which auctions they will and will not bid on, true to the motto: "If you don't bid on my deal, I won't bid on yours" (Berman & Sender, 2006). A potential conflict of interest arises also from the fact that the same private equity firms bidding on a target company are also co-owners of other portfolio companies in which they need to collaborate. While the investigation remained without consequences, a short time later a class action lawsuit was filed by several private equity-backed firms. They accused U.S. private equity firms of collusion during auctions that mitigated competition and resulted in lower proceeds for target shareholders.

2.2. Auction theory

Classical auction theory indeed suggests that bidder collusion leads to depressed prices. Graham & Marshall (1987) model that joint bidding during auctions has a price-reducing effect as it leads to less competition and thus less aggressive bidding. This effect holds also true if only a subset of potential bidders colludes. Similar ideas are set forth by Smith (1983) and McAfee & McMillan (1992) who argue that fewer bidders lead to an anti-competitive effect resulting in lower prices. Such theoretical models also have empirical support: For example, collusive bidding was found to be detrimental to prices in spectrum auctions (Cramton & Schwartz, 2000) and forest service timber sales (Baldwin et al., 1997). However, it is argued that collusion only benefits bidders in the short term, but in the long term attracts new entrants to the industry and restores competition (McAfee & McMillan, 1992).

Furthermore, such findings cannot be generalized as potential collusion depends on various factors. Hendricks & Porter (1992), who do not find

support for the collusion hypothesis through joint bidding in auctions for offshore leases, argue that the impact of collusion largely depends on the type of object to be auctioned off. Marshall & Marx (2009) show that auction design is instrumental in either preventing or facilitating collusive behaviour and is backed by empirical findings on the IPO market and for treasury auctions (Back & Zender, 1993; Biais & Faugeron-Crouzet, 2002; Umlauf, 1993).

A key difference in traditional auction models compared to corporate takeovers is the assumption that the number of bidders is fixed, while in M&A transactions new buyers can enter the bidding process easily (Klemperer, 2002; Boone & Mulherin, 2011). Moreover, M&A transactions have another peculiarity compared to auctions for licenses, rights, or leases: Both the board of directors and target shareholders of a company have the option to simply reject a bid if it is deemed to be too low. This can be seen like the concept of a *"reserve price"* pointed out by McAfee & McMillan (1992) which reflects the minimum amount a buyer must pay to win the auction and thereby counteracting negative effects of a bidding cartel. In line with this reasoning, the actual number of bidders should be of no relevance for the purchase price due to the negotiating power of the target's board of directors and shareholders (Betton et al., 2008; Schwartzman, 2006). In addition, the threat of competing bidders if the initial bid is too low provides a rationale to submit high initial bids (Fishman, 1988). These reasonings cast doubt whether the collusion hypothesis which states that a reduction in the number of bidders leads to lower purchase prices in club deals holds true in a corporate takeover setting. On the contrary, the formation of consortia could even promote competition. If individual private equity firms are unable to participate in an auction on their own, they could team up to share risk, increase scale, and thus be able to participate in the auction and bid more money for a company due to less risk and shared resources. Therefore, club deals could have a positive effect on competition and increase returns for target shareholders.

2.3. Pricing of club deals

Only after the DOJ investigation in 2006, characteristics of club deals were analysed in more detail. Evidence for the collusion hypothesis was first found by Officer et al. (2010) who analyse a sample of 201 public-to-private transactions completed by private equity firms in the U.S. from 1984 to 2007. Their findings show that shareholders receive 40% lower returns in club deals and that sales and EBITDA multiples are significantly lower compared to single-sponsored deals. This club deal discount is concentrated in target firms with low institutional ownership and prior to 2006 – before the DOJ investigation and media coverage of club deals – and disappearing afterwards. Another observation pointing towards less competition in club deals are significantly fewer post-announcement competing bids in successful club deals than in their sole-sponsored counterparts. Notably, the research is limited to deals that are conducted by prominent private equity firms, i.e., the top 50 private equity firms in terms of fundraising, as the authors suggest that only such private equity firms have the market power to influence acquisition prices.

Opposing evidence, however, is presented by Boone & Mulherin (2011). By investigating whether joint bidding by private equity consortiums facilitates collusion in the takeover bidding, they analyse 170 private equity takeovers of publicly traded targets in the U.S. between 2003 and 2007. They find that private equity consortiums do not impede takeover competition and do not negatively impact the returns to target shareholders. In fact, their results suggest that private equity consortiums are associated with significantly greater levels of takeover competition than other types of bidders. The findings cast doubt that one motivation for club deals is collusion to obtain lower prices as they also hold true for a sub-sample consisting of prominent private equity firms only, further supporting the competition hypothesis.

Club deals were also addressed in general research on buyouts: For example, Axelson et al. (2008) analyse 153 of the largest buyouts from

1985 to 2006 in the U.S. and Europe with an average deal volume of over $1 billion in enterprise value (EV). They find that club deals are priced significantly higher in terms of EBITDA multiples. However, the results are neither controlled for industry, year, nor size reducing the robustness of the results. Bargeron et al. (2008) study excess returns to shareholders of 1,667 U.S. public target firms from 1980 to 2005 distinguishing between private and public bidders. They find a negative but insignificant differential return for private equity club deals. Cao et al. (2015) look at a sample of 3,317 completed LBOs from 1995 to 2007 in 43 different countries. Thereby, club deal targets show relatively lower, but insignificant, EBITDA multiples than non-club deals even though the average transaction size of club deals is more than three times larger. Supporting the findings of Officer et al. (2010), Cao et al. (2019) find that shareholders indeed receive lower premiums in club deals by analysing a sample from 1995 to 2007 of 5,305 public takeovers, of which 844 are classified as LBOs. They suggest that LBO club deals are motivated by an anti-competitive strategy to avoid overpayment for target firms. Notably, they adopt a difference-in-difference approach by using non-private equity takeovers as control group. When limiting their sample to LBOs only, they find no difference in takeover premiums for club deals after controlling for the endogeneity selection of such deals. Guo et al. (2011) analyse 192 U.S. going private transactions from 1990 to 2006 with a deal value greater than $100m of which 26 are club deals. They find that both pre- and post-buyout capital returns are higher for club deals, but that those returns are not related to competition during the bidding process. They suggest that this can be explained by deals with better ex-ante prospects attracting participation by multiple private equity firms and thus are more likely to be shared by a consortium. Kim & Palia (2014) set forth that club deals experience significantly lower returns but not due to collusion, but due to different target characteristics. These results are found by using a propensity score methodology on their sample of 5,287 publicly traded targets in the U.S. from 1980 to 2009.

Overall, it can be concluded that the current empirics are very contradictory when it comes to whether club deals are priced lower than single deals. Marquez & Singh (2013) developed a model aiming to reconcile this opposing evidence on club pricing. They mathematically proof a non-monotonic relationship between club formation and bidding costs stating that club formation is beneficial for shareholders when competition is intermediate. If bidding costs are too large, then the number of potential acquirers is correspondingly low. Thus, club formation is then detrimental to the returns of target shareholders as competition, measured as the number of actual bidders, is further reduced by the formation of such a club. In contrast, if bidding costs are too low, the number of potential acquirers is correspondingly high. However, the acquisition price is then determined by the low bidding costs and not by high competition. They argue that because Officer et al. (2010) focus only on larger deals completed by prominent private equity firms, the competition for such transactions is limited by nature since bidding costs increase with transaction size. Boone & Mulherin (2011), on the other hand, review on average smaller deals for which bidding costs and thus competition might be intermediate and thus club formation would be beneficial for target shareholders. Therefore, they build a bridge between the club deal discount found by Officer et al. (2010) and the greater level of competition for club deals found by Boone & Mulherin (2011).

Moreover, it must be noted that that it is hardly empirically verifiable whether the decision to form a consortium, even if leading to less competition, is made intentionally to just pay a lower price or. In the following, we look therefore also more closely at benign reasons for private equity firms to form consortia to better understand the motivation behind this decision.

Based on the empirical evidence reported above, we follow the findings of Officer et al. (2010) and therefore first hypothesize that there is a general club deal discount in the private equity industry:

H_1: Club deals are priced lower than single private equity deals.

Moreover, if only prominent private equity firms have the market power to significantly influence prices by collusion, it follows:

H_2: Club deals by prominent private equity firms are priced lower than club deals by non-prominent private equity firms.

Based on the impact of the DOJ investigation, the related media attention and the evidence found by Officer et al. (2010) that club deal discounts and club formation are concentrated before 2006, the third and fourth hypothesis states the following:

H_3: Club deals are priced lower pre-2006.

H_4: Club formation is more likely pre-2006.

Closely related are the collusion lawsuits filed against well-known private equity firms in 2007. The next hypotheses therefore argues that private equity firms are less inclined to collude or even appear to collude after the lawsuits have been settled in 2014 to avoid a second lawsuit and any further media attention:

H_5: Club deals are priced higher post-2014.

H_6: Club formation is less likely post-2014.

On a regional level, it is hypothesized that collusion by private equity clubs is less present pre-2006 in Europe compared to the U.S. since no regulatory investigations or lawsuits by European target companies were filed:

H_7: Club deals are priced lower pre-2006 in the U.S. than in Europe.

Similar, it is argued that after the lawsuits have been settled in 2014, private equity clubs were very cautious in the U.S. and completely restrained from any collusion to avoid a second lawsuit and negative publicity. However, European private equity firms and targets did not have to cope with such accusations, and it is therefore hypothesized as follows:

H_8: Club deals are priced higher post-2014 in the U.S. than in Europe.

Finally, we test the claim put forth by Officer et al. (2010) that club deals for private targets should not lead to lower prices as private firms tend to have concentrated owners. This reasoning is based on their finding that greater institutional ownership in public companies mitigates the club deal discount:

H_9: Club deals on private targets are priced higher than club deals on public targets.

2.4. Benign reasons for club formation

While collusion hypothesis suggests that anti-competitive behaviour is the main driver behind club formation, there are several opponents arguing that benign reasons, especially deal and target characteristics, lead to consortium deals. In the following, the main reasons put forth in classic deal syndication theory are explained in more detail. Since most of the empirics on deal syndication are based on the VC industry, reference is also made to these results to ensure as complete a summary as. In particular, hypotheses based on capital constraints, risk diversification, information and resource sharing as well as debt quality certification are developed.

Capital constraint

Contractual agreements in the private equity industry between general and limited partners usually include investment restrictions, amongst other one that restricts the private equity firm to invest more than a given percentage of the total fund commitments into one single investment (Axelson et al., 2009; Gompers & Lerner, 1996). Such covenants suggest that a private equity firm may be contractually restricted to enter a bidding process or is forced to enter a consortium to gather sufficient capital to enter the competition in the first place. While some research opposes the capital constraint hypothesis (Kim & Palia, 2014; Officer et al., 2010), Boone & Mulherin (2011) find that larger target size increases the likelihood of club formation as club deals are on average twice as large as single-sponsored deals. Similar results have been found in the VC industry supporting the

hypothesis that syndication is positively related to deal size (Manigart et al., 2006; Wright & Locket, 2003). It is therefore hypothesized as follows:

H_{10}: Club formation is positively related to transaction size.

Risk diversification

Clubbing can also be used as a strategy to diversify risk. For very risky or large targets, private equity firms might be inclined to invite other firms to bid jointly on a target to share risks attached to the investment. On the one hand, the private equity firm would not bear the entire loss in the event of a malinvestment. On the other hand, the committed capital of the private equity fund can be spread across more investments to reduce the fund's unsystematic risk through diversification. Empirical work on VC syndication shows that risk sharing is indeed an important determinant for consortiums (Brander et al., 2002; Manigart et al., 2006). Officer et al. (2010), however, do not find evidence for diversification motives in private equity syndication as their findings suggest that club deal targets are not systematically riskier measured by beta, historical stock-return volatility, and historical cash flow volatility than targets of sole-sponsored LBOs. Opposing evidence is found by Boone & Mulherin (2011) using book leverage as a proxy of risk. In line with classic portfolio theory regarding risk diversification (Evans & Archer, 1968), the next hypothesis is stated as following:

H_{11}: Club formation is positively related to risk of the target firm.

Information and resource sharing

Another benign reason for club formation is the advantage of sharing information, expertise, and resources among the members. This is beneficial both during the bidding process through improved screening and reduced agency costs and during the monitoring of the target firm post-buyout through pooling resources and levering on each member’s expertise to enhance the value creation process during the holding period. Lerner (1994) shows that VC clubs are better in evaluating and selecting a target as they are able to combine their asymmetric information to make a more

informed decision. Similar, Sorenson & Stuart (2001) argue that VC firms syndicate when they invest in targets outside of their traditional geographic or sector focus. Through sharing information with their consortium members, such firms are then more inclined to invest in unfamiliar regions and industries. Another factor is a complementary skillset among private equity firms that would allow for superior operating performance as some investors have a distinguishing experience in certain subsectors or in a certain field of value creation, such as financial engineering or operational engineering. For instance, Silver Lake Partners and Thoma Bravo are more focused on technology investments, while Cerberus Capital specializes in distressed investments. Such resource pooling should finally result in high-quality support and intense monitoring during the value creation phase which is shown by higher post-buyout returns of club deals (Guo et al., 2011). Stanfield (2020) provides proof that especially low-skill firms use syndication to improve performance and overcome lack of engineering skills by pooling resources and information with others. Opposing evidence, however, is found by Scellato & Ughetto (2013) who do not find any difference in post-buyout profitability between targets of club and single private equity deals. They postulate that conflicting interests and coordination problems regarding strategic objectives and exit strategy as well as agency problems arising from syndication might lead to inefficient monitoring and engineering. Based on the evidence of Sorenson & Stuart (2001), cross-border deals are used as a proxy in the following to measure the need for information, expertise, and resource sharing as they are assumed to be more complex. It is thus hypothesized that private equity firms might tend to team up with another private equity firm, potentially a local sponsor, to pool their expertise:

H_{12}: Club formation is positively related to cross-border deals.

Deal quality certification

Malenko & Malenko (2015) develop a theory on LBO activity that suggests that private equity firms form a club when they have different reputations

with creditors. The low-reputation bidder adds significant value through operational engineering while simultaneously benefiting from the high reputation of the other club member to achieve favourable financing terms for the target company. Without borrowing the other sponsor's reputation, the low-reputation bidder may not be able to win the auction due to unfavourable financing terms. Therefore, club deals should create value post-buyout as they allow bidders with low reputation but high valuations for their targets to borrow reputation from more reputable bidders with low valuations. Demiroglu & James (2010) find that reputation of private equity groups is indeed linked to the financing structure of deals as they profit from lower loan spreads, longer maturities and can rely more on institutional loans. Despite finding no evidence, Officer et al. (2010) argues that private equity clubs should obtain debt financing more easily and at better conditions as multiple private equity firms attach their reputation and name to the deal which should serve as a signal of deal quality and lower risk. This reasoning is closely linked to the competition hypothesis, as buyout leverage is predominantly related to credit conditions. Thus, if club deals can borrow debt cheaper, buyouts should be more leveraged and transaction multiples should rise as acquirers tend to overpay when access to debt is easy (Axelson et al., 2013). Following this reasoning, private equity players should be motivated to form clubs in particular when creditor rights in the target's country are weak as debt financing is more difficult to obtain. Thus, club deals might enable private equity firms to obtain more favourable debt conditions which provides them an advantage in the bidding process compared to single bidders:

H_{13}: Club formation is negatively related to creditor rights.

In conclusion, the hypotheses developed along the review of the literature aim to give a more nuanced insight into the research debate between the collusion and competition hypothesis around private equity club deals and provides novel contribution to the literature by including European and private transactions.

3. Data overview

The following chapter describes the method used to collect the empirical data and which criteria are used to select the final sample. Moreover, a more detailed picture of the sample is given and the main characteristics and descriptive statistics of the private equity transactions in the final sample are reported.

3.1. Sample selection

The financial database used to retrieve the relevant transaction data on M&A deals and the accounting figures of the targets is Capital IQ, primarily because of its superior data availability and data quality for private companies compared to other databases. Transactions are required to be acquisitions of majority stakes, i.e., percentage sought greater than 50%, with an announcement date between 1996 and 2021. The sample begins in 1996, as data availability is limited before then and acquisition premiums could therefore only be determined to a limited extent in the further course of the study using the industry comparable transaction method which is described in more detail in Chapter 4. Furthermore, the transactions must be closed as of June 2022 to eliminate any transactions that might be withdrawn after announcement. As the aim of the thesis is to analyse differences between private equity club deals and sole-sponsored deals based on valuation multiples, we require that the transaction value is disclosed and that either sales or EBITDA multiple is available. Any transaction with negative multiples is excluded from the final sample. Finally, as an important contribution of the thesis is to provide geographical differences in club formation and club deal pricing, the sample is restricted to acquisitions of targets with headquarter in the U.S. or Europe. The initial screening results into a total sample of 41,480 M&A transactions.

As a next step, the transactions conducted only by private equity firms are identified. While Capital IQ flags transactions as LBOs, this classification is determined to be insufficient as several LBOs from large private equity players have not been identified as an LBO from Capital IQ. Examples

include the acquisition of McAfee Corp. for €18bn by a consortium consisting, among others, of Advent International and Permira in 2021 and the buyout of ThyssenKrupp Elevator AG for €17.2bn by Advent International and Cinven the year before. Similar issues were reported by Officer et al. (2010) using SDC Platinum as primary database. Therefore, a two-folded approach is used to identify all transactions completed by private equity firms. First, a list of private equity firms from Preqin and the Private Equity International (PEI) 300 rankings published from 2007 to 2022 is compiled[1]. The ranking is published on a yearly basis by PEI, an analysis and data provider for the private equity industry, and is based on the amount of direct-investment capital that a private equity firm has been raised in the preceding five-year period. If the LBO designation from Capital IQ and the respective designation based on the private equity firm list created do not match, further analysis is performed, and it is meticulously decided on a case-by-case basis as to whether the transaction is private equity-backed or not. During the decision-making process, news articles regarding the transaction, transaction comments published on Capital IQ as well as other financial databases such as Preqin and Mergr are consulted to ensure data accuracy. The LBO screening resulted in a total sample of 3,628 private equity transactions.

Further data preparation is then centred on the distinction between single and club deals, private and publicly listed target firms, as well as prominent and non-prominent private equity firms buying the target. First, to identify the number of private equity firms involved in the acquisition, the private equity firm list created in the previous step is used. Thereby, if the transaction included two or more private equity firms as buyers, it is classified as a club deal and as a single deal otherwise. Second, to identify prominent private equity firms, a similar approach to previous papers is deployed by utilizing the PEI 300 ranking as main source. One innovation in this paper, however, is a differentiated approach of how to identify

[1] In the years of 2007 and 2008, a PEI 50 instead of PEI 300 ranking was published.

prominent private equity players. Instead of using only one ranking of a specific year as a basis, as in previous papers, we use all PEI 300 rankings from 2007 to 2022 and create an overall list of the top 50 firms in the ranking of each respective year. In line with Officer et al. (2010), HM Capital Partners (formerly Hicks, Muse, Tate & Furst) and Forstmann Little are added to the list due to their historical importance and prominence, particularly during the first LBO wave up to the dot-com bubble, even though they have raised fewer funds since the turn of the millennium. This approach gives a more accurate list of firms (see Appendix A) that were market leaders during the period of analysis in this paper, especially when considering the fundraising cycle within the private equity industry. Ultimately, our final list of prominent private equity players includes 130 firms, which together represent very well the leading players within the last three decades and arguably shaped and dominated the private equity space. Third, it is necessary to distinguish between privately held and publicly listed companies at the time of the acquisition. If the target firm had a share price as per Capital IQ on any of the seven days prior to the announcement date, then the company is classified as publicly listed. If Capital IQ does not display a single share price on any of the seven days prior to the announcement date, then the target firm is classified as privately held. To ensure the correctness of the classifications, several cross-checks are applied: First, it is checked that Capital IQ flags none of the private transactions as *"Going Private Transaction".* Additionally, if the transaction shows an offer price per share or if there are any indications in the transaction commentary that the initial classification might be wrong, then it is again decided very precisely on a case-by-case basis what type of transaction it is by consulting appropriate news articles.

3.2. Sample characteristics

In the following, the descriptive statistics of the sample under study are discussed in more detail. In particular, the time-series distribution of the private equity deals regarding the number of transactions, transaction volume and multiple valuation will be presented.

Table 1. Time-series distribution of sample

This table reports the time-series distribution of the sample of private equity transactions from 1996 to 2021 in the U.S. and Europe as per Capital IQ database. Private equity transactions are identified using a search in the deal synopsis for buyers based on a comprehensive list of private equity firms complied from PEI 300 rankings and Preqin. When the deal synopsis identifies one private equity firm from the list as buyer, then the deal is classified as "Single deal". When the deal synopsis identifies two or more private equity firms from the list as buyer, then the deal is classified as "Club deal". "Year" refers to the year of the transaction announcement date. "Deal no." refers to the annual sum of transactions conducted by private equity firms. "Deal value" refers to the sum of transaction volumes in €m per year as reported by Capital IQ.

	Single deals		Club deals		Total		
Year	**Deal no.**	**Deal value**	**Deal no.**	**Deal value**	**Deal no.**	**Deal value**	**Avg. deal value**
1996	25	3,722	18	3,134	43	6,856	159
1997	46	10,631	14	5,971	60	16,602	277
1998	52	11,131	16	5,342	68	16,472	242
1999	65	26,445	18	5,761	83	32,207	388
2000	46	18,023	23	20,162	69	38,184	553
2001	56	14,455	15	3,947	71	18,402	259
2002	65	29,582	27	11,030	92	40,613	441
2003	101	39,692	35	12,895	136	52,587	387
2004	119	45,506	65	46,135	184	91,642	498
2005	160	74,180	54	53,523	214	127,703	597
2006	234	133,561	83	249,507	317	383,068	1,208
2007	274	196,714	75	160,880	349	357,594	1,025
2008	177	33,333	37	15,865	214	49,198	230
2009	97	10,584	28	9,434	125	20,018	160
2010	164	45,642	34	25,489	198	71,131	359
2011	161	55,134	40	22,487	201	77,621	386
2012	147	80,689	25	25,138	172	105,827	615
2013	127	75,797	23	37,931	150	113,728	758
2014	134	67,274	22	29,592	156	96,866	621
2015	112	86,609	22	36,969	134	123,577	922
2016	96	106,428	26	29,410	122	135,838	1,113
2017	98	106,231	14	45,554	112	151,786	1,355
2018	91	93,208	17	52,125	108	145,333	1,346
2019	74	88,647	14	61,599	88	150,246	1,707
2020	58	50,426	13	48,453	71	98,879	1,393
2021	78	143,832	13	76,585	91	220,417	2,422
Total	**2,857**	**1,647,476**	**771**	**1,094,919**	**3,628**	**2,742,395**	**756**

Table 1 reports the number of deals and deal volumes split between club and single private equity deals over the entire study period from 1996 to 2021. While club deals represent only one fifth of the total sample in terms of number, they are responsible for 40% of the total transaction volume. This serves as a first indication that club deals are on average larger than single private equity deals, i.e., 2.5 times larger in this sample. This is in line with Boone & Mulherin (2011) who report that the club deals in their sample are 2.7 times larger than single private equity deals. The M&A boom before the global financial crisis in 2008 and the accompanying second major wave of private equity deals after the 1980s are also clearly evident.

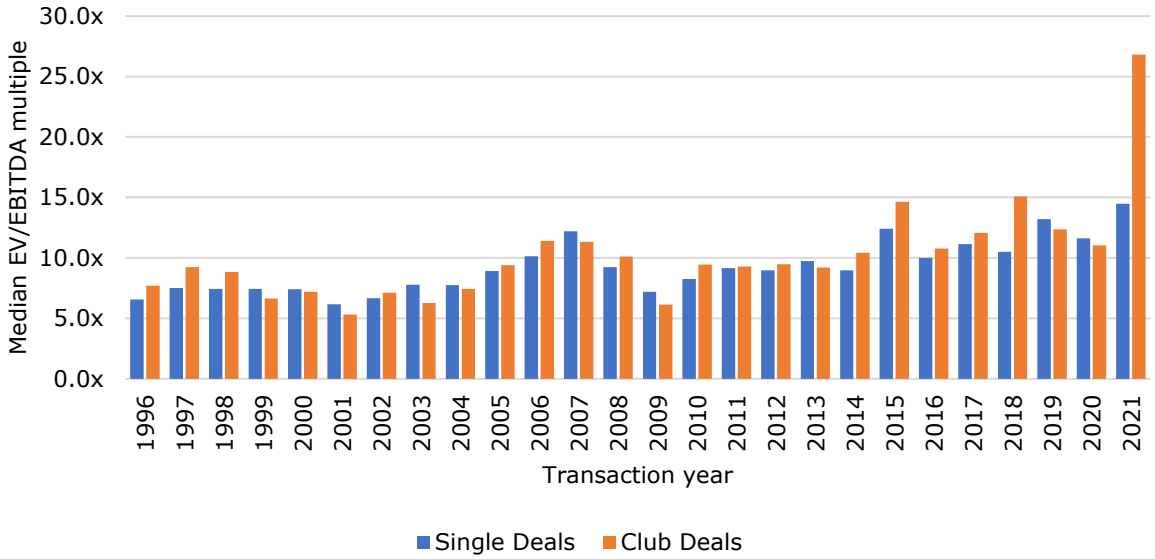
Both transaction volume and number peak in the period from 2006 to 2007. Club deals reach their highest popularity at the same time, presenting 65% of total private equity transaction volume in 2006 within the sample. After a slump in the private equity market in the midst and immediate aftermath of the financial crisis, deal volume picked up again after 2014, reaching its post-financial crisis peak in 2021 after a brief slowdown in the previous year due to the Covid-19 pandemic. At the same time, club deals returned as well. In 2020, they represented almost half of all deals and in 2021 they reached their post-crisis peak in terms of deal volume.

Cross-checking with other studies, the share of club deals of 21% is slightly smaller compared to those papers. This can likely be attributed to the inclusion of European transactions and a longer time horizon within this sample as the popularity of club deals in the U.S. declined in the immediate aftermath of the financial crisis, but most papers limit their samples to U.S. transactions up to 2006 or 2007. For example, Axelson et al. (2008) report that 31% of the 153 LBOs that they study between 1985 and 2006 are club deals. The samples studied by Officer et al. (2010) and Boone & Mulherin (2011) consist of 35% and 44% respectively. By limiting our sample to U.S. transactions between 2003 and 2007 only, similar to Boone & Mulherin (2011), club deals then also represent 46% of the sample.

Considering the DOJ investigation in 2006 about collusive bidding behaviour and the class action lawsuits filed in 2007 by private equity-backed portfolio companies, club deals represent 51% of total deal volume up to 2006, but this share declines to 35% over the post-2006 period. This finding gives a first indication that club formation might have directly impacted by the extensive media attention during this time span. In fact, club deals reached their low in 2009 accounting for only €10bn in deal value and took until 2015 to reach deal values similar to the years immediately before the DOJ investigation. As reported in Appendix B, club deals represent only 16% of all private equity transactions after 2014 indicating that club formation became less likely in this period. A possible explanation points toward the

hypothesis that private equity firms want to avoid a second lawsuit after the first collusion lawsuits was settled in 2014 and thereby withdraw from forming clubs in the first place.

Graph 1. Distribution of median EV/EBITDA transaction multiples for single and club deals



Next, the development of private equity transaction multiples over time is examined in more detail. For sake of clarity, only EBITDA multiples displayed in Graph 1 are described in more detail, while sales multiples are reported in Appendix C. Since the multiple valuation is largely subject to outliers, the analysis mainly refers to median rather than average deal multiples.

EBITDA multiples increased steadily after the dot-com bubble around the turn of the millennium, peaking in 2007 with a median multiple of 12.0x and an average multiple of 13.1x. After the outbreak of the financial crisis in 2008, multiples reached an interim low like the one in 2001. In fact, multiple compression between 2006 and 2009 amounts to more than 40%. After a sideways development in the following years around 9.0x EV/EBITDA, multiples expanded again from 2015 onwards and peaked in 2021. These general observations are similar to the development of transaction volumes over the same period, albeit somewhat weaker.

Notably, club deal valuation shows a stark outlier to the upside in 2021 with a median EBITDA multiple of 26.8x. This can mainly be explained by the fact that club transactions in this year have been predominantly conducted within the information technology industry. Examples of this are the acquisitions of the software firms McAfee Corp., Cloudera, and Hoist Group. This finding is confirmed by Bain & Company (2022), who noted that multiples for software acquisitions reached new highs in 2021 as more and more capital entered the market through the raising of new technology mega funds leading to fierce competition for deals.

In this context, it is worth noting that comparisons between single and club deals based on raw multiples should be treated with caution, as they are not adjusted for deal size or industry. Larger deals are generally associated with higher multiple valuations and there are also differences in multiple valuation among different industries as they have different capital structures, expected growth rates, and returns on invested capital (ROIC) – all of which drive multiples (Koller et al., 2005). These theoretical frameworks are confirmed in Appendix D and Appendix E. In particular, with respect to deal size, we see a clear positive relationship between size and valuation for both sales and EBITDA multiples when dividing the sample into quartiles by transaction volume. For this reason, the comparable industry transaction method is presented in the next chapter to adjust for time and industry. Plus, we control for size in the subsequent acquisition premium regressions.

On a geographical level, Appendix E reports that 58% of the sample to be analysed consists of European target firms, of which almost two-thirds come from the three largest economic regions: the United Kingdom, France, and Germany. While the UK and France also account for the highest number of club deals in the sample (28% each), Germany ranks only fifth behind Italy and Spain representing 5% of total club deals. However, it is striking that although in Germany club deals represent only 13% of all private equity deals, their volume is on average 5.5 times larger than in France for

example, where club deals represent one third of all private equity deals. This might suggest that both the private equity and general corporate landscape among different countries lead to significant differences in when and why private equity firms come together to form a bidding consortium. One potential explanation could be differences regarding creditor rights in the target's country which might influence the attractiveness of leveraged buyouts – a key sub-sector in private equity. As evident in Appendix B, weaker creditor rights in the country of the target firm seem to attract the formation of club deals. While 32% of all deals conducted in countries with the weakest creditor rights are club deals, only 16% of the private equity deals in countries with the strongest creditor rights are completed by consortiums. This nourishes the deal quality certification hypothesis that club deals might enable private equity firms to obtain more favourable debt conditions and thus gives them an edge in the bidding process.

A key difference between the U.S. and European private equity market is that the transactions involving U.S.-based targets are on average 2.4 times larger than their European counterparts as visible in Appendix B. First, large acquisitions take place much more regularly in the U.S. Evidently, the sample includes 27 U.S. deals with a deal volume over €10bn, but only seven such European deals. Second, the U.S. equity market is further developed and bigger than the European one. While the European sample is dominated by acquisitions of privately held firms (79%), the U.S. sample consists of more than half of publicly listed target firms. These findings have two major implications: On the one hand, the capital constraint argument presented in Chapter 2.4 may be stronger in the U.S. market as the need to pool capital is more prevalent due to larger transaction sizes. On the other hand, it clearly shows that the U.S. and European private equity markets are very different. Therefore, the presented thesis makes an important contribution to gain a more accurate insight into the European market and to identify differences between the two markets. Previous findings from U.S. only focused papers regarding club deals cannot simply be applied to the European private equity market. Wright et al. (2006)

reinforce this finding in their study, stating that the U.S. buyout market is much more mature in terms of total buyout transaction value to GDP, a typical measure for market maturity.

Overall, 65% of the sample are acquisitions of privately held companies, which again underlines the fact that private equity firms invest mostly in non-public companies and the thesis therefore closes a research gap, as all previous papers on club deals have only referred to publicly listed companies. Dividing the sample by the fundraising capabilities and firepower of private equity firms, i.e., differentiating between prominent and non-prominent private equity firms, 40% of the deals in the sample are executed by prominent private equity firms. Their market power is particularly evident when one considers that they account for 75% of the total transaction volume in the sample.

As shown in Table 2, the five most active private equity firms within our sample are Blackstone, The Carlyle Group, Apollo Global Management, KKR, and Bain Capital. Together, they are responsible for 304 private equity acquisitions recorded in the sample. Only two out of the top 25 most frequent private equity buyers are non-prominent private equity firms. Both Lloyds Development Capital (LDC) and Ratos are mid-market private equity firms engaging very rarely in club deals and are predominantly active in their local home market. LDC has conducted all of its 43 acquisitions in the UK with an average transaction size of only €45m. Similarly, Ratos bought all but one target with headquarter in the Nordics and an average transaction size of €184m. This underlines the importance to focus not only on prominent private equity firms as non-prominent firms such as LDC and Ratos are very active in their local markets and play a significant role within the private equity landscape of their region. Another important observation is that the top 25 list is dominated by U.S. based private equity firms. Only nine firms are headquartered in Europe represented in the UK, Sweden, France, and Luxembourg. Moreover, it is evidently, that some private equity firms engage more in club deals than others. Goldman Sachs, KKR, Bain

Table 2. List of most active private equity firms

The table reports the most active private equity firms within the sample according to total deals conducted.

Rank	Name of Private Equity Firm	Single deals	Club deals	All deals	% of club deals
1	Blackstone	51	29	80	36%
2	The Carlyle Group	44	21	65	32%
3	Apollo Global Management	48	12	60	20%
4	KKR	26	26	52	50%
5	Bain Capital	22	25	47	53%
6	EQT	37	9	46	20%
7	TPG	20	26	46	57%
8	Apax Partners	27	16	43	37%
9	Lloyds Development Capital (LDC)	42	1	43	2%
10	Bridgepoint	30	9	39	23%
11	Advent International	25	13	38	34%
12	3i Group	24	13	37	35%
13	Goldman Sachs	8	29	37	78%
14	CVC Capital Partners	26	9	35	26%
15	Permira	23	12	35	34%
16	Ardian (formerly AXA Private Equity)	20	14	34	41%
17	Equistone Partners Europe (formerly Barclays Private Equity)	18	12	30	40%
18	PAI Partners	19	9	28	32%
19	Thoma Bravo	25	3	28	11%
20	Platinum Equity	26	0	26	0%
21	Sun Capital Partners	23	3	26	12%
22	Motion Equity Partners (formerly Electra Partners)	17	8	25	32%
23	Ratos	24	1	25	4%
24	Warburg Pincus	15	8	23	35%
25	Cinven	16	6	22	27%

Table 3. Cross-participation matrix

This table reports the number of club deals the top 10 private equity firms in terms of conducted club deals have closed with each other.

	Black-stone	Gold-man Sachs	KKR	TPG	Bain Capital	The Carlyle Group	Apax Part-ners	Ardian	Advent Inter-national	3i
Goldman Sachs	2	-	-	-	-	-	-	-	-	-
KKR	4	5	-	-	-	-	-	-	-	-
TPG	4	5	4	-	-	-	-	-	-	-
Bain Capital	5	1	4	1	-	-	-	-	-	-
The Carlyle Group	1	1	2	1	1	-	-	-	-	-
Apax Partners	0	1	0	1	0	0	-	-	-	-
Ardian	1	0	1	1	0	2	0	-	-	-
Advent International	0	1	0	0	3	1	0	0	-	-
3i	0	0	0	0	0	0	0	0	0	-

Capital, and TPG conduct more than half of their deals as part of a private equity consortium. Other firms such as LDC, Thoma Bravo, Platinum Equity, Sun Capital Partners, or Ratos are primarily acquiring targets by themselves without teaming up with another private equity sponsor. This might indicate that there are motivating factors that encourage some private equity firms to clubbing – either collusive behaviour or other benign reasons that make it more beneficial for some firms to acquire firms jointly, e.g. due to the type of transactions or regional focus in which they conduct their deals.

As reported in Table 3, the most active private equity firms are also the most engaging in club deals. Indeed, the top 10 private equity firms in terms of conducted club deals are also among the sixteen most active private equity firms within the sample in terms of total deals. The private equity firms mentioned within the DOJ investigation, and which were accused of collusion lawsuits by their portfolio firms coincide also with the most frequent club participants. Only Silver Lake is missing from the list. In fact, Bain Capital, Blackstone, The Carlyle Group, Goldman Sachs, KKR, and TPG are not only the firms which were publicly accused of collusive behaviour, they are also the six private equity firms which conducted the most club deals in our sample. Even more striking is the fact, that these are also the private equity firms who have teamed up with each other the most as reported in the cross-participation matrix in Table 3. Together they acquired 41 target firms in our sample. This finding gives further rise to the collusion hypothesis and is line with the findings of Officer et al. (2010) who show that the most active private equity firms tend to team up together rather than combining forces with less active firms.

Appendix G reports the 50 largest club deals within our sample. Thereby, it is also clearly visible that the largest club deals were carried out directly before the global financial crisis and started picking up again since 2018 along with the third wave of private equity and LBOs. This confirms the current status that club deals are making a comeback as pointed out earlier.

4. Methodology

In the following chapter, the methodology to analyse the hypothesis of Chapter 2 is outlined in more detail. First, the logistic regressions, including the respective equations and variables, to identify any benign reasons why private equity firms choose to team up to acquire a target company jointly are characterized. Finally, the methodology to analyse the pricing of private equity transactions in terms of deal multiples is reported. Thereby, the adopted industry comparable transaction method by Kaplan & Ruback (1995) is described and the linear regressions on deal pricing utilizing this method are delineated.

4.1. Club formation

The first research topic on club formation aims to shed light on the benign reasons that motivate private equity firms to form a club to jointly acquire a target firm. A logistic regression with a club deal dummy as independent variable as well as target and deal characteristics as dependent variables is used to measure their influence on the probability of a club deal and to test the hypotheses H_4, H_6 and H_{10} to H_{13}.

Since the dependent variable *CLUB* is binary, taking the value 1 if the target firm was acquired by more than one private equity firm and 0 otherwise, a binary logistic regression is used to analyse any influencing factors that make the formation of a club deal more likely. In the following, these influencing factors, i.e., predictor variables, are characterized in more detail.

Deal Size

To test the capital constraint hypothesis H_{10}, the natural logarithm of the transaction value is included in the regression. The natural log is applied as the distribution of the deal size variable is positively skewed with extreme outliers.

Book Leverage

To provide evidence for the argument of risk reduction in club deal formation of hypothesis H_{11}, book leverage as a proxy of risk is included as an independent variable. Book leverage is thereby defined as total debt divided by total assets of the target firm at the date of deal announcement.

Cross-Border Deal

To test hypothesis H_{12} that clubs are formed to share knowledge and are used in case of complex transactions, the dummy variable *CROSS-BORDER* is introduced as an explanatory variable to proxy complexity and the need for knowledge sharing. The binary variable equals 1 if one or more of the buyers has its headquarter in another country than the target. The hypothesis is that club formation is more likely when a private equity firm acquires a target firm located in a country with which it is unfamiliar in terms of market information, knowledge, or other factors, and therefore decides to partner with a local sponsor or a firm more experienced and familiar with the local and geographical market.

Creditor Rights

For the deal quality certification hypothesis H_{13}, the creditor rights index first introduced by La Porta et al. (1998) and updated by Djankov et al. (2007) is invoked. The index ranges from 0 (weak creditor rights) to 4 (strong creditor rights), depending on the strength of creditor rights in the country where the acquired company is headquartered. The index is calculated for each country as the sum of scores on four credit protection rights. The first score is based on whether there are restrictions, such as creditor approval or minimum dividends, on a debtor's ability to file a reorganization petition. For the second score, secured creditors should have the option to liquidate their collateral after the reorganization petition is approved, meaning there is no asset freeze or automatic stay. The third measure is based on whether secured creditors are paid first from the proceeds of the liquidation of an insolvent company and finally, whether

creditors rather than debtors are responsible for running a business during reorganization (La Porta et al., 1998).

DOJ Investigation

In light of the DOJ investigation in 2006 and the class action lawsuits that followed shortly thereafter and were settled in 2014, club deals were brought into the spotlight of the public, media, and financial research. Thus, the two dummies *PRE-2006* and *POST-2014* are included in the logistic regressions as instrumental variables to test the hypotheses H_4 and H_6, i.e., whether the investigation in 2006 and the settlement of the lawsuits in 2014 had any impact on the likelihood of club deal formation. The dummy variables equal 1 if the transaction was announced prior to 2006 or after 2014 respectively and 0 otherwise.

The regressions on club deal formation also include several control variables such as a regional target dummy variable *US*, which equals 1 if the target firm is headquartered in the U.S. and equals 0 if it is headquartered in Europe. To provide more advanced findings in comparison to existing papers on club deals, we run the regression for four additional subsamples: Public takeovers, private takeovers, U.S. region and European region. For the subsample considering only publicly held target firms, additional financial and deal characteristic control variables are included. The financial control variables consist of a profitability control variable, EBITDA margin, a size control variable, the log transformation of total assets. The deal characteristic controls include the dummy variables *TENDER* and *GO-SHOP* which equal 1 if the offering bid was a tender offer or respectively if the deal included a go-shop provision and 0 otherwise. For each sample analysis that includes private deals, such control variables including the book leverage ratio are omitted due to data availability reasons as privately held firms often do not disclose any financial information. In fact, it is only to calculate the book leverage ratio for 13% of the private companies in our sample due to undisclosed total debt or asset values.

For each subsample analysis and the total sample analysis, additional logistic regressions are for on a different binary dependent variable, *PROMINENT CLUB*. The dummy variable equals 1 if the target was acquired by a private equity club that includes at least one prominent private equity firm as per Appendix A and 0 if it was acquired by a single private equity firm or a non-prominent club. Similarly, we run regressions on the binary variable *NON-PROMINENT CLUB* which equals 1 if the target was acquired by a private equity club that includes no prominent private equity firm and 0 if it was acquired by a single private equity firm or a consortium that includes one or more prominent private equity firms. This approach is designed to establish possible links and extended insights to existing research such as Officer et al. (2010), which has focused only on takeovers by prominent private equity firms. To identify prominent private equity firms, we utilize the PEI 300 ranking as explained in more detail in Chapter 3.1.

Table 2 summarizes the independent variables introduced in this chapter together with the hypotheses of Chapter 2 which are tested through logistic regressions. Moreover, the expected sign of the independent variables in line with those hypotheses are shown. Since a logistic regression is applied, an expected positive sign in Table 2 resembles a coefficient above one, while an expected negative sign resembles a coefficient below one.

Table 4. Overview of the main independent variables of the regressions on club formation

Variable	Definition	Expectation	Hypothesis
Size	LN (Transaction size)	+	H_{10}: Capital constraint
Leverage ratio	Book leverage = Total Debt / Total Assets	-	H_{11}: Risk reduction
Creditor rights	Index ranging from 0 (weak creditor rights) to 4 (strong creditor rights)	-	H_{13}: Deal quality certification
Cross-border Deal	Dummy variable: 1 = Cross-border Deal 0 = No cross-border Deal	+	H_{12}: Need for information and knowledge sharing due to deal complexity
Pre-2006	Dummy variable: 1 = Deal announced before 2006 0 = Deal announced after 2005	+	H_4: Impact of DOJ investigation in 2006
Post-2014	Dummy variable: 1 = Deal announced after 2014 0 = Deal announced before 2015	-	H_6: Impact of collusion lawsuit settlements in 2014

4.2. Acquisition premium

The second major research question concerns the impact of private equity club formation during the bidding process on acquisition prices. If private equity clubs lower competition by colluding, then prices paid in single-sponsored deals should be significantly higher than in consortium deals.

4.2.1. Industry comparable transaction method

While most empirical studies address this question by measuring the abnormal returns to shareholders using an event study analysis, I compare acquisition multiples paid using the industry comparable transaction method set forth by Kaplan & Ruback (1995). Since one of the novelties of this paper is that the sample includes both listed and unlisted companies, it is not possible to collect return data for private targets and thus to execute an event study comparing abnormal returns. However, as public-to-private takeovers represent less than 42% of global buyout deal value in 2021 (Bain & Company, 2022), the upcoming analysis provides a more comprehensive and accurate overview of the private equity industry. This is further confirmed by the fact that 65% of all acquired targets in this sample were privately held (see Appendix B).

Private equity professionals commonly use multiple valuation in form of transaction or trading multiples to estimate the value of a target company. The multiple is constructed by taking the ratio of a company's value relative to an accounting measure for a subset of comparable companies and then apply this multiple to the target's own accounting measure. Most used are EV to sales and EV to EBITDA. The advantages of using these enterprise value multiples instead of equity multiples are that they are not impacted by capital structure (Koller et al., 2005). The industry comparable transactions method uses a multiple of firms in the same industry that were subject to a takeover within a similar time period as the firm being valued. Kaplan & Ruback (1995) show that this valuation method is similarly accurate to an intrinsic valuation using the example of a so-called compressed APV valuation which discounts capital cash flows at the

appropriate discount rate for an all-equity firm. In the following, the data preparation and adoption of the industry comparable transaction method is outlined in more detail.

Following the methodology applied by Officer et al. (2010), each multiple of the sample is first winsorized at the 5th and 95th percentile to minimize the influence of extreme outliers and to avoid spurious conclusions. This is particularly important as raw acquisition multiples are extremely noisy showing very high standard deviations with large outliers on both distribution tails. For example, the average raw EBITDA multiple in the sample is 12.6x with a maximum of 295.5x and a minimum of 0.5x.

Subsequently, for each transaction a portfolio of comparable transactions is formed. For this purpose, we use the transactions from our initial data screening that were not carried out by private equity companies. Therefore, the comparable set of transactions is mainly based on strategic acquisitions. Each transaction in our sample is therefore matched against transactions where the target belongs to the same two-digit Standard Industrial Classification (SIC) code. This approach ensures that multiples are controlled for industry, which is crucial since, for example, the average EBITDA multiple ranges from 7.8x in Agriculture, Forestry and Fishing to 13.8x in Finance, Insurance and Real Estate as multiple valuation drivers such as expected growth rates and ROIC vary widely among industries (see Appendix E). Utilizing the two-digit SIC code thus allows for a very nuanced distinction among differences in sub-sectors.

To match transactions by year, it is then required that the comparable transactions is announced in a window of three years centred on the announcement date of each private equity deal following the approach of Officer et al. (2010). As a robustness check, another portfolio of comparable industry transactions is formed, but in a three-year window trailing the announcement date of each private equity deal. The comparable industry multiple M_{jy} is then calculated as the average sales or EBITDA multiple of all comparable transactions in industry y within time window j :

$$M_{jy} = \frac{1}{N} \sum_{i=1}^{N} (EV/Sales)_{jy}$$

$$M_{jy} = \frac{1}{N} \sum_{i=1}^{N} (EV/EBITDA)_{jy}$$

The deal premium for transaction x within the sample is then computed as the percentage difference between the respective valuation multiple M_x of the private equity deal x and the comparable industry multiple M_{jy}:

$$Deal\ premium_x = \frac{(M_x - M_{jy})}{M_{jy}}$$

For simplistic arithmetic reasons, the deal premium is positive if the private equity transaction has a higher multiple than the comparable industry multiple which consists mainly of strategic acquisitions. However, when the private equity firm pays less than its strategic counterparts in terms of multiples, then the deal premium will be negative, and we will speak of a deal discount rather than a deal premium. In general, we expect a deal discount rather than a deal premium, as private equity firms empirically pay less compared to strategic buyers. This finding is often attributed to the fact that financial investors cannot unlock any operational synergies with the target firm (Bargeron et al., 2008). Following the procedure by Officer (2007), any observation with a deal premium greater than 100% is discarded to minimize the noise in the acquisition multiples which results in extreme outliers in the right-hand tail of the distribution, especially for revenue multiples for which we observe a maximum deal premium of more than +10 in our sample. The upper bound of +100% is then also symmetric with the implied lower bound of -100%. For robustness checks, the upper bound is increased to +2 to identify any qualitative impact on the results. It must be noted that the comparable transactions are not matched for size directly as we control for (log) size in the linear regressions which are described in more detail in the following. The reason to control for size only in the regressions is that matching comparable transactions only based on

industry and transaction period has the benefit to produce more matches in comparable firms as otherwise several transactions would have been omitted from the analysis due to an insufficient number of comparable transactions.

4.2.2. Regression analysis

To explain the impact of club deals and other independent variables on deal premium and to test the hypotheses set in Chapter 2.3, several multivariate linear regressions are deployed. Thereby, we control for size and identify any factors that might influence deal premiums. Those factors include the prominence of the private equity firm, whether the acquired target was publicly listed or privately held, whether the target is based in the U.S. or Europe and whether the transaction was announced in the pre-2006 or post-2014 period. Accordingly, *PROMINENT, PRIVATE, US, PRE-2006,* and *POST-2014* represent dummy variables that equal one when the respective condition is fulfilled and zero otherwise.

The dummy variable *PROMINENT* refers to whether any of the buyers is classified as a prominent private equity firm as per Appendix A. The variable is included in relation to Officer et al. (2010) who argue that only such prominent and large private equity firms as the top 50 of the PEI 300 ranking have the ability and market power to constrain competition and thus reduce prices by forming clubs. The dummy variable *PRIVATE* is intended to provide information on whether private companies are priced differently compared to public companies. In fact, the interaction variable *CLUB*×*PRIVATE* gives evidence whether private ownership can mitigate any club deal discount.

To control for the size of the targets, the implied enterprise value of the transaction is used as a proxy. While similar studies use equity value, one of the key innovations of this study is the sample composition of not only public but also private targets. Therefore, as equity value is often not disclosed or available for privately held firms, we opt for enterprise value as proxy for target size similar to Meuleman et al. (2009). Equivalent to

deal size, enterprise value is positively skewed with extreme outliers on the right-hand tail of the distribution. Therefore, we apply the natural log of this variable for the linear regressions.

To test the conditional hypotheses of Chapter 2.3, interaction terms are implemented in the linear regression to examine if hypothesized effects are reinforced or moderated by another variable (Burks et al., 2019). For example, to find out the relationship between club deal pricing and the ownership structure of the target firms, i.e., publicly or privately held, it is necessary to account for such a relationship in the linear regressions. Thereby, by including interaction terms such as the dummy variable *CLUB×PRIVATE* which equals one if the target was privately held and acquired by multiple private equity firms, we can filter out any effects that are only attributable to club deals in general, but not to club deals for privately held companies. By analysing the interaction terms included in the regressions, we can draw meaningful conclusions on the relationship between several of the dummy variables mentioned previously.

Moreover, as including non-significant variables may cause other variables to become irrelevant – despite being marginally significant without the inclusion of non-significant variables – several separate models are used (Brooks, 2014). In those models, we first control only for size and the presence of a club deal, before we independently include other dummy variables such as *PROMINENT, PRIVATE, US, PRE-2006,* and *POST-2014* together with their interaction term with the club deal dummy variable. Therefore, the following equations are developed to test the hypotheses set out in Chapter 2.3 on the total sample:

(1) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \varepsilon$

(2) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_3 * Prominent + \beta_4 * Club \times Prominent + \varepsilon$

(3) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_5 * Pre\text{-}2006 + \beta_6 * Club \times Pre\text{-}2006 + \varepsilon$

(4) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_7 * Post\text{-}2014 + \beta_8 * Club \times Post\text{-}2014 + \varepsilon$

(5) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_9 * Private + \beta_{10} * Club \times Private + \varepsilon$

(6) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_{11} * US + \beta_{12} * Club \times US + \varepsilon$

(7) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_3 * Prominent + \beta_4 * Club \times Prominent + \beta_5 * Pre\text{-}2006 + \beta_6 * Club \times Pre\text{-}2006 + \beta_7 * Post\text{-}2014 + \beta_8 * Club \times Post\text{-}2014 + \beta_9 * Private + \beta_{10} * Club \times Private + \beta_{11} * US + \beta_{12} * Club \times US + \varepsilon$

(8) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_5 * Pre\text{-}2006 + \beta_6 * Club \times Pre\text{-}2006 + \beta_{11} * US + \beta_{12} * Club \times US + \beta_{13} * Pre\text{-}2006 \times US + \beta_{14} * Club \times Pre\text{-}2006 \times US + \varepsilon$

(9) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_7 * Post\text{-}2014 + \beta_8 * Club \times Post\text{-}2014 + \beta_{11} * US + \beta_{12} * Club \times US + \beta_{15} * Post\text{-}2014 \times US + \beta_{16} * Club \times Post\text{-}2014 \times US + \varepsilon$

(10) $Premium = \alpha_0 + \beta_1 * Club + \beta_2 * Size + \beta_3 * Prominent + \beta_4 * Club \times Prominent + \beta_5 * Pre\text{-}2006 + \beta_6 * Club \times Pre\text{-}2006 + \beta_7 * Post\text{-}2014 + \beta_8 * Club \times Post\text{-}2014 + \beta_9 * Private + \beta_{10} * Club \times Private + \beta_{11} * US + \beta_{12} * Club \times US + \beta_{13} * Pre\text{-}2006 \times US + \beta_{14} * Club \times Pre\text{-}2006 \times US + \beta_{15} * Post\text{-}2014 \times US + \beta_{16} * Club \times Post\text{-}2014 \times US + \varepsilon$

Similar to the methodology used for club formation, several regressions are run on subsamples, such as the public, private, U.S., and European sample to identify any differences in acquisition premia among the subsamples. Table X summarizes the independent variables introduced and defined in this chapter. Furthermore, the hypotheses of Chapter 2.3 which are tested through those independent variables and their expected signs are reported.

Table 5. Overview of the main independent variables of the regressions on acquisition premia

Variable	Definition	Expectation	Hypothesis
Club	Dummy variable: 1 = Deal conducted by two or more PE firms 0 = Deal conducted by one PE firm	-	H_1
Club×Prominent	Dummy variable: 1 = Deal conducted by two or more PE firms of which at least one is a prominent PE firm 0 = Deal conducted by one PE firm or more than one non-prominent PE firm	-	H_2
Club×Pre-2006	Dummy variable: 1 = Club deal announced before 2006 0 = Deal announced after 2005 or single deal announced before 2006	-	H_3
Club×Post-2014	Dummy variable: 1 = Club deal announced after 2014 0 = Deal announced before 2015 or single deal announced after 2014	+	H_5
Club×Pre-2006×US	Dummy variable: 1 = U.S. club deal announced before 2006 0 = European deal, U.S. single deal or U.S. club deal announced after 2005	-	H_7
Club×Post-2014×US	Dummy variable: 1 = U.S. club deal announced after 2014 0 = European deal, U.S. single deal or U.S. club deal announced before 2015	+	H_8
Club×Private	Dummy variable: 1 = Club deal to acquire privately held target 0 = Club deal to acquire publicly listed target or single deal	+	H_9

5. Result analysis

In the following chapter, the results on the hypotheses regarding club deal formation and pricing, which have been comprehensively argued in Chapter 2, are presented in detail according to the methodology from Chapter 4. Throughout the chapter, the theoretical contribution to the existing research gap made by the thesis is highlighted and discussed. All results are obtained using SPSS as primary statistics tool.

5.1. Results for club deal formation

The first part of the data analysis looks at benign reasons why private equity firms team up to buy a target firm. The results shed light on whether other reasons – apart from potential collusion and associated lower prices – are responsible for consortium deals. Analysis through logistic regressions provide innovative insight using an extensive sample that includes both private and public targets. For this reason, in the following not only the total sample but also several subsamples are analysed with respect to geographical region, prominence of the private equity firm and whether the target firm is privately held or publicly listed.

Panel A represents the overall sample consisting of 3,628 private equity deals, while Panel B represents the results for the sample of 1,265 publicly traded target firms and Panel C represents the results for the sample of 2,363 private target firms. For data availability reasons, control variables regarding target and deal characteristics are solely used for the public sample.

Table 6. Overview of the main independent variables of the regressions on club formation

The panels report logit regression analyses of the likelihood that a private equity acquisition is conducted by a (prominent or non-prominent) club. The dependent variables (Club, Prominent Club and Non-Prominent Club) are dummy variables that equal 1 if the respective condition is fulfilled and 0 otherwise. Size is defined as the natural logarithm of the transaction value. Leverage Ratio is defined as total debt divided by total assets at time of deal announcement. Creditor rights represent an index taking values from zero (poor creditor rights) to four (strong creditor rights) and is computed as the sum of scores on four measures of credit protection for each country. Cross-Border Deal is a dummy variable that equals 1 if one or more of the buyers has its headquarter in another country than the target. Pre-2006 is a dummy variable that equals 1 if the transaction has been announced in 2005 or earlier. Post-2014 is a dummy variable that equals 1 if the transaction has been announced in 2015 or later. US is a dummy variable that equals 1 if the target has its headquarter in the U.S. As Leverage Ratio suffers from data availability limitations and substantially reduces the size of the sample, it is only included in the public sample. The public sample also includes further control variables: Assets is defined as the natural logarithm of total assets at deal announcement. Profitability is defined as EBITDA divided by revenue at deal announcement. Tender is a dummy variable that equals 1 if the transaction involved a tender offer. Go-Shop is a dummy variable that equals 1 if the transaction involved a go-shop provision. Standard errors are displayed in brackets. Statistical significance is denoted as *** for a p-value < 0.01, ** for < 0.05, * for < 0.1.

Panel A: Total sample

Variables	Club	Prominent Club	Non-Prominent Club
Size	**1.246*****	**1.926*****	**0.867*****
	(0.026)	(0.043)	(0.031)
Creditor Rights	**0.833*****	**0.851*****	**0.844*****
	(0.038)	(0.057)	(0.045)
Cross-Border Deal	**2.023*****	**2.886*****	**1.430*****
	(0.101)	(0.146)	(0.131)
Pre-2006	**1.656*****	**1.706*****	**1.680*****
	(0.095)	(0.132)	(0.121)
Post-2014	**0.598*****	**0.490*****	**0.717***
	(0.122)	(0.163)	(0.175)
US	1.010	**1.513****	**0.740****
	(0.114)	(0.165)	(0.144)
Constant	**0.082*****	**0.082*****	**0.270*****
	(0.165)	(0.165)	(0.177)
Observations	3,628	3,628	3,628
Cox & Snell R^2	0.068	0.130	0.022
Nagelkerke R^2	0.105	0.259	0.045
Hosmer-Lemeshow Test	0.103	0.380	0.694

Panel B: Private sample

Variables	Club	Prominent Club	Non-Prominent Club
Size	**1.104*****	**1.742*****	**0.864*****
	(0.032)	(0.059)	(0.037)
Creditor Rights	**0.800*****	**0.839****	**0.806*****
	(0.043)	(0.070)	(0.049)
Cross-Border Deal	**2.070*****	**3.504*****	**1.392****
	(0.125)	(0.207)	(0.150)
Pre-2006	**1.693*****	**1.927*****	**1.500*****
	(0.118)	(0.176)	(0.144)
Post-2014	**0.612*****	**0.463*****	0.746
	(0.168)	(0.258)	(0.210)
US	1.017	**1.658****	0.791
	(0.141)	(0.220)	(0.170)
Constant	**0.159*****	**0.002*****	**0.327*****
	(0.182)	(0.400)	(0.193)
Observations	2,363	2,363	2,363
Cox & Snell R^2	0.055	0.099	0.022
Nagelkerke R^2	0.087	0.227	0.042
Hosmer-Lemeshow Test	0.394	0.262	0.382

Panel C: Public sample

Variables	Club	Club	Prom. Club	Prom. Club	Non-Prom. Club	Non-Prom. Club
Size	**1.662*** **	**1.765*** **	**2.182*** **	**3.133*** **	0.938	**0.688** **
	(0.052)	(0.134)	(0.069)	(0.172)	(0.070)	(0.189)
Leverage Ratio	**0.993** **	**0.993** **	**0.990*** **	**0.992** **	1.000	0.999
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)
Creditor Rights	0.932	0.935	0.857	0.859	1.073	1.067
	(0.084)	(0.084)	(0.103)	(0.103)	(0.116)	(0.118)
Cross-Border Deal	**2.348*** **	**2.384*** **	**2.515*** **	**2.570*** **	**1.562** *	**1.587***
	(0.178)	(0.179)	(0.209)	(0.210)	(0.271)	(0.273)
Pre-2006	**1.952*** **	**2.003*** **	**1.565** **	**1.744** **	**2.381*** **	**2.025*** **
	(0.169)	(0.176)	(0.209)	(0.218)	(0.239)	(0.248)
Post-2014	**0.533*** **	**0.531*** **	**0.499*** **	**0.467*** **	0.712	0.730
	(0.190)	(0.190)	(0.219)	(0.223)	(0.334)	(0.335)
US	1.288	1.265	1.283	1.060	1.115	1.451
	(0.229)	(0.240)	(0.275)	(0.291)	(0.328)	(0.342)
Constant	**0.010*** **	**0.011*** **	**0.001*** **	**0.001*** **	**0.065*** **	**0.050*** **
	(0.409)	(0.431)	(0.551)	(0.576)	(0.525)	(0.568)
Assets		0.922		**0.666** **		**1.387** *
		(0.134)		(0.164)		(0.194)
Profitability		1.002		1.001		1.006
		(0.002)		(0.002)		(0.005)
Tender		1.005		0.843		1.343
		(0.171)		(0.217)		(0.239)
Go-Shop		1.135		1.337		0.488
		(0.227)		(0.251)		(0.546)
Observations	1,265	1,265	1,265	1,265	1,265	1,265
Cox & Snell R^2	0.128	0.129	0.163	0.169	0.020	0.027
Nagelkerke R^2	0.192	0.194	0.279	0.288	0.049	0.065
Hosmer-Lemeshow Test	0.577	0.721	0.382	0.563	0.487	0.819

First, the goodness-of-fit statistics of the Hosmer and Lemeshow test show a significance value above 0.1 for all logistic regressions. Therefore, it can be concluded that the regression models adequately describe and fit the data. The Pseudo-R-squared values given by Cox & Snell R^2 as well as Nagelkerke R^2 are particularly high for the regressions using either club deal or prominent club deal as dependent variable. While the regressions seem to capture most variation regarding prominent club deals as dependent dummy variable with a Nagelkerke R^2 above 0.27 for all models, only a very small portion of whether a club is formed by non-prominent private equity

firms is explained by the chosen independent variables in the model. Indeed, none of the regressions with non-prominent club as dependent variable shows a higher Nagelkerke R^2 than 0.07. Comparing the goodness-of-fit measures with the empirical model of private equity consortium formation reported by Boone & Mulherin (2011) which shows a pseudo-R^2 of 0.123, the regressions shown in Table 4 are in line with the explanatory power of other studies on club deal formation and superior in terms of prominent club deals.

Regarding the total sample, the deal size variable shows a positive and significant relationship with club formation. This is in line with hypothesis H_{10} arguing that private equity firms team up with peers for large transactions as they might be restricted in how much capital of the total commitment they can deploy to a single deal. A similar positive relationship between deal size and club formation can be observed for the private and public sample. However, capital constraints seem to be more pronounced for public deals which can likely be explained by the fact that public transactions within our sample are on average 3.6 times larger than private transactions. Most striking, however, is the fact that deal size is positively related to club formation only for prominent clubs, while it is negatively related for non-prominent clubs. This is particularly surprising since prominent private equity firms raise and have the most capital available and should therefore be less affected by capital constraints. However, the fact is that prominent private equity firms target large cap firms in particular and that there is a positive relationship between capital raised and transaction size which leads to prominent and non-prominent private equity firms targeting firms of different sizes. A possible explanation could be that prominent private equity firms join forces exactly when a transaction is very large and thus generally only a few bidders – especially strategic buyers – come into question, which increases the chances of a successful takeover. However, if two mid-cap, non-prominent private equity players join forces to buy a target that is outside their normal transaction volume, they are likely to compete with large, prominent private equity firms without

generating a significant advantage in the bidding process due to capital constraints of other investors.

Regarding the deal quality certification hypothesis, the results show a negative and significant relationship between creditor rights and the likelihood of club formation. This finding confirms hypothesis H_{13} stating that private equity players form clubs when creditor rights in the target's country are weak and thus debt financing is more difficult to obtain, and creditors are less protected. It is argued that the formation of clubs then enables private equity firms to obtain more favourable debt conditions which gives them an advantage in an auction compared to single bidders to pay a premium. The deal quality certification, however, seems to be more important for private deals as the creditor rights variable is for the most part not significant – despite also showing a negative relationship – for the public sample. The results also provide evidence for Malenko & Malenko's (2015) theory that PE firms form a club based on differences in reputation. If a prominent private equity firm has a higher reputation than a non-prominent private equity firm, it is understandable that the creditor rights variable has a more negative relationship for prominent private equity firms, as non-prominent private equity firms, i.e., bidders with low reputation, club with prominent private equity firms to benefit from their high reputation and obtain favourable financing terms for the target firm. Without the reputation of the prominent private equity firm, the low-reputation bidder may not win the auction due to unfavourable financing terms.

Moreover, the results show that club formation is positively correlated with the cross-border deals proving the information and resource sharing hypothesis. A potential explanation is that a private equity firm joins forces with a local private equity sponsor to benefit from its knowledge, network, information, and resources in the local market. For example, a U.S. private equity firm that mostly operates in its home market might benefit from the local expertise of a Swedish private equity firm when acquiring a Swedish

target firm. Nevertheless, these results must be interpreted with caution, as large private equity firms today operate very internationally and often have offices around the world with locally integrated teams, reducing the need for the expertise of a local private equity firm.

Regarding the impact of the DOJ investigation and the lawsuits filed by portfolio firms against several private equity firms accusing them of collusive behaviour, the results clearly show that club deals were more likely to be formed pre-2006 and less likely post-2014. These findings suggest that the additional media and regulatory attention from the DOJ investigation in 2006 caused private equity firms to move away from forming clubs to acquire companies. This is in line with the observations of Boone & Mulherin (2011) and Officer et al. (2010). The negative relationship between the post-2014 variable and club formation might suggest that private equity firms may be less inclined to form clubs after the lawsuits were settled in 2014 to avoid a second lawsuit and the upcoming of another collusion debate around club deals. The fact that only prominent private equity firms have been accused of collusion and were subject to the DOJ investigation also provides insight into why the odds-ratios for the pre-2006 variable are larger for prominent clubs than for non-prominent ones. Similarly, the post-2014 variable is not statistically significant for non-prominent clubs, but for prominent clubs there is a strong negative relationship at the 1% significance level. This demonstrates clearly that prominent private equity firms in particular have been affected by the investigations and lawsuits in the U.S. impacting their decision whether they should collude with other private equity firms to buy targets.

The region dummy variable *U.S.* is not statistically significant at a 10% level for most of the regressions indicating that there is no difference in the likelihood of club formation on whether private equity firms acquire a target that is based in the U.S. or in Europe. Only in the total sample do we see a difference between prominent and non-prominent clubs in the sense that the probability of a prominent club being formed is higher when a US-based

firm is purchased, but lower for non-prominent clubs. One potential explanation might be that most prominent private equity firms as per Appendix A are headquartered in the U.S. and therefore presumably invest most of their capital there.

The risk reduction hypothesis is tested solely on the public sample because book leverage used as a proxy for risk has limited data availability for the private sample. The results show that club formation is positively related to risk of the target firm since leverage ratio is inversely related to firm risk. This suggests that private equity firms tend to acquire very risky targets jointly to diversify and share the risks attached to the investment. Panel C also shows that both target and deal characteristics used as control variables such as assets, profitability, tender offer, and go-shop provisions have no significant impact on the likelihood of club deal formation. Therefore, the results for the public sample hold true after controlling for these variables.

In Appendix H, we display also the regression outputs for the European and U.S. subsample. The results mainly resemble the results of the total sample indicating that there are no significant geographical differences regarding the motivating drivers why private equity firms tend to form a club to acquire a target.

Overall, it can be concluded that club deals are more likely to occur when deals are larger, riskier, require knowledge and information sharing and when creditor rights are weak. These findings are consistent with the competition hypothesis stating that club deals are formed for benign rather than for collusive reasons. Indeed, the results support the arguments of capital constraint, risk reduction, deal quality certification as well as complexity and knowledge sharing as benign reasons for private equity firms to form clubs. Furthermore, club deals were more likely to occur pre-2006 and less likely post-2014 indicating that the DOJ investigation and lawsuits filed by some portfolio firms against private equity firms might

have had a direct impact on the eagerness of private equity firms to acquire targets jointly.

5.2. Results for club deal pricing

After the results on club formation have been described and analysed in the previous part, the following section deals with the results of the linear regressions on acquisition premiums using the comparable industry transaction method and controlling for size. For reasons of clarity and simplicity, we will only discuss the results on EBITDA multiple valuation with a 3-year matching window centred on deal announcement in the following. The results of the 3-year matching window preceding deal announcement and the revenue multiple premium analysis will be displayed in the appendix and shortly described in the end of the section. The results are presented for the overall sample, but also for several subsamples, including the European and U.S. subsamples as well as the public and private subsamples. It must be noted that the total sample for acquisition premiums on EBITDA multiples includes only 1,809 observations since not all private companies disclose their EBITDA figures and thus were unavailable using Capital IQ as primary database.

The club deal dummy coefficients are negative for all regression models using the total sample in Panel A of Table 5. However, they are only statistically significant at a 1% level in model 1 and 5 and at a 5% level in model 4. Nevertheless, we find partly evidence that the formation of a club depresses the acquisition price. Furthermore, the club deal discount seems to apply not only to prominent private equity firms, but to all private equity firms. This can be concluded from the fact that the interaction variable *Club x Prominent PE* is negative for all models, but not statistically significant in any of them.

While we see that pre-2006 club deals were priced at a discount since the coefficients of the interaction variable *Club x Pre-2006* are all negative, but also insignificant indicating that there is no clear evidence that the club deal discount prevails only for the period preceding the DOJ investigations.

Table 7 - Panel A: Total sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Club	**-5.303*** **	**-5.936***	-2.692	**-4.429****	**-7.965*** **	**-4.995***	-5.918	-2.289	-3.214	-4.382
	(2.001)	(3.053)	(2.460)	(2.212)	(2.521)	(2.957)	(4.826)	(3.446)	(3.331)	(5.307)
Target Size	**7.525*** **	**6.962*** **	**7.021*** **	**6.853*** **	**7.552*** **	**7.457*** **	**5.953*** **	**6.757*** **	**6.693*** **	**5.915*** **
	(0.524)	(0.593)	(0.527)	(0.536)	(0.529)	(0.531)	(0.613)	(0.543)	(0.547)	(0.617)
Prominent		**3.646***					**3.473***			3.421
		(2.111)					(2.109)			(2.114)
Club × Prominent		0.909					1.244			1.047
		(3.993)					(4.048)			(4.110)
Pre-2006			**-9.310*** **				**-7.149*** **	**-7.993****		-5.295
			(2.111)				(2.300)	(3.510)		(3.690)
Club × Pre-2006			-4.117				-4.841	-4.684		-5.934
			(4.085)				(4.425)	(6.559)		(7.020)
Post-2014				**10.291*** **			**8.015*** **		**9.850*** **	**8.670****
				(2.265)			(2.419)		(3.215)	(3.363)
Club × Post-2014				1.815			0.310		-3.330	-5.365
				(4.909)			(5.263)		(6.957)	(7.381)
Private					-2.964		-1.598			-1.413
					(1.986)		(2.024)			(2.048)
Club × Private					**7.089***		**6.978***			**7.003***
					(4.059)		(4.186)			(4.250)
US						1.530	3.112	**4.449***	1.938	4.331
						(1.950)	(2.017)	(2.316)	(2.223)	(2.908)
Club × US						-0.495	1.354	-0.509	-1.956	-1.388
						(3.934)	(4.076)	(4.811)	(4.383)	(6.059)
Pre-2006 × US								-3.398		-3.106
								(4.453)		(4.787)
Club × Pre-2006 × US								1.085		2.132
								(8.435)		(9.253)
Post-2014 × US									1.312	-1.287
									(4.465)	(4.756)
Club × Post-2014 × US									10.831	11.855
									(9.842)	(10.486)
Constant	**-63.762*** **	**-62.271*** **	**-58.177*** **	**-62.478*** **	**-62.788*** **	**-64.205*** **	**-57.421*** **	**-58.796*** **	**-62.673*** **	**-57.833*** **
	(3.130)	(3.246)	(3.267)	(3.135)	(3.286)	(3.211)	(3.579)	(3.334)	(3.330)	(3.718)
Observations	1,809	1,809	1,809	1,809	1,809	1,809	1,809	1,809	1,809	1,809
Adjusted R^2	0.101	0.103	0.117	0.114	0.102	0.101	0.125	0.117	0.114	0.124
F-Statistic	103.1***	52.6***	60.8***	59.1***	52.5***	51.7***	22.4***	31.0***	30.0***	16.9***

Table 7 - Panel B: European sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(11)
Club	**-5.725****	-4.960	-3.644	-4.153	**-14.749*****	**-11.759***
	(2.838)	(4.008)	(3.311)	(3.192)	(3.980)	(5.998)
Target Size	**8.410*****	**7.721*****	**8.398*****	**8.069*****	**8.518*****	**7.462*****
	(0.741)	(0.827)	(0.737)	(0.749)	(0.741)	(0.831)
Prominent		**5.399***				**5.164***
		(2.958)				(2.933)
Club × Prominent		-1.537				1.854
		(5.583)				(5.592)
Pre-2006			**-8.100****			**-6.605***
			(3.345)			(3.514)
Club × Pre-2006			-4.316			-4.018
			(6.250)			(6.733)
Post-2014				**9.180*****		**7.376****
				(3.071)		(3.205)
Club × Post-2014				-4.009		-5.025
				(6.628)		(7.033)
Private					**-6.329****	**-6.523 ****
					(2.690)	(2.698)
Club × Private					**17.914*****	**17.006 *****
					(5.542)	(5.664)
Constant	**-69.373*****	**-67.947*****	**-67.664*****	**-69.952*****	**-66.808*****	**-63.809*****
	(4.238)	(4.373)	(4.260)	(4.261)	(4.481)	(4.687)
Observations	821	821	821	821	821	821
Adjusted R^2	0.134	0.136	0.144	0.142	0.144	0.159
F-Statistic	64.4***	33.2***	35.4***	34.9***	35.4***	16.5***

Table 7 - Panel C: US sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(11)
Club	**-4.796***	-6.823	-1.028	-4.008	-3.812	-0.221
	(2.803)	(4.609)	(3.606)	(3.057)	(3.283)	(6.357)
Target Size	**6.636*****	**6.189*****	**5.166*****	**5.404*****	**6.601*****	**4.239*****
	(0.753)	(0.856)	(0.788)	(0.788)	(0.759)	(0.899)
Prominent		2.248				2.250
		(2.991)				(2.993)
Club × Prominent		2.971				-0.060
		(5.753)				(5.930)
Pre-2006			**-12.867*****			**-10.631*****
			(2.871)			(3.155)
Club × Pre-2006			-4.425			-3.538
			(5.497)			(6.198)
Post-2014				**12.725*****		**9.373*****
				(3.335)		(3.590)
Club × Post-2014				7.796		5.524
				(7.218)		(7.760)
Private					0.966	4.481
					(3.027)	(3.052)
Club × Private					-3.583	-3.545
					(6.206)	(6.258)
Constant	**-57.830*****	**-56.327*****	**-44.411*****	**-53.489*****	**-57.899*****	**-44.316*****
	(4.646)	(4.827)	(5.201)	(4.691)	(4.782)	(5.345)
Observations	988	988	988	988	988	988
Adjusted R^2	0.071	0.071	0.098	0.091	0.070	0.104
F-Statistic	38.9***	19.8***	27.8***	25.7***	19.5***	12.5***

Table 7 - Panel D: Private sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(12)
Club	-0.921	-0.038	1.568	-1.095	2.485	4.650
	(3.260)	(4.173)	(4.056)	(3.491)	(3.955)	(5.369)
Target Size	**6.890*** **	**6.571*** **	**6.839*** **	**6.806*** **	**6.829*** **	**6.286*** **
	(0.693)	(0.785)	(0.694)	(0.701)	(0.706)	(0.812)
Prominent		3.362				3.849
		(3.501)				(3.514)
Club × Prominent		-2.695				-1.413
		(6.691)				(6.753)
Pre-2006			-3.397			-3.978
			(3.353)			(3.549)
Club × Pre-2006			-5.444			-3.867
			(6.874)			(7.266)
Post-2014				2.209		1.399
				(3.815)		(3.968)
Club × Post-2014				3.144		0.587
				(9.887)		(10.288)
US					2.880	3.785
					(3.263)	(3.325)
Club × US					-10.612	-10.082
					(6.951)	(7.124)
Constant	**-54.734*** **	**-54.302*** **	**-53.657*** **	**-54.750*** **	**-55.284*** **	**-53.513*** **
	(3.432)	(3.539)	(3.522)	(3.461)	(3.454)	(3.688)
Observations	682	682	682	682	682	682
Adjusted R^2	0.125	0.124	0.127	0.124	0.126	0.124
F-Statistic	49.8***	25.1***	25.7***	25.0***	25.5***	10.6***

Table 7 - Panel E: Public sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(12)
Club	**-8.017*** **	**-12.287*** **	-4.793	**-6.703** **	**-14.319*** **	**-13.570** **
	(2.677)	(4.386)	(3.244)	(3.013)	(4.418)	(6.375)
Target Size	**6.713*** **	**6.135*** **	**5.875*** **	**5.593*** **	**6.681*** **	**4.763*** **
	(0.639)	(0.717)	(0.640)	(0.660)	(0.641)	(0.733)
Prominent		2.964				**2.517**
		(2.732)				(2.687)
Club × Prominent		6.454				4.252
		(5.427)				(5.424)
Pre-2006			**-15.467*** **			**-11.857*** **
			(2.771)			(2.972)
Club × Pre-2006			-2.428			-1.518
			(5.360)			(5.878)
Post-2014				**13.883*** **		**10.026*** **
				(2.855)		(3.033)
Club × Post-2014				3.790		2.371
				(6.032)		(6.531)
US					-0.858	0.136
					(2.603)	(2.546)
Club × US					**9.635***	**9.313 ***
					(5.366)	(5.279)
Constant	**-56.747*** **	**-54.989*** **	**-47.826*** **	**-54.350*** **	**-56.030**	**-46.734*** **
	(3.782)	(3.874)	(3.949)	(3.763)	(4.017)	(4.198)
Observations	1,127	1,119	1,119	1,119	1,119	1,119
Adjusted R^2	0.088	0.090	0.122	0.112	0.089	0.133
F-Statistic	55.2***	28.8***	40.0***	36.7***	28.5***	18.3***

Results are even more mixed for the post-2014 period. The coefficients of the interaction variable *Club x Post-2014* point in different directions across the models and are all insignificant. This leads to the conclusion that also the settlement of the lawsuits against several prominent private equity firms in 2014 had no significant impact in club deal pricing. However, the *Pre-2006* coefficient are negative while the *Post-2014* are all positive and statistically significant at a 1% level. This finding provides evidence that private equity deals held an acquisition discount before 2006, but this discount disappeared in the post-2014 period. Therefore, private equity firms paid lower multiples than strategic buyers pre-2006 which in the literature is mostly attributed to the fact that private equity firms, unlike strategic buyers, cannot form revenue or cost synergies with the target and therefore often cannot pay top dollar. Potential explanations why private equity firms no longer acquire companies at a considerable discount over time could be, on the one hand, that many private equity firms nowadays follow a sector-specific approach or so-called buy-and-build strategies. This means that private equity firms buy a platform company, followed by meaningful acquisitions of further companies. In doing so, they may be able to generate synergies themselves, which allows them to pay higher prices. On the other hand, fiercer competition for transactions could be a reason, as the private equity industry has a lot of dry powder, which needs to be deployed and ultimately may lead to higher multiples.

The coefficients of the dummy variable *Private* are all negative, however, only statistically significant at a 10% level in model 5. These findings point towards the observation that private equity firms pay lower EBITDA multiples for private firms compared to publicly listed firms. The interaction variable *Private x Club* is positive and statistically significant at a 10% level for all models. This finding provides evidence for the hypothesis that club deal discounts are lower for private targets than for public targets pointing to the condition that a concentrated ownership structure can mitigate the club deal discount.

The results do not show any indication that the DOJ investigation and the settlement of related lawsuits regarding collusive behaviour had any different impact comparing U.S. and European target companies. The findings suggest that acquisition premiums for club deals are not significantly different between the U.S. and Europe, neither in the pre-2006 nor in the post-2014 period or in general.

Taking a closer look at the private and public subsample in Panel D and E, it is clearly observable that the club deal discount is only applicable to publicly listed companies but disappears within the private sample. This confirms the evidence found for the overall sample that private ownership appears to attenuate and even make the club deal discount disappear. Apart from that, we find no statistically significant evidence that club deal discounts are higher for prominent private equity firms, higher pre-2006 or lower post-2014 mirroring the results found for the total sample.

For the U.S. and European subsample reported in Panel B and C, the club deal discount is less pronounced in each of the subsamples as it becomes insignificant when including the independent variables for prominent private equity firms, the pre-2006 or the post-2014 period along with the respective interaction variables. However, it is striking that the interaction variable *Club x Private* is only statistically significant for the European sample indicating that in the U.S., private ownership plays a minor, insignificant role in deal pricing. As a control, all findings also hold true when increasing the upper bound for acquisition premiums to 200%.

Regarding the acquisition premiums on sales multiples reported in Appendix I, we do not find any evidence for a club deal discount, neither in the 3-year matching window preceding deal announcement nor in the one centred on deal announcement. Moreover, the subsample analysis shows that the club deal discount is predominantly appearing in the U.S. These findings are more in line with Officer et al. (2010) who find that deal values in terms of sales multiples are significantly lower in club deals than in sole-sponsored LBOs prior to 2006.

6. Discussion

After presenting the empirical results in the previous chapter, the following paragraphs will compare and discuss the findings with the current research frontier, particularly with the two core papers on private equity club deals from Officer et al. (2010) and Boone & Mulherin (2011).

While Officer et al. (2010) do not find any evidence for benign reasons on club formation when testing for several motivation factors such as capital constraints, diversification motives, or ability for clubs to obtain favourable debt amounts or prices, this thesis is more consistent with the findings by Boone & Mulherin (2011). In particular, the results provided confirm their findings that club formation is positively correlated to deal size and risk and that clubs were more likely to be formed before 2006. While Boone & Mulherin (2011) use the number of business segments as a proxy for the need of expertise sharing and the complexity of a deal, this thesis uses cross-border deals as a proxy, but comes to similar conclusions, i.e., that club deals are positively correlated to complex deals and the need to share information. Additionally, the research thesis shows that club deals are negatively correlated to creditor rights confirming evidence found by Cao et al. (2015). This finding indicated that when private equity firms acquire a target firm in a country with weak creditor rights in which debt financing is typically more difficult to obtain, they choose to form consortiums to obtain more favourable debt amounts or pricing. Compared to the existing literature, core innovations of this thesis are a more in-depth review of differences between prominent and non-prominent private equity firms as well as a more extensive sample covering not only U.S. and public deals, but also European and private deals. Through these distinctions, the paper can provide several contributions to the existing literature: First, capital constraints appear to be only a motivating factor for prominent private equity firms to form consortia, although their actual qualification as a prominent private equity firm is determined by the capital they raise. This finding contradicts the intuition that particularly prominent private equity

firms are less subject to capital constraints as they are the firms which raise the most capital in the industry. One explanation for this is that private equity firms often set up funds whose size is determined by the size of the transactions they aim to complete within the fund according to their investment criteria. That is, a large-cap fund will mainly buy large-cap companies rather than small-cap companies. Taking the argument further, if a small private equity fund wants to acquire a mid- or large cap company, just like a large cap fund that wants to buy an even bigger company, it will probably have to partner with other peers to raise the capital for the acquisition and to not violate contractual investment restrictions. Since the small private equity fund within the consortium is now competing with mid-sized private equity players who have sufficient firepower without the need to form a club, the chance of winning the auction is considerably smaller than for the large private equity consortium, which at most bids against large strategic buyers or other private equity clubs, in terms of number of potential bidders.

In terms of club deal pricing, the thesis offers innovative contributions filling important research gaps in the current literature. In particular, both Officer et al. (2010) and Boone & Mulherin (2011) note that their sample consists exclusively of public-to-private transactions, and one should also consider private-to-private transactions. Thereby, we find evidence for the hypothesis postulated that club deals for private targets should not lead to lower prices compared to their public counterparts as they tend to have concentrated owners. Therefore, we extend the finding of Officer et al. (2010) that institutional ownership mitigates the club deal discount in public targets. In general, we find evidence for a club deal discount based on EBITDA multiples in line with Officer et al. (2010) but opposing the findings of Boone & Mulherin (2011). However, we reject the existence of a general club deal discount based on sales multiples, even though we find evidence for a club deal discount in the pre-2006 period confirming the evidence of Officer et al. (2010) who show that club deal discounts are concentrated before 2006 and disappear after the DOJ inquiry. In line with Boone &

Mulherin (2011), we also find that consortiums formed by prominent firms do not have any significant, negative effects on pricing.

Overall, the analysis in this research paper differs from the two core papers described in four dimensions: First, our sample horizon extends from 1996 to 2021, while Officer et al. (2011) examine transactions from 1986 to 2007 and Boone & Mulherin (2011) from 2003 to 2007. Second, the sample includes European transactions and third, private-to-private deals, while the other two papers consider only public-to-private transactions in the United States. Fourth, and due to the inclusion of private-to-private transactions, this work leverages takeover premiums based on multiple valuations, while existing literature focuses mainly on returns to target shareholders. For these reasons, the analysis presented provides a more comprehensive, detailed, and recent overview of club deals in the private equity industry.

7. Conclusion

Private equity club deals have been among the most controversial criticisms of the private equity business model since 2006, when a DOJ investigation about potential collusion during bidding processes drew media attention and generated negative headlines. As several private equity-backed portfolio companies filed a collusion lawsuit shortly after, the accusations were still on the table until 2014, when the lawsuits were finally settled. Although club deals took a back seat after the start of the DOJ investigation and the global financial crisis, just as the next private equity wave reaches its premature peak in 2021, club deals are also making a big comeback. The aim of this thesis was thus to test on a broader basis the following research questions:

1. Are club deals priced lower compared to single-sponsored deals?
2. Does such a club deal discount differ between Europe and the U.S.?
3. Did the DOJ investigation and the settlement of lawsuits affect the pricing of club deals?
4. Does a more concentrated ownership structure mitigate the club deal discount?
5. What are other possible drivers that motivate private equity firms to form a club?

The empirical study investigating 3,628 private equity acquisitions[2] between 1996 and 2021 in the U.S. and Europe found that capital constraints, the riskiness of the target, and deal complexity drive the formation of club deals. Moreover, the formation of club deals is negatively related to the creditor rights in the country of the target, indicating that private equity firms choose to team up, when creditor rights are weak, which makes access to debt financing harder and more expensive. Club deals can thereby be a sign of deal quality to debt financiers and a way to achieve better financing terms and conditions. Club deals were also more likely before

[2] The sample size is reduced to 1,809 for the investigation of pricing, as the EV/EBITDA multiple is not available due to non-disclosable financials for some private acquisitions.

2006 and less likely after 2014, suggesting that the DOJ investigation in the U.S. and the filed lawsuits against private equity firms had a direct impact on private equity firms' willingness to acquire targets together.

For the empirical study on club deal pricing, the thesis levers on the comparable industry transaction method by Kaplan & Ruback (1995) and investigates multiples – with a particular focus on EBITDA multiples of a subsample of 1,809 transactions – to identify any pricing differences between club and single deals. The findings are in favour of a general club deal discount, not just limited to the discount concentrated before 2006 as found by Officer et al. (2010). However, this discount disappears when the acquired company is privately held indicating that concentrated ownership can mitigate the club deal discount. Indeed, the club deal discount is only present for publicly listed targets. Therefore, the presented analysis provides a large contribution to the research on club deals which has only been focusing on public-to-private deals, but not on private-to-private deals even though they account for most of the deals conducted by private equity firms.

Regarding limitations of the thesis, it must be pointed out that no data regarding competitiveness of the bidding process was available, i.e., how many bidders took part in the auctions. This limitation derives by nature when investigating acquisitions of privately held firms as data for such bidding processes is very limited. Therefore, it is not possible to make a direct bridge arguing that club deal pricing is directly related to actual competition, but it is only possible to make such suggestions based on the theoretical framework and empirical results reported. Moreover, even if club deals are priced lower due to less competition, it cannot be directly linked to deliberate clubbing by private equity firms to reduce the acquisition price. Another limitation of the thesis is that it might be subject to missing private equity transactions if they were conducted via add-ons or special purpose vehicles for which Capital IQ might not have identified the ultimate owner.

For further research, it is suggested to analyse differences in operational performance between club deals and sole-sponsored LBO deals. The purpose is to determine whether the pooling of skills and resources from multiple private equity firms contributes to greater operational improvement than sole-sponsored deals, or whether clubs negatively impact operations, possibly due to decision-making problems among the club members.

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9. Appendix

Appendix A – List of prominent private equity firms

The following table represents all private equity firms which were listed in the top 50 of the PEI 300 ranking in any year from 2007 to 2022.

Prominent Private Equity Firm	Country (HQ)
3i Group	United Kingdom
AAC Capital Partners (formerly ABN Amro Capital)	Netherlands
Adams Street Partners	United States
Advent International	United States
Affinity Equity Partners	Hong Kong
AIG Investments	United States
AlpInvest Partners	Netherlands / United States
American Capital	United States
American Securities	United States
Andreessen Horowitz	United States
Apax Partners	United Kingdom
Apollo Global Management	United States
ArcLight Capital Partners	United States
Ardian (formerly AXA Private Equity)	France
Ares Management	United States
Bain Capital	United States
Barclays Private Equity	United Kingdom
Baring Private Equity Asia	Hong Kong
BC Partners	United Kingdom
BDT Capital Partners	United States
Berkshire Partners	United States
BlackRock	United States
Blackstone	United States
Blue Owl Capital	United States
Bridgepoint	United Kingdom
Brookfield Asset Management	Canada
Candover Investments	United Kingdom
CCMP Capital	United States
CDH Investments	Hong Kong
Centerbridge Capital Partners	United States
Cerberus Capital Management	United States
Charterhouse Capital Partners	United Kingdom
China Investment Corporation	China
China Merchants Capital	China
China Reform Fund Management Corporation	China
Cinven	United Kingdom
Citi Capital Advisors	United States
Clayton, Dubilier & Rice	United States
Clearlake Capital Group	United States
CPP Investment Board	Canada
CVC Capital Partners	Luxembourg
DH Private Equity (formerly Doughty Hanson & Co.)	United Kingdom

Prominent Private Equity Firm	Country (HQ)
EIG Global Energy Partners	United States
EnCap Investments	United States
Energy Capital Partners	United States
EQT	Sweden
Equistone Partners Europe	United Kingdom
Eurazeo	France
First Reserve	United States
Forstmann Little & Company	United States
Fortress Investment Group	United States
Francisco Partners	United States
General Atlantic	United States
Genstar Capital	United States
Georgian Co-Investment Fund (GCF)	Georgia
Golden Gate Capital	United States
Goldman Sachs	United States
GTCR	United States
H.I.G. Capital	United States
HarbourVest Partners	United States
Hellman & Friedman	United States
Hg	United Kingdom
HIG Capital	United States
Hillhouse Capital Group	Hong Kong
HitecVision AS	Norway
HM Capital Partners (formerly Hicks, Muse, Tate & Furst)	United States
Hony Capital	China
Insight Partners (formerly Insight Venture Partners)	United States
International Petroleum Investment Company	United Arab Emirates
Inventis Investment	China
JC Flowers & Co.	United States
JP Morgan Asset Management	United States
Kelso & Company	United States
KKR	United States
L Catterton	United States
Lehman Brothers Private Equity	United States
Leonard Green & Partners	United States
Lindsay Goldberg	United States
Lone Star Funds	United States
Madison Dearborn Partners	United States
Marfin Investment Group	Greece
MatlinPatterson	United States
MBK Partners	South Korea
Montagu Private Equity	United Kingdom
Mount Kellett Capital	United States
Neuberger Berman Private Markets	United States
New Mountain Capital	United States
NGP Energy Capital Management	United States
Nordic Capital	United States
Oak Hill Capital	United States

Prominent Private Equity Firm	Country (HQ)
Oak Investment Partners	United States
Oaktree Capital Management	United States
Onex	Canada
Pacific Equity Partners	Australia
PAG	Hong Kong
PAI Partners	France
Pamplona Capital	United Kingdom
Partners Group	Switzerland
Permira Advisers	United Kingdom
Pine Brook Road Partners	United States
Platinum Equity	United States
Providence Equity Partners	United States
Quantum Energy Partners	United States
Riverstone Holdings	United States
Roark Capital Group	United States
RRJ Capital	Hong Kong / Singapore
Russian Direct Investment Fund (RDIF)	Russia
Sequoia Capital	United States
Silver Lake	United States
Stone Point Capital	United States
Summit Partners	United States
Sun Capital Partners	United States
TA Associates	United States
TDR Capital	United Kingdom
Teachers' Private Capital (Ontario Teachers' Pension Plan)	Canada
Terra Firma Capital Partners	United Kingdom
The Abraaj Group	United Arab Emirates
The Carlyle Group	United States
The Energy & Minerals Group	United States
Thoma Bravo	United States
Thomas H. Lee Partners	United States
Tiger Global Management	United States
TowerBrook Capital Partners	United States
TPG	United States
Triton Partners	United Kingdom
Veritas Capital	United States
Vista Equity Partners	United States
Warburg Pincus	United States
Welsh, Carson, Anderson & Stowe	United States
WL Ross & Co.	United States

Appendix B – Summary table for sample descriptive statistics

This table reports number of transactions, transaction volume and average deal volume for the total sample and split between single and club deals along several criteria. When the deal synopsis identifies one private equity firm from the list as buyer, then the deal is classified as "Single deal". When the deal synopsis identifies two or more private equity firms from the list as buyer, then the deal is classified as "Club deal". "No. of deals" refers to the annual sum of transactions conducted by private equity firms. "Total deal value" refers to the sum of transaction volumes in €m as reported by Capital IQ.

	No. of deals			**Total deal value**			**Avg. deal value**		
	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total
Total	2,857	771	3,628	1,647,476	1,094,919	2,742,395	577	1,420	756
Target Status:									
Public	967	298	1,265	1,023,627	782,015	1,805,642	1,059	2,624	1,427
Private	1,890	473	2,363	623,849	312,904	936,753	330	662	396
Type of PE firm:									
Prominent	1,042	399	1,441	1,131,766	934,752	2,066,518	1,086	2,343	1,434
Non-prominent	1,815	372	2,187	515,710	160,166	675,876	284	431	309
Region:									
U.S.	1,159	353	1,512	1,018,031	726,420	1,744,450	878	2,058	1,154
Europe	1,698	418	2,116	629,445	368,499	997,944	371	882	472
Creditor Rights Aggregate Score:									
0	246	118	364	80,149	51,067	131,217	326	433	360
1	1,411	394	1,805	1,118,193	769,040	1,887,233	792	1,952	1,046
2	189	56	245	50,798	18,675	69,473	269	333	284
3	375	85	460	162,635	108,156	270,791	434	1,272	589
4	636	118	754	235,700	147,981	383,681	371	1,254	509
Transaction period:									
Pre-2006	735	285	1,020	273,367	167,900	441,267	372	589	433
2006-2014	1,515	367	1,882	698,728	576,323	1,275,051	461	1,570	677
Post-2014	607	119	726	675,381	350,696	1,026,077	1,113	2,947	1,413
Transaction size:									
1st Quartile	787	123	910	14,102	1,972	16,074	18	16	18
2nd Quartile	732	178	910	67,462	17,051	84,514	92	96	93
3rd Quartile	728	177	905	243,087	64,040	307,128	334	362	339
4th Quartile	610	293	903	1,322,824	1,011,855	2,334,680	2,169	3,453	2,585
Cross-Border Deal:									
Yes	914	374	1,288	660,666	635,415	1,296,081	723	1,699	1,006
No	1,943	397	2,340	986,809	459,504	1,446,314	508	1,157	618
Tender Offer:									
Yes	317	82	399	194,230	123,247	317,477	613	1,503	796
No	2,540	689	3,229	1,453,246	971,672	2,424,918	572	1,410	751
Go-Shop Provision:									
Yes	113	44	157	223,423	242,491	465,913	519	1,173	656
No	2,744	727	3,471	1,424,053	852,428	2,276,481	1,977	5,511	2,968

Appendix C – Time-series distribution of private equity deal multiples

	Median EV/Sales			Median EV/EBITDA		
Year	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total
1996	0.7	0.8	0.8	6.6	7.7	7.2
1997	1.0	0.8	0.9	7.5	9.2	7.7
1998	0.9	1.0	0.9	7.4	8.8	7.6
1999	1.2	1.1	1.2	7.5	6.6	7.3
2000	0.9	0.8	0.9	7.4	7.2	7.2
2001	0.7	0.7	0.7	6.2	5.3	6.1
2002	0.7	0.9	0.7	6.7	7.1	6.7
2003	0.8	1.1	0.9	7.8	6.3	6.9
2004	1.0	1.0	1.0	7.8	7.4	7.7
2005	1.1	1.1	1.1	8.9	9.4	9.1
2006	1.1	1.7	1.2	10.1	11.4	10.3
2007	1.1	1.6	1.2	12.2	11.3	12.0
2008	0.9	1.3	1.0	9.2	10.1	9.4
2009	0.8	1.2	0.9	7.2	6.1	7.1
2010	1.1	1.5	1.1	8.3	9.4	8.7
2011	1.0	1.3	1.0	9.2	9.3	9.2
2012	0.9	0.9	0.9	9.0	9.5	9.0
2013	1.3	1.3	1.3	9.8	9.2	9.7
2014	1.4	1.5	1.4	9.0	10.4	9.2
2015	1.2	2.2	1.2	12.4	14.6	12.9
2016	1.4	1.8	1.5	10.0	10.8	10.2
2017	1.8	2.1	1.8	11.1	12.1	11.2
2018	1.4	2.8	1.7	10.5	15.1	11.6
2019	1.6	3.7	2.0	13.2	12.4	12.8
2020	1.3	2.9	1.5	11.6	11.0	11.4
2021	2.0	2.7	2.4	14.5	26.8	15.4
Total	**1.1**	**1.3**	**1.1**	**9.2**	**9.8**	**9.4**

Appendix D – Summary table for sample valuation multiples

	Avg. EV/Sales			Avg. EV/EBITDA		
	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total
Total	2.4	2.3	2.4	12.3	13.3	12.6
Target Status:						
Public	1.3	1.5	1.3	9.5	10.2	9.7
Private	1.0	1.2	1.0	9.0	9.3	9.1
Type of PE firm:						
Prominent	1.4	1.7	1.5	10.2	11.0	10.4
Non-prominent	0.9	1.0	0.9	8.4	8.3	8.4
Region:						
U.S.	1.2	1.4	1.2	9.6	10.4	9.8
Europe	1.0	1.2	1.1	9.0	9.4	9.1
Creditor Rights Aggregate Score:						
0	2.1	1.6	1.9	11.3	9.6	10.7
1	2.8	2.4	2.7	12.9	13.6	13.1
2	1.8	1.6	1.7	9.2	8.1	8.9
3	1.8	2.1	1.8	11.5	11.5	11.5
4	2.2	3.4	2.4	12.2	18.2	13.4
Transaction period:						
Pre-2006	0.9	0.9	0.9	7.6	7.6	7.6
2006-2014	1.1	1.4	1.1	9.4	10.4	9.7
Post-2014	1.5	2.5	1.7	11.6	12.9	12.1
Transaction size:						
1st Quartile	0.6	0.6	0.6	6.1	6.2	6.1
2nd Quartile	1.0	1.0	1.0	8.3	7.4	8.0
3rd Quartile	1.4	1.2	1.3	9.5	9.2	9.4
4th Quartile	2.0	2.3	2.1	11.4	11.2	11.3
Cross-Border Deal:						
Yes	3.3	3.0	3.2	12.3	15.0	13.2
No	1.9	1.7	1.9	12.4	11.6	12.2
Tender Offer:						
Yes	2.7	1.9	2.5	11.6	11.2	11.5
No	2.3	2.4	2.3	12.5	13.8	12.8
Go-Shop Provision:						
Yes	2.7	2.6	2.7	16.4	19.9	17.5
No	2.4	2.3	2.3	12.0	12.6	12.2

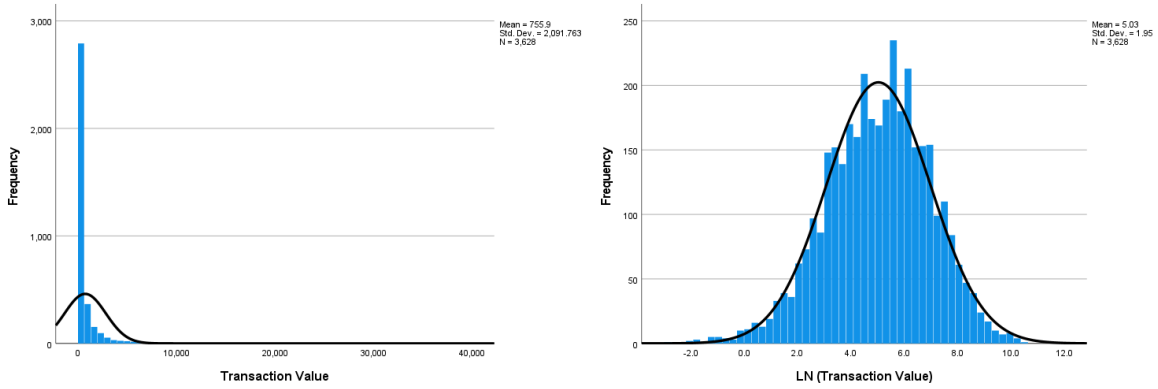
Appendix E – Sample descriptive statistics on industry and country level

	No. of deals			Avg. deal value			Avg. EV/EBITDA		
	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total
Total	2,857	771	3,628	577	1,420	756	12.3	13.3	12.6
Target Country:									
Austria	14	2	16	388	265	372	8.4	4.5	6.6
Belgium	27	6	33	330	339	332	9.1	8.0	8.6
Bulgaria	2	1	3	670	1,200	847	10.6	4.4	7.5
Croatia	1	0	1	232	-	232	7.7	-	7.7
Czech Republic	13	3	16	62	948	228	5.9	10.2	7.9
Denmark	48	8	56	365	1,600	541	8.5	9.8	8.5
Finland	45	4	49	345	916	392	11.1	7.3	10.6
France	246	118	364	326	433	360	8.8	9.0	8.8
Germany	137	21	158	527	2,364	771	7.3	9.8	7.5
Greece	7	1	8	393	1,287	504	9.7	6.3	9.7
Hungary	4	0	4	592	-	592	7.3	-	7.3
Ireland	24	8	32	815	1,351	949	11.0	12.1	11.8
Italy	93	41	134	244	333	271	8.8	7.0	8.5
Latvia	2	0	2	224	-	224	7.4	-	7.4
Moldova	1	0	1	8	-	8	-	-	-
Netherlands	62	21	83	492	1,207	673	8.0	9.4	8.1
Norway	51	5	56	281	318	284	8.4	10.5	8.4
Poland	29	2	31	78	1,709	183	12.4	10.5	11.7
Portugal	6	1	7	174	150	170	9.7	-	9.7
Romania	11	0	11	56	-	56	6.6	-	6.6
Russia	3	3	6	969	70	520	4.9	8.3	7.4
Slovenia	1	0	1	29	-	29	-	-	-
Spain	97	30	127	366	567	413	8.6	7.7	8.5
Sweden	108	18	126	280	1,142	403	9.3	14.4	10.5
Switzerland	29	7	36	911	391	810	8.8	10.3	9.9
Ukraine	1	0	1	39	-	39	-	-	-
United Kingdom	636	118	754	371	1,254	509	9.9	10.3	10.1
United States	1,159	353	1,512	878	2,058	1,154	9.6	10.4	9.8
Target SIC Industry:									
Agriculture & Forestry	16	1	17	257	10	243	7.3	-	7.3
Construction	69	21	90	335	463	365	8.5	7.4	8.0
Finance & Insurance	212	55	267	1,332	1,745	1,417	14.1	11.6	13.8
Manufacturing	1,058	264	1,322	428	873	517	8.4	9.1	8.5
Mining	33	8	41	349	1,586	590	7.8	7.7	7.8
Public Administration	1	0	1	29	-	29	-	-	-
Retail Trade	240	88	328	449	1,092	622	8.3	9.0	8.5
Services	799	217	1,016	572	1,470	764	10.7	11.3	10.9
Transportation, etc.	230	83	313	968	3,525	1,646	9.5	10.3	9.8
Wholesale Trade	199	34	233	434	1,127	535	8.6	9.9	9.0

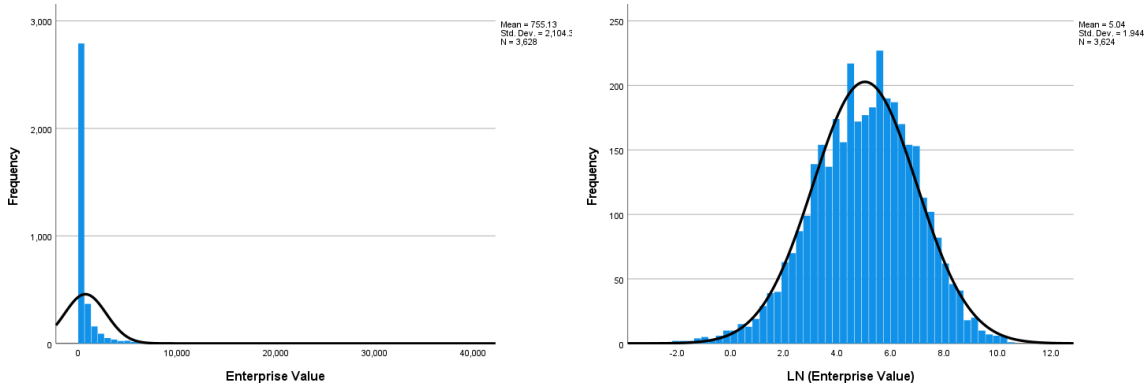
Appendix F – Graphical representation of variables pre- and post-normalization

The following graphs shows the independent variables used within the regression for which a log normal transformation was applied. The histograms for each variable pre-normalization are shown on the left side, while the histograms for each variable post-normalization are shown on the right side. The variables include transaction value, enterprise value, and total assets as per announcement date of the transaction. The representation of the graphs is conducted via SPSS.

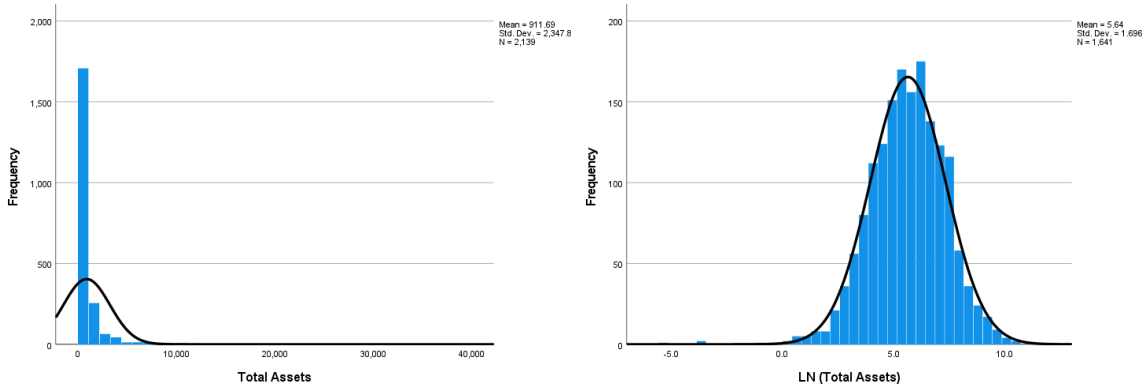
Panel A: Transaction Value



Panel B: Enterprise Value



Panel C: Total Assets



Appendix G – List of the 50 largest club deals within in the sample

The following list shows the 50 largest club deals within the sample in terms of deal value. Deal value is shows in million €.

Year	Target Firm	Private Equity Buyer	Deal Value
2007	TXU Corp.	Citigroup; Goldman Sachs; KKR; Lehman Brothers; Morgan Stanley; TPG	33,785
2006	HCA Healthcare	Bain Capital; KKR; Merrill Lynch	26,892
2006	Kinder Morgan	AIG; Carlyle; Goldman Sachs; Riverstone	23,712
2013	H. J. Heinz Company	3G Capital; Berkshire	21,516
2006	Harrah's Entertainment	Apollo; TPG; TriArtisan Capital	21,183
2007	Alltel Corporation	Goldman Sachs; TPG	20,610
2021	McAfee Corp.	Advent; CPPI; Crosspoint Capital; GIC; Permira	18,000
2020	thyssenkrupp Elevator AG	Advent; Cinven	17,200
2007	Alliance Boots	AXA Private Equity; KKR	15,754
2006	Clear Channel Communications	Bain Capital; Thomas H. Lee Partners	15,374
2017	Calpine Corporation	Access Industries; CPPI; Energy Capital Partners	14,775
2006	Freescale Semiconductor	AIG; AXA Private Equity; Blackstone; Carlyle; Permira; TPG	14,581
2018	Refinitiv US Holdings	Blackstone; Canson Capital Partners; CPPI; GIC	13,963
2021	CyrusOne	KKR; GIP	13,691
2006	Albertson's	Cerberus; Lubert-Adler	13,267
2019	Zayo Group Holdings	Digital Colony Management; Devonshire Investors; EQT	12,885
2006	Thames Water	AMP Capital; Macquarie; Santander Private Equity	11,884
2006	Univision Communications	Madison Dearborn Partners; Providence; Saban Capital; Thomas H. Lee Partners; TPG	10,931
2021	SUEZ Groupe SA	Ardian; GIP	10,400
2018	Clarios	Brookfield; CDPQ	10,279
2006	Nielsen Holdings	AlpInvest Partners; Blackstone; Carlyle; Hellman & Friedman; KKR; Thomas H. Lee Partners	10,178
2019	The Ultimate Software Group	Blackstone; CPPI; GIC; Hellman & Friedman; JMI Management; Qatar Investment Authority	9,610
2006	Anglian Water Group	3i; CPPI; IFM Investors; First Sentier Investors	9,334
2005	SunGard Data Systems	Bain Capital; Blackstone; Goldman Sachs; KKR; Silver Lake; Providence; TPG	8,962
2006	Biomet	Blackstone; Goldman Sachs; KKR; TPG	8,545
2019	Genesee & Wyoming Inc.	Brookfield; GIC	8,446
2014	Songbird Estates	Brookfield; Qatar Investment Authority	8,362
2007	Kelda Group	Citigroup; GIC; HSBC	7,732
2017	Panera Bread Company	BDT Capital Partners; JAB	7,268
2014	PetSmart	BC Partners; CDPQ; GIC	7,145
2015	Fortum Distribution AB	OMERS; Första AP-fonden	6,731
2021	CoreLogic	Insight Partners; Stone Point Capital	6,698
2006	Station Casinos	Colony Capital; Eurazeo	6,677
2019	Tallgrass Energy	Blackstone; GIC	6,605
2013	BMC Software	Bain Capital; GIC; Golden Gate Private Equity; Insight Partners; Elliott Management	6,409
2021	Inovalon Holdings	22C Capital; Insight Partners; Nordic Capital	6,361
2019	Merlin Entertainments	Blackstone; CPPI; Kirkbi Invest	6,295
2005	Toys "R" Us	Bain Capital; KKR	6,274
2007	The Home Depot Supply	Bain Capital; Carlyle; Clayton, Dubilier & Rice	6,236
2007	Avaya	Silver Lake; TPG	6,103

2012	EP Energy	Access Industries; Apollo; Riverstone	5,940
2018	The Dun & Bradstreet Corporation	CC Capital; Motive Capital; Thomas H. Lee Partners; Qatar Investment Authority	5,925
2019	Axel Springer	CPPI; KKR; Public Sector Pension Investment Board	5,716
2000	MEPC	Hermes; GE Equity	5,670
2017	Nets A/S	Advent; Bain Capital; Fisher Lynch Capital; GIC; Hellman & Friedman	5,664
2007	Dollar General Corp.	Citigroup; KKR; Goldman Sachs	5,478
2007	CDW Corporation	Madison Dearborn Partners; Providence	5,440
2012	Cequel Communications	BC Partners; CPPI	5,368
2018	athenahealth	Evergreen Coast Capital; Veritas Capital	5,282
2007	U.S. Foodservice	Clayton, Dubilier & Rice; KKR	5,220

Appendix H – Logistic regressions on club formation drivers

The following panels report logit regression analyses of the likelihood that a private equity acquisition is conducted by a (prominent or non-prominent) club. The dependent variables (Club, Prominent Club and Non-Prominent Club) are dummy variables that equal 1 if the respective condition is fulfilled and 0 otherwise. Size is defined as the natural logarithm of the transaction value. Leverage Ratio is defined as total debt divided by total assets at time of deal announcement. Creditor rights represent an index taking values from zero (poor creditor rights) to four (strong creditor rights) and is computed as the sum of scores on four measures of credit protection for each country. Cross-Border Deal is a dummy variable that equals 1 if one or more of the buyers has its headquarter in another country than the target. Pre-2006 is a dummy variable that equals 1 if the transaction has been announced in 2005 or earlier. Post-2014 is a dummy variable that equals 1 if the transaction has been announced in 2015 or later. Standard errors are displayed in brackets. Statistical significance is denoted as *** for a p-value < 0.01, ** for < 0.05, * for < 0.1.

Panel D: European sample

Variables	Club	Prominent Club	Non-Prominent Club
Size	**1.205*****	**1.826*****	**0.927***
	(0.035)	(0.062)	(0.041)
Creditor Rights	**0.831*****	**0.858*****	**0.839*****
	(0.037)	(0.057)	(0.045)
Cross-Border Deal	**1.541*****	**2.983*****	1.068
	(0.129)	(0.236)	(0.155)
Pre-2006	**1.773*****	**2.380*****	**1.309***
	(0.129)	(0.190)	(0.160)
Post-2014	**0.728*****	**0.646***	0.785
	(0.159)	(0.235)	(0.202)
Constant	**0.110*****	**0.002*****	**0.251*****
	(0.186)	(0.405)	(0.199)
Observations	2,116	2,116	2,116
Cox & Snell R^2	0.057	0.111	0.013
Nagelkerke R^2	0.090	0.253	0.025
Hosmer-Lemeshow Test	0.617	0.521	0.021

Panel E: U.S. sample

Variables	Club	Prominent Club	Non-Prominent Club
Size	**1.349*****	**1.997*****	**0.805*****
	(0.041)	(0.061)	(0.052)
Cross-Border Deal	**3.474*****	**2.793*****	**2.714****
	(0.163)	(0.188)	(0.236)
Pre-2006	**1.712*****	1.284	**2.568*****
	(0.143)	(0.186)	(0.202)
Post-2014	**0.448*****	**0.383*****	0.576
	(0.194)	(0.226)	(0.365)
Constant	**0.040*****	**0.002*****	**0.180*****
	(0.269)	(0.428)	(0.294)
Observations	1,512	1,512	1,512
Cox & Snell R^2	0.094	0.140	0.044
Nagelkerke R^2	0.142	0.249	0.098
Hosmer-Lemeshow Test	0.226	0.232	0.111

Appendix I – Linear regressions on acquisition premiums

Panel A: Total sample - 3-year match window centred on deal announcement – Revenue multiples

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Club	-2.529	-2.207	0.443	**-4.041****	-2.672	-3.308	-2.758	-0.919	-4.156	-2.085
	(1.843)	(2.553)	(2.283)	(2.015)	(3.004)	(2.457)	(4.905)	(2.951)	(2.689)	(5.144)
Target Size	**10.452*****	**10.547*****	**10.308*****	**10.590*****	**10.589*****	**10.685*****	**10.874*****	**10.498*****	**10.805*****	**10.848*****
	(0.388)	(0.447)	(0.389)	(0.398)	(0.409)	(0.400)	(0.476)	(0.403)	(0.411)	(0.476)
Prominent		-0.608					-0.385			-0.226
		(1.936)					(1.947)			(1.953)
Club × Prominent		-0.592					-1.331			-1.635
		(3.667)					(3.802)			(3.843)
Pre-2006			**-5.183*****				**-6.633*****	**-5.390****		**-7.896*****
			(1.911)				(2.027)	(2.661)		(2.761)
Club × Pre-2006			-6.147				-4.841	-4.817		-4.099
			(3.848)				(4.084)	(5.353)		(5.631)
Post-2014				**-4.657****			**-6.992*****		**-7.671*****	**-9.771*****
				(2.084)			(2.195)		(2.706)	(2.804)
Club × Post-2014				7.314			4.715		2.646	0.362
				(4.909)			(5.233)		(6.503)	(6.858)
Private					1.722		-0.063			-0.055
					(1.826)		(1.923)			(1.925)
Club × Private					0.186		1.673			1.606
					(3.763)		(4.085)			(4.093)
US						**-4.069****	**-3.307***	**-3.753***	**-5.586*****	**-5.737****
						(1.746)	(1.845)	(2.059)	(1.954)	(2.521)
Club × US						1.754	2.575	3.233	0.639	1.905
						(3.645)	(3.897)	(4.546)	(3.989)	(5.565)
Pre-2006 × US								1.523		3.262
								(3.864)		(4.100)
Club × Pre-2006 × US								-3.316		-1.726
								(7.714)		(8.266)
Post-2014 × US									**6.909***	7.017
									(4.143)	(4.388)
Club × Post-2014 × US									9.893	9.756
									(9.891)	(10.460)
Constant	**-82.090*****	**-82.330*****	**-80.055*****	**-81.773*****	**-83.896*****	**-81.574*****	**-79.428*****	**-79.607*****	**-80.538*****	**-78.532*****
	(2.064)	(2.140)	(2.134)	(2.077)	(2.701)	(2.093)	(2.934)	(2.178)	(2.149)	(3.004)
Observations	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284
Adjusted R^2	0.183	0.183	0.187	0.184	0.183	0.184	0.189	0.187	0.186	0.189
F-Statistic	368.4***	184.2***	190.0***	185.8***	184.5***	185.9***	64.6***	95.4***	94.7***	48.9***

Panel B: Total sample - 3-year match window preceding deal announcement – Revenue multiples

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Club	-1.323	-2.170	0.905	-2.070	-1.974	-1.640	-2.583	-0.622	-1.799	-3.010
	(1.902)	(2.634)	(2.356)	(2.080)	(3.098)	(2.535)	(5.065)	(3.045)	(2.779)	(5.315)
Target Size	**10.307*** **	**10.312*** **	**10.173*** **	**10.387*** **	**10.502*** **	**10.525*** **	**10.620*** **	**10.345*** **	**10.603*** **	**10.614*** **
	(0.400)	(0.461)	(0.401)	(0.411)	(0.422)	(0.413)	(0.491)	(0.416)	(0.452)	(0.492)
Prominent		-0.483					-0.313			-0.178
		(1.998)					(2.010)			(2.018)
Club × Prominent		1.769					1.769			1.222
		(3.783)					(3.926)			(3.971)
Pre-2006			**-6.068*** **				**-7.016*** **	**-7.050** **		**-8.561*** **
			(1.972)				(2.093)	(2.746)		(2.853)
Club × Pre-2006			-3.890				-3.921	-0.061		-0.085
			(3.971)				(4.218)	(5.523)		(5.819)
Post-2014				-2.523			**-4.848** **		-3.877	**-6.055** **
				(2.151)			(2.267)		(2.795)	(2.898)
Club × Post-2014				3.463			1.289		-0.407	-1.154
				(5.067)			(5.404)		(6.719)	(7.086)
Private					2.246		0.785			0.740
					(1.883)		(1.986)			(1.989)
Club × Private					0.934		2.248			2.411
					(3.882)		(4.219)			(4.229)
US						**-3.598** **	-2.475	**-3.567** *	**-4.256** **	-4.156
						(1.802)	(1.906)	(2.125)	(2.019)	(2.605)
Club × US						0.716	0.983	3.645	-0.377	2.664
						(3.762)	(4.025)	(4.691)	(4.122)	(5.570)
Pre-2006 × US								2.971		3.548
								(3.987)		(4.237)
Club × Pre-2006 × US								-8.239		-6.780
								(7.960)		(8.541)
Post-2014 × US									2.932	3.122
									(4.280)	(4.534)
Club × Post-2014 × US									8.157	5.578
									(10.219)	(10.808)
Constant	**-80.263*** **	**-80.113*** **	**-78.051*** **	**-80.117*** **	**-82.700*** **	**-79.863*** **	**-78.350*** **	**-77.583*** **	**-79.418*** **	**-77.763*** **
	(2.129)	(2.208)	(2.202)	(2.145)	(2.787)	(2.160)	(3.030)	(2.248)	(2.220)	(3.104)
Observations	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250	3,250
Adjusted R^2	0.172	0.172	0.176	0.172	0.172	0.173	0.176	0.176	0.173	0.176
F-Statistic	338.7***	169.3***	174.6***	170.0***	170.0***	170.7***	59.0***	87.8***	85.7***	44.3***

Panel C: Total sample - 3-year match window preceding deal announcement – EBITDA multiples

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Club	**-4.296****	-4.258	-0.986	**-3.390***	**-5.794***	-4.475	-3.408	-2.607	-2.965	-3.106
	(2.359)	(2.919)	(2.581)	(2.282)	(3.432)	(2.811)	(5.522)	(3.325)	(3.048)	(5.772)
Target Size	**6.348*****	**6.138*****	**6.112*****	**5.731*****	**6.607*****	**6.285*****	**5.489*****	**5.832*****	**5.606*****	**5.529*****
	(0.443)	(0.511)	(0.439)	(0.451)	(0.467)	(0.458)	(0.536)	(0.454)	(0.466)	(0.534)
Prominent		1.729					2.569*			2.062
		(2.214)					(2.191)			(2.191)
Club × Prominent		-0.256					-0.464			-1.554
		(4.192)					(4.280)			(4.312)
Pre-2006			**-12.177*****				**-10.047*****	**-6.738****		-4.237
			(2.160)				(2.281)	(2.998)		(3.098)
Club × Pre-2006			-4.734				-4.796	-2.080		-3.157
			(4.350)				(4.598)	(6.030)		(6.319)
Post-2014				**11.945*****			**9.086*****		**10.293*****	**9.467****
				(2.361)			(2.471)		(3.066)	(3.147)
Club × Post-2014				5.368			3.289		-3.567	-4.237
				(5.561)			(5.891)		(7.369)	(7.695)
Private					2.643		**3.840***			**4.159***
					(2.806)		(2.165)			(2.160)
Club × Private					2.306		2.919			3.196*
					(4.300)		(4.599)			(4.593)
US						0.904	**3.600***	**6.187*****	0.431	**7.472*****
						(1.998)	(2.078)	(2.320)	(2.214)	(2.828)
Club × US						0.398	1.715	3.715	-1.928	1.297
						(4.171)	(4.388)	(5.121)	(4.521)	(6.244)
Pre-2006 × US								**-12.382*****		**-12.507*****
								(4.353)		(4.601)
Club × Pre-2006 × US								-5.502		-2.538
								(8.691)		(9.275)
Post-2014 × US									4.134	-1.512
									(4.964)	(4.924)
Club × Post-2014 × US									**20.866***	18.731
									(11.208)	(11.737)
Constant	**-50.620*****	**-50.232*****	**-46.340*****	**-50.158*****	**-53.629*****	**-50.681*****	**-50.726*****	**-47.246*****	**-49.750*****	**-52.298*****
	(2.359)	(2.446)	(2.412)	(2.353)	(3.087)	(2.395)	(3.303)	(2.454)	(2.435)	(3.370)
Observations	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840
Adjusted R^2	0.102	0.101	0.126	0.119	0.102	0.101	0.135	0.132	0.120	0.141
Statistic	102.6***	51.4***	65.6***	61.4***	52.1***	51.3***	24.3***	35.1***	31.7***	19.4***

Part 2: A European perspective with evidence from the Nordics

Abstract: The thesis investigates the motivating drivers for private equity firms to form a club and the impact of club deals on pricing compared to single-sponsored deals. The analysis examines a sample of 2,116 private equity transactions announced between 1996 and 2021, focusing on regional differences between the Nordic countries (Denmark, Finland, Norway, and Sweden) and other European markets, as well as variations between public-to-private and private-to-private transactions. The study finds evidence of a general club deal discount in Europe, which notably disappears in the Nordic region, suggesting unique market dynamics that mitigate typical pricing effects. While capital constraints, deal quality certification, and information sharing drive club formation in broader Europe, these factors, except for capital constraints, do not explain club formation in the Nordic market. The analysis reveals that private equity firms are less likely to form clubs in the Nordic region, likely due to the market's maturity and established financial ecosystem. The findings extend previous research by Hetzenecker (2022) and provide evidence that the Nordic private equity market operates under distinctly different dynamics compared to the rest of Europe, supporting theories about the unique characteristics of the Nordic market, including high levels of trust, transparency, and governance frameworks.

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1. Introduction

The private equity industry plays a significant role in modern financial markets, offering a dynamic alternative to traditional corporate financing mechanisms. Across Europe, the private equity industry has followed a similar trend as globally and is amid its next boom period exceeding the $1tn mark of global deal volume for the first time in 2021. However, the characteristics and functioning of the private equity market in Europe is less comparable to its U.S. counterpart as the region is much more fragmented and less homogenous with main differences across European buyout markets being generally attributed to different levels of maturity among those markets (Wright et al., 2006).

In particular, the Nordic countries – Denmark, Finland, Norway, and Sweden – are often associated with a unique and distinctive private equity landscape. For example, Spliid (2013) argues that cultural, economic, and political factors distinguish the Nordic countries and make it difficult to apply general theories to the Nordic market without empirically testing them. Despite being relatively small markets compared to major European economies like the U.K., Germany, and France, the Nordics are marked by a high level of private equity activity and specialization. A recent report by StepStone (2023) argues that the "Nordic private equity market has long held a reputation for high quality and perceived outperformance within Europe" making it one of the most attractive markets for private equity investors. The article highlights that the Nordic private equity market has consistently outperformed other regions by delivering higher returns on a risk-adjusted basis compared to their peers in Europe and North America. This outperformance is attributed to several factors, including the region's unique market dynamics with strong economic stability, investment strategies with a higher focus on operational improvements and a longer-term investment approach, as well as cultural characteristics including gender equality and a high degree of governance, innovation and entrepreneurialism.

These factors form the basis and give reason to extend a recent study by Hetzenecker (2022) on private equity club deals to a more regional level, including analysing the Nordic region on a standalone basis, as the earlier work focused exclusively on the U.S. and Europe as a whole:

The resurgence of club deals spurred the initial need to take a closer look at the phenomenon by Hetzenecker (2022), which had so far only been analysed and tested on U.S. samples but had received less attention from a European perspective. The comeback of private equity club deals – investments in which multiple private equity firms syndicate to jointly acquire a target firm – are one of the phenomena closely related to the latest private equity peak. Club deals have peaked during the last private equity boom period preceding the financial crisis of 2008, often tagged as the golden era of mega buyouts (Carey & Banerjee, 2016). However, their popularity has declined sharply in the following years after gaining significant media attention following an investigation of the U.S. Department of Justice (DOJ) about potential collusion among the biggest private equity firms (Braithwaite, 2014; Sender, 2014). The inquiry investigated potential collaboration of private equity firms during bidding processes leading to anti-competitive behaviour and ultimately lower purchase prices, true to the motto: "If you don't bid on my deal, I won't bid on yours" (Canada, 2014; Fernyhough & Klees, 2018).

Analysing a sample of 3,628 private equity transactions between 1996 and 2021 in the U.S. and Europe, including both publicly listed and privately held target companies, the study by Hetzenecker (2022) finds evidence that club deals are priced lower than single-sponsored deals (i.e. deals in which a target firm is acquired by only one private equity firm rather than multiple ones). Noteworthy, this discount disappears when the acquired company is privately held indicating that concentrated ownership fully mitigates the club deal discount. However, the findings suggest that private ownership only plays a significant role in mitigating the club deal discount for the European sample, but not for the U.S. sample. Those findings confirm the

limited comparability between the U.S and European private equity market and form the basis for the following research thesis.

The aim of the following is to dissect the heterogeneous European market in order to extend and shed more light on the findings by Hetzenecker (2022), in particular by analysing the Nordic region on a standalone basis given the aforementioned, unique characteristics attributed to the region by Spliid (2013) and StepStone (2023). The analysis will focus on whether the findings for the European market as a whole also apply to the Nordic countries and whether there are other differences between the Nordic market and the rest of Europe in terms of club deal pricing and club formation.

The thesis is divided into six chapters and is organized as follows. The second chapter lays out the key findings of Hetzenecker (2022), examines the relevant literature on differences within the European private equity market, in particular the particularities of the Nordic region. Chapter 3 provides an overview of the data collection criteria and the characteristics of the analysed sample. Chapter 4 defines the empirical methodology used, while Chapter 5 presents the results obtained followed by a critical discussion of the findings and its contribution to the current research frontier in Chapter 6 that also summarizes the main results, points out certain limitations of the thesis and proposes future research topics.

2. Literature Review

A full literature review on the private equity model and the classical auction theory that provides the fundamental understanding of anti-competition drivers during auctions and the theoretical groundings of the collusion and competition hypothesis in relation to private equity club deals are presented by Hetzenecker (2022), alongside empirical evidence on club deal pricing and benign reasons to form clubs based on the syndication theory framework. The following chapter focuses exclusively on the relevant theorical motivation for this extension, including the key findings by Hetzenecker (2022), and develops the relevant hypotheses tied to the Nordic market.

Private Equity Club Formation & Club Deal Pricing

Hetzenecker (2022) leverages a sample of 3,628 private equity acquisitions between 1996 and 2021 in the U.S. and Europe to answer to the following research questions: What motivates the formation of private equity club deals and are such club deals priced differently than single private equity deals? Furthermore, the thesis analyses whether private ownership can mitigate any club deal discount as hypothesized by Officer et al. (2010) and whether there are any geographical differences between the U.S. and European subsamples, especially before and after the public media attention of club deals following the DOJ investigation.

Thereby, Hetzenecker (2022) extends prior research on private equity club deals from Officer et al. (2010) and Boone & Mulherin (2011) by including European as well as private transactions, as the previous papers focus exclusively on the U.S. public-to-private transaction. This wider geographic scope allows for comparisons in creditor rights across different regulatory environments and the inclusion of private transactions allows the thesis to explore pricing differences in private transactions, which are found to not exhibit the same club deal discount observed in public transactions and are a more accurate representation of the private equity market, in which public-to-private transactions are a minority. Moreover, the thesis covers

deals from 1996 to 2021, providing a more recent and extended analysis compared to Officer et al. (1986-2007) and Boone & Mulherin (2003-2007). This longer time span captures post-2006 developments, including the impact of regulatory scrutiny (e.g., the DOJ inquiry) on club deal formation and pricing.

The results of Hetzenecker (2022) are outlined in more detail in the following and are split between findings for benign reasons of club formation and findings from club deal pricing. In terms of *club formation*, the thesis finds that capital constraints (proxied by deal size), the riskiness of the target (proxied by book leverage ratio), and deal complexity (proxied by a cross-border deal dummy variable) drive the formation of club deals. Moreover, the formation of club deals is negatively related to the creditor rights in the country of the target, indicating that private equity firms choose to team up, when creditor rights are weak, which makes access to debt financing harder and more expensive. Club deals can thereby be a sign of deal quality to debt financiers and a way to achieve better financing terms and conditions, supporting prior evidence from Cao et al. (2015). Club deals were also more likely before 2006 and less likely after 2014, suggesting that the DOJ investigation in the U.S. and the filed lawsuits against private equity firms had a direct impact on private equity firms' willingness to acquire targets together. On a geographical level, the findings suggest that prominent private equity firms are more likely to form a club to acquire a U.S.-based target company. A potential explanation for the finding is that most prominent private equity firms as per Appendix A are headquartered in the U.S. and therefore presumably invest most of their capital in their home market. The European subsample analysis finds similar results to the overall sample - which consists of both U.S. and European headquartered target companies - and are especially pronounced for prominent clubs. The general findings are consistent with the competition hypothesis stating that club deals are formed for benign rather than for collusive reasons as the results support the arguments of capital constraint, risk reduction, deal quality certification as well as complexity and knowledge sharing as benign

reasons for private equity firms to form clubs. The results align with Boone & Mulherin (2011), showing that deal size and risk are key motivations for forming clubs. The thesis also adds that cross-border deals (as a proxy for complexity) are positively correlated with club formation, similar to Boone & Mulherin's use of business segments to measure deal complexity. However, the thesis contradicts Officer et al. (2010) who found no evidence that capital constraints, diversification motives, or debt advantages are the driving factors for club deals.

In terms of *club deal pricing*, the thesis finds evidence for a general club deal discount which is not just limited to the discount concentrated before 2006 as found by Officer et al. (2010). However, this discount disappears when the acquired company is privately held indicating that concentrated ownership can mitigate the club deal discount. Indeed, the club deal discount is only present for publicly listed targets confirming the assumption by Officer et al. (2010) that club deals should not lead to lower prices for private targets as they tend to have concentrated owners. Most striking, however, is that the club deal discount is only mitigated by private, concentrated ownership for the European subsample but not for the U.S. subsample. Therefore, the findings call for an in-depth analysis of the European market to shed more light on the regional findings within Europe and slice the European sample into several subsamples again, incl. European private and public subsamples and a Nordic and Rest of Europe subsample. The reason for this geographical differentiation is motivated in more detail in the following.

The Nordic Private Equity Landscape & its Distinctiveness in a European Context

The private equity landscape in Europe has been the subject of extensive academic research due to its regional diversity. the unique characteristics of the Nordic private equity market continue to attract particular attention. While private equity activity across Europe has expanded significantly over the past decades, the Nordic market - comprising Denmark, Finland,

Norway, and Sweden - has emerged as a standout region, driven by unique institutional, cultural, economic, and structural factors. This literature review explores these distinguishing characteristics, emphasizing the differences between the Nordic and broader European private equity landscape making it difficult to generalize findings from broader European private equity studies to the Nordic market.

One of the fundamental differences between the Nordic private equity market and the broader European market is the *level of market maturity and development* and often regarded as more efficient than the rest of Europe. According to Wright et al. (2006), the European private equity market is highly fragmented, with significant differences in market sophistication, legal frameworks, and institutional support across regions. While markets such as the U.K. and Germany are highly developed with deep pools of capital and experienced players, Southern and Eastern European markets remain relatively immature and have historically lagged behind, often constrained by weaker financial infrastructure, less favourable regulatory environments, and lower levels of institutional investment. The Nordic region, though smaller in market size, is often compared to e.g. the U.K. in terms of sophistication and maturity, characterized by well-established institutional frameworks, highly skilled management teams, and an active entrepreneurial ecosystem (Spliid, 2013). Research by Groh & Liechtenstein (2011) finds that markets such as Spain, Italy, and parts of Eastern Europe struggle with a lack of liquidity and less-developed deal pipelines, making them less attractive to global investors. The Nordic market, in contrast, benefits from a robust institutional framework, skilled financial professionals, and a high degree of integration into global financial markets, which have all contributed to its sustained success. According to La Porta et al. (1998), countries with strong legal frameworks that protect investors tend to have more efficient financial markets. In the Nordic region, legal protections are robust, and regulatory bodies are highly effective, reducing agency costs and fostering a more secure environment for private

equity investments compared to countries with less stable regulations (Groh & Liechtenstein, 2011).

The distinctive *cultural and governance frameworks* also play a crucial role in differentiating the Nordic private equity market. As noted by Spliid (2013), cultural factors in the Nordic countries, such as a high level of trust, transparency, gender equality, and a collaborative, consensus-driven approach to decision-making and corporate governance, significantly impact how private equity firms operate in the region (Gompers et al., 2016). These characteristics foster transparency and collaboration between investors, management teams, and other stakeholders, which contrasts with the more hierarchical and competitive governance models seen in other European markets. This is further supported by Cumming et al. (2018) who explore how governance affects the performance of private equity investments, making it relevant for discussions about the efficiency and structure of private equity markets.

Economic and regulatory stability in the Nordic region is another distinguishing feature of its private equity market providing an important contrast to other European regions. According to Aizenman & Spiegel (2010) and StepStone (2023), the Nordic economies have long been characterized by strong macroeconomic fundamentals, low levels of corruption, and stable political environments, making them highly attractive for private equity investments. This stability provides a significant advantage over more volatile regions in Southern and Eastern Europe, where political instability and regulatory inconsistencies can pose substantial risks to private equity investors (Cumming et al., 2018). For example, Gompers & Lerner (1998) point to the challenges faced by private equity firms in navigating complex and unpredictable regulatory environments, where bureaucratic inefficiencies often result in higher transaction costs and prolonged deal timelines.

A distinct feature of the Nordic private equity market is the *strategic focus on operational improvements and long-term value creation*, rather than

relying heavily on financial engineering. StepStone (2023) notes that Nordic private equity firms are more likely to emphasize hands-on management and operational improvements in their portfolio companies. This contrasts with firms in other regions, such as the U.K. and Germany, where high leverage and financial restructuring are often the primary drivers of value creation. This operationally focused strategy aligns with the longer-term investment horizons typically adopted by Nordic firms, as opposed to the shorter-term exit strategies favoured in some other European markets.

Finally, *performance outcomes* in the Nordic private equity market have consistently outpaced those in other European regions. StepStone (2023) highlights that Nordic private equity firms have delivered superior risk-adjusted returns compared to their European and North American counterparts. The report attributes this outperformance to the region's unique market dynamics, including its focus on operational improvements, its stable economic environment, and the incorporation of ESG principles into investment decisions. This combination of factors has led to the Nordic region being viewed as a "safe haven" for private equity investments, particularly during periods of broader economic uncertainty in Europe.

In conclusion, the Nordic private equity market stands out within the broader European context due to its maturity, governance and cultural frameworks, economic stability, and emphasis on long-term value creation through operational improvements. These factors have not only contributed to the region's superior performance but have also positioned it as a leading market for private equity investors seeking both stability and returns.

Hypotheses Development

Based on classic deal syndication theory and existing literature on private equity club deals put forth by Hetzenecker (2022) and in line with the hypotheses developed in the same paper, we argue for similar benign reasons why private equity firms form clubs in the following. These hypotheses are tested both on the total European sample as well as on the Nordic and Rest of Europe subsamples to identify any potential changes in

the results given the distinctiveness of the Nordic private equity market laid out in this chapter.

H_1 – Capital constraints: Club formation is positively related to transaction size.

H_2 – Risk sharing: Club formation is positively related to risk of the target firm.

H_3 – Information & resource sharing: Club formation is positively related to cross-border deals.

H_4 – Deal quality certification: Club formation is negatively related to creditor rights.

H_5 – DOJ impact: Club formation is more likely pre-2006.

H_6 – Legal scrutiny: Club formation is less likely post-2014.

Similarly to the hypotheses on club formation, we align the hypotheses on club deal pricing with Hetzenecker (2022) which will be tested again both on the total European sample as well as on the Nordic and Rest of Europe subsamples:

H_7: Club deals are priced lower than single private equity deals.

H_8: Club deals by prominent private equity firms are priced lower than club deals by non-prominent private equity firms.

H_9: Club deals are priced lower pre-2006.

H_{10}: Club deals are priced higher post-2014.

H_{11}: Club deals on private targets are priced higher than club deals on public targets.

Grounded on the attributions to the Nordic market discussed in Chapter 2, it is hypothesized that the discussed factors such as a high level of market maturity and development, strong governance frameworks, and transparent financial markets contribute to a lower likelihood of club deals and no club deal discount in the Nordics, because of either higher market efficiency leading to less price inefficiencies (collusion hypothesis) or because the benign reasons of hypotheses H_1 to H_4 play a minor role (competition hypothesis) in a market with such attractive characteristics.

H_{12}: Club formation is less likely in the Nordics than in the Rest of Europe.

H_{13}: Club deals in Rest of Europe are priced lower than single private equity deals in Rest of Europe while club deals in the Nordics are not priced differently than single private equity deals in the Nordics.

H_{14}: Club deals in Rest of Europe are priced lower pre-2006 while club deals in the Nordics are not priced differently pre-2006.

H_{15}: Club deals in Rest of Europe are priced higher post-2014 while club deals in the Nordics are not priced differently post-2014.

Overall, the hypotheses aim to extend the current research frontier on private equity club deals, including the work of Hetzenecker (2022), by testing them on a purely European sample and by dividing this sample into several subsamples depending on ownership structure (publicly listed vs. privately held companies) and region (Nordics vs. Rest of Europe) to provide a holistic overview of club formation and club deal pricing in the European market with the Nordics as a selected key region due to its distinctiveness described in this chapter. The motivation behind this structure is to extend the analysis of Hetzenecker (2022) which focuses on a sample consisting of U.S. and European companies as a whole, without segregating the European sample by ownership structure and region.

In particular, the thesis further explores a key finding by Hetzenecker (2022) who observed a general club deal discount on the global sample, including U.S. and European companies, which is, however, mitigated by private ownership. This finding answers one of the questions posed by Officer et al. (2010), who analysed a sample consisting only of U.S. public-to-private transactions, namely whether club deals lead to lower prices for private targets as they tend to have concentrated ownership – in line with their finding that higher institutional ownership in the public sample mitigates the club deal discount. The main motivation for the regional European analysis, with a particular focus on the Nordics, is based on the observation that the club deal discount is mitigated by private ownership only for the European but not for the U.S. subsample.

3. Data overview

The following chapter describes the method used to collect the empirical data and which criteria are used to select the final sample. Moreover, a more detailed picture of the sample is given and the main characteristics and descriptive statistics of the private equity transactions in the final sample are reported.

3.1. Sample selection

The sample selection framework follows the same approach as Hetzenecker (2022) and is fully described therein. Similarly, Capital IQ is used as the financial database to retrieve the relevant transaction data on M&A deals and the accounting figures of the targets. Transactions are required to be acquisitions of majority stakes, i.e., percentage sought greater than 50%, with an announcement date between 1996 and 2021. The sample begins in 1996, as data availability is limited before then and acquisition premiums could therefore only be determined to a limited extent in the further course of the study using the industry comparable transaction method which is described in more detail in Chapter 4. Furthermore, the transactions must be closed as of June 2022 to allow for a like-for-like comparison to the sample by Hetzenecker (2022). The restriction had been implemented in the study to eliminate any transactions that might be withdrawn after announcement. Finally, as an important contribution of the thesis is to provide geographical differences in club formation and club deal pricing, the sample is restricted to acquisitions of targets with headquarter in Europe.

Further following the step-by-step approach by Hetzenecker (2022), including the classification of prominent private equity firms displayed in Appendix A and of public-to-private transactions, the LBO screening resulted in a total sample of 2,116 private equity transactions.

3.2. Sample characteristics

In the following, the descriptive statistics of the sample under study are discussed in more detail. In particular, the time-series distribution of the private equity deals regarding the number of transactions, transaction volume and multiple valuation will be presented.

Table 1. Time-series distribution of sample

This table reports the time-series distribution of the sample of private equity transactions from 1996 to 2021 in Europe as per Capital IQ database. Private equity transactions are identified using a search in the deal synopsis for buyers based on a comprehensive list of private equity firms complied from PEI 300 rankings and Preqin. When the deal synopsis identifies one private equity firm from the list as buyer, then the deal is classified as "Single deal". When the deal synopsis identifies two or more private equity firms from the list as buyer, then the deal is classified as "Club deal". "Year" refers to the year of the transaction announcement date. "Deal no." refers to the annual sum of transactions conducted by private equity firms. "Deal value" refers to the sum of transaction volumes in €m per year as reported by Capital IQ.

	Single deals		Club deals		Total		
Year	**Deal no.**	**Deal value**	**Deal no.**	**Deal value**	**Deal no.**	**Deal value**	**Avg. deal value**
1996	8	357	6	749	14	1,106	79
1997	8	1,061	3	185	11	1,246	113
1998	18	1,364	4	758	22	2,122	96
1999	17	2,511	6	1,545	23	4,057	176
2000	15	5,479	9	11,864	24	17,344	723
2001	36	7,904	8	1,450	44	9,353	213
2002	39	15,109	16	4,430	55	19,539	355
2003	55	19,633	20	8,286	75	27,919	372
2004	69	20,223	34	20,376	103	40,599	394
2005	91	37,061	32	22,023	123	59,084	480
2006	143	47,933	41	60,945	184	108,878	592
2007	182	54,854	42	43,077	224	97,930	437
2008	129	24,974	28	11,977	157	36,951	235
2009	68	6,238	20	2,468	88	8,706	99
2010	101	16,948	17	7,281	118	24,229	205
2011	107	29,176	24	8,366	131	37,542	287
2012	84	22,998	11	5,572	95	28,570	301
2013	77	34,793	18	6,745	95	41,538	437
2014	103	39,835	11	9,741	114	49,576	435
2015	71	22,483	11	16,345	82	38,828	474
2016	59	52,727	17	13,005	76	65,731	865
2017	53	18,727	8	17,308	61	36,035	591
2018	48	35,938	6	8,593	54	44,532	825
2019	42	34,937	9	19,860	51	54,797	1074
2020	32	21,351	10	40,773	42	62,124	1479
2021	43	54,831	7	24,777	50	79,608	1592
Total	**1,698**	**629,445**	**418**	**368,499**	**2,116**	**997,944**	**472**

Table 1 reports the number of deals and deal volumes split between club and single private equity deals over the entire study period from 1996 to 2021. While club deals represent only one fifth of the total sample in terms of number, they are responsible for 37% of the total transaction volume. This serves as a first indication that club deals are on average larger than

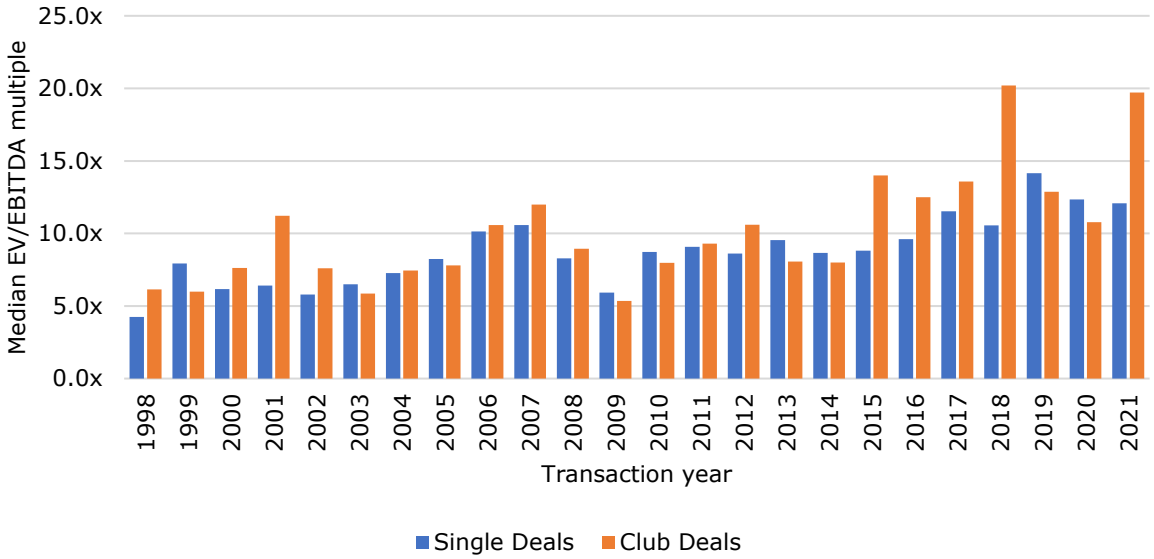
single private equity deals, i.e., 2.4 times larger in this sample. This is in line with Boone & Mulherin (2011) who report that the club deals in their sample are 2.7 times larger than single private equity deals. The M&A boom before the global financial crisis in 2008 and the accompanying second major wave of private equity deals after the 1980s are also clearly evident. Both transaction volume and number peak in the period from 2006 to 2007. Club deals reach their highest popularity at the same time, presenting 56% of total private equity transaction volume in 2006 within the sample. After a slump in the private equity market in the midst and immediate aftermath of the financial crisis, deal volume has continuously increased since 2017 reaching its post-financial crisis peak in 2021. At the same time, club deals returned as well. In 2020, they represented almost two-thirds of deal volume.

Cross-checking with other studies, the share of club deals of 20% is slightly smaller compared to those papers. This is likely due to being an exclusively European sample with a longer time horizon as the popularity of club deals in the U.S. declined in the immediate aftermath of the financial crisis, but most papers limit their samples to U.S. transactions up to 2006 or 2007. For example, Axelson et al. (2008) report that 31% of the 153 LBOs that they study between 1985 and 2006 are club deals. The samples studied by Officer et al. (2010) and Boone & Mulherin (2011) consist of 35% and 44% respectively.

Considering the DOJ investigation in 2006 about collusive bidding behaviour and the class action lawsuits filed in 2007 by private equity-backed portfolio companies, club deals represent 46% of total deal volume up to 2006, but this share declines to 33% over the post-2006 period. This finding gives a first indication that club formation might have directly impacted by the extensive media attention during this time span. In fact, club deals in Europe reached their low in 2009 accounting for only €2.5bn in deal value and took until 2015 to reach deal values similar to the years immediately before the DOJ investigation. As reported in Appendix B, club deals

represent only 16% of all private equity transactions after 2014 indicating that club formation became less likely in this period. A possible explanation points toward the hypothesis that private equity firms want to avoid a second lawsuit after the first collusion lawsuits was settled in 2014 and thereby withdraw from forming clubs in the first place.

Graph 1. Distribution of median EV/EBITDA transaction multiples for single and club deals



Next, the development of private equity transaction multiples over time is examined in more detail. For sake of clarity, only EBITDA multiples displayed in Graph 1 are described in more detail, while sales multiples are reported in Appendix C. Since the multiple valuation is largely subject to outliers, the analysis mainly refers to median rather than average deal multiples.

EBITDA multiples increased steadily after the dot-com bubble around the turn of the millennium, peaking in 2007 with a median multiple of 10.9x. After the outbreak of the financial crisis in 2008, multiples reached an interim low. In fact, multiple compression between 2006 and 2009 amounts to almost 50%. After a sideways development in the following years around 9.0x EV/EBITDA, multiples expanded again from 2015 onwards and peaked in 2019 and 2021. These general observations are similar to the development of transaction volumes over the same period, albeit somewhat weaker.

Notably, club deal valuation shows a stark outlier to the upside in 2018 and 2021 with a median EBITDA multiple of 20.2x and 19.7x respectively. This can mainly be explained by the fact that club transactions in this year have been predominantly conducted within the information technology industry. Examples of this are the acquisitions of the software firms Hoist Group or ZPG. This finding is confirmed by Bain & Company (2022) noting that multiples for software acquisitions reached new highs in 2021 as more and more capital entered the market through the raising of new technology mega funds leading to fierce competition for deals.

In this context, it is worth noting that comparisons between single and club deals based on raw multiples should be treated with caution, as they are not adjusted for deal size or industry. Larger deals are generally associated with higher multiple valuations and there are also differences in multiple valuation among different industries as they have different capital structures, expected growth rates, and returns on invested capital (ROIC) – all of which drive multiples (Koller et al., 2005). These theoretical frameworks are confirmed in Appendix D and Appendix E. In particular, with respect to deal size, we see a clear positive relationship between size and valuation for both sales and EBITDA multiples. For this reason, the comparable industry transaction method is presented in the next chapter to adjust for time and industry. Plus, we control for size in the subsequent acquisition premium regressions.

On a geographical level, Appendix E reports that 60% of the sample includes deals in the three largest economic regions: the United Kingdom, France, and Germany. While the UK and France also account for the highest number of club deals in the sample (28% each), Germany ranks only fifth behind Italy and Spain representing 5% of total club deals. The Nordics region represents 14% of all deals with Sweden representing 6%, Norway and Denmark 3% each, followed by Finland with 2% and no deal in Iceland. Nordic club deals, however, only represent 8% of all club deals, indicating that club formation might be less likely in the region. While the avg. deal

size of a Nordic and Rest of Europe private equity deal is similar in size (€405m compared to €482m), Nordic club deals exceed on average €1.1bn in value and are therefore significantly larger compared to the Rest of Europe with €861m, indicating that size constraints might be a more critical factor in the Nordic region.

As shown in Table 2, the five most active private equity firms within our sample are Lloyds Development Capital (LDC), EQT, Bridgepoint, Carlyle and 3i. Together, they are responsible for 195 private equity acquisitions recorded in the sample. Only four out of the top 25 most frequent private equity buyers are non-prominent private equity firms. Thereof, Lloyds Development Capital (LDC) and Ratos are mid-market private equity firms engaging very rarely in club deals and are predominantly active in their local home market. LDC has conducted all of its 43 acquisitions in the UK with an average transaction size of only €45m. Similarly, Ratos bought all but one target with headquarter in the Nordics and an average transaction size of €184m. This underlines the importance to focus not only on prominent private equity firms, but also on non-prominent firms such as LDC and Ratos as they are very active in their local markets and play a significant role within the private equity landscape of their region. Another important observation is that the top 25 list is dominated by private equity firms that are either European based or have a strong foothold in Europe. Moreover, it is evidently, that some private equity firms engage more in club deals than others. Apax Partners, Equistone, Goldman Sachs, and KKR conduct more than 40% of their deals as part of a private equity consortium. Other firms such as LDC, Triton or Ratos are primarily acquiring targets by themselves without teaming up with another private equity sponsor. This might indicate that there are motivating factors that encourage some private equity firms to clubbing – either collusive behaviour or other benign reasons, e.g. due to the type of transactions or regional focus in which they conduct their deals.

Table 2. List of most active private equity firms

The table reports the most active private equity firms within the sample according to total deals conducted.

Rank	Name of Private Equity Firm	Single deals	Club deals	All deals	% club deals
1	Lloyds Development Capital (LDC)	42	1	43	2%
2	EQT	31	8	39	21%
3	Bridgepoint	30	9	39	23%
4	Carlyle	27	11	38	29%
5	3i Group	23	13	36	36%
6	Apax Partners	20	15	35	43%
7	Advent International	24	10	34	29%
8	Ardian (formerly AXA Private Equity)	19	12	31	39%
9	CVC Capital Partners	24	7	31	23%
10	Equistone Partners Europe (formerly Barclays Private Equity)	17	12	29	41%
11	Permira	20	8	28	29%
12	PAI Partners	18	8	26	31%
13	Blackstone	19	6	25	24%
14	Motion Equity Partners (formerly Electra Partners)	17	8	25	32%
15	Ratos	23	1	24	4%
16	Cinven	16	6	22	27%
17	KKR	10	9	19	47%
18	LBO France	13	6	19	32%
19	Goldman Sachs	2	16	18	89%
20	Triton	17	1	18	6%

Table 3. Cross-participation matrix

This table reports the number of club deals the top 10 private equity firms in terms of conducted club deals have closed with each other.

	Gold-man Sachs	Apax	3i	Ardian (AXA)	Equistone (Barclays)	Carlyle	Advent	Bridge-point	KKR	EQT
Apax	0	-	-	-	-	-	-	-	-	-
3i	0	0	-	-	-	-	-	-	-	-
Ardian (AXA)	0	0	0	-	-	-	-	-	-	-
Equistone (Barclays)	1	2	1	2	-	-	-	-	-	-
Carlyle	0	0	0	0	0	-	-	-	-	-
Advent	0	0	0	0	0	1	-	-	-	-
Bridgepoint	1	2	1	0	0	0	0	-	-	-
KKR	2	0	0	1	0	0	0	0	-	-
Permira	0	2	0	0	0	0	0	1	1	-

4. Methodology

The methodology to analyse the hypothesis of Chapter 2 generally follows the approach by Hetzenecker (2022), including the industry comparable transaction method by Kaplan & Ruback (1995) to analyse the pricing of private equity transactions in terms of deal multiples. Therefore, the following chapter focuses only on the differences and adjustments to the methodology set out by Hetzenecker (2022).

4.1. Club formation

The first research topic on club formation analyses the benign reasons that motivate private equity firms to form a club to jointly acquire a target firm. For this reason, a logistic regression approach is used with a club deal dummy as independent variable as well as target and deal characteristics as dependent variables to measure their influence on the probability of a club deal and to test the hypotheses H_1 to H_6 and H_{12}.

Since the dependent variable *CLUB* is binary, taking the value 1 if the target firm was acquired by more than one private equity firm and 0 otherwise, a binary logistic regression is used to analyse any influencing factors that make the formation of a club deal more or less likely. These influencing factors, i.e., predictor variables, are characterized in more detail by Hetzenecker (2022) and summarized in the following: *Deal size* is proxied by the natural logarithm of the transaction value to test the capital constraint hypothesis H_1. *Deal riskiness* is proxied by book leverage, defined as total debt divided by total assets of the target firm at the date of deal announcement to test the risk reduction hypothesis H_2. *Deal complexity* is proxied by a binary dummy variable indicating whether the transaction is a cross-boarder deal, defined as whether one or more of the buyers has its headquarter in another country than the target company, to test hypothesis H_3. The *deal quality certification* hypothesis H_4 leverages the creditor rights index ranges from 0 (weak creditor rights) to 4 (strong creditor rights), depending on the strength of creditor rights in the country where the acquired company is headquartered and was first introduced by La Porta et

al. (1998) before being updated by Djankov et al. (2007). To take into account the DOJ investigation in 2006 and the settlement of collusion lawsuits in 2014 filed by shareholders of portfolio companies, which caused significant media attention and traction on club deals, two dummy variables are introduced to identify transactions announced prior to 2006 or after 2014 to test the hypotheses H_5 and H_6.

The regressions on club deal formation also include several control variables. Due to the particular focus on the Nordic region, we introduce the regional target dummy variable *NORDICS*, which equals 1 if the target firm is headquartered in the Nordics and 0 if it is headquartered in the Rest of Europe. To provide more advanced findings in comparison to existing papers on club deals, we run the regression on four subsamples, i.e. on public and private takeovers as well as on the Nordic region and Rest of Europe.

For the subsample considering only publicly held target firms, the same financial and deal characteristic control variables as by Hetzenecker (2022) are taken into account, including EBITDA margin as profitability control variable, the log transformation of total assets as a size control variable and a dummy variable on tender offers as a deal characteristic control variable. Compared to Hetzenecker (2022), the control dummy variable on go-shop provisions is not included due to the lack of availability in the European sample. All control variables as well as book leverage ratio as a proxy for deal riskiness are omitted in all regressions including private deals due to data availability reasons as privately held firms often do not disclose any financial information. In fact, information on book leverage ratio is available for less than 20% of the private companies in our sample due to undisclosed total debt or asset values.

Similar to Hetzenecker (2022), each logistic regression is run not only on the binary dependent variable *CLUB* described previously but also the binary dependent variables *PROMINENT CLUB* and *NON-PROMINENT CLUB*. The *PROMINENT CLUB* dummy variable equals 1 if the target was acquired by a private equity club that includes at least one prominent private equity firm

as per Appendix A and 0 if it was acquired by a single private equity firm or a non-prominent club. Similarly, binary variable *NON-PROMINENT CLUB* which equals 1 if the target was acquired by a private equity club that includes no prominent private equity firm and 0 if it was acquired by a single private equity firm or a consortium that includes one or more prominent private equity firms.

Table 4 summarizes the independent variables introduced in this chapter together with the hypotheses of Chapter 2 which are tested through logistic regressions. Moreover, the expected sign of the independent variables in line with those hypotheses are shown. Since a logistic regression is applied, an expected positive sign in Table 4 resembles a coefficient above one, while an expected negative sign resembles a coefficient below one. Please refer to Hetzenecker (2022) for a more detailed description of the dependent and independent variables on club formation.

Table 4. Overview of the main independent variables of the regressions on club formation

Variable	Definition	Expectation	Hypothesis
Size	LN (Transaction size)	+	H_1: Capital constraint
Leverage ratio	Book leverage = Total Debt / Total Assets	-	H_2: Risk reduction
Creditor rights	Index ranging from 0 (weak creditor rights) to 4 (strong creditor rights)	-	H_3: Deal quality certification
Cross-border Deal	Dummy variable: 1 = Cross-border Deal 0 = No cross-border Deal	+	H_4: Need for information & knowledge sharing due to deal complexity
Pre-2006	Dummy variable: 1 = Deal announced before 2006 0 = Deal announced after 2005	+	H_5: Impact of DOJ investigation in 2006
Post-2014	Dummy variable: 1 = Deal announced after 2014 0 = Deal announced before 2015	-	H_6: Impact of collusion lawsuit settlements in 2014
Nordics	Dummy variable: 1 = Target HQ in the Nordics 0 = Target HQ outside of the Nordics	-	H_7: Nordic private equity market characteristics

4.2. Acquisition premium

The second major research question concerns the impact of private equity club formation during the bidding process on acquisition prices. If private equity clubs lower competition by colluding, then prices paid in single-sponsored deals should be significantly higher than in consortium deals.

In line with Hetzenecker (2022), the industry comparable transaction method set forth by Kaplan & Ruback (1995) is used to assess pricing of the transaction. While most empirical studies address deal pricing by measuring the abnormal returns to shareholders using an event study analysis, the industry comparable transaction method allows to include private company transactions in the sample. However, as public-to-private takeovers represent less than 42% of global buyout deal value in 2021 (Bain & Company, 2022), the upcoming analysis provides a more comprehensive and accurate overview of the private equity industry. This is further confirmed by the fact that 79% of all acquired targets in this sample were privately held (see Appendix B). The following summarizes the regression equations developed to test the hypotheses set out in Chapter 2 and provides an overview of the main independent variables of the multivariate linear regressions deployed to assess acquisition premia. Please refer to Hetzenecker (2022) for a full review of the methodology.

When analysing club deal pricing, we first control only for size and the presence of a club deal, before we independently include other dummy variables such as *PROMINENT, PRIVATE, NORDICS, PRE-2006,* and *POST-2014* together with their interaction term with the club deal dummy variable. Therefore, the following equations are developed to test the hypotheses set out in Chapter 2 on the total sample:

(1) $\text{Premium} = \alpha_0 + \beta_1 * \text{Club} + \beta_2 * \text{Size} + \varepsilon$

(2) $\text{Premium} = \alpha_0 + \beta_1 * \text{Club} + \beta_2 * \text{Size} + \beta_3 * \text{Prominent} + \beta_4 * \text{Club} \times \text{Prominent} + \varepsilon$

(3) $\text{Premium} = \alpha_0 + \beta_1 * \text{Club} + \beta_2 * \text{Size} + \beta_5 * \text{Pre-2006} + \beta_6 * \text{Club} \times \text{Pre-2006} + \varepsilon$

(4) $\text{Premium} = \alpha_0 + \beta_1 * \text{Club} + \beta_2 * \text{Size} + \beta_7 * \text{Post-2014} + \beta_8 * \text{Club} \times \text{Post-2014} + \varepsilon$

(5) $\text{Premium} = \alpha_0 + \beta_1 * \text{Club} + \beta_2 * \text{Size} + \beta_9 * \text{Private} + \beta_{10} * \text{Club} \times \text{Private} + \varepsilon$

(6) $\text{Premium} = \alpha_0 + \beta_1 * \text{Club} + \beta_2 * \text{Size} + \beta_{11} * \text{NORDICS} + \beta_{12} * \text{Club} \times \text{Nordics} + \varepsilon$

(7) $Premium = \alpha_0 + \beta_1*Club + \beta_2*Size + \beta_3*Prominent + \beta_4*Club\times Prominent + \beta_5*Pre\text{-}2006 + \beta_6*Club\times Pre\text{-}2006 + \beta_7*Post\text{-}2014 + \beta_8*Club\times Post\text{-}2014 + \beta_9*Private + \beta_{10}*Club\times Private + \beta_{11}*NORDICS + \beta_{12}*Club\times Nordics + \varepsilon$

(8) $Premium = \alpha_0 + \beta_1*Club + \beta_2*Size + \beta_5*Pre\text{-}2006 + \beta_6*Club\times Pre\text{-}2006 + \beta_{11}*Nordics + \beta_{12}*Club\times Nordics + \beta_{13}*Pre\text{-}2006\times Nordics + \beta_{14}*Club\times Pre\text{-}2006\times Nordics + \varepsilon$

(9) $Premium = \alpha_0 + \beta_1*Club + \beta_2*Size + \beta_7*Post\text{-}2014 + \beta_8*Club\times Post\text{-}2014 + \beta_{11}*Nordics + \beta_{12}*Club\times Nordics + \beta_{15}*Post\text{-}2014\times Nordics + \beta_{16}*Club\times Post\text{-}2014\times Nordics + \varepsilon$

(10) $Premium = \alpha_0 + \beta_1*Club + \beta_2*Size + \beta_3*Prominent + \beta_4*Club\times Prominent + \beta_5*Pre\text{-}2006 + \beta_6*Club\times Pre\text{-}2006 + \beta_7*Post\text{-}2014 + \beta_8*Club\times Post\text{-}2014 + \beta_9*Private + \beta_{10}*Club\times Private + \beta_{11}*NORDICS + \beta_{12}*Club\times Nordics + \beta_{13}*Pre\text{-}2006\times Nordics + \beta_{14}*Club\times Pre\text{-}2006\times Nordics + \beta_{15}*Post\text{-}2014\times Nordics + \beta_{16}*Club\times Post\text{-}2014\times Nordics + \varepsilon$

Similar to the methodology used for club formation, several regressions are run on subsamples, such as the public, private, Nordics, and Rest of Europe sample to identify any differences in acquisition premia among the them. Table 5 summarizes the independent variables introduced and defined in this chapter. Furthermore, the hypotheses of Chapter 2 which are tested via those independent variables and their expected signs are reported.

Table 5. Overview of the main independent variables of the regressions on acquisition premia

Variable	Definition	Expectation	Hypothesis
Club	Dummy variable: 1 = Deal conducted by two or more PE firms 0 = Deal conducted by one PE firm	-	H_7
Club×Prominent	Dummy variable: 1 = Deal conducted by two or more PE firms of which at least one is a prominent PE firm 0 = Deal conducted by one PE firm or more than one non-prominent PE firm	-	H_8
Club×Pre-2006	Dummy variable: 1 = Club deal announced before 2006 0 = Deal announced after 2005 or single deal announced before 2006	-	H_9
Club×Post-2014	Dummy variable: 1 = Club deal announced after 2014 0 = Deal announced before 2015 or single deal announced after 2014	+	H_{10}
Club×Private	Dummy variable: 1 = Club deal to acquire privately held target 0 = Club deal to acquire publicly listed target or single deal	+	H_{11}
ClubxNordics	Dummy variable: 1 = Nordics club deal 0 = Rest of Europe deal or Nordics single deal	Insig.	H_{13}
Club×Pre-2006 ×Nordics	Dummy variable: 1 = Nordics club deal announced before 2006 0 = Rest of Europe deal, Nordics single deal or Nordics club deal announced after 2005	Insig.	H_{14}
Club×Post-2014 ×Nordics	Dummy variable: 1 = Nordics club deal announced after 2014 0 = Rest of Europe deal, Nordics single deal or Nordics club deal announced before 2015	Insig.	H_{15}

5. Result analysis

In the following chapter, the results on the hypotheses regarding club deal formation and pricing, which have been comprehensively argued in Chapter 2, are presented in detail according to the methodology from Chapter 4. Throughout the chapter, the theoretical contribution to the existing research gap made by the thesis is highlighted and discussed. All results are obtained using SPSS as primary statistics tool.

5.1. Results for club deal formation

The result analysis begins by examining the benign reasons why private equity firms team up to acquire a target firm, addressing whether motivations beyond potential collusion and lower purchase prices influence club deals. This exploration aims to determine if there are other factors, such as firm characteristics or regional differences, driving these partnerships. To achieve this, the analysis employs logistic regressions on a large sample that includes both privately held and publicly listed target firms, offering a comprehensive view of private equity behaviour across Europe.

The dataset is divided into several subsamples to explore variations by geographical region, focusing on the Nordics versus the rest of Europe. The distinction between private and public targets is also considered to assess whether ownership structures influence the motivations for club deals. Panel A presents the overall sample, comprising 2,116 private equity transactions. Panel B specifically looks at the 287 deals where the target firm is headquartered in one of the Nordic countries, while Panel C focuses on 1,829 deals with targets based outside the Nordics, representing the rest of Europe. This regional breakdown helps illuminate differences in private equity behaviour between the Nordic market and the rest of Europe, potentially highlighting unique market dynamics in each region. Appendix I reports the results for the privately held and publicly listed subsamples across all European target firms, extending the analysis by distinguishing between privately held and publicly listed firms, offering a nuanced

understanding of whether ownership type impacts the prevalence or nature of club deals. For data availability reasons, control variables regarding target and deal characteristics are solely used for the public sample.

By breaking down the sample into these distinct groups, the analysis aims to uncover whether factors such as regional differences (Nordics vs. rest of Europe), prominence of the private equity firms involved, and the public or private nature of the target firm play a role in the decision to form clubs. These results will help clarify whether benign factors, such as a need for capital or specialized expertise, risk sharing, or operational synergies, are significant contributors to club formation in private equity, alongside or instead of anti-competitive motivations.

First, the goodness-of-fit statistics from the Hosmer-Lemeshow test reveal that all logistic regression models adequately describe and fit the data showing a significance value above 0.1, except for the regressions with non-prominent club as dependent variable in both the total European and the rest of Europe subsample. The Pseudo-R-squared values from Cox & Snell R^2 as well as Nagelkerke R^2 indicate that the regressions with prominent club deal as dependent variable exhibit particularly high explanatory power with a Nagelkerke R^2 exceeding 0.23 for all models. In contrast, the models examining non-prominent clubs as dependent variable show a significantly lower explanatory power, with no model achieving a Nagelkerke R^2 above 0.07, indicating that only a very small portion of whether a club is formed by non-prominent private equity firms is explained by the chosen independent variables. When comparing the goodness-of-fit measures with the empirical model of private equity club formation reported by Boone & Mulherin (2011) which reports a pseudo-R^2 of 0.123, the current study and regressions reported in Table 6 align with the explanatory power of previous research on club deal formation while demonstrating superior explanatory power regarding prominent club deals.

Table 6. Overview of the main independent variables of the regressions on club formation

The panels report logit regression analyses of the likelihood that a private equity acquisition is conducted by a (prominent or non-prominent) club. The dependent variables (Club, Prominent Club and Non-Prominent Club) are dummy variables that equal 1 if the respective condition is fulfilled and 0 otherwise. Size is defined as the natural logarithm of the transaction value. Leverage Ratio is defined as total debt divided by total assets at time of deal announcement. Creditor rights represent an index taking values from zero (poor creditor rights) to four (strong creditor rights) and is computed as the sum of scores on four measures of credit protection for each country. Cross-Border Deal is a dummy variable that equals 1 if one or more of the buyers has its headquarter in another country than the target. Pre-2006 is a dummy variable that equals 1 if the transaction has been announced in 2005 or earlier. Post-2014 is a dummy variable that equals 1 if the transaction has been announced in 2015 or later. Nordics is a dummy variable that equals 1 if the target has its headquarter in the Nordics. As Leverage Ratio suffers from data availability limitations and substantially reduces the size of the sample, it is only included in the public sample. The public sample also includes further control variables: Assets is defined as the natural logarithm of total assets at deal announcement. Profitability is defined as EBITDA divided by revenue at deal announcement. Tender is a dummy variable that equals 1 if the transaction involved a tender offer. Go-Shop is a dummy variable that equals 1 if the transaction involved a go-shop provision. Standard errors are displayed in brackets. Statistical significance is denoted as *** for a p-value < 0.01, ** for < 0.05, * for < 0.1.

Panel A: Total European sample

Variables	Club	Prominent Club	Non-Prominent Club
Size	**1.200*****	**1.821*****	**0.919****
	(0.035)	(0.062)	(0.041)
Creditor Rights	**0.809*****	**0.849*****	**0.815*****
	(0.037)	(0.058)	(0.044)
Cross-Border Deal	**1.572*****	**3.001*****	1.090
	(0.130)	(0.237)	(0.156)
Pre-2006	**1.772*****	**2.380*****	1.289
	(0.130)	(0.190)	(0.161)
Post-2014	**0.754***	**0.658***	0.816
	(0.160)	(0.235)	(0.203)
Nordics	**0.441*****	0.729	**0.322*****
	(0.195)	(0.256)	(0.277)
Constant	**0.129*****	**0.002*****	**0.308*****
	(0.189)	(0.407)	(0.203)
Observations	2,116	2,116	2,116
Cox & Snell R^2	0.066	0.112	0.022
Nagelkerke R^2	0.105	0.255	0.044
Hosmer-Lemeshow Test	0.358	0.561	0.067

Panel B: Nordics sample

Variables	Club	Prominent Club	Non-Prominent Club
Size	**1.496*****	**2.012*****	1.076
	(0.129)	(0.194)	(0.161)
Creditor Rights	0.847	1.029	0.633
	(0.247)	(0.309)	(0.392)
Cross-Border Deal	1.985	3.068	1.522
	(0.492)	(0.811)	(0.632)
Pre-2006	**3.185****	**3.561****	2.394
	(0.456)	(0.611)	(0.635)
Post-2014	1.224	1.042	1.303
	(0.486)	(0.655)	(0.685)
Constant	**0.010*****	**0.000*****	**0.045*****
	(0.800)	(1.371)	(0.920)
Observations	287	287	287
Cox & Snell R^2	0.094	0.108	0.015
Nagelkerke R^2	0.179	0.273	0.043
Hosmer-Lemeshow Test	0.537	0.862	0.142

Panel C: Rest of Europe sample

Variables	Club	Prominent Club	Non-Prominent Club
Size	**1.177*****	**1.801*****	**0.908****
	(0.037)	(0.065)	(0.042)
Creditor Rights	**0.808*****	**0.843*****	**0.817*****
	(0.037)	(0.059)	(0.044)
Cross-Border Deal	**1.547*****	**2.971*****	1.072
	(0.135)	(0.249)	(0.162)
Pre-2006	**1.672*****	**2.255*****	1.232
	(0.136)	(0.201)	(0.166)
Post-2014	**0.706****	**0.614***	0.776
	(0.171)	(0.255)	(0.214)
Constant	**0.148*****	**0.002*****	**0.333*****
	(0.193)	(0.424)	(0.207)
Observations	1,829	1,829	1,829
Cox & Snell R^2	0.059	0.113	0.018
Nagelkerke R^2	0.092	0.253	0.034
Hosmer-Lemeshow Test	0.495	0.795	0.045

Deal Size – Capital Constraint Hypothesis

Regarding the total sample, the analysis finds a positive and signification relationship between deal size and club formation, supporting hypothesis H_1. This suggests that private equity firms collaborate for larger transactions as they might be restricted in how much capital they can deploy to a single deal for portfolio construction reasons. A similar positive relationship exists across all subsamples, although capital constraints appear to be more pronounced in public deals, likely because public-to-private transactions in the dataset are on average 2.9 times larger than private transactions. Notably, while deal size is positively related to prominent club formation, it shows a negative relationship for non-prominent clubs. This is surprising, as prominent private equity firms generally have more capital at their disposal and should therefore be less affected by capital constraints. On the flip side, prominent private equity firms typically target large-cap firms and given the positive relationship between capital raised and transaction size, prominent and non-prominent private equity firms typically acquire firms of different sizes. A possible explanation could be that prominent private equity firms join forces exactly when a transaction is very large and thus generally only a few bidders – especially strategic buyers – come into question, which increases the chances of a successful takeover. However, if two mid-cap, non-prominent

private equity players join forces to buy a target that is outside their normal transaction volume, they are likely to compete with large, prominent private equity firms without generating a significant advantage in the bidding process due to capital constraints of other investors.

Creditor Rights – Deal Quality Certification Hypothesis

The analysis also tests the deal quality certification hypothesis, revealing a negative and significant relationship between creditor rights and the likelihood of club formation. This finding supports hypothesis H_3, suggesting that private equity firms are more inclined to form clubs in regions with weaker creditor rights, as this enhances their ability to secure more favourable debt conditions which might give them an advantage in an auction compared to single bidders to pay a premium. This dynamic appears more relevant for private transactions and for transactions outside the Nordics, as the creditor rights variable lacks significance in the public or Nordic samples.

Cross-Border Deal – Information & Resource Sharing Hypothesis

Moreover, the results indicate that club formation is positively correlated with cross-border deals, supporting the information and resource sharing hypothesis. This suggests that private equity firms join forces with local sponsors to leverage and benefit from their knowledge, network, information, and resources in the local market. For example, a foreign private equity firm that mostly operates in its home market might benefit from the local expertise of a domestic private equity firm when acquiring a target firm. Nevertheless, these results must be interpreted with caution, as large private equity firms today operate very internationally and often have offices around the world with locally integrated teams, reducing the need for the expertise of a local private equity firm. While cross-border deals also correlate positively with club formation in the Nordics sample, the relationship is not statistically significant. This might be an indicator for the developed financial markets in the Nordics with private equity being an integral part of the financial ecosystem for decades, therefore requiring less

information sharing and local expertise than other European regions such as Southern or Eastern Europe.

Impact of DOJ Investigation & Legal Scrutiny

The analysis also examines the impact of the DOJ investigation and subsequent lawsuits against private equity firms for alleged collusion. The findings demonstrate that club deals were more likely to occur pre-2006 and less so post-2014, indicating that the heightened media and regulatory scrutiny stemming from the 2006 investigation led to a decline in club formations. Regarding the impact of the DOJ investigation and the lawsuits filed by portfolio firms against several private equity firms accusing them of collusive behaviour, the results clearly show that club deals were more likely to be formed pre-2006 and less likely post-2014. These findings suggest that the additional media and regulatory attention from the DOJ investigation in 2006 caused private equity firms to move away from forming clubs to acquire companies. This is in line with the observations of Boone & Mulherin (2011) and Officer et al. (2010). The negative correlation between the post-2014 variable and club formation suggests that private equity firms may be reluctant to form clubs after the lawsuits were settled in 2014 to avoid the possibility of renewed scrutiny over club deals. Notably, the odds-ratios for the pre-2006 variable are larger for prominent clubs than for non-prominent ones, and the post-2014 variable exhibits a strong negative relationship at the 1% significance level for prominent clubs, while it is not statistically significant for non-prominent clubs, underscoring that these prominent private equity firms have been particularly affected by the investigations and lawsuits impacting their decision to form a consortium. Again, the Nordics subsample produces diverging results compared to the European sample as the post-2014 variable suggests a positive albeit insignificant relationship with club formation, further supporting the claim that other variables, not captured by the chosen independent variables, drive club formation in the Nordics.

Book Leverage – Risk Reduction Hypothesis

The risk reduction hypothesis is tested solely on the public sample due to limited data availability of book leverage – used as a proxy for risk – for private transactions. The book leverage variable is not statistically significant at a 10% level across all regressions of the public sample, indicating that the riskiness of a target company does not play a significant role in the decision of private equity firms when acquiring a European firm.

Regional Differences in Club Formation

The regional dummy variable for the Nordics shows a statistically significant and negative relationship with club formation at a 1% level for the total European sample. This suggests that private equity firms are less likely to collaborate when acquiring target firms based in the Nordics. However, taking a closer look at the subsamples, this negative association is not observed in the public subsample or in any regressions with the prominent club variable as dependent variable, indicating that the conclusion only holds true for privately held companies and deals involving a non-prominent private equity club.

Conclusion

In conclusion, the analysis indicates that European club deals are more likely to arise in scenarios involving larger transactions that require knowledge and information sharing, particularly when creditor rights are weak. These findings are consistent with the competition hypothesis stating that club deals are formed for benign rather than for collusive reasons. Indeed, the results affirm that factors such as capital constraint, deal quality certification as well as information and knowledge sharing play significant roles in the formation of private equity clubs. Additionally, the data shows that club deals were more prevalent pre-2006 and less common post-2014, suggesting a direct impact from the DOJ investigations and lawsuits filed by some portfolio firms against private equity firms on the eagerness of private equity firms to acquire targets jointly. From a geographical perspective, club deals are less likely to be formed in the Nordics compared to the rest of

Europe, especially for privately held targets and in the case of non-prominent private equity clubs. Notably, none of the benign reasons that apply to the broader European sample seem to hold for the formation of non-prominent private equity clubs targeting Nordic firms, implying that factors beyond those captured in this analysis drive club formation in that specific region.

Table 7 summarizes the results on club formation for the total European and Nordic sample, indicates whether the results align with the hypotheses developed in Chapter 2, and compares them to the results found by Hetzenecker (2022) on a combined U.S. and European sample (referred to as *global sample*). The table also shows three different panels given the varying dependent club variable (all club deal vs. prominent club deal vs. non-prominent club deals).

Table 7. Overview of results on club formation & comparison with findings of Hetzenecker (2022)

Statistical significance is denoted as *** for a p-value < 0.01, ** for < 0.05, * for < 0.1. Grey shadowing implies that results align with theoretical expectation and show a statistical significance of at least < 0.1.

Panel A: Club Deals

Club Formation Hypotheses	Expectation	Global Sample	European Sample	Nordics Sample
Capital constraints (H_1)	+	+***	+***	+***
Risk reduction (H_2)	-	-**	-	n/a[(1)]
Deal quality certification(H_3)	-	-***	-***	-
Information & resource sharing (H_4)	+	+***	+***	+
Impact of DOJ investigation in 2006 (H_5)	+	+***	+***	+**
Impact of collusion lawsuit settlements in 2014 (H_6)	-	-***	-*	+
Nordic PE market characteristics (H_{12})	-	n/a	-***	n/a

Panel B: Prominent Club Deals

Club Formation Hypotheses	Expectation	Global Sample	European Sample	Nordics Sample
Capital constraints (H_1)	+	**+*****	**+*****	**+*****
Risk reduction (H_2)	-	-**	-	n/a[(1)]
Deal quality certification(H_3)	-	-***	-***	+
Information & resource sharing (H_4)	+	+***	+***	+
Impact of DOJ investigation in 2006 (H_5)	+	+***	+***	+**
Impact of collusion lawsuit settlements in 2014 (H_6)	-	-***	-*	+
Nordic PE market characteristics (H_{12})	-	n/a	-	n/a

Panel C: Non-Prominent Club Deals

Club Formation Hypotheses	Expectation	Global Sample	European Sample	Nordics Sample
Capital constraints (H_1)	+	**-*****	**-****	**+**
Risk reduction (H_2)	-	-	-	n/a(1)
Deal quality certification(H_3)	-	-***	-***	-
Information & resource sharing (H_4)	+	+***	+	+
Impact of DOJ investigation in 2006 (H_5)	+	+***	+	+
Impact of collusion lawsuit settlements in 2014 (H_6)	-	-*	-	+
Nordic PE market characteristics (H_{12})	-	*n/a*	-***	*n/a*

Note: (1) Analysis is omitted due to the limited number of publicly listed Nordic club deals in the sample.

5.2. Results for club deal pricing

Following the analysis on club formation, the subsequent section examines the results of the linear regressions on acquisition premiums utilizing the comparable industry transaction method and controlling for size. For the sake of clarity and simplicity, the following discussion will centre on the results of the EBITDA multiple valuation with a 3-year matching window centred on deal announcement. The results of the 3-year matching window preceding deal announcement and the revenue multiple premium analysis can be found in Appendix J, with a summary provided at the end of this section. The following results are reported for the overall European sample, along with several subsamples that include the Nordics, Rest of Europe, public, and private subsamples. It must be noted that the total sample for acquisition premiums based on EBITDA multiples includes only 821 observations as not all private companies disclose their EBITDA figures, limiting data availability through Capital IQ as primary database.

Total European Sample Analysis

The coefficients for the club deal dummy variable are negative across all regression models utilizing the total European sample in Panel A of Table 8. However, they are only statistically significant at a 1% level in model 5, at a 5% level in models 1, 6 and 7 and at a 10% level in model 10. Therefore, we find partial evidence that the formation of a club tends to depress acquisition prices. Intriguingly, the club deal discount does not solely pertain to prominent private equity firms (*Club × Prominent*), the pre-2006 (*Club x Pre-2006*) or the post-2014 period (*Club x Post-2014),* as all

interaction variables are not statistically significant in any of the models. While both the pre-2006 and post-2014 club deals were priced at a discount, exhibiting negative coefficients, they are statistically insignificant, indicating a lack of clear evidence that the club deal discount prevails only for the period preceding the DOJ investigations or that the settlement of the lawsuits against several prominent private equity firms in 2014 had any significant impact in club deal pricing. Nevertheless, the *Pre-2006* coefficients are negative while the *Post-2014* coefficients are positive and statistically significant, indicating that private equity deals experienced an acquisition discount before 2006, a trend that appears to have reversed in the post-2014 period. Therefore, private equity firms paid lower multiples than strategic buyers pre-2006 which in literature is mostly attributed to the fact that private equity firms, unlike strategic buyers, cannot realize revenue or cost synergies with the target and therefore often cannot pay top dollar. Several factors may explain the apparent shift in pricing behaviour post-2014, including a growing tendency among many private equity firms to adopt a sector-specific approach or "buy-and-build" strategies. This approach involves acquiring a platform company followed by meaningful strategic acquisitions of complementary firms. In doing so, they may be able to generate synergies themselves, which allows them to pay higher prices. Additionally, increased competition for transactions, driven by substantial available capital, known as "dry powder", within the private equity industry may heighten pressure to deploy capital and subsequently increase their willingness to pay higher prices for target firms.

The coefficients of the dummy variable *Private* are consistently negative and statistically significant at a 5% level. This observation indicates that private equity firms tend to pay lower prices for private firms compared to publicly listed firms. Notably, the interaction variable *Private x Club* is positive and statistically significant at a 1% level for all models, supporting the hypothesis that the club deal discount disappears for private targets in line with the finding of Hetzenecker (2022) when analysing the global sample. This finding underscores the notion that a concentrated ownership

Table 8 - Panel A: Total European sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Club	**-5.725****	-4.960	-3.644	-4.153	**-14.749*****	**-5.965****	**-12.735****	-4.496	-3.225	**-12.004***
	(2.838)	(4.008)	(3.311)	(3.192)	(3.980)	(3.000)	(6.106)	(3.512)	(3.336)	(6.183)
Target Size	**8.410*****	**7.721*****	**8.398*****	**8.069*****	**8.518*****	**8.410*****	**7.461*****	**8.388*****	**8.165*****	**7.529*****
	(0.741)	(0.827)	(0.737)	(0.749)	(0.741)	(0.742)	(0.832)	(0.739)	(0.750)	(0.834)
Prominent		**5.399***					**5.195***			**5.056***
		(2.958)					(2.932)			(2.932)
Club × Prominent		-1.537					2.296			2.303
		(5.583)					(5.600)			(5.608)
Pre-2006			**-8.100****				**-6.564***	**-8.985****		**-7.865****
			(3.345)				(3.513)	(3.625)		(3.811)
Club × Pre-2006			-4.316				-4.184	-2.002		-2.947
			(6.250)				(6.731)	(6.621)		(7.092)
Post-2014				**9.180*****			**7.228****		**9.868*****	**8.066****
				(3.071)			(3.210)		(3.405)	(3.540)
Club × Post-2014				-4.009			-6.236		-10.280	-11.185
				(6.628)			(7.097)		(7.286)	(7.679)
Private					**-6.329****		**-6.525****			**-6.965****
					(2.690)		(2.697)			(2.721)
Club × Private					**17.914*****		**17.814*****			**17.818*****
					(5.542)		(5.690)			(5.708)
Nordics						3.851	3.007	2.362	4.635	2.875
						(3.636)	(3.591)	(3.994)	(4.375)	(5.041)
Club × Nordics						5.129	8.544	9.932	-8.636	-3.381
						(8.957)	(8.990)	(10.316)	(11.429)	(15.036)
Pre-2006 × Nordics								6.748		8.512
								(9.452)		(9.908)
Club×Pre-2006×Nordics								-20.964		-5.832
								(20.682)		(23.263)
Post-2014 × Nordics									-4.791	-4.397
									(7.812)	(8.171)
Club×Post-2014×Nordics									**36.087***	33.266
									(18.656)	(20.949)
Constant	-69.373***	-67.947***	-67.664***	-69.952***	-69.373***	-70.007***	-64.286***	-68.019***	-71.166***	-64.318***
	(4.238)	(4.373)	(4.260)	(4.261)	(4.238)	(4.307)	(4.745)	(4.350)	(4.351)	(4.808)
Observations	821	821	821	821	821	821	821	821	821	821
Adjusted R^2	0.134	0.136	0.144	0.142	0.144	0.134	0.160	0.143	0.144	0.160
F-Statistic	64.4***	33.2***	35.4***	34.9***	35.4***	32.8***	14.0***	18.1***	18.2***	10.8***

Table 8 - Panel B: Nordics sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(11)
Club	0.109	2.958	6.410	-10.616	-6.809	-14.229
	(8.058)	(10.880)	(9.220)	(10.260)	(9.770)	(18.180)
Target Size	**7.684*** **	**6.342*** **	**7.679*** **	**7.354*** **	**5.664*** **	**5.718*** **
	(1.820)	(2.051)	(1.819)	(1.832)	(6.496)	(2.094)
Prominent		9.498				10.541
		(6.844)				(6.787)
Club × Prominent		-3.534				5.739
		(15.465)				(16.775)
Pre-2006			-2.056			0.195
			(7.996)			(8.440)
Club × Pre-2006			-23.216			-5.314
			(17.934)			(20.532)
Post-2014				5.664		7.555
				(6.496)		(7.064)
Club × Post-2014				25.228		17.377
				(15.556)		(17.930)
Private					2.149	4.173
					(6.066)	(6.213)
Club × Private					22.765	24.279
					(16.346)	(18.081)
Constant	-62.337***	-59.206***	-61.957***	-62.451***	-63.915***	-60.944***
	(10.042)	(10.334)	(10.054)	(9.898)	(10.788)	(10.994)
Observations	123	123	123	123	123	123
Adjusted R^2	0.126	0.126	0.130	0.151	0.132	0.149
F-Statistic	9.8***	5.4***	5.5***	6.4***	5.6***	3.1***

Table 8 - Panel C: Rest of Europe sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(11)
Club	**-6.046** **	-5.610	-4.580	-3.301	**-16.032*** **	**-12.706** **
	(3.052)	(4.338)	(3.570)	(3.394)	(4.348)	(6.426)
Target Size	**8.526*** **	**7.913*** **	**8.502*** **	**8.294*** **	**9.811*** **	**7.790*** **
	(0.812)	(0.905)	(0.807)	(0.820)	(3.462)	(0.909)
Prominent		4.774-				4.172
		(3.273)				(3.237)
Club × Prominent		-1.010-				2.673
		(6.034)				(6.026)
Pre-2006			**-8.988** **			**-8.390** **
			(3.677)			(3.872)
Club × Pre-2006			**-1.981** **			-2.694
			(6.717)			(7.213)
Post-2014				**9.811*** **		**7.866** **
				(3.462)		(3.591)
Club × Post-2014				-10.367		-11.470
				(7.406)		(7.792)
Private					**-8.062*** **	**-9.126*** **
					(2.983)	(3.009)
Club × Private					**19.384*** **	**18.752*** **
					(5.977)	(6.105)
Constant	-70.643***	-69.352***	-68.638***	-71.854***	-67.352***	-64.127***
	(4.671)	(4.833)	(4.705)	(4.709)	(4.919)	(5.186)
Observations	698	698	698	698	698	698
Adjusted R^2	0.135	0.135	0.144	0.142	0.147	0.163
F-Statistic	55.2***	28.2***	30.4***	29.8***	31.0***	14.6***

Table 8 - Panel D: Private sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(12)
Club	3.080	3.368	6.376	3.079	3.322	7.201
	(3.774)	(5.021)	(4.202)	(4.216)	(3.922)	(5.894)
Target Size	**8.681*** **	**8.053*** **	**8.662*** **	**8.553*** **	**3.796*** **	**7.843*** **
	(0.980)	(1.127)	(0.978)	(0.989)	(4.205)	(1.136)
Prominent		4.366				4.959
		(4.167)				(4.152)
Club × Prominent		-0.551				1.878
		(7.558)				(7.584)
Pre-2006			-2.299			-2.206
			(5.034)			(5.196)
Club × Pre-2006			-14.512			-15.136
			(9.371)			(9.678)
Post-2014				3.796		4.059
				(4.205)		(4.315)
Club × Post-2014				1.747		-5.411
				(9.409)		(9.817)
Nordics					**9.200***	**9.456***
					(4.874)	(4.887)
Club × Nordics					11.290	13.254
					(14.379)	(14.826)
Constant	-74.007***	-72.340***	-73.554***	-74.284***	-75.790***	-73.707***
	(5.559)	(5.811)	(5.622)	(5.624)	(5.657)	(6.054)
Observations	409	409	409	409	409	409
Adjusted R^2	0.165	0.163	0.170	0.163	0.173	0.176
F-Statistic	41.2***	20.9***	21.9***	20.9***	22.3***	9.7***

Table 8 - Panel E: Public sample - 3-year match window centred on deal announcement

Variables	(1)	(2)	(3)	(4)	(5)	(12)
Club	**-14.570*** **	**-16.198** **	**-15.894*** **	**-11.719** **	**-15.707*** **	**-16.085** **
	(4.231)	(6.426)	(5.214)	(4.789)	(4.545)	(7.924)
Target Size	**8.341*** **	**7.641*** **	**8.441*** **	**7.648*** **	**13.987*** **	**7.124*** **
	(1.117)	(1.211)	(1.111)	(1.131)	(4.436)	(1.234)
Prominent		5.010				4.982
		(4.198)				(4.152)
Club × Prominent		2.549				3.674
		(8.344)				(8.308)
Pre-2006			**-13.889*** **			**-10.011** **
			(4.524)			(4.876)
Club × Pre-2006			**7.963*** **			4.260
			(8.591)			(9.555)
Post-2014				**13.987*** **		**11.301** **
				(4.436)		(4.807)
Club × Post-2014				-7.058		-7.892
				(9.286)		(10.377)
Nordics					-1.354	-5.263
					(5.338)	(5.354)
Club × Nordics					8.263	11.308
					(11.765)	(11.704)
Constant	-65.837***	-64.337***	-62.903***	-65.899***	-65.547***	-61.233***
	(6.434)	(6.574)	(6.442)	(6.430)	(6.517)	(6.694)
Observations	412	412	412	412	412	412
Adjusted R^2	0.120	0.120	0.137	0.138	0.117	0.143
F-Statistic	29.0***	15.1***	17.3***	17.4***	14.6***	7.9***

structure can help to mitigate the club deal discount that is present across the European sample.

Nordics vs. Rest of Europe Sample Analysis

Examining potential differences between the Nordics and Rest of Europe subsamples, the results do not indicate significant variations in pricing private equity transactions since the coefficients for the *Nordics* variable and for its interaction variables are not statistically significant. However, the two subsamples in Panel B and C reveal that the general findings of the total European sample primarily hold true for the Rest of Europe subsample but not for the Nordics. Specifically, there is no statistically significant evidence supporting a club deal discount within the Nordics, where only target size positively influences acquisition premium. Conversely, the Rest of Europe subsample aligns with the overall findings that a club deal discount is present, albeit partially mitigated by private ownership.

Public vs. Private Sample Analysis

Examining the private and public subsamples presented in Panel D and E, it is evident that the club deal discount is only applicable to publicly listed companies, disappearing in the private sample. This observation further confirms the previous findings that private ownership appears significantly reduces or even eliminates the club deal discount.

Robustness Analysis

The results reported on acquisition premiums based on EBITDA multiples preceding deal announcement, reported in Appendix J, largely mirror the findings for EBITDA multiples centred on deal announcement. However, there is more robust evidence suggesting that club deals are priced higher post-2014 in the Nordics compared to the Rest of Europe. Regarding the acquisition premiums based on sales multiples, we find no evidence of a general club deal discount in either the 3-year matching window preceding deal announcement or the one centred on deal announcement. Nevertheless, the sales multiple regressions find partial evidence for a club

deal discount in the Nordics, which appears to diminish in the post-2014 period.

Conclusion

In summary, this section sheds light on the dynamics of acquisition premiums within private equity transactions, highlighting key differences between club deals and their implications on pricing across various subsamples, including the Nordics and Rest of Europe. The results suggest that while club deals tend to suppress acquisition prices on a total European level, this effect varies significantly depending on the nature of the target – privately held versus publicly listed - and the geographic context. In particular, the club deal discount is only present for the public and Rest of Europe subsamples. For both the total European sample and the Rest of Europe subsample, the club deal discount can be mitigated through private and therefore concentrated ownership. The Nordics subsample does not experience any club deal discount on a statistically significant level providing a crucial distinction to the findings by Hetzenecker (2022) and confirming hypothesis H_{13} that Nordic club deals are not priced lower compared to single-sponsored deals. This observation provides evidence for the suggestion of StepStone (2023) for the existence of a *Nordic Model* which is characterized by a high level of market maturity, strong cultural and governance frameworks as well as economic and regulatory stability and therefore – as hypothesised – makes it less vulnerable to club collusion and in turn to depressed acquisition prices for club deals.

6. Discussion & Conclusion

As private equity reached its premature peak in 2021, private equity club deals made a significant comeback. Private equity club deals have bbeen subject to one of the most controversial criticisms of the private equity business model since 2006, when a DOJ investigation into potential collusion during bidding processes drew considerable media attention and generated negative headlines. Following the investigation, several private equity-backed portfolio companies filed a collusion lawsuit. These accusations were still on the table until 2014, when the lawsuits were finally settled. The resurgence of club deals led Hetzenecker (2022) to expand the research frontier, which was primarily based on papers by Officer et al. (2010) and Boone & Mulherin (2011) that solely focus on a U.S. public-to-private sample, which had limited explanatory value to the private equity market as a whole due to its single country focus and exclusion of privately held target companies which represent the majority of private equity deals.

The findings of Hetzenecker (2022), based on a sample consisting of both U.S. and European companies, call for a more detailed analysis of the fragmented European landscape. In particular, he finds evidence for a general club deal discount which prevails also in the U.S. and European subsamples but can only be mitigated by private and thus concentrated ownership in the European subsample. This thesis levers the research by Spliid (2013) as a theoretical framework, suggesting that the Nordic private equity market has unique characteristics compared to the rest of Europe and thus requires its own empirical analysis as general findings on the U.S. or European market cannot be applied to the Nordics market in the same way. In fact, Spliid's (2013) research underscores that the Nordic private equity market is characterized by high levels of trust and transparency, operational focus, sector specialization, a stable economic and regulatory environment, as well as a strong governance framework.

Therefore, the thesis poses the following research questions:

1. Are club deals in Europe priced lower compared to single-sponsored deals?
2. Does this club deal discount differ between the Nordics and the Rest of Europe?
3. Did the DOJ investigation and settlement of lawsuits affect the pricing of club deals?
4. Does a more concentrated ownership structure mitigate the club deal discount?
5. What are other possible drivers that motivate private equity firms to form a club?
6. Are private equity firms less likely to team up in the Nordics compared to the rest of Europe?

The empirical study investigates 2,116 private equity acquisitions[1] in Europe between 1996 and 2021 and provides the following evidence for the aforementioned research questions which are put in context to the findings by Hetzenecker (2022):

1. Yes, the findings are in favour of a general club deal discount in Europe. Moreover, such club deal discount is not just concentrated before 2006 as found by Officer et al. (2010).This finding is in line with the analysis of a global and U.S. sample by Hetzenecker (2022).
2. Yes, the club deal discount differs between the Nordics and the rest of Europe. While the rest of Europe exhibits a club deal discount, the Nordics do not show statistically significant evidence of such a discount. This suggests that the club deal discount is more prominent in the rest of Europe, while the Nordic market's unique characteristics, such as high maturity and strong governance frameworks, may prevent a club deal discount.

[1] The sample size is reduced to 821 for the investigation of pricing, as the EV/EBITDA multiple is not available due to non-disclosable financials for some private acquisitions.

3. No, we did not find evidence that the DOJ investigation in 2006 or the settlement of lawsuits in 2014 had an effect on the pricing of club deals, with no significant differences between the Nordics and the rest of Europe subsamples. This finding aligns with the analysis of a global and U.S. sample by Hetzenecker (2022).
4. Yes, concentrated ownership structure, such as in privately held companies, appears to mitigate and reduce the club deal discount across European deals as more concentrated control and decision-making tends to reduce the potential for pricing discounts seen in club deals for public companies with more fragmented ownership structures. The more centralized control in private companies allows for faster, more aligned decision-making, reducing inefficiencies associated with club deal negotiations. This finding for the European market is in line with the findings from the global sample of Hetzenecker (2022), however, this holds only true for the Rest of Europe subsample but not for the Nordics one where no statistically significant club deal discount was found to begin, so the mitigating effect of concentrated ownership is not as relevant.
5. European club formation appears to be driven by several benign (non-collusive) reasons, including (i) capital constraints as larger deals might require multiple private equity firms to pool capital and portfolio construction considerations limit single-deal exposure, (ii) deal quality certification as private equity firms team up in regions with weaker creditor rights to help secure more favourable debt conditions which enables paying premium in auctions due to lower cost of capital, and (iii) information and resource sharing by leveraging another, often local, partner in which the target firm is based to share local market knowledge, benefitting from local access to networks and expertise. Moreover, European club deals were more likely pre-2006 and less likely post-2014 indicating that the occurrence of the DOJ investigation in 2006 and the settlements of lawsuits against private equity firms in 2014 resulting into large fines had a direct impact on

private equity firms' willingness to form a club. These findings are generally in line with the sample of Hetzenecker (2022) that also include U.S. target companies, except for risk reduction which does not appear to be a motivating factor in Europe to form clubs, contradicting evidence from Hetzenecker (2022). However, the most striking finding is that none of the benign reason for European club formation, except for capital constraints, hold true for the Nordic subsample suggesting that there are unique regional factors driving club formation in the Nordics that are not captured in the analysis.

6. Yes, private equity firms are less likely to team up in the Nordics market compared to the Rest of Europe. Therefore, this thesis provides evidence that club formation in the Nordics is not only motivated by different reasons than the rest of Europe but that there is also lower likelihood for club deals in the Nordics in general. This is supposed to be related to unique characteristics of the developed Nordic financial markets in which private equity is an integral part of the financial ecosystem for decades, which require less information sharing and local expertise compared to other European regions.

Regarding the limitations of the thesis, it must be pointed out that, similar to Hetzenecker (2022), no data regarding competitiveness of the bidding process was available, i.e., how many bidders took part in the auctions. This limitation derives by nature when investigating acquisitions of privately held firms as data for such bidding processes is very limited. Therefore, it is not possible to make a direct bridge arguing that club deal pricing is directly related to actual competition, but it is only possible to make such suggestions based on the theoretical framework and empirical results reported. Moreover, even if club deals are priced lower due to less competition, it cannot be directly linked to deliberate clubbing by private equity firms to reduce the acquisition price. Another limitation of the thesis is that it might be subject to missing private equity transactions if they were conducted via add-ons or special purpose vehicles for which Capital IQ might not have identified the ultimate owner.

For further research, it is suggested to analyse what other reasons drive club deal formation in the Nordics and to further analyse why private equity firms are less inclined to form club deals in the Nordics. In addition, the differences in operational performance between club deals and single-sponsored private equity deals within the different regions can be investigated, with the purpose is to determine whether the pooling of skills and resources from multiple private equity firms contributes to greater operational improvement than single-sponsored deals, or whether clubs negatively impact operations, possibly due to decision-making problems among the club members.

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8. Appendix

Appendix A – List of prominent private equity firms

The following table represents all private equity firms which were listed in the top 50 of the PEI 300 ranking in any year from 2007 to 2022.

Prominent Private Equity Firm	Country (HQ)
3i Group	United Kingdom
AAC Capital Partners (formerly ABN Amro Capital)	Netherlands
Adams Street Partners	United States
Advent International	United States
Affinity Equity Partners	Hong Kong
AIG Investments	United States
AlpInvest Partners	Netherlands / United States
American Capital	United States
American Securities	United States
Andreessen Horowitz	United States
Apax Partners	United Kingdom
Apollo Global Management	United States
ArcLight Capital Partners	United States
Ardian (formerly AXA Private Equity)	France
Ares Management	United States
Bain Capital	United States
Barclays Private Equity	United Kingdom
Baring Private Equity Asia	Hong Kong
BC Partners	United Kingdom
BDT Capital Partners	United States
Berkshire Partners	United States
BlackRock	United States
Blackstone	United States
Blue Owl Capital	United States
Bridgepoint	United Kingdom
Brookfield Asset Management	Canada
Candover Investments	United Kingdom
CCMP Capital	United States
CDH Investments	Hong Kong
Centerbridge Capital Partners	United States
Cerberus Capital Management	United States
Charterhouse Capital Partners	United Kingdom
China Investment Corporation	China
China Merchants Capital	China
China Reform Fund Management Corporation	China
Cinven	United Kingdom
Citi Capital Advisors	United States
Clayton, Dubilier & Rice	United States
Clearlake Capital Group	United States
CPP Investment Board	Canada
CVC Capital Partners	Luxembourg
DH Private Equity (formerly Doughty Hanson & Co.)	United Kingdom

Prominent Private Equity Firm	Country (HQ)
EIG Global Energy Partners	United States
EnCap Investments	United States
Energy Capital Partners	United States
EQT	Sweden
Equistone Partners Europe	United Kingdom
Eurazeo	France
First Reserve	United States
Forstmann Little & Company	United States
Fortress Investment Group	United States
Francisco Partners	United States
General Atlantic	United States
Genstar Capital	United States
Georgian Co-Investment Fund (GCF)	Georgia
Golden Gate Capital	United States
Goldman Sachs	United States
GTCR	United States
H.I.G. Capital	United States
HarbourVest Partners	United States
Hellman & Friedman	United States
Hg	United Kingdom
HIG Capital	United States
Hillhouse Capital Group	Hong Kong
HitecVision AS	Norway
HM Capital Partners (formerly Hicks, Muse, Tate & Furst)	United States
Hony Capital	China
Insight Partners (formerly Insight Venture Partners)	United States
International Petroleum Investment Company	United Arab Emirates
Inventis Investment	China
JC Flowers & Co.	United States
JP Morgan Asset Management	United States
Kelso & Company	United States
KKR	United States
L Catterton	United States
Lehman Brothers Private Equity	United States
Leonard Green & Partners	United States
Lindsay Goldberg	United States
Lone Star Funds	United States
Madison Dearborn Partners	United States
Marfin Investment Group	Greece
MatlinPatterson	United States
MBK Partners	South Korea
Montagu Private Equity	United Kingdom
Mount Kellett Capital	United States
Neuberger Berman Private Markets	United States
New Mountain Capital	United States
NGP Energy Capital Management	United States
Nordic Capital	United States
Oak Hill Capital	United States

Prominent Private Equity Firm	Country (HQ)
Oak Investment Partners	United States
Oaktree Capital Management	United States
Onex	Canada
Pacific Equity Partners	Australia
PAG	Hong Kong
PAI Partners	France
Pamplona Capital	United Kingdom
Partners Group	Switzerland
Permira Advisers	United Kingdom
Pine Brook Road Partners	United States
Platinum Equity	United States
Providence Equity Partners	United States
Quantum Energy Partners	United States
Riverstone Holdings	United States
Roark Capital Group	United States
RRJ Capital	Hong Kong / Singapore
Russian Direct Investment Fund (RDIF)	Russia
Sequoia Capital	United States
Silver Lake	United States
Stone Point Capital	United States
Summit Partners	United States
Sun Capital Partners	United States
TA Associates	United States
TDR Capital	United Kingdom
Teachers' Private Capital (Ontario Teachers' Pension Plan)	Canada
Terra Firma Capital Partners	United Kingdom
The Abraaj Group	United Arab Emirates
The Carlyle Group (Carlyle)	United States
The Energy & Minerals Group	United States
Thoma Bravo	United States
Thomas H. Lee Partners	United States
Tiger Global Management	United States
TowerBrook Capital Partners	United States
TPG	United States
Triton Partners	United Kingdom
Veritas Capital	United States
Vista Equity Partners	United States
Warburg Pincus	United States
Welsh, Carson, Anderson & Stowe	United States
WL Ross & Co.	United States

Appendix B – Summary table for sample descriptive statistics

This table reports number of transactions, transaction volume and average deal volume for the total sample and split between single and club deals along several criteria. When the deal synopsis identifies one private equity firm from the list as buyer, then the deal is classified as "Single deal". When the deal synopsis identifies two or more private equity firms from the list as buyer, then the deal is classified as "Club deal". "No. of deals" refers to the annual sum of transactions conducted by private equity firms. "Total deal value" refers to the sum of transaction volumes in €m as reported by Capital IQ.

	No. of deals			**Total deal value**			**Avg. deal value**		
	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total
Total	1,689	418	2,116	629,445	368,499	997,944	371	882	472
Target Status:									
Public	350	101	451	263,425	178,638	442,063	753	1,769	980
Private	1,348	317	1,665	366,020	189,861	555,881	272	599	334
Type of PE firm:									
Prominent	532	179	711	374,513	277,079	651,592	704	1,548	916
Non-prominent	1,166	239	1,405	254,932	91,420	346,353	219	383	247
European Region:									
Nordics	252	35	287	77,578	38,606	116,183	308	1,103	405
Rest of Europe	1,446	383	1,829	551,867	329,894	881,761	382	861	482
Creditor Rights Aggregate Score:									
0	246	118	364	80,149	51,067	131,217	326	433	360
1	252	41	293	100,162	42,620	142,782	397	1,040	487
2	189	56	245	50,798	18,675	69,473	269	333	284
3	375	85	460	162,635	108,156	270,791	434	1,272	589
4	636	118	754	235,700	147,981	383,681	371	1,254	509
Transaction period:									
Pre-2006	356	138	494	110,702	71,667	182,369	311	519	369
2006-2014	994	212	1,206	277,749	156,171	433,921	279	737	360
Post-2014	348	68	416	240,994	140,661	381,654	693	2,069	917
Cross-Border Deal:									
Yes	796	273	1,069	475,649	336,780	812,429	598	1,234	760
No	902	145	1,047	153,796	31,720	185,515	171	219	177
Tender Offer:									
Yes	188	53	241	128,070	89,340	217,410	681	1,686	902
No	1,510	365	1,875	501,375	279,159	780,534	332	765	416

Appendix C – Time-series distribution of private equity deal multiples

	Median EV/Sales			Median EV/EBITDA		
Year	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total
1996	0.6	0.6	0.6	-	-	-
1997	1.0	0.4	0.8	7.8	-	7.8
1998	0.8	0.7	0.8	4.3	6.1	4.6
1999	0.7	0.5	0.7	7.9	6.0	6.6
2000	1.0	0.9	1.0	6.2	7.6	6.9
2001	0.8	0.9	0.8	6.4	11.2	7.3
2002	0.7	0.8	0.7	5.8	7.6	7.3
2003	0.9	1.2	1.0	6.5	5.9	6.5
2004	0.9	0.8	0.8	7.3	7.4	7.3
2005	1.1	1.0	1.0	8.3	7.8	8.2
2006	1.1	1.7	1.2	10.1	10.6	10.1
2007	1.0	1.9	1.2	10.6	12.0	10.9
2008	1.0	1.3	1.0	8.3	9.0	8.5
2009	0.9	1.2	0.9	5.9	5.3	5.9
2010	1.1	1.6	1.2	8.7	8.0	8.4
2011	0.9	1.4	0.9	9.1	9.3	9.1
2012	0.8	0.8	0.8	8.6	10.6	8.7
2013	1.3	1.2	1.3	9.6	8.1	9.0
2014	1.3	1.1	1.3	8.7	8.0	8.6
2015	1.2	2.3	1.2	8.8	14.0	9.5
2016	1.0	1.5	1.2	9.6	12.5	10.0
2017	1.6	2.8	1.6	11.5	13.6	11.7
2018	1.4	4.7	1.6	10.6	20.2	11.0
2019	1.7	2.7	2.3	14.2	12.9	13.2
2020	1.3	1.9	1.5	12.3	10.8	11.7
2021	1.5	2.6	1.5	12.1	19.7	12.7
Total	**1.0**	**1.2**	**1.1**	**9.0**	**9.4**	**9.1**

Appendix D – Summary table for sample valuation multiples

	Median EV/Sales			Median EV/EBITDA		
	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total
Total	1.0	1.2	1.1	9.0	9.4	9.1
Target Status:						
Public	1.5	2.6	1.5	12.1	19.7	12.7
Private	1.4	1.4	1.4	9.2	9.4	9.3
Type of PE firm:						
Prominent	1.5	1.6	1.5	10.1	10.3	10.2
Non-prominent	0.9	1.0	0.9	8.3	8.3	8.3
European Region:						
Nordics	1.0	1.3	1.1	9.0	12.4	9.4
Rest of Europe	1.0	1.2	1.1	9.0	9.3	9.0
Creditor Rights Aggregate Score:						
0	1.0	0.9	1.0	8.8	9.0	8.8
1	1.0	1.5	1.1	9.9	12.3	10.3
2	1.0	1.1	1.1	8.8	7.3	8.2
3	1.0	1.3	1.0	8.1	8.7	8.4
4	1.1	1.8	1.2	9.9	10.3	10.1
Transaction period:						
Pre-2006	0.9	0.9	0.9	7.3	7.3	7.3
2006-2014	1.0	1.4	1.1	9.0	9.2	9.0
Post-2014	1.3	2.4	1.5	10.7	12.6	11.4
Cross-Border Deal:						
Yes	1.2	1.6	1.3	9.4	10.0	9.7
No	0.9	0.8	0.9	8.5	7.3	8.4
Tender Offer:						
Yes	1.3	1.4	1.3	9.1	9.6	9.3
No	1.0	1.2	1.0	9.0	9.3	9.0

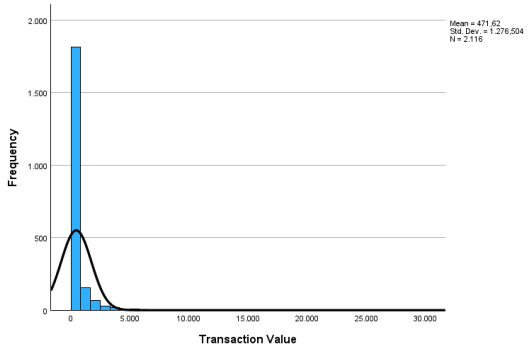
Appendix E – Sample descriptive statistics on country and industry level

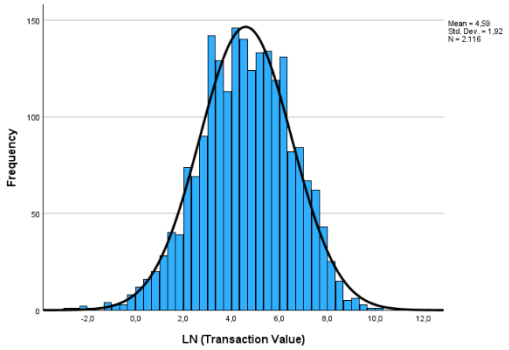
	No. of deals			Avg. deal value			Median EV/EBITDA		
	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total	Single Deals	Club Deals	Total
Total	1,689	418	2,116	371	882	472	9.0	9.4	9.1
European Region:									
Nordics	252	35	287	308	1,103	405	9.0	12.4	9.4
Rest of Europe	1,446	383	1,829	382	861	482	9.0	9.3	9.0
Target Country:									
Austria	14	2	16	388	265	372	8.4	4.5	6.6
Belgium	27	6	33	330	339	332	9.1	8.0	8.6
Bulgaria	2	1	3	670	1,200	847	10.6	4.4	7.5
Croatia	1	0	1	232	-	232	7.7	-	7.7
Czech Republic	13	3	16	62	948	228	5.9	10.2	7.9
Denmark	48	8	56	365	1,600	541	8.5	9.8	8.5
Finland	45	4	49	345	916	392	11.1	7.3	10.6
France	246	118	364	326	433	360	8.8	9.0	8.8
Germany	137	21	158	527	2,364	771	7.3	9.8	7.5
Greece	7	1	8	393	1,287	504	9.7	6.3	9.7
Hungary	4	0	4	592	-	592	7.3	-	7.3
Ireland	24	8	32	815	1,351	949	11.0	12.1	11.8
Italy	93	41	134	244	333	271	8.8	7.0	8.5
Latvia	2	0	2	224	-	224	7.4	-	7.4
Moldova	1	0	1	8	-	8	-	-	-
Netherlands	62	21	83	492	1,207	673	8.0	9.4	8.1
Norway	51	5	56	281	318	284	8.4	10.5	8.4
Poland	29	2	31	78	1,709	183	12.4	10.5	11.7
Portugal	6	1	7	174	150	170	9.7	-	9.7
Romania	11	0	11	56	-	56	6.6	-	6.6
Russia	3	3	6	969	70	520	4.9	8.3	7.4
Slovenia	1	0	1	29	-	29	-	-	-
Spain	97	30	127	366	567	413	8.6	7.7	8.5
Sweden	108	18	126	280	1,142	403	9.3	14.4	10.5
Switzerland	29	7	36	911	391	810	8.8	10.3	9.9
Ukraine	1	0	1	39	-	39	-	-	-
United Kingdom	636	118	754	371	1,254	509	9.9	10.3	10.1
Target SIC Industry:									
Agriculture & Forestry	8	-	8	83	-	83	7.1	-	7.1
Construction	55	16	71	330	543	378	8.4	7.5	7.9
Finance & Insurance	158	40	198	732	1,601	908	11.5	10.2	10.5
Manufacturing	600	152	752	294	589	354	8.4	7.8	8.3
Mining	15	2	17	218	1,185	332	8.8	9.1	8.8
Public Administration	1	-	1	29	-	29	-	-	-
Retail Trade	132	45	177	390	600	443	9.0	8.3	8.7
Services	459	99	558	300	672	366	10.2	11.0	10.3
Transportation, etc.	150	49	199	641	2,094	999	9.4	10.2	9.7
Wholesale Trade	120	15	135	247	512	277	9.0	9.6	9.0

Appendix F – Graphical representation of variables pre- and post-normalization

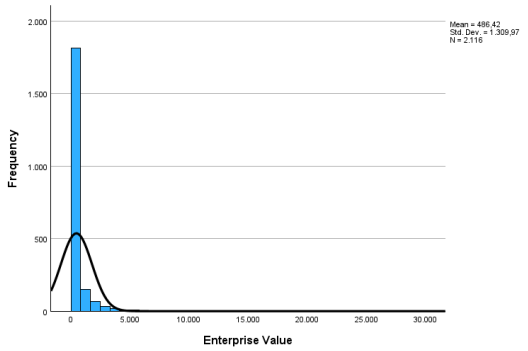
The following graphs shows the independent variables used within the regression for which a log normal transformation was applied. The histograms for each variable pre-normalization are shown on the left side, while the histograms for each variable post-normalization are shown on the right side. The variables include transaction value, enterprise value, and total assets as per announcement date of the transaction. The representation of the graphs is conducted via SPSS.

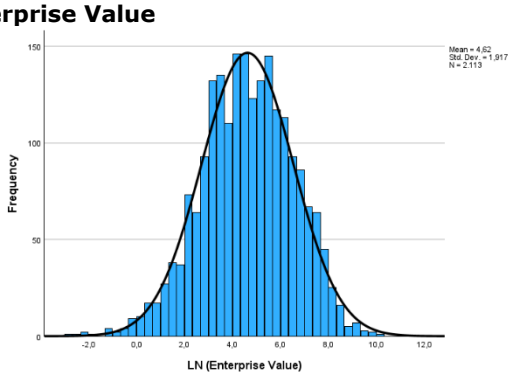
Panel A: Transaction Value



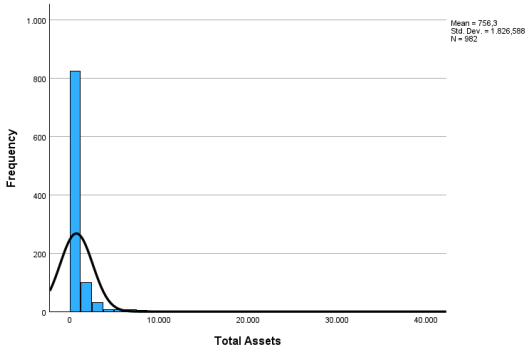


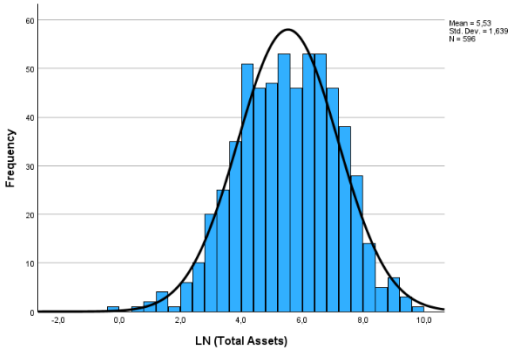
Panel B: Enterprise Value





Panel C: Total Assets





Appendix G – List of the 25 largest club deals within in the sample

The following list shows the 25 largest club deals within the sample in terms of deal value. Deal value is shows in million €.

Year	Target Firm	Private Equity Buyer	Deal Value
2020	thyssenkrupp Elevator AG	Advent; Cinven	17,200
2007	Alliance Boots	AXA Private Equity; KKR	15,754
2006	Thames Water	AMP Capital; Macquarie; Santander Private Equity	11,884
2021	SUEZ Groupe SA	Ardian; GIP	10,400
2006	Anglian Water Group	3i; CPPI; IFM Investors; First Sentier Investors	9,334
2014	Songbird Estates	Brookfield; Qatar Investment Authority	8,362
2007	Kelda Group	Citigroup; GIC; HSBC	7,732
2015	Fortum Distribution AB	OMERS; Första AP-fonden	6,731
2019	Merlin Entertainments	Blackstone; CPPI; Kirkbi Invest	6,295
2019	Axel Springer	CPPI; KKR; Public Sector Pension Investment Board	5,716
2000	MEPC	Hermes; GE Equity	5,670
2017	Nets A/S	Advent; Bain Capital; Fisher Lynch Capital; GIC; Hellman & Friedman	5,664
2021	Signature Aviation plc	Blackstone; Cascade Investment	5,153
2019	Inmarsat plc	Apax Partners; CPPI; Warburg Pincus	5,130
2021	T-Mobile NL	Apax Partners; Warburg Pincus	5,100
2020	MásMóvil Ibercom, S.A.	Cinven; KKR; Providence Equity Partners	4,930
2006	Associated British Ports Holdings	Borealis; GIC; Goldman Sachs; M&G	4,859
2005	ISS International Service System	EQT; Goldman Sachs	4,494
2005	Amadeus IT	BC Partners; Cinven	4,115
2006	KION Group GmbH	Goldman Sachs; KKR	4,000
2015	Autobahn Tank & Rast Holding	Allianz Capital Partners; OMERS	3,900
2018	Travelport Worldwide Limited	Evergreen Coast Capital; Siris Capital	3,827
2017	Paysafe Group Plc	Blackstone; CVC	3,679
2020	AA plc	TowerBrook Capital Partners; Warburg Pincus	3,667
2021	zooplus AG	EQT; Hellman & Friedman	3,552

Appendix H – List of the 25 largest Nordic club deals within in the sample

The following list shows 25 largest Nordic club deals within the sample in terms of deal value. Deal value is shows in million €.

Year	Target Firm	Private Equity Buyer	Deal Value
2015	Fortum Distribution AB	OMERS; Första AP-fonden	6,731
2017	Nets A/S	Advent; Bain Capital; Fisher Lynch Capital; GIC; Hellman & Friedman	5,664
2005	ISS International Service System	EQT; Goldman Sachs	4,494
2020	Ahlstrom-Munksjö Oyj	Ahlström Capital; Bain Capital	3,187
2020	IFS AB	EQT; TA Associates	3,000
2007	Mölnlycke Health Care Group AB	Investor AB; Morgan Stanley	2,850
2006	Capio AB	Apax Partners; Nordic Capital	2,607
2005	Com Hem AB	Providence Equity Partners; Carlyle	1,112
2007	Securitas Direct Oy	EQT; Investment AB	1,083
2004	Falck A/S	ATP Private Equity Partners; Nordic Capital	942
2007	Scandic Hotels AB	Accent Equity Partners; EQT Partners	833
2007	Get AS	Goldman Sachs; Quadrangle Capital Partners;	726
2018	Cherry AB	Bridgepoint; Klein Group	656
2006	Visma ASA	HgCapital; Intermediate Capital Group	590
2015	Esvagt A/S	3i; AMP Capital Investors	550
2006	Attendo AB	IK Partners; Intermediate Capital Group	499
2000	Icopal	Axcel; Kirkbi	443
2002	Vest-Wood A/S	Axcel; Polaris Private Equity	368
2020	Gunnebo AB	Altor Equity Partners; Stena Adactum	362
2021	Hoist Group Holding Intressenter	Advent; Eurazeo	322
2002	Nordkalk Oyj	Ahlström Capital; CapMan	282
2008	KMD A/S	ATP Private Equity Partners; EQT	269
1996	Finnish Chemicals Oy	HSBC Private Equity; Prudential Venture	189
2001	Dynal Biotech ASA	Nordic Capital; Ratos	168
2008	Cederroth International AB	CapMan; Litorina	159

Appendix I – Logistic regressions on club formation drivers

The following panels report logit regression analyses of the likelihood that a private equity acquisition is conducted by a (prominent or non-prominent) club. The dependent variables (Club, Prominent Club and Non-Prominent Club) are dummy variables that equal 1 if the respective condition is fulfilled and 0 otherwise. Size is defined as the natural logarithm of the transaction value. Leverage Ratio is defined as total debt divided by total assets at time of deal announcement. Creditor rights represent an index taking values from zero (poor creditor rights) to four (strong creditor rights) and is computed as the sum of scores on four measures of credit protection for each country. Cross-Border Deal is a dummy variable that equals 1 if one or more of the buyers has its headquarter in another country than the target. Pre-2006 is a dummy variable that equals 1 if the transaction has been announced in 2005 or earlier. Post-2014 is a dummy variable that equals 1 if the transaction has been announced in 2015 or later. Nordics is a dummy variable that equals 1 if the target has its headquarter in the Nordics. As Leverage Ratio suffers from data availability limitations and substantially reduces the size of the sample, it is only included in the public sample. The public sample also includes further control variables: Assets is defined as the natural logarithm of total assets at deal announcement. Profitability is defined as EBITDA divided by revenue at deal announcement. Tender is a dummy variable that equals 1 if the transaction involved a tender offer. Standard errors are displayed in brackets. Statistical significance is denoted as *** for a p-value < 0.01, ** for < 0.05, * for < 0.1.

Panel D: Public European sample

Variables	Club	Club	Prom. Club	Prom. Club	Non-Prom. Club	Non-Prom. Club
Size	**1.562*****	1.407	**2.073*****	**3.484*****	0.991	**0.455****
	(0.089)	(0.221)	(0.122)	(0.306)	(0.119)	(0.307)
Leverage Ratio	0.996	0.995	0.994	0.995	1.001	0.998
	(0.006)	(0.006)	(0.007)	(0.007)	(0.009)	(0.010)
Creditor Rights	0.915	0.912	0.855	0.847	1.036	1.044
	(0.085)	(0.086)	(0.107)	(0.108)	(0.120)	(0.124)
Cross-Border Deal	**1.675***	**1.705***	**2.855****	**3.217*****	0.957	0.934
	(0.282)	(0.285)	(0.419)	(0.428)	(0.370)	(0.381)
Pre-2006	**1.702***	**1.684***	**2.210****	**2.694*****	1.151	0.831
	(0.283)	(0.296)	(0.361)	(0.380)	(0.401)	(0.434)
Post-2014	0.858	0.903	0.930	0.956	0.850	0.837
	(0.310)	(0.317)	(0.395)	(0.408)	(0.445)	(0.455)
Nordics	0.799	0.742	0.808	0.726	0.841	0.840
	(0.366)	(0.388)	(0.461)	(0.489)	(0.529)	(0.562)
Constant	**0.018*****	**0.017*****	**0.001*****	**0.001*****	**0.090*****	**0.058*****
	(0.558)	(0.581)	(0.870)	(0.907)	(0.675)	(0.733)
Assets		1.103		**0.563***		**2.300*****
		(0.228)		(0.299)		(0.319)
Profitability		1.003		1.001		1.012
		(0.005)		(0.003)		(0.008)
Tender		1.169		1.201		1.168
		(0.260)		(0.331)		(0.371)
Observations	451	451	451	451	451	451
Cox & Snell R^2	0.103	0.105	0.154	0.161	0.002	0.021
Nagelkerke R^2	0.157	0.160	0.277	0.291	0.004	0.048
Hosmer-Lemeshow Test	0.361	0.340	0.568	0.554	0.131	0.824

Panel E: Private European sample

Variables	Club	Prominent Club	Non-Prominent Club
Size	**1.131*****	**1.718*****	**0.916***
	(0.040)	(0.076)	(0.045)
Creditor Rights	**0.774*****	**0.830*****	**0.781*****
	(0.042)	(0.070)	(0.048)
Cross-Border Deal	**1.646*****	**3.240*****	1.144
	(0.148)	(0.290)	(0.173)
Pre-2006	**1.808*****	**2.424*****	**1.374***
	(0.149)	(0.228)	(0.177)
Post-2014	**0.668****	**0.498****	0.795
	(0.195)	(0.317)	(0.232)
Nordics	**0.351*****	0.657	**0.259*****
	(0.240)	(0.333)	(0.336)
Constant	**0.190*****	**0.003*****	**0.351*****
	(0.205)	(0.474)	(0.218)
Observations	1,665	1,665	1,665
Cox & Snell R^2	0.067	0.093	0.031
Nagelkerke R^2	0.108	0.234	0.067
Hosmer-Lemeshow Test	0.431	0.881	0.229

Appendix J – Linear regressions on acquisition premiums

Panel A: Total sample - 3-year match window centred on deal announcement – Revenue multiples

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Club	-1.969	-0.276	0.926	-2.788	**-8.904***	-0.848	-3.897	1.636	-1.074	-3.207
	(2.519)	(3.237)	(3.072)	(2.763)	(5.086)	(2.649)	(6.627)	(3.225)	(2.886)	(6.692)
Target Size	**9.732*****	**9.823*****	**9.657*****	**10.002*****	**9.808*****	**9.764*****	**10.054*****	**9.675*****	**10.030*****	**10.027*****
	(0.519)	(0.593)	(0.519)	(0.529)	(0.543)	(0.520)	(0.620)	(0.520)	(0.529)	(0.620)
Prominent		0.167					0.662			0.695
		(2.635)					(2.648)			(2.651)
Club × Prominent		-4.201					-2.223			-2.333
		(5.129)					(5.255)			(5.255)
Pre-2006			**-5.682****				**-8.291*****	**-6.523****		**-9.429*****
			(2.637)				(2.747)	(2.836)		(2.951)
Club × Pre-2006			-5.912				-5.055	-4.590		-4.364
			(5.393)				(5.747)	(5.690)		(6.024)
Post-2014				**-7.282*****			**-9.963*****		**-7.913*****	**-10.732*****
				(2.736)			(2.842)		(2.993)	(3.103)
Club × Post-2014				2.419			0.564		-1.505	-3.518
				(6.548)			(7.026)		(7.099)	(7.521)
Private					-1.325		-2.128			-2.194
					(2.723)		(2.733)			(2.739)
Club × Private					9.129		7.855			7.702
					(5.820)		(5.996)			(6.003)
Nordics						4.544	4.558	2.971	4.245	1.893
						(3.026)	(3.018)	(3.355)	(3.439)	(3.949)
Club × Nordics						-9.658	-6.830	-5.978	**-19.390***	-20.002
						(8.477)	(8.536)	(10.527)	(10.051)	(14.453)
Pre-2006 × Nordics								7.173		8.328
								(7.733)		(7.995)
Club×Pre-2006×Nordics								-11.859		2.387
								(18.069)		(20.554)
Post-2014 × Nordics									2.720	4.788
									(7.206)	(7.458)
Club×Post-2014×Nordics									**33.520***	**35.448***
									(18.910)	(21.511)
Constant	-76.365***	-76.814***	-74.810***	-76.080***	-75.655***	-77.194***	-73.202***	-75.362***	-76.817***	-72.640***
	(2.524)	(2.605)	(2.583)	(2.546)	(3.722)	(2.577)	(3.938)	(2.653)	(2.608)	(3.968)
Observations	1,909	1,909	1,909	1,909	1,909	1,909	1,909	1,909	1,909	1,909
Adjusted R^2	0.156	0.155	0.160	0.159	0.156	0.156	0.165	0.160	0.160	0.165
F-Statistic	177.4***	88.8***	91.8***	90.9***	89.3***	89.4***	32.3***	46.3***	46.4***	24.6***

Panel B: Total sample - 3-year match window preceding deal announcement – Revenue multiples

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Club	-0.530	-0.460	0.852	-0.690	-6.132	0.806	-4.049	1.878	1.210	-3.257
	(2.610)	(3.345)	(3.186)	(2.866)	(5.231)	(2.742)	(6.854)	(3.339)	(2.995)	(6.921)
Target Size	**9.805*** **	**9.788*** **	**9.765*** **	**9.947*** **	**9.881*** **	**9.843*** **	**9.939*** **	**9.794*** **	**9.989*** **	**9.943*** **
	(0.536)	(0.614)	(0.536)	(0.547)	(0.561)	(0.536)	(0.643)	(0.537)	(0.547)	(0.644)
Prominent		0.192					0.736			0.700
		(2.726)					(2.746)			(2.751)
Club × Prominent		-0.194					1.616			1.425
		(5.320)					(5.472)			(5.476)
Pre-2006			**-7.582*** **				**-9.246*** **	**-8.018*** **		**-9.853*** **
			(2.723)				(2.845)	(2.929)		(3.057)
Club × Pre-2006			-0.909				-0.891	-0.050		-0.824
			(5.583)				(5.955)	(5.889)		(6.246)
Post-2014				-3.475			**-6.305** **		-3.685	**-6.550** **
				(2.832)			(2.945)		(3.091)	(3.209)
Club × Post-2014				-0.260			-0.520		-3.972	-4.729
				(6.805)			(7.294)		(7.337)	(7.777)
Private					-0.949		-1.675			-1.721
					(2.818)		(2.834)			(2.842)
Club × Private					7.414		7.049			7.049
					(6.000)		(6.206)			(6.215)
Nordics						4.672	4.476	3.621	4.737	3.277
						(3.138)	(3.137)	(3.483)	(3.561)	(4.097)
Club × Nordics						-12.274	-10.303	-9.554	**-21.418** **	-24.589
						(8.856)	(8.936)	(11.093)	(10.386)	(14.946)
Pre-2006 × Nordics								4.096		4.482
								(7.985)		(8.274)
Club×Pre-2006×Nordics								-7.542		7.456
								(18.774)		(21.256)
Post-2014 × Nordics									0.330	1.549
									(7.534)	(7.804)
Club×Post-2014×Nordics									**34.146***	**38.063***
									(20.110)	(22.750)
Constant	-75.582***	-75.562***	-73.772***	-75.505***	-75.168***	-76.449***	-72.486***	-74.464***	-76.369***	-72.270***
	(2.602)	(2.691)	(2.659)	(2.627)	(3.845)	(2.657)	(4.079)	(2.733)	(2.693)	(4.113)
Observations	1,899	1,899	1,899	1,899	1,899	1,899	1,899	1,899	1,899	1,899
Adjusted R^2	0.151	0.150	0.155	0.151	0.151	0.152	0.156	0.155	0.152	0.156
F-Statistic	170.2***	85.0***	88.2***	85.6***	85.5***	85.9***	30.3***	44.5***	43.7***	22.9***

Panel C: Total sample - 3-year match window preceding deal announcement – EBITDA multiples

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Club	**-6.248****	-3.283	-4.758	-3.950	**-13.782*****	**-7.348****	-9.846	**-6.141***	-3.685	-8.431
	(2.835)	(3.991)	(3.317)	(3.174)	(3.994)	(2.999)	(6.117)	(3.524)	(3.317)	(6.196)
Target Size	**9.073*****	**8.651*****	**9.080*****	**8.639*****	**9.155*****	**9.029*****	**8.220*****	**9.029*****	**8.701*****	**8.304*****
	(0.743)	(0.826)	(0.739)	(0.748)	(0.744)	(0.743)	(0.832)	(0.741)	(0.749)	(0.834)
Prominent		4.631					4.737			4.574
		(2.947)					(2.919)			(2.919)
Club × Prominent		-5.902					-2.597			-2.454
		(5.588)					(5.601)			(5.608)
Pre-2006			**-8.507****				**-6.098***	**-9.069****		**-6.783***
			(3.361)				(3.534)	(3.648)		(3.836)
Club × Pre-2006			-2.001				-2.303	-0.871		-2.755
			(6.250)				(6.736)	(6.628)		(7.099)
Post-2014				**11.479*****			**9.741*****		**12.552*****	**10.929*****
				(3.052)			(3.204)		(3.380)	(3.529)
Club × Post-2014				-6.325			-8.561		**-13.895***	**-14.628***
				(6.672)			(7.175)		(7.359)	(7.781)
Private					**-5.417****		**-5.507****			**-5.872****
					(2.690)		(2.696)			(2.718)
Club × Private					**14.918*****		**14.605****			**14.413****
					(5.559)		(5.707)			(5.724)
Nordics						1.461	0.369	0.485	2.476	1.663
						(3.615)	(3.574)	(3.974)	(4.335)	(5.016)
Club × Nordics						12.376	**15.201***	13.826	-1.456	-4.450
						(8.908)	(8.959)	(10.276)	(11.322)	(14.964)
Pre-2006 × Nordics								3.990-		4.200
								(9.421)		(9.864)
Club×Pre-2006×Nordics								-7.486		11.760
								(20.590)		(23.145)
Post-2014 × Nordics									-6.018	-6.502
									(7.739)	(8.134)
Club×Post-2014×Nordics									**37.563****	**42.357****
									(18.532)	(20.892)
Constant	-72.752***	-72.452***	-71.095***	-73.463***	-70.500***	-72.759***	-68.856***	-70.903***	-74.167***	-69.223***
	(4.253)	(4.384)	(4.275)	(4.256)	(4.501)	(4.315)	(4.746)	(4.361)	(4.339)	(4.809)
Observations	813	813	813	813	813	813	813	813	813	813
Adjusted R^2	0.153	0.153	0.162	0.167	0.160	0.155	0.178	0.161	0.169	0.179
Statistic	74.6***	74.6***	40.3***	41.6***	39.5***	38.1***	15.6***	20.5***	21.7***	12.0***