

Club Deals and LBO Pricing: A Study on the Implications of Bidding Consortia

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Abstract: Concerns have been raised that collaboration amongst LBO sponsors might constitute a form of anti-competitive behaviour and could negatively affect deal pricing. This paper provides an empirical investigation of the pricing implications of club deals relative to single sponsor LBOs. Employing a sample of 617 LBOs in the period from 1996 to 2007, it is found that, on the whole, club deals do not exhibit significantly lower pricing levels than single sponsor deals after controlling for transaction characteristics.

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1 Introduction

The recent boom in the leveraged buyouts (LBOs) was characterized by immense growth. Between 2003 and 2006, annual global LBO volume increased fourfold to over \$700 billion, while commitments to funds rose by 260% (Acharya et al., 2007). For the largest LBO sponsors, this period was characterized by significant changes in the size of acquisition targets and the degree to which firms collaborated with each other.

The emergence of so called ‘mega funds’ laid the foundation to a surge of buyout activity in public equity markets. As Figures 1 and 2 show¹, the largest US and European LBO sponsors had great success increasing the size of their capital commitments during this boom period. This enabled the acquisition of large listed companies in public-to-private (PTP) transactions. Many of the targets being bought had been beyond the financial reach of private equity since the landmark RJR Nabisco transaction in 1988.

As Figures 3 and 4 clearly illustrate, the surge in PTP activity from 2005-2007 was accompanied by increased collaboration amongst LBO sponsors. Prior to this period, club deals, where two or more sponsors form a bidding consortium and purchase a target together, were relatively uncommon.

In the US, the rapid emergence of club deals sparked a legal and regulatory debate about their competitive implications. While critics argued that bidding consortia were a means of colluding to push down transaction prices, supporters claimed that they increased competition by strengthening the financial capacity of LBO sponsors.

As it stands today, there is still no clear consensus on whether or not club deals have implications for LBO pricing. From the perspectives of owners of corporate assets and regulatory bodies, this is an important issue. If club deals consistently have unfavourable pricing levels relative to other transactions, one could argue that it would be logical to consider regulating or restricting them. However, if this is not the case, such measures would have the undesirable effect of lowering competition for assets beyond the reach or interest of individual LBO sponsors.

In this paper a sample of 617 LBO transactions in the period 1996 to 2007 is used to analyze the pricing implications of club deals. Compared to previous research this investigation distinguishes itself by utilizing an international sample which includes both PTP and private transactions.

¹ All Tables and Figures can be found in the Appendix.

After controlling for relevant transaction characteristics, it is found that, in concurrence with the hypothesis developed in this paper, club deals generally do not have negative implications for LBO pricing. This implies that, regardless of whether or not claims that club deals are driven by anti-competitive intentions are true, the use of bidding consortia by LBO sponsors does not systematically depress pricing levels for corporate assets.

In the remaining sections of Chapter 1, a historical overview of the debate on club deals is provided and the research objectives of the paper are outlined. In Chapter 2, relevant theoretical and practical considerations are discussed. This is followed by the hypothesis in Chapter 3, while Chapters 4 and 5 discuss the construction of the sample and the statistical methodology used to test the hypothesis. Finally, results and analysis are presented in Chapter 6.

1.1 Historical background

To fully understand the debate on club deals, the period from the second quarter of 2006 to the second quarter of 2007 is critical. During this time, the use of bidding consortia by LBO sponsors attracted attention like never before. As Figures 5 and 6 show, nine of the ten largest PTP transactions in history were executed within this short time window and bidding consortia were used in every case except two.²

In the midst of this series of landmark club deals, concerns were raised about anti-competitive behavior. On October 10th of 2006, an article was published in the Wall Street Journal stating that the US Department of Justice (DOJ) was investigating whether or not club deals were being used to manipulate bidding processes and consequently, LBO pricing. Later in November, a follow up article indicated that the DOJ had requested documentation from KKR, the Carlyle Group, Silver Lake Partners, Merrill Lynch's private equity arm and Clayton, Dubilier & Rice. It was also indicated that other unnamed LBO sponsors were part of the investigation.

Shortly after the announcement of the DOJ investigation, on November 15th of the same year, a class action lawsuit was launched by former shareholders of public companies which had been taken private in club deals (Murphy et al. v. Kohlberg Kravis Roberts & Company et al.). Thirteen top-tier LBO sponsors were accused of violating antitrust laws by conspiring to fix deal prices in a series of PTP transactions: KKR, the Carlyle Group, Silver Lake Partners, the Blackstone Group, Bain Capital, Thomas H. Lee Partners, TPG, Madison Dearborn

² The Blackstone Group's purchase of Equity Office Properties in November of 2006 and KKR's purchase of First Data in April of 2007.

Partners, Apollo Management, Providence Equity Partners, Merrill Lynch's private equity arm, Warburg Pincus and Clayton, Dubilier & Rice.

With a number of the world's largest private equity firms now publicly associated with allegations of collusion, the debate on club deals intensified. Detractors claimed that consortia were being used to control competition in bidding processes and thereby manipulate LBO pricing. To their defense, sponsors claimed that the deals were motivated by a host of financial and skill synergies, enabling more attractive bids than those which could be produced by an individual LBO sponsor. Those supporting this view argued that the surge in club deals increased competition for assets, by enabling the buyouts of companies which had previously been too large for private equity.

As shown in Figure 7, large headline-making PTP club deals disappeared as credit markets deteriorated due to the onset of the subprime crisis in the third quarter of 2007. Although club deals are far less common today, the debate about their pricing implications is still highly relevant, especially when one considers the possibility of a comeback at some point in the future when debt markets are more accessible. Furthermore, there is still a legal and regulatory spotlight on club deals. Despite the fact that *Murphy et al. v. Kohlberg Kravis Roberts & Company et al.* was recently withdrawn, a new class action suit of a similar nature, *Dahl et al. v. Bain Capital Partners, LLC et al.*, was recently filed in February of 2008. It is also still not publicly known whether or not the DOJ investigation will result in any charges.

1.2 Objectives

The overriding objective of this paper is to determine the general pricing implications of club deals relative to single sponsor LBOs, while reviewing theoretical and practical considerations related to this question. However, evaluating whether or not an individual example of a club deal had an unfair pricing level due to collusion is beyond the scope of this paper. There will also be no legal analysis of whether or not LBO sponsors have broken specific laws or regulations. As a result, no conclusions about the validity of the DOJ investigation or the aforementioned class action lawsuits will be made.

1.3 Relevance of findings

From the perspective of US based LBO sponsors, allegations against club deals are a serious issue. Charges stemming from the DOJ investigation or an unfavourable ruling in the *Dahl et al. v. Bain Capital Partners, LLC et al.* lawsuit could have a significant financial cost.

The issue is also important to owners of corporate assets and their financial advisors. If bidding consortia are generally unfavourable from a pricing perspective, targets would

logically consider managing private auction and public tender offer processes in a manner which discourages club deals. A real life example of this is GE's sale of its plastics division in 2007, which was managed by Goldman Sachs. At the onset of the sale process all contacted LBO sponsors were advised that offers from bidding consortia would not be considered (Smith and Kranhold, 2007).

Finally, allegations regarding club deals are also of interest to regulatory bodies. Understanding the pricing implications of club deals is critical when evaluating whether or not additional regulatory oversight is needed.

2 Theoretical and practical considerations

In Chapter 2, potential motivations for club deals are explored from the perspective of the LBO sponsor. Under the assumption that LBO sponsors do use bidding consortia as a collusion mechanism, practical limitations which would likely limit the effectiveness of such behaviour, are then discussed. After this, relevant aspects of auction theory are assessed to identify theoretical expectations about the pricing implications of club deals. Finally, prior research on this topic is reviewed to clarify the added value of this particular study.

2.1 Potential motivations for club deals

Plausible motivations for the use of bidding consortia are discussed below. No hypotheses evaluating the degree to which these explanations hold are tested. However, a general understanding of this topic is beneficial when analyzing the pricing implications of club deals.

Information and knowledge sharing

Although there is a lack of research on information sharing amongst LBO sponsors in club deals, a significant amount of research on venture capital firms (VCs) suggest that they use syndication as a means of gathering information and knowledge from each other when making investment decisions. Lerner (1994) finds evidence supporting the view that the syndication of first round investments enables experienced VCs to gather information from each other in order to decide whether or not it is advisable to invest in risky firms. Sorenson and Stuart (2001) find that VCs are most likely to go outside of their traditional industry and geographic focuses when they participate in syndicates with other VCs. Using a sociological perspective, it is argued that the use of syndication establishes strong and embedded social networks which enable the flow of high quality information beyond the industry and geographical boundaries of individual VCs.

Assuming the work of Sorenson and Stuart has some applicability to the LBO market, one would expect that the use of bidding consortia could be motivated by situations where certain sponsors are evaluating opportunities in industries in which they have little past experience. A potentially illustrative example of this would be the \$ 10.9 billion USD PTP buyout³ of SunGard Data Systems by a consortium which was formed by Silver Lake Partners (Silver Lake), a specialist LBO sponsor focusing on the technology sector (Kaplan, 2005). Bain Capital, the Blackstone Group, GS Capital Partners, KKR, Providence Equity Partners and TPG were the other participating sponsors in the transaction and although all of them had strong track records, they had limited experience investing in the technology sector. As Figure 1 shows, Silver Lake had less financial resources than most of the other sponsors and would have probably been unable to complete the transaction independently. It is possible that the other participating sponsors were willing to join the consortium, offer to share their financial resources and go outside of their traditional industry boundaries because they had access to Silver Lake's specialist information and knowledge when evaluating the target.

LBO sponsors may also choose to use bidding consortia while evaluating investment opportunities outside of markets which their investment professionals are familiar with. To avoid having information asymmetries relative to local competitors, when evaluating targets in unfamiliar markets, one would argue that it would be logical for foreign LBO sponsors to form consortia with local LBO sponsors in certain cross border transactions.

Skill synergies

While the presented information and knowledge sharing rationale for club deals pertains to evaluating and assessing investment opportunities during sales processes, it is also important to look at how collaboration amongst LBO sponsors could be beneficial after the point at which a target has been purchased. The increased focus on operational engineering amongst LBO sponsors raises the possibility that the formation of bidding consortia is, at least in part, motivated by a desire to secure to the unique industry skill sets of other sponsors. While financial and governance engineering represented the primary types of change LBO sponsors implemented in their holdings during the 1980's, operational engineering has emerged as a third category in recent years (Kaplan and Strömberg, 2008). This development is reflected in the fact that many LBO sponsors now employ professionals with backgrounds in industry in addition to dealmakers with investment banking backgrounds.

³ The transaction value stated is the implied enterprise value of the transaction as given by the Capital IQ database.

Given the increased focus on operational issues, it is possible that combining the expertise and backgrounds of multiple LBO sponsors could enhance value creation potential in certain cases. An illustrative example would be a sale process where the target was a “turnaround” case with lots of room for operational improvements. The largest sponsor interested in the target could have a competitive advantage over others in terms of financial capacity but lack the industry experience and skill set needed to fully implement all available operational improvements. In such a case, it would be logical to partner with another sponsor holding the required industrial competence but lacking the financial resources to win the bidding process alone.

Financial capacity synergies

One of the most often cited arguments from those supporting club deals is that they are used in situations where the capital required to purchase a target is beyond the capacity of individual sponsors. While this assumption has not been thoroughly investigated in the context of the LBO market, studies by Lockett & Wright (2001) and Manigart et al. (2004) have both found evidence suggesting that securing access to larger transactions appears to be an important motivation for syndication in venture capital markets.

Partnership agreements between fund managers (general partners, GPs) and investors (limited partners, LPs) in LBO funds typically contain covenants limiting the fraction of total committed capital which GPs can invest in individual transactions (Axelson et al., 2007b). Subsequently, one could argue that GPs would be interested in forming bidding consortia in situations where they identified attractive investment opportunities that are too large to take on independently due to the restrictions of their partnership agreements with LPs.

If financial capacity is indeed a valid motivation for club deals, it does not imply that bidding consortia would only be used in the world’s largest LBOs. This is due to the fact that there are many sub-groups of LBO sponsors according to target size criteria, geographical focus and preferences for certain industries. The fact that a small private target in a European country could easily be purchased independently by a whole host of multi-billion dollar mega funds does not cancel out the rationale for a club deal because such sponsors would have no interest in acquiring targets of this nature. The more relevant question is what the cost of the transaction is relative to the available resources of individual sponsors who are active in the market for targets of a similar nature.

Collusion

Due to the regulatory and legal attention club deals have attracted in the US, the possibility that they are used as a means of collusion should not be ignored. Unfortunately, few details about the nature of the DOJ investigation have been publicly released but court filings from class action lawsuits filed by target shareholders in past club deals offer a useful outline of the reasoning behind the argument that these transactions have anti-competitive motivations. The overriding allegation in both of these cases is that groups of large LBO sponsors conspired and used bidding consortia with the intention of securing PTP targets at lower prices than what would be possible in the absence of collusion.

In the first of the two class action complaints, *Murphy et al. v. Kohlberg Kravis Roberts & Company et al.*, it was alleged that a group of 13 LBO sponsors were “engaged in an illegal scheme and price-fixing conspiracy” designed to “artificially fix, maintain or stabilize prices of equity shares” in a series of 33 PTP transactions⁴. According to the complaint filed, those involved in the alleged conspiracy violated competition laws by “exchanging information amongst themselves on bids and potential bids”, “agreeing amongst themselves as to bids submitted and not submitted” and “submitting bids for equity shares at agreed upon prices”. LBO sponsors were also accused of intentionally entering into separate and exclusive financing agreements with leading banks to deprive other bidders of financing.

Although the second class action complaint, *Dahl et al. v. Bain Capital Partners, LLC et al.*, has the same general premise as the first, it differs in the sense that target company executives and investment banks are also explicitly named as co-conspirators assisting LBO sponsors. It is alleged that bidding consortia gave company management financial stakes in transactions “in exchange for their assistance in preventing potentially competing bids”⁵. Investment banks responsible for auction processes are accused of steering their corporate clients to consortia of LBO sponsors instead of strategic (corporate) buyers because “LBOs produce much larger advisory and future debt underwriting fees – and often a cut of the deal for the investment banks’ private equity affiliates”.

⁴ *Murphy et al. v. Kohlberg Kravis Roberts & Company et al.*, 1:2006cv13210, United States District Court, Southern District of New York, 2006.

Named defendants: KKR, the Carlyle Group, Silver Lake Partners, the Blackstone Group, Bain Capital, Thomas H. Lee Partners, TPG, Madison Dearborn Partners, Apollo Management, Providence Equity Partners, Merrill Lynch’s private equity arm, Warburg Pincus and Clayton, Dubilier & Rice.

⁵ *Dahl et al. v. Bain Capital Partners, LLC et al.*, 1:2008cv10254, United States District Court, District of Massachusetts, 2008.

Named defendants: Bain Capital, the Blackstone Group, the Carlyle Group, Goldman Sachs, GS Capital Partners, JP Morgan Chase, JP Morgan’s private equity arm, KKR, Merrill Lynch, Merrill Lynch’s private equity arm, Permira, Providence Equity Partners, Silver Lake Partners, TPG, Thomas H. Lee Partners and Warburg Pincus.

2.2 Limitations to club deals as a collusion mechanism

Even if club deals have anti-competitive motivations, it does not necessarily imply that they have a negative effect on LBO pricing. Colluding LBO sponsors may be ineffective in their attempts to rig sale processes due to a number of practical considerations discussed in the sections below.

The enforcement problem

For the alleged conspiracies in the two aforementioned class action lawsuits to work effectively, a great deal of coordination and discipline would be required. This is related to the enforcement problem, which is an often discussed issue in auction theory. The basis of the problem is that “members of a bidding ring, particularly the designated losers, may find it in their interest to deviate from the recommended strategy” and make a more competitive independent bid (Robinson, 1985).

In the context of club deals, a central point of tension in relation to the enforcement problem would likely be how a bidding ring would allocate shares of each transaction and determine which sponsors would participate in each sale process. It seems questionable that a ring, in the sizes suggested in the aforementioned class action lawsuits, would be able to make collective decisions regarding transactions shares, deal participation and other profit distributions without some conflicts between members. As a result, it is a reasonable expectation that if a certain club deal is in fact part of a collusion agreement, some participants could break out of their bidding ring and make more favourable independent offers, which would in turn reduce the ability of the bidding consortium to manipulate the pricing of the target.

Outside competition

The presence of strategic buyers and non-colluding LBO sponsors would likely limit the ability of bidding consortia to completely remove competition from a sale process. In situations where bidding consortia submit rigged bids, strategic buyers and other LBO sponsors with a genuine interest in the target would have an obvious incentive to make more competitive offers. Bidding consortia would only be able to completely eliminate competition for targets in cases where no other parties outside of the bidding ring would be willing to make an offer. It seems unlikely that this condition would hold in most situations, especially when one considers the presence of strategic buyers in the mergers and acquisitions market.

Shareholder activism

Hedge fund activism has grown significantly in recent years (Brav et al., 2006). Within this trend, an area with particular relevance to the debate on club deals is situations where hedge funds attempt to play an active role in a pending merger or acquisition, by pressing for a better price when a firm has received a public tender offer or by trying to stop a pending acquisition if the pricing terms are viewed as unfavorable. Funds active in this area tend to hold large minority stakes in public companies and use a mixture of cooperative measures with target management and hostile actions in collaboration with other shareholders to implement their agendas.

In assessing the efficacy of hedge fund activism with PTP targets, Huang (2008) found evidence suggesting that it can successfully put upwards pressure on LBO pricing. Buying activity by activist hedge funds after the announcement of an initial offer is positively associated with a greater likelihood and a larger magnitude of an upward revision of the initial offer. When taking a broader perspective and looking at the entire mergers and acquisitions market for public companies, Greenwood and Schor (2007) show that the involvement of activist hedge funds is associated with the highest announcement returns and long term abnormal returns in situations where they are involved in a change in corporate ownership. Given these findings, it is possible that the growing presence of activist hedge funds would make it more difficult for artificially low public tender offers to succeed.

Revlon duties

In 1985, following a fierce takeover battle for Revlon in which the company's board of directors tried to fence off a takeover attempt by MacAndrews & Forbes Holdings by entering into an exclusive agreement with the LBO sponsor Forstmann Little, MacAndrews & Forbes Holdings decided to take legal action against the aforementioned parties.

In its landmark ruling the Supreme Court of Delaware held that "when sale of the company becomes inevitable, [the] duty of [the] board of directors changes from preservation of the corporate entity to maximization of the company's value at a sale for the stockholders' benefits". The resulting fiduciary duties of a board of directors to sell a company "at the highest price attainable for the stockholders' benefit"⁶, often referred to as so-called Revlon duties, is a commonly cited legal precedent in US takeover law, not only in Delaware but in a number of other states.

⁶ Revlon, Inc. v. MacAndrews & Forbes Holdings, Inc., 506 A.2d 173, Supreme Court of Delaware, 1986.

As Subramanian (2008) states, “virtually all private equity buyouts [in the US] are subject to examination under the Revlon standard because target shareholders are typically getting cashed out of the company”. It can be argued that these Revlon duties can possibly serve as a control on the board to ensure that it does its utmost to allow market forces to “operate freely to bring the target’s shareholders the best price available for their equity”.⁷

Go-shops

One of the means by which a firm can fulfil its Revlon duties is the so-called go-shop provision, a contractual feature that has grown in popularity since 2004 (Cao, 2008). It “enables the target to continue to actively seek other bidders once a merger agreement has been signed, in contrast to the standard no-shop provision that prohibits active solicitation of bidders once an initial agreement has been reached” (Boone and Mulherin, 2008). Typically, such a provision allows for a go-shop window of 30-60 days during which the target can solicit other buyers (Subramanian, 2008).

After a winning bidder has emerged from the initial auction it will generally be difficult for the target to assess whether this bidder colluded with any of the other bidders and, consequently, if the offer is reasonable. The go-shop window effectively allows the target to perform what Subramanian (2008) calls a “market check”; the target can canvass the market to determine if there are parties that would want to make a higher bid.

Introducing a go-shop provision results in the target being able to check whether a competitive bid has been made; if the winning bid was uncompetitive it is likely that higher offers will emerge from the market check. In such a case the initial winning bidder will usually have the right to match this higher offer. Moreover, as Subramanian (2008) notes, having a go-shop provision could actually induce the initial winning bidder to bid the full value from the start as it will realize that, in case it makes an uncompetitive bid, it will have to match the higher offers that are likely to emerge during the go-shop window. Consequently, this recent trend in the US could, to a certain degree, limit the effectiveness of bidding consortia as a collusion mechanism.

However, it should be noted that the decision to accept a higher offer made by a new bidder would generally be subject to a breakup fee (typically 2-4% of the deal value) which would have to be paid to the initial bidder by the target and thus indirectly by the new bidder (Subramanian, 2008). Hence, a go-shop provision would not be as effective in cases of only slightly uncompetitive bids resulting from collusion.

⁷ Revlon, Inc. v. MacAndrews & Forbes Holdings, Inc., 506 A.2d 173, Supreme Court of Delaware, 1986.

2.3 Auction theory

LBOs generally involve an auction like process where, assuming multiple financial and/or strategic buyers are interested in the target, competing bids are placed to acquire a privately or publicly held company.

One of the key concerns in auction theory is the occurrence of anti-competitive behaviour, where interested parties cooperate to avoid bidding up prices (Klemperer, 2002a). The notion that collusion can result in lower prices is widely discussed in the literature on auction design. For instance, Graham and Marshall (1987) demonstrate, using a model of collusive bidder behaviour, that by reducing the number of bidders, collusion can indeed be a viable and profitable strategy in certain types of auctions. Similar studies include Robinson (1985), McAfee and McMillan (1992) and Marshall and Marx (2007).

The literature also offers a wide range of real world examples from a variety of industries where bidding consortia have indeed resulted in lower pricing. These studies investigate auctions for timber harvest contracts (Baldwin et al., 1997), offshore oil and gas leases (Moody and Kruvant, 1988), (Hendricks and Porter, 1992) and spectrum auctions⁸ (Cramton and Schwartz, 2000, Klemperer, 2002b and Salmon, 2004).

In the case of LBOs one would thus be tempted to conclude that club deals, by reducing the number of competing bidders, would indeed result in lower prices. However, as Mares and Shor (2007) argue, club deals do not necessarily have to be anti-competitive. Whereas the vast majority of research on auction design (including abovementioned articles) assumes bidders' estimates of the value of an asset for sale are independent, Mares and Shor argue instead that, in the case of bidding for takeover targets in financial markets, it is more realistic to assume that such estimates of value are correlated⁹. Under this assumption they demonstrate that commonly used auction-like mechanisms in these markets can be suboptimal and in such situations increased concentration could actually turn out to increase competition and raise prices.

In addition, as Boone and Mulherin (2008) argue, the standard assumption of auction design theory that the number of bidders is fixed does not actually apply to company sale processes, where new bidders can easily enter.

All in all, auction design theory indicates that, given certain assumptions, the use of bidding consortia could theoretically have anti-competitive effects. However, many of the models that predict this are limited in terms of their applicability to the specific context of LBOs.

⁸ i.e. auctions for licenses to use wireless communication frequencies, e.g. the European 3G auctions in 2000.

⁹ If, for example, you perceive a higher value it is more likely that other bidders will do so too.

2.4 Previous research

The main findings of previous research on club deals are discussed and evaluated in the sections below.

Bidding consortia and takeover competition levels

Boone and Mulherin (2008) find that takeovers of public US targets won by consortia of LBO sponsors are not associated with lower levels of competition, in terms of the number of non-binding and binding offers received, than those won by individual LBO sponsors or strategic buyers.

However, one would have greater confidence in Boone and Mulherin's work if a two stage least squares instrumental variable regression had been used, due to the possibility of dual causality. If club deals are indeed driven by anti-competitive price fixing motivations, one would logically expect that LBO sponsors would only feel the need to form bidding consortia in highly competitive sale processes, characterized by higher than average numbers of non-binding and binding offers. If this holds in reality, the accuracy of the paper's empirical results would be distorted, due to the fact that they were produced by a standard linear regression (Stock and Watson, 2007).

Bidding consortia and target shareholder returns

One of the means by which a number of authors try to assess the impact of club deals on LBO pricing is by analyzing the abnormal returns (cumulative or buy-and-hold) earned by target shareholders during the buyout process.

In Boone and Mulherin (2008), the authors try to determine whether the prices paid by consortia of LBO sponsors, in terms of target abnormal returns, differ from those paid by other categories of winning bidders. They find no significant differences in abnormal returns for target shareholders in club deals and single sponsor LBOs.

Instead of using a sample comprised of purely US transactions like Boone and Mulherin, Cao (2008) evaluates LBOs from a number of different countries. Cao's results point towards the same conclusion as the one reached by Boone and Mulherin.

In contrast to the two aforementioned studies, Officer et al. (2008) focus exclusively on US deals led by the largest and most prominent LBO sponsors. Their argument for this restrictive focus is that concerns about club deals have primarily been directed to large transactions led by prominent LBO sponsors and that these sponsors are responsible for the majority of global LBO deal volume in terms of enterprise value. They find that transactions

led by consortia result in significantly lower abnormal returns for target shareholders than those led by independent sponsors.

Besides conflicting in terms of their conclusions, the aforementioned studies use abnormal return data which is only available for PTP transactions, thus restricting them to a specific type of LBO. It can be argued that it would be interesting to utilize more points of comparison for pricing levels and include private LBOs when researching this topic.

Due to the fact that abnormal returns earned by target shareholders during a PTP transaction process only represent a part of the actual price paid by a buyer, it can also be argued that it is not an appropriate pricing proxy. Although abnormal returns are definitely of interest to the targets' shareholders, they do not indicate whether or not club deals have uncompetitive pricing levels. The question of whether or not single LBO sponsors pay more, in relative terms, than consortia of LBO sponsors, remains unanswered. Furthermore, results obtained using abnormal returns are quite sensitive to the length of the event window being used, due to the effects of information leakage and revelations pertaining to the buyout process.

Bidding consortia and LBO pricing

Pricing multiples based on enterprise values and accounting variables are a common measure in research on private equity. Besides being a clearer indicator of pricing levels, they additionally allow for the comparison of PTP and private LBOs, as the latter do not have publicly listed shares for which returns can be measured.

Using a wide range of pricing multiples, Officer et al. (2008) find that, for deals occurring before the DOJ investigation, multiples are significantly lower for club deals as compared to single sponsor LBOs. The authors find a similar negative relationship between club deals and pricing when including transactions occurring after the DOJ investigation, but the results are not statistically significant.

Although it is true that the most prominent LBO sponsors are responsible for the vast majority of global LBO deal volume in terms of enterprise value, one can argue that it would be useful to establish whether the findings of Officer et al. also hold for the LBO market as a whole. Moreover, it would be informative to include non-US and non-PTP transactions in the analysis to increase the number of comparison points for pricing levels.

3 Hypothesis

Given the previously discussed theoretical and practical considerations one would expect that club deals would not have lower pricing multiples than single sponsor LBOs after controlling for relevant differences in transaction characteristics.

There are a number of explanations for the use of bidding consortia by LBO sponsors (information and knowledge sharing, skill synergies, financial capacity synergies) which are unrelated to anti-competitive intentions and well supported by theoretical and practical considerations. One factor which may support these arguments is the fact that manager ability is observable in private equity. Kaplan and Schoar (2005) and Phalippou and Gottschalg (2008) both find that the performance of a private equity sponsor in a specific fund is indicative of their performance in subsequent funds. As a result, one could argue that LBO sponsors would be more willing to work together and form bidding consortia in cases where it is mutually beneficial, because they can distinguish between competent and incompetent potential partners by looking at their historical track records.

Even if club deals are truly motivated by anti-competitive intentions there are a number of practical limitations which would probably prevent bidding consortia from successfully rigging sale processes in many cases. Likely constraints include the enforcement problem in bidding rings, outside competition, the growing influence of activist hedge funds, Revlon duties and go-shop provisions. However, it is important to note that some of these factors are only relevant in certain legal environments and types of LBOs (i.e. PTP).

Standard models from auction theory have the expectation that the formation of consortia by potential buyers can result in lower pricing outcomes. However, these models are not directly applicable to the LBO market due to the incompatibility of their assumptions. Given the likelihood that there is indeed some correlation across bids (Mares and Shor, 2007) and that the number of bidders is not constant throughout the sale process, the use of bidding consortia may not have a negative impact on pricing outcomes.

Given the aforementioned factors, it appears there is a stronger argument for the case that bidding consortia do not impede competition levels. Subsequently, the hypothesis of this paper is that club deals do not have negative pricing implications.

4 Sample and data

All transaction data used in the empirical test of this paper's hypothesis comes from the Capital IQ database, which contains descriptive and financial information about mergers and acquisitions. Data on stock market valuation levels, in the form of average annual book-to-market ratios for each target country represented in the sample, was taken from Kenneth French's website.

As a starting point for constructing the sample, 27,727 reported transactions were downloaded from the Capital IQ database. Cancelled transactions which did not go through after their announcement dates were then taken out, along with those lacking pricing multiples

and target asset values. These adjustments dramatically reduced the number of remaining observations to 1,520. From this point, non-LBO transactions, bankruptcies, sales of minority stakes and transactions with negative pricing multiples were taken out. Finally, transactions with targets outside of the US, Canada and Western Europe were removed. As a result of these adjustments, the final sample includes 617 LBOs which span from the beginning of 1996 to the end of 2007.

The sample is primarily comprised of PTP transactions occurring during the LBO boom from 2003 to 2007. This overrepresentation of PTP transactions is due to the fact that transaction pricing information in the private LBO market is seldom reported, whereas the terms of tender offers for listed companies are publicly announced due to regulatory requirements. Subsequently, 71% of observations are PTP transactions, with the remainder being made up of private LBOs. In terms of timing, the factor that the majority of observations are concentrated around the period 2003-2007 reflects the cyclical nature of the LBO market. For a more detailed overview of the sample and its summary statistics, please refer to Tables 1-6.

5 Methodology

A two stage least squares instrumental variable regression process was used to evaluate the hypothesis. This approach was used to insure that the model's coefficient estimate of the effect of bidding consortia on LBO pricing is not distorted by correlations between explanatory variables and the error term. It thereby overcomes potential problems related to the possibility that there are significant explanatory variables which were omitted due to unavailable data, measurement errors or a case of simultaneous causality (Stock and Watson, 2007). The possibility of simultaneous causality is particularly relevant in this case, as highly competitive sale processes characterized by higher than average pricing multiples may encourage the formation of bidding consortia.

In the sections below, the performed regressions are specified and this is followed by a overview of the variables used in these equations.

5.1 First stage logistic regression

In the first stage a logistic regression was used to identify the factors which affect the probability of an LBO being a club deal and the instrumental variable was established. The following estimation equation was used:

$$CD_i = \ln(P_i / 1 - P_i) = \Pi_0 + \Pi_1 \ln assets_i + \Pi_2 control\ variable_{1i} + \dots + \Pi_{30} control\ variable_{29i} + v_i$$

5.2 Second stage regressions

After the logistic regression, two categories of LBO pricing multiples were regressed against control variables and the fitted values of the dependent variable in the logistic regression. The following estimation equations were used:

$$\ln(EV / Revenue)_i = \beta_0 + \beta_1 \hat{CD}_i + \beta_2 \text{control variable}_{1i} + \dots + \beta_{30} \text{control variable}_{29i} + u_i$$

$$\ln(EV / EBITDA)_i = \beta_0 + \beta_1 \hat{CD}_i + \beta_2 \text{control variable}_{1i} + \dots + \beta_{30} \text{control variable}_{29i} + u_i$$

5.3 Variables

The variables used in the two stage regression process are described and explained below.

Dependent variable in the logistic regression

Values for the dependent variable CD_i were based on a dummy variable indicating whether or not a transaction is a club deal involving two or more LBO sponsors.

Instrumental variable

The variable $\ln assets_i$ was selected as the instrumental variable because it is uncorrelated with the error term in the second stage regressions. It represents the natural logarithm of the target's assets at the most recent year end prior to the announcement date of the LBO in question.

Control variables

To account for relevant differences across transactions, a set of control variables was developed and used in both stages of the regression process. These variables are described in the sections below.

Book-to-market ratio: To account for the strong role that public market valuation levels appear to play in terms of explaining buyout pricing (Axelson et al., 2007a), the natural logarithm of the target country average annual book-to-market ratio has been used as a proxy for stock market valuation levels in the regressions.

Cross-border deal: In the section that discussed information and knowledge sharing as a potential motivation for club deals it was argued that LBO sponsors may actively choose to use bidding consortia when evaluating investment opportunities outside of markets that they are

familiar with. In line with this, a control variable has been constructed indicating whether or not transactions in the sample took place on a cross-border level.

Transaction year: To account for the cyclical nature of the LBO market, variables were assigned to observations according to transaction year. Kaplan and Strömberg (2008) show that large PTP transactions in the US have displayed a clear pattern of rising and falling pricing levels, in terms of EV/EBITDA, since the 1980's. Axelson et al. (2007a) take this observation a step further and find empirical evidence supporting the view that the availability of financing impacts LBO pricing. Given the variance in conditions in credit markets and pricing multiples over time, it is thus logical to control for transaction timing.

Target industry: The Fama-French 12 industry classification scheme was used to classify transactions according to sector, to account for the possibility that differences in target industry impact LBO pricing. This approach was also used by Officer et al. (2008).

Target region: A variable was constructed to identify US and non-US (Canada and Western Europe) transactions.

DOJ investigation: To distinguish whether or not the DOJ investigation and the aforementioned class action lawsuits in the US had an impact on the occurrence of club deals or changed pricing levels, a dummy variable was constructed. This variable was calculated as the product of the abovementioned variable indicating whether or not the target's region was the US and another variable indicating if the transaction took place after the DOJ investigation was brought to light in the Wall Street Journal article of October 10, 2006.

LBO type: A group system was used to control for different types of LBOs. Transactions where LBO sponsors purchase publicly traded targets and take them private were classified as *PTP*. In situations where targets were purchased from private sellers, they were put into the group *independent private*, whereas targets being sold by corporations were distinguished as *divisional*. Finally, transactions with LBO sponsors as both buyers and sellers were identified as *secondary*. These classification categories are the same as those used by Axelson et al. (2007a).

Fitted values of the dependent variable in the first stage logistic regression

\hat{CD}_i was inserted into the second stage pricing regressions as an explanatory variable. Subsequently, pricing multiples were regressed against the fitted dummy variable values indicating whether or not a specific LBO is a club deal.

Dependent variables used in the second stage regressions

To measure pricing in relative and comparable terms, ratios based on the enterprise value (EV) of each transaction and target financial characteristics were used. Second stage regressions were run using EV/Revenue and EV/EBITDA¹⁰, which are based on the pricing of a transaction relative to the target's most recent annual financial results. These pricing measures have been used in past research, for example Officer et al. (2008) and Axelson et al. (2007a).

6 Results and analysis

In Chapter 6 the results of the two stage least squares instrumental variable regression process outlined in the preceding section are discussed in relation to the hypothesis.

6.1 First stage logistic regression

The results presented in Table 7 show that there is a statistically significant (1% level) positive relationship between the instrumental variable $\ln assets_i$ and CD_i . This indicates that the probability that an LBO is a club deal rises as the size of the target increases.

It does not appear that whether or not an LBO sponsor is investing outside of their country of origin has a strong effect on the likelihood that they use bidding consortia, due to the fact that the *cross-border_i* dummy variable has a statistically insignificant odds ratio. However, this does not automatically cancel-out cross-border information and knowledge sharing as a potential explanation for club deals, because the variable does not accurately capture the degree to which the sponsors in question are familiar with the target's market. This is due to the fact that many LBO sponsors are active in a number of different markets and employ investment professionals with a range of national backgrounds. As a result, the fact that an LBO sponsor is assessing an opportunity outside of its country of origin does not necessarily mean that it is unfamiliar with that market.

¹⁰ Earnings before interest, taxes, depreciation and amortization.

The $post-DOJ_i * US_i$ variable also has an insignificant odds ratio, which suggests that LBO sponsors in the US market continued to use bidding consortia after onset of the DOJ investigation and aforementioned class action lawsuits.

6.2 Second stage regressions

The results presented in Table 8 support the hypothesis that club deals do not have lower transaction multiples than single sponsor LBOs after controlling for differences.

One would expect that \hat{CD}_i would have a statistically significant negative coefficient if the use of bidding consortia was an effective collusion measure in LBO transactions. However, the variable has a statistically significant (1% level) positive coefficient when regressed against $\ln(EV/Revenue)_i$ and a positive coefficient when regressed against $\ln(EV/EBITDA)_i$, which is close to statistical significance at a 10% level (p-value = 0.106). Subsequently, it appears that club deals typically result in relative pricing outcomes which are, at the least, as high as those associated with single sponsor LBOs. It is also interesting note that the $post-DOJ_i * US_i$ has a statistically insignificant positive coefficient, which implies that the onset of the DOJ investigation and the aforementioned class action lawsuits did not have a major impact on pricing levels in the US LBO market.

It is interesting to note that empirical results point towards the same conclusion when this paper's methodology is re-run using a sub-sample only including US deals led by the largest and most prominent LBO sponsors. This selective transaction focus, which was employed by Officer et al. (2007), still produces regression results which indicate that club deals do not have negative pricing implications. Please refer to Tables 9-11 for a more detailed overview of the construction and regression results of the sub-sample.

6.3 Conclusion

The main finding of this paper is that club deals do not have lower pricing levels than single sponsor LBOs after controlling for transaction characteristics. One possible explanation is that the primary motivations for club deals are not connected to collusive behaviour. In such a case, it would be likely that factors unrelated to anti-competitive intentions (information and knowledge sharing, skill synergies, financial capacity synergies) would explain the use of bidding consortia. In the absence of prevalent anti-competitive intentions it would be logical to find that club deals do not have negative pricing implications. Another possibility is that collusion is indeed a motivation for club deals but it is ineffective due to a number of

constraints, for instance the enforcement problem in bidding rings, outside competition, hedge fund activism, Revlon duties and go-shop provisions.

In the ongoing debate about club deals the findings of this paper have interesting implications for owners of corporate assets and regulatory bodies. Given that club deals do not typically have negative pricing implications, it is not logical to exclude bidding consortia of LBO sponsors from sale processes. From the perspective of regulatory bodies it appears to be more logical to treat club deals on a case by case basis as opposed to discouraging the use of bidding consortia in all situations, by means of standard policies and regulations. If sellers of corporate assets or regulatory bodies rely on misguided assumptions about bidding consortia when making decisions about whether or not to permit club deals, it could have the undesirable effect of lowering competition for targets which are out of the reach or interest of individual LBO sponsors.

An interesting area of exploration for further research would be an investigation of the prevailing motivations for the use of bidding consortia. Although it was identified that increases in target size increased the probability that an LBO is a club deal, it does not necessarily imply that financial capacity synergies are a genuine motivating factor. This result may be explained by the tendency for LBO sponsors who focus on the largest LBO targets to collaborate with each other. To further investigate this matter it would be interesting to compare the sizes of funds involved in LBOs relative to target size for club deals and single sponsor LBOs. If financial capacity synergies are indeed a significant motivating factor, one would expect club deals to occur more in situations where the sizes of the individual funds involved in the transaction were small relative to the targets' enterprise values.

Another interesting area for further research would be to investigate the involvement of LBO sponsors in club deals relative to the backgrounds of their investment professionals in terms of industry experience and market knowledge (i.e. geographic focus). This would enable one to analyze information and knowledge sharing as well as skill synergies as potential motivating factors for the use of club deals.

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8 Appendix

8.1 Figures

Figure 1
The twelve largest US based LBO funds relative to predecessors, as of June 2007

Figure 1 displays the total capital commitments of the twelve largest US based LBO funds by sponsor. The size of each fund is presented along with its predecessors to show historical patterns in fundraising. Within this group, the majority of funds active as of 2007 are significantly larger than their most recent predecessors, which reflects the emergence of so called ‘mega funds’ during the recent boom in the LBO market. Source: Cornelius et al., *Journal of Applied Corporate Finance* (A Morgan Stanley publication), 2007.

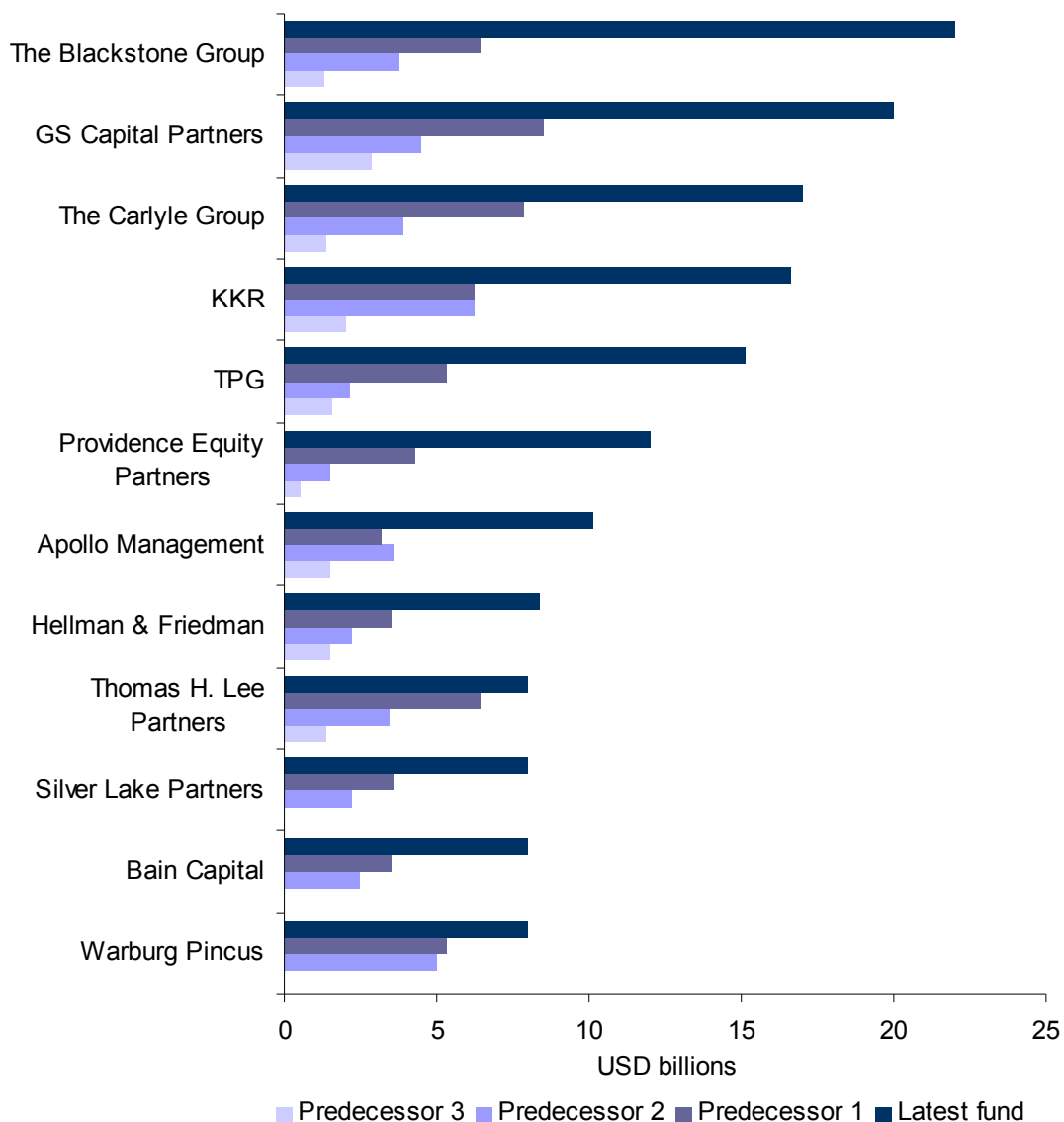


Figure 2
The seven largest Europe based LBO funds relative to predecessors, as of June 2007

Figure 2 displays the total capital commitments of the seven largest Europe based LBO funds by sponsor. The size of each fund is presented along with its predecessors to show historical patterns in fundraising. Within this group, the majority of funds active as of 2007 are significantly larger than their most recent predecessors, which reflects the emergence of so called ‘mega funds’ during the recent boom in the LBO market. Source: Cornelius et al., Journal of Applied Corporate Finance (A Morgan Stanley publication), 2007.

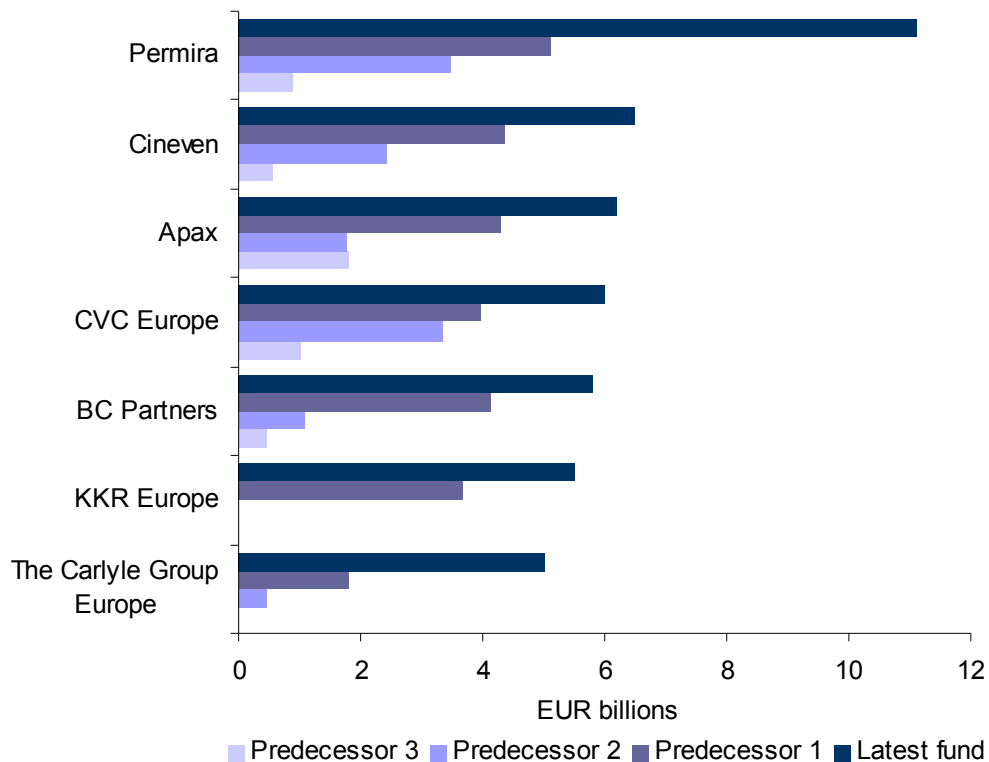


Figure 3
Public-to-private (PTP) transactions, 1999-2007

Figure 3 displays the total PTP transactions in the US, Canada and Western Europe per year in terms of enterprise value and number of transactions. This highlights the surge in PTP activity from 2005-2007. Source: Capital IQ database.

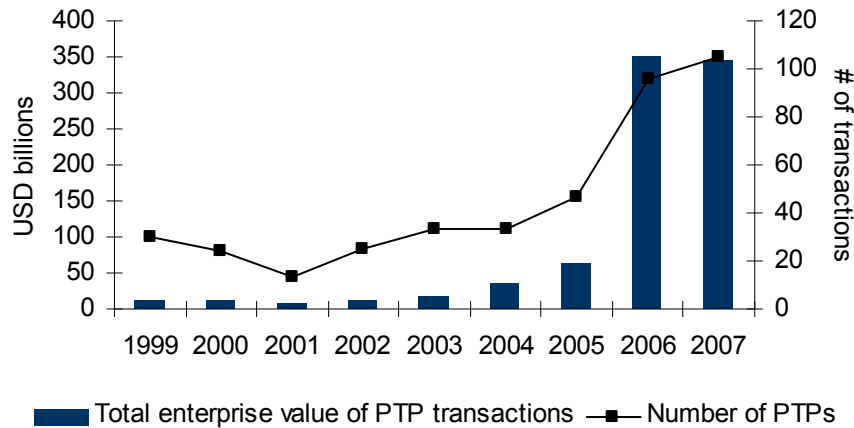
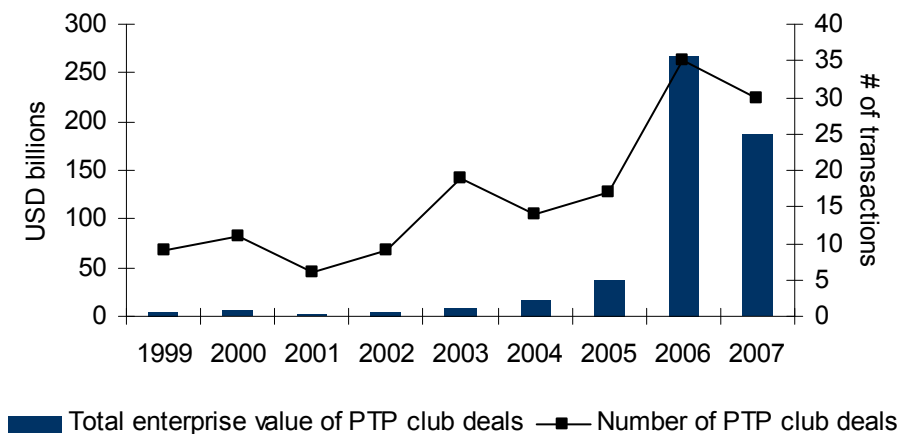


Figure 4
PTP club deals, 1999-2007

Figure 4 displays the total PTP club deals in the US, Canada and Western Europe per year in terms of enterprise value and number of transactions. This highlights the surge in the use of bidding consortia in PTP transactions from 2005-2007. Source: Capital IQ database.



Figures 5 and 6
Ten largest PTP transactions (and LBOs), as of September 2008

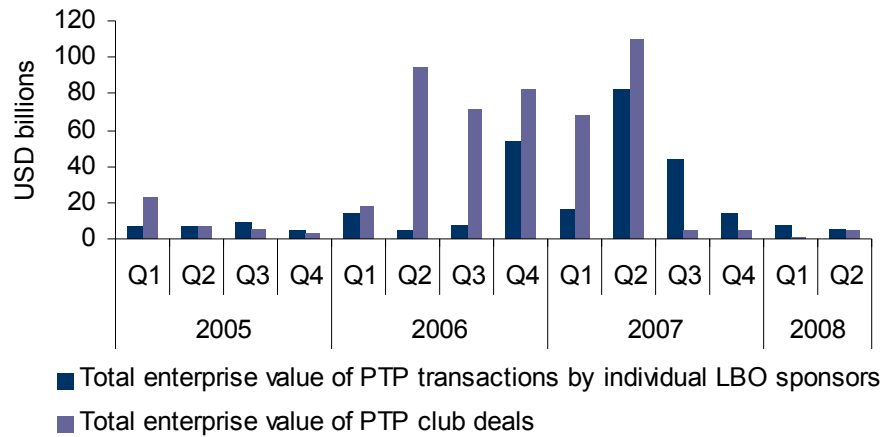
Figures 5 and 6 display the ten largest PTP transactions (and LBOs) in history in terms of enterprise value, according to target location, size, announcement date and participating sponsors. Enterprise values are listed in inflation adjusted terms as of September 2008 and the historical enterprise values of each transaction at announcement are also provided in brackets. These tables highlight the concentrated boom in large-cap PTP club deals from the second quarter of 2006 to the second quarter of 2007. Sources: Capital IQ database, Sorkin (2007), the US Department of Labour, the Bank of Canada and authors' calculations.

		RJR Nabisco	Kinder Morgan	HCA	Harrah's Entertainment	Clear Channel
	<i>Target location</i>	US	US	US	US	US
	<i>Enterprise value (USD billions)</i>	\$ 57.5 (\$ 31.1)	\$ 32.7 (\$ 30.1)	\$ 35.9 (\$ 33.1)	\$ 27.7 (\$ 25.5)	\$ 29.5 (\$ 27.2)
	<i>Announcement date</i>	Oct-88	May-06	Jul-06	Oct-06	Nov-06
<i>Participating sponsors</i>	Apollo Management				•	
	Bain Capital			•		•
	The Carlyle Group		•			
	GS Capital Partners		•			
	KKR	•		•		•
	Merrill Lynch (private equity arm)			•		
	Riverstone Holdings		•			
	Thomas H. Lee Partners					•
	TPG				•	

		Equity Office Properties	TXU	First Data	Alltel	BCE
	<i>Target location</i>	US	US	US	US	Canada
	<i>Enterprise value (USD billions)</i>	\$ 39.9 (\$ 36.8)	\$ 48.0 (\$ 45.5)	\$ 29.2 (\$ 27.7)	\$ 28.7 (\$ 27.2)	\$ 50.0 (\$ 48.4)
	<i>Announcement date</i>	Nov-06	Feb-07	Apr-07	May-07	Jun-07
<i>Participating sponsors</i>	The Blackstone Group	•				
	Citigroup (private equity arm)		•			
	GS Capital Partners		•		•	
	KKR		•	•		
	Madison Dearborn Partners					•
	Merrill Lynch (private equity arm)					•
	Morgan Stanley (private equity arm)		•			
	Providence Equity Partners					•
	TPG		•		•	

Figure 7
PTP transactions by quarter, 2005-2008

Figure 7 displays the total PTP transactions in the US, Canada and Western Europe per year in terms of enterprise value, with a split between transactions led by individual LBO sponsors and club deals. This highlights the dramatic drop in PTP club deals which began with the onset of the subprime crisis in the third quarter of 2003. Source: Capital IQ database.



8.2 Tables

Table 1
Sample distribution by year, type of LBO and region

Table 1 summarizes the observed LBO transactions in the sample according to year, transaction type and region. This table highlights the prevalence of PTP transactions and the concentration of observations around the period from 2003 to 2007, due to the boom in the LBO market during that period.

LBO types are classified according to the approach used in Axelson et al. (2007a). Transactions where LBO sponsors purchase publicly traded targets and take them private are classified as *PTP*. In observations where targets are purchased from private sellers, they are in the group *independent private*, whereas targets being sold by corporations are distinguished as *divisional*. Transactions with LBO sponsors as both buyers and sellers are identified as *secondary*. Furthermore, all types of LBOs backed by two or more sponsors are represented in the category *club deal*.

Year	Number of LBOs	PTP	Type of LBO				Location		
			Independent private	Divisional	Secondary	Club deal	US	Canada	Western Europe
1996	8	2	2	2	2	1	8	0	0
1997	31	23	3	1	4	9	31	0	0
1998	16	9	3	1	3	4	15	0	1
1999	40	30	2	4	4	15	39	0	1
2000	31	24	1	2	4	13	24	0	7
2001	24	13	3	5	3	9	14	2	8
2002	33	25	2	3	3	11	16	0	17
2003	55	33	5	6	11	22	33	1	21
2004	67	32	4	11	20	24	36	3	28
2005	69	47	4	4	14	22	39	1	29
2006	125	96	4	7	18	41	77	7	41
2007	118	105	1	1	11	34	67	14	37
Total	617	439	34	47	97	205	399	28	190
	(100%)	(71.2%)	(5.5%)	(7.6%)	(15.7%)	(33.2%)	(64.7%)	(4.5%)	(30.8%)

Table 2
Sample distribution by target country

Table 2 summarizes the observed LBO transactions in the sample according to target country. This highlights the concentration of observations in the US market but also to a lesser extent in the UK, France and Canada.

Austria	2	Netherlands	10
Belgium	2	Norway	5
Canada	28	Spain	3
Denmark	6	Sweden	16
Finland	1	Switzerland	2
France	39	UK	73
Germany	15	US	399
Ireland	4		
Italy	12	Total	617

Table 3
Sample distribution by target industry

Table 3 summarizes the observed LBO transactions in the sample according to target industry using the Fama-French 48 industry classification scheme. This highlights the broad spectrum of targets represented. Please note that these classifications are consolidated into the Fama-French 12 industry classification scheme when used as control variables in two stage least squares regression process.

Agriculture	3	Measuring and Control Equipment	1
Aircraft	7	Medical Equipment	11
Alcoholic Beverages	1	Miscellaneous	8
Apparel	8	Personal Services	15
Automobiles and Trucks	17	Petroleum and Natural Gas	13
Banking	9	Pharmaceutical Products	6
Business Services	67	Printing and Publishing	18
Business Supplies	2	Real Estate	8
Candy and Soda	2	Recreational Products	6
Chemicals	15	Restaurants, Hotel, Motel	41
Computers	23	Retail	53
Construction	9	Rubber and Plastic Products	1
Construction Materials	24	Shipping Containers	9
Consumer Goods	32	Steel Works, Etc.	11
Defense	1	Telecommunications	21
Electrical Equipment	10	Textiles	4
Electronic Equipment	9	Trading	8
Entertainment	18	Transportation	9
Food Products	8	Utilities	9
Healthcare	36	Wholesale	25
Insurance	9		
Machinery	30	Total	617

Table 4
Distribution of club deal observations in sample

Table 4 summarizes the distribution of club deals in the sample according to LBO type and location. This highlights the concentration of observations in the period from 2003 to 2007.

Year	Total club deals	PTP	Club deals by LBO type			US	Location	
			Independent private	Divisional	Secondary		Canada	Western Europe
1996	1	0	0	1	0	1	0	0
1997	9	6	0	1	2	9	0	0
1998	4	3	0	0	1	4	0	0
1999	15	9	0	4	2	14	0	1
2000	13	11	0	1	1	10	0	3
2001	9	6	1	1	1	4	1	4
2002	11	7	0	2	2	6	0	5
2003	22	18	1	1	2	13	1	8
2004	24	11	2	7	4	10	2	12
2005	22	17	2	1	2	12	0	10
2006	41	34	0	2	5	28	0	13
2007	34	29	0	0	5	22	3	9
Total	205	151	6	21	27	133	7	65
	(100%)	(73.7%)	(2.9%)	(10.2%)	(13.2%)	(64.9%)	(3.4%)	(31.7%)

Table 5
Descriptive statistics for target size in sample (USD millions)

Table 5 summarizes descriptive statistics for target size in all observations, measured in terms of transaction enterprise value and the most recently reported assessment of the total assets of the target at the time of the LBO. This highlights the tendency for club deals to be much larger than single sponsor LBOs. It also shows the dramatic increases in average target size in the LBO market from 2003 to 2007.

	Num obs.	EV at buyout				Assets at buyout			
		Mean	Median	Max	Min	Mean	Median	Max	Min
All LBOs	617	1656.1	478.8	48441.5	21.9	1278.8	388.1	35239.6	12.6
PTP	439	1950.3	444.8	48441.5	31.0	1509.3	397.0	35239.6	27.4
Independent private	34	383.5	174.0	2326.4	22.0	280.5	163.7	1427.8	22.5
Divisional	47	1046.1	599.4	7103.3	26.1	1063.9	600.9	8749.1	30.0
Secondary	97	1066.1	695.8	8033.0	21.9	689.8	412.3	5089.0	12.6
Club deals	205	2959.6	757.0	48441.5	21.9	2135.2	632.7	35239.6	27.4
Single sponsor	412	1007.4	371.9	36770.8	22.0	852.7	289.9	32692.3	12.6
US	399	1771.5	505.3	44466.9	22.0	1314.8	387.4	32692.3	22.5
Canada	28	2507.9	316.3	48441.5	37.4	1809.1	303.0	35239.6	22.0
Western Europe	190	1288.2	421.3	28745.6	21.9	1125.0	440.8	28293.5	12.6
1996	8	219.1	247.8	356.9	42.7	162.3	102.9	526.5	31.2
1997	31	407.9	320.0	1449.0	22.0	348.5	257.1	1259.8	46.9
1998	16	436.1	282.9	1874.3	26.9	291.7	184.0	870.9	22.5
1999	40	349.8	241.7	1061.4	49.0	280.7	184.8	984.2	37.1
2000	31	463.0	280.7	2108.7	56.3	479.3	503.5	2043.1	41.4
2001	24	579.0	351.1	2823.4	37.1	560.1	324.9	2786.7	44.5
2002	33	422.7	270.3	1795.1	31.0	457.7	254.3	2048.4	30.0
2003	55	634.5	320.8	3193.3	21.9	752.6	752.6	8749.1	12.6
2004	67	962.3	599.4	4006.1	37.5	855.0	500.4	5350.2	34.5
2005	69	1269.5	681.6	10861.2	45.6	1033.1	416.6	9768.0	39.1
2006	125	3161.7	674.8	36770.8	37.4	2303.7	519.9	28293.5	22.0
2007	118	3068.2	975.0	48441.5	28.3	2200.7	663.6	35239.6	32.6

Table 6
Descriptive statistics for LBO pricing in sample

Table 6 summarizes descriptive statistics for LBO pricing multiples in the sample, measured in terms of enterprise value (EV) over target revenue and EBITDA, which is a proxy for cash flow. This highlights the upwards trend in pricing levels in the LBO market from 2003 to 2007.

	Num obs.	EV/Revenue				EV/EBITDA			
		Mean	Median	Max	Min	Mean	Median	Max	Min
All LBOs	617	1.83	1.19	23.94	0.08	9.87	8.78	45.28	2.19
PTP	439	1.90	1.15	23.94	0.11	9.73	8.35	32.38	2.43
Independent private	34	1.27	1.05	3.95	0.09	9.87	8.78	19.42	2.19
Divisional	47	1.45	1.30	7.29	0.08	8.27	7.61	25.20	2.34
Secondary	97	1.89	1.43	11.51	0.20	11.29	10.28	45.28	3.49
Club deals	205	1.97	1.32	17.80	0.08	9.85	9.12	31.72	2.34
Single sponsor	412	1.76	1.17	23.94	0.09	9.88	8.57	45.28	2.19
US	399	1.859	1.21	23.94	0.081	10.015	8.82	45.28	2.19
Canada	28	2.691	1.075	16.88	0.256	10.245	8.57	32.38	5.83
Western Europe	190	1.632	1.15	17.8	0.112	9.5104	8.73	29.89	2.34
1996	8	1.31	1.52	2.11	0.51	10.56	9.19	19.09	3.86
1997	31	1.33	0.94	4.09	0.09	7.55	7.06	14.82	2.19
1998	16	1.63	1.03	7.95	0.40	9.33	8.32	16.69	3.92
1999	40	1.27	1.24	3.42	0.08	7.47	7.31	13.04	3.62
2000	31	1.10	0.77	4.61	0.11	7.64	6.63	18.57	2.34
2001	24	1.33	0.86	6.90	0.24	8.81	7.31	19.98	4.28
2002	33	1.68	0.71	17.80	0.13	7.10	6.26	17.98	2.43
2003	55	1.55	1.04	9.19	0.17	8.72	8.72	25.20	2.87
2004	67	1.85	1.16	23.94	0.12	8.94	8.35	31.51	3.82
2005	69	1.85	1.33	9.09	0.19	10.00	8.94	23.07	3.08
2006	125	2.28	1.60	16.88	0.18	11.15	10.14	45.28	3.50
2007	118	2.17	1.54	17.66	0.29	12.53	11.69	32.38	4.70

Table 7
First stage logistic regression

Table 7 presents the results of the first stage logistic regression. Values for the dependent variable CD_i are based on a dummy variable indicating whether or not a transaction is a club deal. Estimated coefficients are presented in odds ratio form. These figures indicate how the probability of an LBO being a club deal is affected by changes in the selected variables. When interpreting these estimates one should look at how they deviate from 1. The total odds ratio represents the probability that an event will occur over the probability that it will not ($P_i/1-P_i$). If there is an increase of 1 in a variable with an odds ratio of 1.5, this would cause the total odds ratio that an LBO is a club deal to increase by 50%, whereas it would fall by 50% if the variable had an individual odds ratio of 0.5. If an explanatory variable is a dummy, an odds ratio of 1.5 means that in the identified group the total odds are 50% higher, while an odds ratio of 0.5 means that they are 50% lower. Robust White standard errors are provided.

	Dependent variable = CD		
	Odds ratio	Robust standard error	p value
Ln(target assets) (instrumental variable)	1.435***	0.109	0.000
Ln(target country average book-to-market ratio)	0.551	0.342	0.338
<i>Base case = not a cross-border deal</i>			
Cross-border	1.472	0.366	0.120
<i>Transaction year base case = 1996</i>			
1997	1.706	2.196	0.678
1998	1.660	2.250	0.708
1999	3.081	3.956	0.381
2000	3.342	4.282	0.346
2001	2.902	3.887	0.426
2002	2.330	3.024	0.514
2003	3.272	4.207	0.356
2004	1.803	2.270	0.640
2005	1.428	1.791	0.776
2006	1.163	1.458	0.904
2007	0.685	0.878	0.768
<i>Target industry base case = other</i>			
Business equipment	0.944	0.385	0.889
Chemicals and allied products	0.483	0.399	0.378
Consumer durables	0.549	0.262	0.208
Consumer non-durables	1.209	0.431	0.595
Finance	1.218	0.504	0.634
Healthcare, medical equipment and drugs	1.418	0.473	0.295
Manufacturing	0.732	0.248	0.357
Oil, gas, and coal	2.703*	1.596	0.092
Telephone and television transmission	1.813	0.887	0.224
Utilities	1.619	1.272	0.540
Wholesale, retail and services	1.533	0.434	0.131
<i>Target region base case = non-US</i>			
US	1.088	0.291	0.753
<i>Base case = pre-DOJ and/or non-US</i>			
Post-DOJ * US	1.534	0.589	0.265
<i>LBO type base case = independent private</i>			
Divisional	2.696*	1.602	0.095
PTP	2.075	1.034	0.143
Secondary	1.554	0.840	0.414
*10%, **5% and ***1% statistical significance levels			
Number of observations	617		
Pseudo R ²	0.086		

Table 8
Second stage regressions

Table 8 presents the results of the second stage regressions. The dependent variables in these regressions are the natural logarithms of enterprise value (EV) over revenue and EV over EBITDA, which is a proxy for cash flow. The coefficient estimates for all explanatory variables are presented. Robust White standard errors are provided.

	Ln(EV/Revenue)			Ln(EV/EBITDA)		
	Coefficient	Robust standard error	p value	Coefficient	Robust standard error	p value
Ln(target country average book-to-market ratio)	-0.121	0.308	0.694	-0.078	0.101	0.438
<i>Base case = not a cross-border deal</i>						
Cross-border	-0.051	0.116	0.663	0.109**	0.048	0.024
<i>Base case = not a club deal</i>						
CD (fitted values from stage 1)	1.233***	0.395	0.002	0.277	0.171	0.106
<i>Transaction year base case = 1996</i>						
1997	-0.450	0.282	0.111	-0.312	0.225	0.166
1998	-0.215	0.325	0.508	-0.088	0.228	0.698
1999	-0.495*	0.267	0.064	-0.269	0.215	0.211
2000	-0.778***	0.293	0.008	-0.298	0.228	0.192
2001	-0.582*	0.306	0.057	-0.111	0.227	0.624
2002	-0.551*	0.304	0.071	-0.306	0.220	0.165
2003	-0.516*	0.290	0.076	-0.200	0.223	0.370
2004	-0.422	0.264	0.111	-0.152	0.212	0.474
2005	-0.192	0.260	0.460	-0.046	0.215	0.829
2006	-0.103	0.261	0.693	0.058	0.213	0.784
2007	-0.081	0.282	0.775	0.160	0.220	0.467
<i>Target industry base case = other</i>						
Business equipment	0.248*	0.135	0.066	0.142**	0.071	0.046
Chemicals and allied products	0.092	0.215	0.671	-0.051	0.088	0.562
Consumer durables	0.061	0.136	0.655	-0.035	0.072	0.625
Consumer non-durables	0.000	0.155	1.000	0.046	0.067	0.492
Finance	0.407*	0.240	0.091	0.107	0.087	0.218
Healthcare, medical equipment and drugs	0.237*	0.144	0.100	0.084	0.058	0.149
Manufacturing	-0.241*	0.131	0.066	-0.176***	0.057	0.002
Oil, gas, and coal	0.879**	0.381	0.021	0.395**	0.195	0.044
Telephone and television transmission	0.291	0.232	0.209	0.046	0.127	0.719
Utilities	0.833**	0.376	0.027	0.293	0.200	0.143
Wholesale, retail and services	-0.590***	0.134	0.000	-0.065	0.053	0.223
<i>Target region base case = non-US</i>						
US	-0.004	0.117	0.974	0.107**	0.049	0.031
<i>Base case = pre-DOJ and/or non-US</i>						
Post-DOJ * US	0.125	0.158	0.431	0.089	0.079	0.260
<i>LBO type base case = independent private</i>						
Divisional	-0.255	0.246	0.300	-0.248**	0.116	0.033
PTP	-0.042	0.187	0.824	-0.150	0.096	0.117
Secondary	0.313	0.200	0.118	0.108	0.097	0.268
*10%, **5% and ***1% statistical significance levels						
Number of observations	617			617		
R ²	0.273			0.305		

Table 9
Sub-sample distribution by single sponsor LBOs and club deals per sponsor

Table 9 summarizes the single sponsor LBOs and club deals per sponsor in the sub-sample created using the transaction selection approach employed by Officer et al. (2008). The paper by Officer et al. focuses only on the largest and most prominent LBO sponsors since, as they argue, concerns about club deals have primarily been directed to large transactions led by prominent LBO sponsors and these sponsors are responsible for the majority of global LBO deal volume in terms of enterprise value.

To create the sub-sample, only transactions involving the most prominent LBO sponsors in the world, as defined by Officer et al. (2008), were selected from this paper's main sample. This resulted in a sub-sample with 194 transactions involving 32 sponsors. It has to be noted that, although the used LBO sponsors are the same, the sources of transaction data are not. In addition, the sub-sample in this paper also includes transactions with targets located outside of the US. For these reasons, the deals analyzed in this paper's sub-sample will evidently not always be the same as those in the sample used by Officer et al. (2008).

LBO sponsor	All LBOs in sample	Single sponsor LBOs	Club deals
Kohlberg Kravis Roberts	19	8	11
The Blackstone Group	24	15	9
TPG	21	6	15
Goldman Sachs Principal Investment Area	23	5	18
Welsh, Carson, Anderson & Stowe	7	4	3
Apollo Management	15	11	4
Morgan Stanley	1	0	1
Merrill Lynch	7	0	7
Thomas H. Lee Partners	15	5	10
Leonard Green & Partners	10	6	4
The Carlyle Group	18	11	7
Forstmann Little	1	1	0
Bain Capital	10	2	8
HM Capital Partners	1	0	1
Madison Dearborn Partners	12	5	7
Warburg Pincus	6	2	4
Providence Equity Partners	10	0	10
Clayton, Dubilier & Rice	3	3	0
Hellman & Friedman	7	2	5
Silver Lake Partners	4	1	3
Fortress Investment Group	6	5	1
JP Morgan	9	2	7
GTCR Golder Rauner	1	1	0
Cerberus Capital Management	2	1	1
Berkshire Partners	3	3	0
Onex	3	2	1
TA Associates	1	0	1
BC Partners	4	2	2
EQT Partners	4	0	4
Pacific Equity Partners	1	1	0
Sun Capital Partners	5	4	1
Permira	10	7	3

Table 10
First stage logistic regression using sub-sample

Table 10 presents the results of the first stage logistic regression using the sub-sample created using the transaction selection approach employed by Officer et al. (2008). Please refer to the text description of Table 9 for a more detailed overview of how this sub-sample was created. Unlike the main sample, this sub-sample contains no *independent private* transactions or transactions occurring during 1996. Furthermore, only 9 of the 12 industries in the Fama French classification scheme are represented.

Values for the dependent variable CD_i are based on a dummy variable indicating whether or not a transaction is a club deal. Estimated coefficients are presented in odds ratio form. These figures indicate how the probability of an LBO being a club deal is affected by changes in the selected variables. Robust White standard errors are provided. Please refer to the text description of Table 7 for an explanation regarding the interpretation of odds ratios.

	Dependent variable = CD		
	Odds ratio	Robust standard error	p value
Lnassets (instrumental variable)	1.738***	0.310	0.002
Ln(target country average book-to-market ratio)	0.509	0.404	0.395
<i>Base case = not a cross-border deal</i>			
Cross-border	1.559	0.929	0.456
<i>Transaction year base case = 1997</i>			
1998	7.361	10.515	0.162
1999	9.289*	10.648	0.052
2000	1.582	1.634	0.657
2001	4.747	6.294	0.240
2002	2.185	3.085	0.580
2003	1.857	2.165	0.595
2004	1.093	1.073	0.928
2005	1.500	1.416	0.667
2006	1.554	1.455	0.638
2007	0.256	0.280	0.213
<i>Target industry base case = other</i>			
Business equipment	5.186**	3.521	0.015
Consumer non-durables	2.557	1.590	0.131
Finance	1.629	1.265	0.530
Healthcare, medical equipment and drugs	1.824	1.055	0.299
Manufacturing	1.063	0.665	0.922
Oil, gas, and coal	13.644**	14.712	0.015
Telephone and television transmission	7.555**	7.030	0.030
Wholesale, retail and services	3.424**	1.782	0.018
<i>Target region base case = non-US</i>			
US	0.684	0.452	0.565
<i>Base case = pre-DOJ and/or non-US</i>			
Post-DOJ * US	2.166	1.331	0.208
<i>LBO type base case = divisional</i>			
PTP	1.080	0.730	0.909
Secondary	0.816	0.610	0.786
*10%, **5% and ***1% statistical significance levels			
Number of observations	194		
Pseudo R ²	0.162		

Table 11
Second stage regressions using sub-sample

Table 11 presents the results of the second stage regressions using the sub-sample created using the transaction selection approach employed by Officer et al. (2008). Please refer to the text description of Table 9 for a more detailed overview of how this sub-sample was created. Unlike the main sample, this sub-sample contains no *independent private* transactions or transactions occurring during 1996. Furthermore, only 9 of the 12 industries in the Fama French classification scheme are represented.

The dependent variables in these regressions are the natural logarithms of enterprise value (EV) over revenue and EV over EBITDA, which is a proxy for cash flow. The coefficient estimates for all explanatory variables are presented. Robust White standard errors are provided.

	Ln(EV/Revenue)			Ln(EV/EBITDA)		
	Coefficient	Robust standard error	p value	Coefficient	Robust standard error	p value
Ln(target country average book-to-market ratio)	-0.560*	0.330	0.092	0.052	0.137	0.707
<i>Base case = not a cross-border deal</i>						
Cross-border	-0.147	0.213	0.490	-0.024	0.087	0.787
<i>Base case = not a club deal</i>						
CD (fitted values from stage 1)	0.642	0.457	0.162	0.25	0.234	0.290
<i>Transaction year base case = 1997</i>						
1998	-0.107	0.532	0.841	0.298	0.245	0.226
1999	-0.091	0.330	0.784	-0.029	0.205	0.887
2000	0.131	0.288	0.650	0.014	0.243	0.954
2001	0.752	0.470	0.112	0.273	0.248	0.273
2002	0.706	0.536	0.190	0.051	0.217	0.814
2003	0.408	0.451	0.367	0.037	0.234	0.876
2004	0.410	0.317	0.197	0.125	0.168	0.460
2005	0.132	0.316	0.676	0.158	0.193	0.415
2006	0.216	0.302	0.475	0.275*	0.165	0.098
2007	0.445	0.314	0.159	0.395**	0.169	0.021
<i>Target industry base case = other</i>						
Business equipment	0.11	0.223	0.611	0.03	0.149	0.831
Consumer non-durables	-0.520*	0.309	0.095	-0.085	0.142	0.547
Finance	0.549*	0.295	0.065	0.073	0.124	0.553
Healthcare, medical equipment and drugs	0.068	0.208	0.745	-0.049	0.102	0.629
Manufacturing	-0.628***	0.214	0.004	-0.338***	0.108	0.002
Oil, gas, and coal	0.362	0.401	0.368	0.266	0.262	0.313
Telephone and television transmission	0.229	0.356	0.522	-0.215	0.196	0.273
Wholesale, retail and services	-1.064***	0.217	0.000	-0.169	0.111	0.128
<i>Target region base case = non-US</i>						
US	0.168	0.240	0.484	0.03	0.112	0.801
<i>Base case = pre-DOJ and/or non-US</i>						
Post-DOJ * US	-0.064	0.230	0.781	0.097	0.112	0.391
<i>LBO type base case = divisional</i>						
PTP	0.226	0.300	0.453	0.192	0.145	0.188
Secondary	0.425	0.338	0.210	0.387**	0.164	0.020
*10%, **5% and ***1% statistical significance levels						
Number of observations	194			194		
R ²	0.379			0.329		