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This study compares the takeover premiums for 55 private equity buyouts with 59 takeovers involving a public acquirer, from the US takeover market between 2004 and 2007. This investigation takes place amidst accusations of anti-competitive behavior against some of the most active private equity groups in the US. While controlling for several other factors that might affect the takeover premium, we find weak evidence that bid premiums are significantly lower for target firms undergoing a private equity takeover than those subject to takeovers by public companies. We also demonstrate that abnormal returns earned by targets around takeover announcements can be a biased and misleading proxy for takeover premium.

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1. Introduction

In October 2006 it was announced that so-called 'club deals' between a number of large buyout firms were to be the focus of a US Department of Justice investigation into possible anti-competitive behaviour.[1] The accusation was that by bidding as a consortium on particular deals, the private equity firms would refrain from competing against 'club' partners for other assets in order to minimise the likelihood of competition inflating takeover premiums. In light of these allegations, a *New York Times* columnist asked whether shareholders might feel that "....they are getting too low a premium when they see the private equity firms double their money seemingly overnight".[2]

The massive inflow of investor funds and genial market conditions have seen the value of private equity takeovers constitute a rising proportion of the overall mergers and acquisitions market in the US over the past few years. In fact, it has been estimated that this proportion has risen from just below 10 percent in 2003 to in excess of 35 percent for the first half of 2007. Such 'overheating' in private finance markets has been shown to be associated with rising asset values and premiums. Examining venture capital funds, Gompers and Lerner (2000) and Ljungqvist and Richardson (2003) found that there is a positive relation between the aggregate amount of investment capital raised and the valuation of venture capital-backed firms – suggesting that a surge in the flow of money increases competition between funds, pushing up prices. Kaplan and Stein (1993) provide evidence of similar 'overheating' in the leveraged buyout market; the massive inflow of new money into LBO funds in the late 1980s was associated with a significant increase in the ratio of buyout price to cash flow.

Oxman and Yildirim (2006) investigate the possibility of overheating in the buyout market in more recent times. They examine the premium paid and the risk profile of buyout target firms acquired during 1986-2005, and find that premiums paid between 1998 and 2005 were lower than during the 'overheated' period of 1986-1989. Rather than leading to 'overheating' in the private equity market, private equity funds appear to

[1] *Financial Times*, October 12th 2006
[2] *New York Times*, October 22nd, 2006

have expanded the set of potential targets – the average size of target firms has increased, and there is some evidence that private equity firms are acquiring targets with higher operating risk. In the only study that we know of examining whether 'networking' between players in a particular market can affect prices, Hochberg, Ljungqvist and Lu (2007) present evidence that networking between venture capital providers can adversely affect firms seeking venture capital funding. They find that the greater the network density, the poorer are the terms on which supported firms are able to raise capital.

Bargeron *et al* (2007) find that the premiums paid by private firms during 1990-2005 are significantly smaller than those paid by public firms. However, rather than private equity premiums being too low, they argue that premiums paid by publicly listed companies are in fact too high. Bargeron *et al* (2007) show that the difference in premiums is explained by publicly listed acquirers' differential levels of managerial share ownership. Those with low levels of managerial ownership pay greater premiums than acquirers with high managerial ownership; managers of firms with diffuse ownership thus do not have sufficient incentive to refrain from overpaying.

In this paper, we look specifically at private equity takeovers during the period of interest to the Justice Department. Our sample comprises 114 consummated takeovers of US listed firms, of which 55 are private equity buyouts and 59 are acquisitions by listed companies, announced between July 2004 and June 2007. We address the question, do shareholders of firms that are 'taken private' by private equity specialists receive lower premiums than firms that are taken over by other acquirers? While controlling for several well-known determinants of premium, we find weak evidence that premiums paid by private equity specialists are significantly lower than those paid by other industrial companies. This cannot be explained by managerial shareholding in public acquirers, because in contrast to Bargeron *et al* (2007), we find a positive relation between officers' and managers' stockholdings and premium.

The remainder of this paper is structured as follows. In section 2 we provide a background to value creation in takeovers, including private equity acquisitions. In

section 3 we discuss the data set, and present descriptive statistics and the results of univariate tests of premium and control variable difference. In section 4 we present the findings of our multivariate analysis, and section 6 summarises and concludes.

2. Background – takeovers and public-to-private transactions

There is a large body of evidence on value creation in takeovers demonstrating that target shareholders earn substantial excess returns around takeover announcements, but the evidence for bidding firms is equivocal,[3] and debate continues as to whether takeovers really create economic value. Seminal research by Marris (1963) and Manne (1965) suggested that the function of the takeover market was to correct the failure of product and input markets by disciplining management teams that fail to act in the interest of stockholders. Since this early work, which has been extensively empirically tested (Mandelker, 1974; Ellert, 1976; Smiley, 1976; Dodd and Ruback, 1977; Langetieg, 1978; Asquith, 1983; Martin and McConnell, 1991; Lang, Stulz and Walkling, 1989; Mikkelson and Partch, 1997), theoretical and empirical research on takeovers has been extended to a plethora of subsequent papers that have investigated a wider set of possible sources of takeover gains. Perhaps the most theoretically appealing is that takeovers result in a synergy between the bidder and target, creating an entity of greater value than the sum of its constituent parts (Asquith, 1983: Bradley, Desai and Kim, 1983; Fabozzi *et al*, 1988; Pound, 1988; Brous and Kini, 1993). A theory that has attracted comparatively little attention is the creation of market power (Stillman, 1983; Eckbo, 1983; Huck, Konrad and Müller, 2001).

Private transactions typically differ in a number of significant ways from other corporate control transactions. With few exceptions, these transactions are financed by borrowing substantially beyond the industry average (Renneboog and Simons, 2005). For this reason, the literature has focused on a specific form of public-to-private transaction: the leveraged buyout (LBO). The main feature of LBOs that sets them apart from other

[3] See Jensen and Ruback (1983) for an early review of the US evidence.

takeovers is the source of equity used; Jensen (1986) dubbed these equity providers 'LBO associations', but they are now more commonly known as private equity groups.

The fact that private equity groups willingly pay a premium to take target companies private and yet still expect to generate a positive return on investors' funds suggests, *prima facie*, that such transactions create value. However, as with takeovers generally, there is continuing debate on whether private equity groups actually do create value. The problem is that, in contrast to takeovers by public firms of public firms – for which objective (if imperfect) market-based evidence on value creation is available – the quality of the data on private equity performance is poor. Despite popular perception and hype from the industry, recent academic evidence shows that private equity returns are decidedly underwhelming. For example, Phalippou and Gottschalg (2007), after correcting for various biases in the data, find that the average private equity fund underperforms the S&P 500 by about 3 percent per year.

Nonetheless, several studies have investigated a number hypotheses explaining how 'going private' transactions potentially create value. Chief among them are tax savings, the reduction of agency costs, wealth transfers from bondholders or employees to shareholders, the reduction of transactions costs, and corporate undervaluation. Two alternative viewpoints have been advanced on the tax benefits of LBOs. Lowenstein (1985) and Frankfurter and Gunay (1993) argue that private equity groups exploit a favourable tax regime without having to contribute any 'real' value; and while Kaplan (1989) and Marais, Schipper and Smith (1988) also attribute a sizeable portion of premiums paid to tax benefits, they do not agree that this alone justifies a firm leaving the public markets. Opler and Titman (1993) find that firms assume more debt than is necessary to eliminate their tax expense, suggesting that there is an additional role played by debt. Lehn and Poulsen (1989) failed to find a significant relation between the size of the premium paid to take a firm private and the ex-ante potential for tax savings, but more recently Kieschnick (1998) finds a positive relation between premium size and tax benefits when outliers are omitted from the sample.

Other authors maintain that the reduction of agency costs is the primary source of value creation stemming from public-to-private transactions, and this can occur via two routes. The first relates to the better alignment between the incentives of management and shareholders' interests. Halpern *et al* (1999) provide evidence that firms with low levels of pre-buyout managerial equity ownership are more likely to undergo a buyout, and Kaplan (1989) finds that equity ownership amongst firms' top officers increases post-buyout. Kieschnick (1998), however, highlights the inability of the incentive realignment theory to explain the high frequency with which secondary IPOs are employed as an exit strategy.

A second route to value creation via the reduction in agency costs involves the quality of control. De Angelo, De Angelo and Rice (1984) speculate that buyout specialists may have a comparative advantage in monitoring a firm's activities, and create value as a result of an increased quality of control. Maug (1998) finds that investors will have an increased incentive to monitor management activities when equity ownership is more concentrated, and Gillian and Starks (2007) describe the buyout specialists of the 1980s as the ultimate shareholder activists, in terms of the vigour with which they would subsequently monitor the firm's activities.

A well-documented source of gains from 'going-private' transactions is encapsulated by the free cash flow hypothesis. Free cash flow is commonly accepted to be the cash flow remaining after financing all positive NPV projects have been financed (Jensen, 1986). Managers have incentives to use free cash flow to expand their firms beyond the size that maximises shareholder wealth (Hope and Thomas, 2007). Lowenstein's (1985) carrot-and-stick theory describes how LBOs counteract this problem. The carrot represents the increased managerial share ownership, which ties managerial incentives to shareholder value. The stick signifies the high leverage associated with such deals, which subsequently consumes much of the firm's free cash flow through an increased interest burden. Opler and Titman (1993) provide evidence in support of the free cash flow hypothesis. They find that firms that go private via an LBO typically have high levels of cash flow and low growth opportunities, suggesting that debt plays a role in eliminating

the incentive of management to invest excess cash flow in negative-NPV projects. However, some more recent evidence fails to provide support for the free cash flow hypothesis. Halpern, Kieschnick and Rotenberg (1999) find a positive but insignificant relation between free cash flow and the propensity to go private, and Renneboog, Simons and Wright (2005) and Weir, Laing and Wright (2004) reach a similar conclusion for studies focusing on the UK public-to-private market. Holmstrom and Kaplan's (2001) claim that shareholder value has been institutionalised post-1980s provides a possible explanation for the lack of support in the more recent literature.

The wealth transfer hypothesis states that gains arising from public-to-private transactions are, at least in part, a transfer of wealth from other stakeholders to stockholders. Asquith and Wizman (1990) find that corporate bondholders with insufficient covenant protection experience losses from a buyout, and Warga and Welch (1993) find significant bondholder wealth losses for successful LBOs in the 1980s. The transfer of wealth from employees to stockholders has also attracted some attention in the empirical literature, with some researchers attempting to investigate the widely-held view that LBOs result in redundancies and wage cuts. Kaplan (1989) and Smith (1990) reported a loss of employment in post-LBO firms after adjusting for industry effects.

The undervaluation hypothesis as a source of wealth gains for going private transactions has also attracted academic attention. Studies have mainly examined MBOs on the basis that incumbent management may benefit from information asymmetry with regard to the true value of their firm. Goh *et al* (2002) test the undervaluation hypothesis by examining analysts' earnings forecast revisions around the time of the announcement. They find a significantly positive relation between forecast revisions and abnormal returns associated with the announcement of the LBO. As these upward revisions do not appear to be to the detriment of competing firm's prospects, the authors posit that the forecasts must have been understated. Lowenstein (1985) and Schadler and Karns (1990) speculate that management may even employ specific accounting and finance techniques to deliberately depress the firm's share price prior to an MBO. However, Smith (1990)

finds that cash flows fail to exceed forecasts following failed buyout attempts, thereby suggesting some other element of the LBO model acts to improve operating performance.

3. Data and descriptive statistics

Our data set comprises consummated takeovers announced during the period 1st July 2004 to 7th June 2007. The takeover-related information is drawn from the Thomson SDC database, and it comprises acquirer and target names, industry, business description and public status, deal value, price paid per share, date of announcement and completion, target management's attitude to the bid, and type of acquisition. Accounting and financial data were obtained from Datastream. (All financial statement variables are drawn from the most recent financial statement prior to announcement). The SEC's *Edgar* database provided a supplementary source of account information where necessary. All sample acquisitions had to fit into one of two groups:

1. Public firms acquired by another listed industrial company.
2. Public firms acquired by a private equity group or consortia of private equity groups.

After removing financial sector firms, we randomly sampled from the remaining 654 deals 102 public acquirer and 98 private equity takeovers. We removed any firms for which accounting and price data were not available on Datastream, those with a transaction value of less than $10 million, and those for which the acquirer did not obtain 100 percent of outstanding shares. Further, following Opler and Titman (1993), we excluded target firms with a negative value for EBITDA for the year preceding the takeover announcement. Likewise, target firms exhibiting a total shareholders' deficit for the year prior to takeover are excluded from the sample. An additional requirement for the private equity takeovers was that management did not constitute part of the buyout team. This last requirement ensures that all transactions relate specifically to the actions of private equity groups. The final sample comprises 114 acquired firms: 59 private equity takeovers and 55 by public companies.

Calculating premium

A popular approach in the academic literature is to use the target's cumulative abnormal return, from some time prior to announcement to the announcement date, as a proxy for premium. We use this approach, and also the simpler approach of taking the difference between the pre-bid stock price and the offer price (for stock-swap bids, the equivalent cash price**,** drawn from SDC, is calculated based on the closing price of the acquiring firm the day before announcement), and expressing this difference as a percentage of the pre-bid price. We call this the 'simple premium'. The pre-bid price (or start date for the abnormal return calculation) is sometimes taken from well before the announcement date, in order to avoid contaminating the calculation with the pre-bid price 'runup'. To be consistent with Bargeron *et al* (2007), we use the 1-day prior AR (*AR1*) and pre-bid price (*PREM1*), and we also calculate 10-day prior AR (*AR10*) and simple premium (*PREM10*). We use the market model to calculate abnormal returns, with the S&P 500 as the market benchmark.

Control variables

We use several deal-related and target-specific control variables. The type of bid financing – cash or stock – has also been found to be associated with premium size. Prior research on the so-called medium of payment decision finds that cash bids are associated with higher premiums than stock-swap bids (Wansley, Lane and Yang, 1983; Huang and Walkling, 1987; and Hayn, 1989). This is perhaps because target shareholders require a higher premium for cash bids to compensate for capital gains tax, and a second potential explanation is that bidders are prepared to pay more when paying in cash due to the tax deductibility of interest payments on additional debt. The dummy variable *STOCK* takes the value of 1 for non-cash bids and 0 for cash bids. Several studies (see Jensen and Ruback, 1983) have found that tender offers are associated with higher premiums than mergers. We include the dummy *TO* which is equal to one if the acquisition was conducted via a tender offer. The bidder's prior ownership of the target firm ('bidder's toehold') has been found to be inversely related to premium size (Walkling and Edmister, 1985; Walkling and Long, 1986; Kaufman, 1988). A value for one in dummy variable *THLD* denotes that the acquiring firm had a toehold in the target. The final deal-related

variable is *DIVERS*, which takes the value of one if the acquired firm is in a different industry (2-digit SIC) from the acquirer.

Several target characteristics have been found to affect the size of the takeover premium. Early studies found that targets with low leverage command significantly higher premiums (Walkling and Edmister, 1985), but Bargeron *et al* (2007) found that leverage is not a significant determinant of premium in their multivariate analysis. We measure leverage, *DA*, as the book debt-to-assets ratio. The size of the target firm has also been found to be positively associated with premium (Asquith, Bruner and Mullins, 1983; Hayn, 1989), although many studies have found this relation to be weak. Post-Sarbanes-Oxley Act, however, there is a stronger regulatory cost argument for small firms attracting higher premiums – there are substantial potential savings involved in taking small firms out of public ownership vis-à-vis large. This benefit would accrue to public company acquirers as well as private, assuming the target is fully acquired and subsequently de-listed. Our proxy for firm size is deal value (*DV*), which is the market capitalisation of the target firm on announcement day.

An inverse relation has been found between premium size and a target's *Tobin's q* ratio – the market value of a firm's assets to the replacement value of those assets (Lang, Stulz and Walkling, 1989; Datta, Iskander-Datta and Raman, 2003). *Tobin's q* is generally accepted as the best way to capture a firm's growth prospects. However, the impracticality of calculating the replacement value of a firm's assets has led other researchers to search for an alternative. Amit, Livnat and Zarowin (1989) find that the ratio of a firm's market value to its book value is a good proxy for Tobin's *q*. We calculate this ratio (*MTB*) as the target firm's market capitalisation on the day of the takeover announcement to its book value of assets.

Lastly, there is some evidence that premiums are higher in the presence of substantial free cash flow (Lehn and Poulsen, 1993). We use EBITDA/market capitalisation as a proxy for free cash flow (*EBM*). Two measures of cash flow have been used in prior literature; one being earnings before interest, tax and depreciation (EBITDA), the other

net cash flow (Kaplan and Stein, 1993). For the purposes of this study, EBITDA holds one key advantage over net cash flow. By definition, EBITDA is a measure of gross cash generated from operations. Given the tax-deductibility of interest, EBITDA will therefore provide a private equity acquirer with an indication of how much additional interest the target firm can afford subsequent to being taken private. Given that cash flow in itself may proxy for size, we scale EBITDA by the target firm's market capitalisation.

We use two additional variables, suggested by Bargeron *et al* (2007) that relate to the pre-bid performance of the acquired companies – *ARET* and *RUNUP*. RUNUP is the market-adjusted target return for day –63 to day –6 relative to announcement day (day 0), and ARET is the same for day –250 to day –63.

There are two control variables that are standard in the takeover premium literature that we do not need to use. The first relates to competition between bidders. There is considerable evidence that premiums are higher when more than one bidder is actively seeking to take over the target (Walkling and Edmister; 1985, Morck, Shleifer and Vishny, 1990; Suk and Sung, 1997). Without taking steps to deliberately exclude them, we have no cases of competing bids in our sample. The extensive evidence on the effect of competition for takeover targets on premiums is perhaps now well understood by stockholders; the fact that competition in takeovers is now rare is consistent with improved corporate governance (Holmstrom and Kaplan, 2001) and the recognition that many acquiring firms have in the past experienced the 'winners curse' by paying too much for acquisitions. From the perspective of private equity groups, reducing the likelihood of competition for a particular target would be important to avoid overpaying, and this is clearly the concern of antitrust regulators – that such groups may be effectively colluding to prevent competition.

The *second* relates to hostile takeover bids. The issue of the relation between target management opposition and premium size has been a popular one in the literature, but the findings vary; Jarrell (1985) and Jennings and Mazzeo (1993) found a positive relation, but Huang and Walkling (1987) and Servaes (1991) found no significant relation.

Similarly to competing bids, hostile bids are now rather rare, and again without design our sample has no hostile bids. Certainly the modern form of private equity takeovers are characterised by a lack of hostility.

Summary statistics

Table 1 provides summary statistics for the non-dummy control variables: ARET and RUNUP, deal value (in millions of dollars) (DV), EBITDA/market capitalization (EBM), market-to-book (MTB), and the debt-to-assets ratio (DA). Panel A presents summary statistics for the sample overall. The mean deal value is $2,235 million, or just over $2 billion, and the median of $1,115 million is considerably lower. Precisely half of the target firms in the sample have a market capitalisation of less than $1 billion, and are therefore classified by the American Association of Individual Investors as small firms[4].

In Panel B, summary statistics are reported for public acquirer and private equity takeovers separately. The public company takeovers are slightly larger than the private equity takeovers, but this difference is not significant ($p = 0.44$ using a Wilcoxon rank sum test).[5] This is interesting because Bargeron *et al* (2007) find that targets of private bidders are about half the size of targets of public companies. Modern private equity targets are larger on average than in previous takeover booms, and this is consistent with Oxman and Yildirim (2007) who found that the size of private equity targets has increased over the last 20 years or so. Targets of public company takeovers have slightly lower EBITDA/market capitalisation and lower levels of debt relative to assets, but have higher market-to-book ratios. None of these differences, however, are significant at standard levels. Consistent with Bargeron *et al* (2007) private equity targets have a higher average (and median) debt-to-assets ratio, but this difference is not significant. On the basis of these financial ratios, it appears to be the case that public firms and private equity acquirers target the same types of firms, with the possible exception of cash flow

[4] Individual Investment Guide, p.37. Available at www.aaii.com

[5] As there is some skewness in most of our variables, we conduct our univariate testing with the non-parametric Wilcoxon rank sum test. However, for most of our variables skewness is not excessive. The exceptions are *deal value*, *market-to-book*, and *EBITDA/market capitalisation*, which are highly positively skewed. For this reason we use the log of these variables for our multivariate analysis.

characteristics – the private equity buyers acquire firms with higher free cash flow. The difference however is barely significant, with p = 0.10 for the Wilcoxon rank sum test.

Also in Table 1 are summary statistics for the pre-bid performance of the target firms. Overall (Panel A) the target firms earn an abnormal return of 5 percent in the runup, and they are slight underperformers relative to the market (-1.84 percent) in the 9 months or so before the runup period. When divided into private equity and public company acquisitions (Panel B), it is clear that the pre-bid behaviour between the two is quite different. Recall that the ARET period begins 250 days prior to announcement and ends at day -63. The targets of public acquirers are on average underperformers (with an average CAR of -8.26 percent and a median of -9.25 percent) whereas the private equity group's ARET average is 5.05 percent (median -0.02 percent). This difference is significant at standard levels using a standard t-test and a Wilcoxon test. This unanticipated finding is at variance with that of Bargeron *et al* (2007), who find that targets of both private equity firms and public companies underperform in the year prior to announcement. In contrast, the RUNUP abnormal returns are not significantly different.

The patterns of pre-bid price behaviour can be seen clearly in Figures 1 to 3, which depict the cumulative average abnormal return (CAAR) for the 250 days up to the announcement of the takeover for the full sample, the public acquirer targets and the private equity targets respectively. Consistent with prior evidence on pre-bid abnormal returns, generally the targets' performance follows that of the market until about 3 months before the takeover, when a relatively small runup begins (Figure 1). However, the private equity and public acquirer subsamples exhibit quite different pre-bid behaviour. The CAAR for targets of public company takeovers (Figure 2) shows underperformance for most of the 250-day pre-bid period, with a runup that is similar to that for the sample overall. In contrast, private equity takeovers appear to involve target firms that outperform the market on average for most of the pre-bid period (Figure 3). This may be because the market is able to anticipate these firms' acquisitions well in advance of the bid. Many commentators attributed the stock market boom of 2003-2007

at least partly to a 'likelihood of being taken private premium', and several websites provide advice on how to pick stocks that will be subject to private equity bids.[6]

Table 2 presents summary statistics for the four measures of premium, and as in Table 1, Panel A presents the statistics for the sample overall and Panel B the private equity and public company acquisitions separately. For the full sample, mean values for abnormal return – at 16.83 and 17.33 percent for the 1-day and 10-day AR – are broadly consistent with previous evidence from the US takeover market, although they are at the lower end of the range presented by Jensen and Ruback (1983) in their summary of 13 early studies of premium. The means for premium at 24.45 and 25.40 for *PREM1* and *PREM10* respectively are considerably higher than for the AR returns, and this is because abnormal returns calculated up to the announcement day (or even a day or two after) understate the actual premium paid to target stockholders. The extent of stock price reaction on announcement day depends not only on the size of the premium but also on the market's perception of the likelihood of success of the bid. On average, the announcement day stock price will increase to a price that is usually somewhere below the bid price, from where (for bids that are ultimately successful) the target stock price tends to drift upward during the offer period (Samuelson and Rosenthal, 1986; Hutson, 2000). In our sample, the (unadjusted) stock price jumps to just over 80 percent of the level of the actual premium on announcement day.

The mean and median premiums for both private equity and public acquirer (Panel B of Table 2) are considerably lower than those of Bargeron *et al* (2007). We find that the 1-day prior AR premium paid for targets by private equity acquirers is 15.45 percent, compared to their 22.2 percent; for public acquirers our equivalent premium is 18.13 versus theirs of 31.74 percent. Their calculation 'FFRET' – the CAR from one day before announcement to the conclusion of the bid – is similar to our PREM1, except that PREM1 is not market adjusted. Despite not being market-adjusted (in a strong bull market), our simple premiums are still much lower than their FFRET (our 20.98 percent

[6] See, for example, http://articles.moneycentral.msn.com/Investing/SimpleStrategies/12TopTakeoverTargets.aspx

versus their 24.21 percent for private equity and 27.69 versus their 33.24 for public acquirers). Because Bargeron *et al*'s (2007) sample runs from 1990 whereas ours starts in 2004, this is consistent with the reduction in takeover premiums over time as reported by Oxman and Yildirim (2006).

Another important difference between our findings and that of Bargeron *et al* (2007) is that we do not find particularly strong evidence that public acquirer premiums are higher than private equity premiums. On a univariate basis, the premiums as measured by AR are not significantly different. In contrast, the difference is significant as measured by simple premium. Compare, for example, the difference between AR1 and PREM1. The public bidder PREM1, at 27.69 percent, is 9.5 percentage points (53 percent) higher than the CAR premium, and for the private equity sample the PREM1 of 20.98 percent is only 5.5 percentage points higher than the AR1 (35 percent). The difference is even greater (56 for public company versus 35 percent) and using the PREM10 and AR10. Using the AR as a proxy for premium appears to inflate the private equity premium relative to the public company premium. This can be explained by the fact that, as discussed above, the announcement day abnormal return does not reflect the full premium – because it also reflects the market's assessment of the likelihood of success of the takeover bid. For private equity takeover bids, the target stock price moves 87 percent of the way to the bid price that day, whereas the stock price of targets of public company bid increases only by 74 percent on average. Applying the simple model of Samuelson and Rosenthal (1986), this implies that private equity takeover bids are generally assessed to have a greater likelihood of success than bids by public companies.

One potential explanation for the inconsistency of our findings and that of Bargeron et al (2007) is that our public company sample contains non-cash bids. Table 3 reports on the public acquirer targets divided into cash and non-cash. 'Non-cash' includes targets of stock-swap as well as mixed bids – those in which the target shareholder has a choice of cash or shares, or the consideration includes both cash and stock. The premiums are higher for cash bids than non-cash, but this is significant only for the AR proxies for premium. Again, this is because of differing likelihoods of success as reflected in the

extent to which the announcement day stock price increases toward the bid price. For the cash bids, the announcement day price jump is 90 percent of the bid premium, whereas for non-cash bids the price increases to only 67 percent of the premium. Nonetheless, as private equity firms pay cash, this may be a reason why popular opinion has it that public company acquirers pay higher premiums than private equity groups – cash premiums are more visible and may attract greater media attention than non-cash premiums.

An interesting finding is that the debt-to-assets ratio is significantly lower for cash bids versus non-cash, with a median of 0.07 for cash versus 0.23 for cash. The difference in premium between cash and non-cash public takeovers may therefore be the result of the very different capacity to take on new debt; cash bidders are perhaps prepared to pay a higher premium when there are additional tax benefits as a result of adding debt to the target's capital structure. Comparing the debt-to-assets ratios of public firms that acquire by paying cash (top of Table 3) with private equity buyers, all of whom paid cash (Panel B in Table 1), debt is much lower for the former (0.11) than the latter (0.24). Perhaps the public acquirer's decision about how to pay for acquisitions depends to some extent on the leverage of the target; those with relatively low leverage are paid for in cash and those with higher leverage, stock. This is consistent with prudence on the part of public acquirers, and this, together with relatively small premiums, is consistent with enhanced corporate governance (Holmstrom and Kaplan, 2001).

Table 4 presents a brief summary of industry. Private equity takeovers dominate public company takeovers in consumer and retail, whereas public firms are more likely to acquire energy and health care targets. High technology, materials and media targets are equally popular with public acquirers and private equity specialists. For the dummy variable controls (not reported in tables), 16 takeovers are tender offers, 9 are diversifying takeovers, and for only 5 the acquirer had a toehold. All of these refer to public acquirers – none of the private equity takeovers were tender offers, nor did any of the private equity firms acquire a pre-bid toehold.

The Pearson correlation matrix for the variables is presented in Table 5. From the four columns on the right-hand-side of the table – reporting correlations between the premiums and the control variables – it is clear that there is a strong inverse relation between premium and our proxy for target firm size (DV). It is also clear that targets that have performed poorly relative to the market before the takeover bid (as measured by ARET) tend to attract higher bid premiums. As the correlations on the left-hand-side of the table – those between the control variables – are small and mostly insignificant, we do not anticipate any multicollinearity problems in the multivariate analysis.

4. Multivariate analysis

We run a series of robust regressions with the four alternative measures of premium as the dependent variable and the full set of controls as explanatory variables. An indicator variable, *PEDUM*, takes the value of 1 if the acquirer is a private equity firm. Table 6 presents the findings of our multivariate analysis. The table is divided into two sections, with the results for abnormal returns as the proxy for premium on the left hand side, and the findings using the simple premium on the right. For the 10-day prior measures, RUNUP is omitted because the runup period overlaps with the premium estimate in these cases. The explanatory power of the models, as indicated by the adjusted R-squared, is much greater for the 1-day prior premiums than the 10-day prior premiums. This is probably because there is less noise in the closer estimates. Further, there is little need to start the premium estimate well before the announcement because there is no dramatic runup in the days immediately before the announcement as has been found in prior studies (see, for example, Schwert, 1996).

The coefficient on the PEDUM indicator variable dummy is negative and significant at the 10 percent level or better in all four models, but is significant at standard levels ($p = 0.03$) only in one – the AR1 model. These findings are generally supportive of private equity premiums being lower than public acquirer premiums, even after controlling for many deal and target-specific variables.

Of the deal-specific control variables, only STOCK is significant, implying that stock bids are associated with lower premiums. Higher premiums are paid for smaller firms (*DV* is significantly negative in three of the models), and higher premiums are paid for firms that perform poorly before the takeover (*ARET* is significantly negative in all cases). The other significant target-specific control is the debt-to-assets ratio, and this is positive – targets with higher debt levels attract greater premiums. This finding is at variance with those of Bargeron *et al* (2007), who found that leverage was not a significant determinant of premiums. Neither *EBM* nor *MTB* – our proxies for free cash flow and the q-ratio – are significant.

There is an argument that the method of payment should not be controlled for in examining the issue of private equity premiums. Private equity firms may well argue that they do not have the ability to offer stock as consideration in takeover bids, and further, non-cash payments can be converted to cash by target shareholders at their discretion. If we agree with this argument, the appropriate comparator in a study of premiums would be all premiums paid by public acquirers, rather than just cash premiums. We therefore re-run the regressions reported in Table 6 without the dummy variable STOCK; the results are reported in Table 7. As can be seen in the table, the indicator variable PEDUM becomes highly insignificant for the AR measures of premium. However, the coefficients on PEDUM for the simple premium measures (PREM1 and PREM10) decrease (in an absolute sense) less dramatically, and the p-values show that their significance decreases only slightly (from p = 0.06 to 0.12 for PREM1 and 0.10 to 0.11 for PREM10). This finding underlines the problems associated with using abnormal returns around the announcement day as a proxy for premium. Rather than picking up a fundamental difference between cash and non-cash premiums, the dummy variable STOCK is more likely to be proxying for a lower likelihood of success for non-cash bids than for cash. This is confirmed by the insignificance of STOCK for PREM1 and PREM10 in our full multivariate results reported in Table 6.

As discussed in the introduction, Bargeron *et al* (2007) found that the difference in premiums between private and public firms could be explained by agency issues, and that

rather than private equity firms paying target shareholders too little, public firms pay too much. They found that acquiring firms with low levels of managerial shareholding paid higher premiums, and that firms with strong managerial shareholdings paid essentially the same premiums as private equity firms. We gathered data from the *Edgar* database on officers' and directors' shareholdings (as a proportion of shares outstanding). The data were available for only 44 of our 59 public acquirers, and these are plotted against the AR1 measure of premium in Figure 4. (Similar patterns were found using the other premium proxies). As can be seen in the figure, rather than being an inverse relation a lá Bargeron *et al* (2007), the relation is in fact positive – premiums are higher for greater levels of managerial shareholding. Although the relation is not particularly strong (the correlation is 0.34), this finding is unexpected. However, most of the acquiring firms for which we were able to find managerial stockholding data were non-cash acquirers; only 7 out of the 44 paid cash premiums, whereas Bargeron *et al*'s (2007) sample of public firms comprised cash acquirers only.

Determinants of private equity and public acquirer premiums

For completeness we re-run our regressions for the private equity and public company sub-samples separately; the results are reported in Table 8. There are several interesting findings from this analysis. *First*, the explanatory power of the private equity models (Panel A) is much higher, and the results more consistent across the four models, than the findings for the public acquirers (Panel B). *Second*, private equity firms do not pay higher premiums for firms with strong cash flow (the cash flow variable, EBM, is not significant). While the finding on EBM is consistent with Bargeron *et al*'s (2007) insignificant operating cash flow variable, it is inconsistent with earlier findings on takeovers generally (Walkling and Edmister, 1985) that free cash flow is associated with higher premiums, and the intuition that private equity buyers would be willing to pay more for such firms because the deals could be financed with greater leverage. *Third*, DV is highly significant – the smaller the private equity target, the larger the premium. This (and the fact that this variable is not as strongly significant for public acquirer firms) is consistent with a regulatory cost argument – that there are significantly more savings involved in taking small firms out of public ownership vis-à-vis larger firms. Given that

many prior studies have not found any relation between firm size and premium (Asquith, Bruner and Mullins, 1983; Hayn, 1989), this finding – in our post-Sarbanes Oxley sample – contributes to the body of evidence on the costs for small firms of complying with the new regulations.

Fourth, as for the sample firms overall, higher premiums are paid by private equity firms in the presence of higher leverage *and* higher market-to-book (MTB). Prior studies of buyout firms – which have largely examined the propensity to go private rather than premium size – found that the typical private equity target had spare debt capacity and few opportunities for growth (Opler and Titman, 1993). Although we are looking at premiums rather than likelihood of being taken private, we are very surprised by these findings. The fact that private equity is paying more for 'growth' firms and those with higher financial risk is consistent with the findings of a recent IMF report[7]. It documents (among other features) falling interest coverage ratios in recent private equity deals, and concludes that:

> Gains to private equity holders on LBO targets are increasingly reliant on earnings growth, as valuation multiples and leverage rise, and as leveraged loan rates have increased. It appears that private equity has picked most of the 'low-hanging fruit', potentially straining the viability of targets in the period ahead" (p. 17).

5. Summary and conclusions

In this paper we have attempted to address the question, do private equity acquirers pay smaller premiums in their acquisitions than listed firms? The background for this study is the recent allegation that private equity specialists have behaved in an anti-competitive manner, and these complaints have attracted the attention of the Department of Justice. We have compared takeover premiums for a sample of 55 private equity takeovers with 59 public company takeovers announced during the 3-year period July 2004 to June 2007. After controlling for several other potential determinants of the size of takeover

[7] IMF Global Financial Stability Report, October 2007
http://www.imf.org/external/pubs/ft/gfsr/2007/02/pdf/chap1.pdf

premiums, we find that private equity premiums are lower than premiums paid by publicly listed acquirers, although this difference is only weakly significant.

However, when we remove the dummy variable that controls for method of payment, private equity premiums – as proxied by abnormal returns around the announcement date – are no longer significantly lower than premiums paid by public firms. Consistent with prior literature, we find that non-cash abnormal returns earned by target shareholder around announcement are lower than cash takeover bid abnormal returns. But this is not the case with the 'simple premium' – that is, the bid price less the target stock price before the announcement (expressed as a percentage of the pre-bid price). This is because the announcement day abnormal return reflects the likelihood of success of the takeover bid as well as the premium, and the market's estimate of the likelihood of success appears to be lower for non-cash bids. Abnormal return is therefore a biased estimate of premium. We find more credible and consistent evidence that premiums are lower in private equity takeovers using the 'simple premium', although this difference is not significant at standard levels in our multivariate analysis.

While we acknowledge that we may be missing some critical control variables, the main weakness of our study is the relatively small sample size. Our marginal findings on premium difference point to the potential for a more definitive conclusion using a larger data set. Our apparently anomalous finding of a positive relation between premium and acquirer officers' and managers' shareholding also merits further investigation.

References

Amit, R. J. Livnat and P. Zarowin (1989) "The mode of corporate diversification: internal ventures versus acquisitions" *Managerial and Decision Economics* 10, 89-100.

Asquith, P. (1983) "Merger bids, uncertainty, and stockholder returns" *Journal of Financial Economics* 11, 51-84.

Asquith, P., R. F. Bruner, and D. W. Mullins (1983) "The gains to bidding firms from merger" *Journal of Financial Economics* 11, 121-139.

Asquith, P. and T. Wizman (1990) "Event risk, covenants and bondholder returns in leveraged buyouts" *Journal of Financial Economics* 27, 195-213.

Bargeron, L., F. Schlingemann, R. Stulz and C. Zutter (2007) "Why do private acquirers pay so little compared to public acquirers? ECGI Finance Working paper #171/2007.

Bradley, M. (1980) "Interfirm tender offers and the market for corporate control" *Journal of Business* 53(4), 345-376.

Bradley, M., A. Desai, and E. H. Kim (1983) "The rationale behind interfirm tender offers: information or synergy" *Journal of Financial Economics* 11, 183-206.

Brous, P.A., and O. Kini (1993) "A re-examination of analysts' earnings forecasts for takeover targets" *Journal of Financial Economics* 33, 201-225.

Datta, S., M. Iskander-Datta and K. Raman (2003) "Value creation in corporate asset sales: the role of managerial, performance and lender monitoring" *Journal of Banking and Finance* 27(2), 351-375.

DeAngelo, H. D., DeAngelo and E.M. Rice (1984) "Going private: minority freezeouts and stockholder wealth" *Journal of Law and Economics* 27, 367-401.

Dodd, P. and R. Ruback (1977) "Tender offers and stockholder retuns: an empirical analysis" *Journal of Financial Economics* 5(3), 351-373.

Eckbo, B.E. (1983) "Horizontal mergers, collusion, and stockholder wealth" *Journal of Financial Economics* 11, 241-273.

Ellert, J. C. (1976) "Mergers, Antitrust law enforcement and stockholder returns" *The Journal of Finance* 31(2), 715-732

Fabozzi, F.J., M.G. Ferri, T.D. Fabozzi, and J. Tucker (1988) "A note on unsuccessful tender offers and stockholder returns" *Journal of Finance* 43(5), 1275-1284.

Frankfurter, G.M. and E. Gunay (1992) "Management buyouts: the sources and sharing of wealth between insiders and outside shareholders" *Quarterly Review of Economics and Finance* 32, 82-95.

Gillian, S. and L. Starks (2007) "The evolution of shareholder activism in the United States" Available at SSRN: http://ssrn.com/abstract=956670

Goh, J., Gombola, M., Liu, F.Y. and Chou, D.W. (2002) "Going-private restructuring and earnings expectations: a test of the release of favorable information for target firms and industry rivals" W*orking paper*.

Gompers, P. and J. Lerner (2000) "Money chasing deals? The impact of fund inflows on private equity valuations" *Journal of Financial Economics* 55, 281-325.

Halpern, P., R. Kieschnick, and W. Rotenburg (1999) "On the heterogeneity of leveraged going private transactions" *Review of Financial Studies* 12, 281-309.

Hayn, C. (1989) "Tax attributes as determinants of shareholder gains in corporate acquisitions" *Journal of Financial Economics* 23(1), 121-153

Holmstrom, B. and S.N. Kaplan (2001) "Corporate governance and merger activity in the US: making sense of the '80s and '90s" *Journal of Economic Perspectives* 15, 121-144.

Hope, O. and W. Thomas (2007) "Managerial empire building and firm disclosure" Available at SSRN: http://ssrn.com/abstract=997864

Huang, Y. and R.A. Walkling (1987) "Target abnormal returns associated with acquisitions announcements: payment, acquisition form and managerial resistance" *Journal of Financial Economics* 19, 329-350.

Huck, S., Konrad, K. A.; Müller, W (2001) "Profitable horizontal mergers without cost advantages: the role of internal organization, information, and market structure." CESifo Working Paper No. 435, March 2001.

Hutson, E., 2000. "Takeover targets and the probability of bid success: evidence from the Australian market" *International Review of Financial Analysis* 9(1), 45-65.

Jarrell, G. (1985) "The wealth effects of litigation by targets: do interests diverge in a merge?" *Journal of Law and Economics* 28, 151-177.

Jennings, R.H. and M.A. Mazzeo (1993) "competing bids, target management and the structure of takeover bids" *The Review of Financial Studies*, 6(4), 883-909

Jensen, M. (1986) "Agency costs of free cash flow, corporate finance, and takeovers" *American Economic Review*, 323-329.

Jensen, M. and R.S. Ruback (1983) "The market for corporate control: the scientific evidence" *Journal of Financial Economics* 11, 5-50.

Kaplan, S. (1989) "The effects of management buyouts on operations and value" *Journal of Financial Economics* 24, 217-254.

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

Kaufman, D.J. (1988) "Factors affecting the magnitude of premiums paid to target firm shareholders in corporate acquisitions" *The Financial Review* 23(4), 465-481.

Kieschnick, R.L.(1998) "Free cash flow and stockholder gains in going private transactions revisited" *Journal of Business Finance & Accounting* 25 (1&2), 187–202.

Lang, L.H.P., R. Stulz, and R. A. Walkling (1989) "Managerial performance, Tobin's Q and the gains from successful tender offers" *Journal of Financial Economics* 24, 137-154.

Langetieg, T. (1978) "An application of a three-factor performance index to measure stockholders gains from mergers" *Journal of Financial Economics* 6, 365-384.

Lehn, K. and A. Poulsen (1989) "Free cash flow and stockholder gains in going private transactions" *Journal of Finance* 44(3), 771-788.

Ljungqvist, A. and M. Richardson (2003) "The cash flow, return and risk characteristics of private equity" working paper, Stern School of Business.

Lowenstein, L. (1985) "Management buyouts" *Columbia Law Review* 85, 730-784.

Mandelker, G. (1974) "Risk and return: the case of merging firm" *Journal of Financial Economics* 1, 303-35.

Manne, H. G. (1965) "Mergers and the market for corporate control" *The Journal of Political Economy* 73(2), 110-120

Marais, L., K. Schipper, and A. Smith (1989) "Wealth effects of going private for senior securities" *Journal of Financial Economics* 23(1), 155-191.

Marris, R. (1963) "A model of 'managerial' enterprise" *Quarterly Journal of Economics* 77, 185-209.

Martin, K. J., and J. J. McConnell (1991) "Corporate performance, corporate takeovers, and management turnover" *Journal of Finance* 46, 671-688.

Maug, E. (1998) "Large shareholders as monitors: is there a tradeoff between liquidity and control?" Journal of Finance 53, 65-98.

Mikkelson, W. H., and M. Partch (1997) "The decline of takeovers and disciplinary managerial turnover" *Journal of Financial Economics* 44(2), 205-228.

Morck, R., A. Shleifer and R.W. Vishny)1990) "Do managerial objectives drive bad acquisitions?" *Journal of Finance* 45(1), 31-48.

Opler, T. and S. Titman (1993) "The determinants of leverage buyout activity: free cash flow versus financial distress costs" *Journal of Finance* 48(5), 1985-1999.

Oxman, J. and Y. Yildirim (2006) "Evidence of competition in the leveraged buyout market" working paper.

Phalippou, L. and O. Gottschalg (2007) "The performance of private equity funds", working paper, University of Amsterdam. (Forthcoming in the *Review of Financial Studies*).

Pound, J. (1988) "Proxy contests and the efficiency of shareholder oversight." *Journal of Financial Economics* 22, 241-285.

Renneboog, L. and T. Simons (2005) "Public-to-private transactions: LBOs, MBOs, MBIs and IBOs" (August 2005). ECGI - Finance Working Paper No. 94/2005 Available at SSRN: http://ssrn.com/abstract=796047

Samuelson, W. and L. Rosenthal (1986) "Price movements as indicators of tender offer success" *Journal of Finance* 41(2), 481-499.

Schadler, F.P. and K.E. Karns (1990) "The unethical exploitation of shareholders in management buyout transactions" *Journal of Business Ethics* 9, 595-602.

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

Servaes, H. (1991) "Tobin's q and the gains from takeovers" *Journal of Finance* 46(1), 409-419.

Smiley, R. (1976) "Tender offers, transactions costs and the theory of the firm" *The Review of Economics and Statistics* 58(1), 22-32

Smith, A. (1990) "Corporate ownership structure and performance: the case of management buyouts" *Journal of Financial Economics* 27, 704-739.

Stillman, R. (1983) "Examining antitrust policy towards horizontal mergers." *Journal of Financial Economics* 11, 225-240.

Suk, D.Y., and H.M. Sung (1997) "The effects of the method of payment and the type of offer on target returns in mergers and tender offers" *The Financial Review* 32(3), 591-607.

Walkling, R.A., and R.O. Edmister (1985) "Determinants of tender offer premiums" *Financial Analysts Journal,* 27-36.

Walkling, R.A. and M.S. Long (1986) "Strategic issues in cash tender offers: predicting bid premiums, probability of success, and target management's response" *Midland Corporate Finance Journal* 4, 57-65.

Wansley, J.W., W.R.Lane, and H. C. Yang (1983) "Abnormal returns to acquired firms by type of acquisition and method of payment" *Financial Management* 12(3), 16-22

Warga, A. and I. Welch (1993) "Bondholder losses in leveraged buyouts" *The Review of Financial Studies* 6, 959-982.

Yochberg, Y., A. Ljungqvist and Y. Lu (2007), "Networking as a barrier to entry and the competitive supply of venture capital" working paper, Kellogg School of Management.

Table 1 Summary statistics – control variables

	Pre-bid performance (%)		Financial data			
	ARET	RUNUP	DV	EBM	MTB	DA
Panel A: Full sample						
mean	-1.84	5.02	2235.00	0.14	1.54	0.22
median	-3.99	5.96	1115.00	0.11	1.20	0.21
min	-101.14	-64.86	11.00	0.00	0.06	0.00
max	102.06	36.17	17704.00	1.21	6.55	0.79
skewness	-0.10	-1.02	2.47	4.14	1.79	0.84
kurtosis	1.55	4.34	9.60	25.07	6.24	3.34
Panel B: By acquirer						
Public company acquirers						
mean	-8.26	6.20	2279.00	0.12	1.68	0.20
median	-9.25	6.58	1362.00	0.09	1.37	0.18
min	-101.14	-26.27	27.00	0.00	0.06	0.00
max	57.71	34.28	12634.00	0.56	5.61	0.74
skewness	-0.35	-0.13	1.94	1.93	1.41	0.92
kurtosis	0.51	0.38	6.37	8.40	4.48	3.53
Private equity acquirers						
mean	5.05	3.75	2189.00	0.16	1.39	0.24
median	-0.02	5.93	947.00	0.11	1.07	0.23
min	-47.39	-64.86	11.00	0.01	0.07	0.00
max	102.06	36.17	17704.00	1.21	6.55	0.79
skewness	1.07	-1.31	2.76	3.72	2.30	0.76
kurtosis	2.61	4.94	10.82	17.97	9.00	3.20
t-test p-value	0.02	0.36	0.88	0.11	0.22	0.27
Wilcoxon p-value	0.04	0.55	0.44	0.10	0.13	0.25

Notes. The dummy control variables are *STOCK* (1 for non-cash bids and 0 for cash bids); *TO* (1 if the acquisition was conducted via a tender offer); *THLD* (1 if the acquiring firm had a toehold in the target); and *DIVERS* (1 if the acquired firm is in a different industry (2-digit SIC) from the acquirer). *DA* is the book debt-to-assets ratio, *DV* is the market capitalisation of the target firm on the day of announcement (in millions of dollars), *MTB* is the market capitalisation on the day of the takeover announcement to book value of assets, and EMB is EBITDA/market capitalisation. RUNUP is the market-adjusted target return for day –63 to day –6 relative to announcement day (day 0), and ARET is the same for day –250 to day –63. The row marked 'Wilcoxon p-value' is the p-value for a two-tailed Wilcoxon rank sum test for the difference between the private equity acquirer variable and the public company acquirer variable.

Table 2 Summary statistics – premiums

	Measures of premium (%)			
	AR1	AR10	PREM1	PREM10
Panel A: Full sample				
mean	16.83	17.33	24.45	25.40
median	15.65	14.81	20.88	21.96
min	-7.13	-16.15	-8.59	-8.94
max	65.51	52.38	96.81	98.72
skewness	0.77	0.41	1.19	1.32
kurtosis	3.72	2.93	4.94	5.38
Panel B: By type				
Public company acquirers				
mean	18.13	18.32	27.69	28.55
median	15.91	17.00	23.51	24.19
min	-5.94	-16.15	-8.59	-8.94
max	65.51	52.38	96.81	98.72
skewness	1.08	0.32	1.32	1.25
kurtosis	4.44	2.72	5.24	4.78
Private equity acquirers				
mean	15.45	16.27	20.98	22.02
median	15.53	14.67	17.65	18.99
min	-7.13	-2.89	-3.21	-2.06
max	44.48	43.26	66.67	65.29
skewness	0.42	0.41	0.84	0.92
kurtosis	2.57	2.76	3.23	3.73
t-test p-value	0.28	0.40	0.05	0.05
Wilcoxon p-value	0.31	0.55	0.05	0.09

Notes. *PREM1* and *PREM10* are 'simple premiums' calculated by subtracting the stock price one and 10 days prior to announcement from the takeover bid price, and *AR1* and *AR10* are market adjusted abnormal returns from 1 and 10 days before the announcement until and including announcement day. The row marked 'Wilcoxon p-value' is the p-value for a two-tailed Wilcoxon rank sum test for the difference between the private equity acquirer variable and the public company acquirer variable.

Table 3 Public acquirer sample characteristics

	Measures of premium (%)				Control variables			
	AR1	AR10	PREM1	PREM10	DV	EBM	MTB	DA
Cash bids (n = 18)								
average	25.51	25.23	32.92	32.15	1842	0.10	1.99	0.11
median	23.55	24.11	29.86	27.43	844	0.08	1.59	0.07
min	3.51	-6.05	7.77	-0.86	33	0.01	0.47	0.00
max	65.51	52.38	96.81	79.61	12634	0.28	4.97	0.39
Non-cash bids (n = 41)								
average	14.88	15.29	25.39	26.97	2470	0.13	1.54	0.24
median	11.56	11.29	20.62	23.15	1590	0.09	1.14	0.23
min	-5.94	-16.15	-8.59	-8.94	27	0.00	0.06	0.00
max	43.54	47.29	89.26	98.72	10901	0.56	5.61	0.74
t-test p-value	0.00	0.01	0.18	0.38	0.44	0.38	0.20	0.01
Wilcoxon p-value	0.00	0.01	0.11	0.13	0.30	0.50	0.15	0.03

Notes. The dummy variables are *STOCK* (1 for non-cash bids and 0 for cash bids); *TO* (1 if the acquisition was conducted via a tender offer); *THLD* (1 if the acquiring firm had a toehold in the target); and *DIVERS* (1 if the acquired firm is in a different industry (2-digit SIC) from the acquirer). *DA* is the book debt-to-assets ratio, *DV* is the market capitalisation of the target firm on the day of announcement (in millions of dollars), *MTB* is the market capitalisation on the day of the takeover announcement to book value of assets, and EMB is EBITDA/market capitalisation. *PREM1* and *PREM10* are 'simple premiums' calculated by subtracting the stock price 1 and 10 days prior to announcement from the takeover bid price, and *AR1* and *AR10* are market adjusted abnormal returns from 1 and 10 days before the announcement until and including announcement day. The row marked 'Wilcoxon p-value' is the p-value for a two-tailed Wilcoxon rank sum test for the difference between the private equity acquirer variable and the public company acquirer variable.

Table 4 Industry characteristics

	Public acquirers	**Private equity acquirers**
Consumer	2	10
Energy and Power	12	1
Healthcare	13	6
High Technology	15	10
Industrials	3	0
Materials	7	9
Media and Entertainment	3	5
Real Estate	0	1
Retail	2	13
Telecommunications	2	0
Total	**59**	**55**

Table 5 Correlations

	DA	DV	MTB	EBM	ARET	RUNUP	AR1	AR10	PREM1	PREM10
DA	0	0.18	0.17	0.47	0.21	-0.09	0.17	0.17	0.12	0.17
		(1.91)	(1.83)	**(5.68)**	**(2.24)**	(0.98)	(1.82)	(1.77)	(1.32)	(1.87)
DV		0	0.25	0.02	0.15	0.02	-0.35	-0.21	-0.40	-0.26
			(2.73)	(0.22)	(1.64)	(0.17)	**(4.01)**	**(2.25)**	**(4.68)**	**(2.85)**
MTB			0	-0.31	0.15	0.10	0.11	0.14	0.08	0.11
				(3.41)	(1.55)	(1.02)	(1.14)	(1.46)	(0.84)	(1.15)
EBM				0	0.01	-0.13	-0.01	-0.02	-0.02	0.02
					(0.06)	(1.40)	(0.12)	(0.18)	(0.25)	(0.25)
ARET					0	-0.08	-0.20	-0.19	-0.21	-0.22
						(0.80)	**(2.20)**	**(2.09)**	**(2.32)**	**(2.42)**
RUNUP						0	-0.10	-0.07	-0.09	-0.07
							(1.10)	(0.74)	(0.93)	(0.74)

Notes. In this table we present the Pearson correlation coefficients for the main control variables and for the measures of premium. In brackets underneath each coefficient is the t-statistic (a **bold** t-statistic denotes significance at the 5 percent level or better). *DA* is the book debt-to-assets ratio, *DV* is the market capitalisation of the target firm on the day of announcement, *MTB* is the market capitalisation on the day of the takeover announcement to book value of assets, and EMB is EBITDA/market capitalisation. *PREM1* and *PREM10* are 'simple premiums' calculated by subtracting the stock price 1 and 10 days prior to announcement from the takeover bid price, and *AR1* and *AR10* are market adjusted abnormal returns from 1 and 10 days before the announcement until and including announcement day.

Table 6 Regression results

	Abnormal Return				Premium			
	AR1		AR10		PREM1		PREM10	
	Coeff	**p-value**	**Coeff**	**p-value**	**Coeff**	**p-value**	**Coeff**	**p-value**
Constant	0.443	0.00	0.329	0.02	0.575	0.00	0.442	0.01
PEDUM	-0.115	0.03	-0.102	0.08	-0.135	0.06	-0.125	0.10
STOCK	-0.114	0.02	-0.113	0.05	-0.074	0.23	-0.071	0.31
THLD	-0.064	0.11	-0.028	0.40	-0.071	0.20	-0.044	0.41
TO	-0.006	0.88	-0.004	0.92	-0.018	0.79	-0.033	0.61
DIVERS	-0.006	0.93	-0.028	0.56	-0.015	0.87	-0.031	0.72
DA	0.183	0.00	0.161	0.04	0.194	0.01	0.214	0.02
logDV	-0.030	0.01	-0.017	0.19	-0.041	0.00	-0.026	0.09
logMTB	0.015	0.33	0.001	0.97	0.030	0.15	0.010	0.62
logEBM	0.001	0.93	-0.009	0.57	0.005	0.84	-0.005	0.83
ARET	-0.092	0.03	-0.078	0.07	-0.141	0.02	-0.161	0.01
RUNUP	-0.131	0.15			-0.246	0.08		
Adj. R-sq	0.23		0.09		0.25		0.15	

Notes. *PREM1* and *PREM10* are 'simple premiums' calculated by subtracting the stock price 1 and 10 days prior to announcement from the takeover bid price, and *AR1* and *AR10* are market adjusted abnormal returns from 1 and 10 days before the announcement until and including announcement day. *PEDUM* is the indicator variable that takes the value of 1 if the acquirer is a private equity firm. The dummy control variables are *STOCK* (1 for non-cash bids and 0 for cash bids); *TO* (1 if the acquisition was conducted via a tender offer); *THLD* (1 if the acquiring firm had a toehold in the target); and *DIVERS* (1 if the acquired firm is in a different industry (2-digit SIC) from the acquirer). *DA* is the book debt-to-assets ratio, *DV* is the market capitalisation of the target firm on the day of announcement, *MTB* is the market capitalisation on the day of the takeover announcement to book value of assets, and EMB is EBITDA/market capitalisation. RUNUP is the market-adjusted target return for day –63 to day –6 relative to announcement day (day 0), and ARET is the same for day –250 to day –63. The row marked 'Wilcoxon p-value' is the p-value for a two-tailed Wilcoxon rank sum test for the difference between the private equity acquirer variable and the public company acquirer variable.

Table 7 Regression results, without controlling for consideration

	Abnormal Return				Premium			
	AR1		AR10		PREM1		PREM10	
	Coeff	**p-value**	**Coeff**	**p-value**	**Coeff**	**p-value**	**Coeff**	**p-value**
Constant	0.340	0.00	0.223	0.02	0.591	0.00	0.448	0.00
PEDUM	-0.014	0.57	-0.002	0.94	-0.066	0.12	-0.058	0.11
THLD	-0.064	0.26	-0.027	0.61	-0.080	0.20	-0.052	0.42
TO	0.071	0.07	0.072	0.06	0.035	0.58	0.018	0.77
DIVERS	-0.001	0.99	-0.023	0.64	-0.010	0.92	-0.026	0.76
DA	0.159	0.01	0.137	0.06	0.180	0.02	0.200	0.02
logDV	-0.028	0.00	-0.014	0.13	-0.049	0.00	-0.032	0.00
logMTB	0.018	0.23	0.004	0.82	0.029	0.14	0.010	0.63
logEBM	0.007	0.64	-0.003	0.83	0.008	0.72	-0.002	0.94
ARET	-0.100	0.02	-0.085	0.05	-0.149	0.02	-0.168	0.01
RUNUP	-0.137	0.14			-0.244	0.08		
Adj. R-sq	0.20		0.06		0.25		0.15	

Notes. In this table we repeat the regressions reported in Table 6 without the control variable *STOCK*. *PREM1* and *PREM10* are 'simple premiums' calculated by subtracting the stock price 1 and 10 days prior to announcement from the takeover bid price, and *AR1* and *AR10* are market adjusted abnormal returns from 1 and 10 days before the announcement until and including announcement day. *PEDUM* is the indicator variable that takes the value of 1 if the acquirer is a private equity firm. The dummy control variables are *TO* (1 if the acquisition was conducted via a tender offer); *THLD* (1 if the acquiring firm had a toehold in the target); and *DIVERS* (1 if the acquired firm is in a different industry (2-digit SIC) from the acquirer). *DA* is the book debt-to-assets ratio, *DV* is the market capitalisation of the target firm on the day of announcement, *MTB* is the market capitalisation on the day of the takeover announcement to book value of assets, and EMB is EBITDA/market capitalisation. RUNUP is the market-adjusted target return for day –63 to day –6 relative to announcement day (day 0), and ARET is the same for day –250 to day –63. The row marked 'Wilcoxon p-value' is the p-value for a two-tailed Wilcoxon rank sum test for the difference between the private equity acquirer variable and the public company acquirer variable.

Table 8 Regression results: private equity and public company separately

	Abnormal Return				Premium			
	AR1		AR10		PREM1		PREM10	
	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
Panel A: Private equity								
Constant	0.449	0.00	0.357	0.00	0.655	0.00	0.543	0.00
DA	0.201	0.00	0.150	0.05	0.234	0.00	0.200	0.04
logDV	-0.041	0.00	-0.025	0.02	-0.060	0.00	-0.040	0.00
logMTB	0.044	0.01	0.029	0.13	0.072	0.01	0.057	0.03
logEBM	0.029	0.22	0.028	0.15	0.043	0.22	0.049	0.13
ARET	-0.109	0.08	-0.058	0.23	-0.114	0.14	-0.085	0.11
RUNUP	-0.229	0.05			-0.228	0.19		
Adj R-sq	0.39		0.16		0.39		0.23	
Panel B: Public companies								
C	0.273	0.01	0.168	0.18	0.519	0.00	0.356	0.02
STOCK	-0.111	0.02	-0.114	0.04	-0.081	0.20	-0.083	0.24
THLD	-0.064	0.04	-0.027	0.40	-0.085	0.13	-0.057	0.33
TO	-0.004	0.91	-0.001	0.98	-0.018	0.80	-0.032	0.64
DIVERS	0.016	0.78	-0.040	0.35	-0.019	0.83	-0.066	0.39
DA	0.065	0.54	0.131	0.33	0.086	0.58	0.185	0.24
logDV	-0.013	0.18	-0.003	0.77	-0.039	0.01	-0.024	0.08
logMTB	-0.030	0.19	-0.028	0.20	-0.032	0.41	-0.049	0.17
logEBM	-0.024	0.16	-0.040	0.03	-0.033	0.25	-0.055	0.08
ARET	-0.078	0.10	-0.094	0.11	-0.139	0.10	-0.203	0.02
RUNUP	0.127	0.23			-0.117	0.65		
Adj R-sq	0.18		0.07		0.13		0.11	

Notes. *PREM1* and *PREM10* are 'simple premiums' calculated by subtracting the stock price 1 and 10 days prior to announcement from the takeover bid price, and *AR1* and *AR10* are market adjusted abnormal returns from 1 and 10 days before the announcement until and including announcement day. *PEDUM* is the indicator variable that takes the value of 1 if the acquirer is a private equity firm. The dummy control variables are *STOCK* (1 for non-cash bids and 0 for cash bids); *TO* (1 if the acquisition was conducted via a tender offer); *THLD* (1 if the acquiring firm had a toehold in the target); and *DIVERS* (1 if the acquired firm is in a different industry (2-digit SIC) from the acquirer). *DA* is the book debt-to-assets ratio, *DV* is the market capitalisation of the target firm on the day of announcement, *MTB* is the market capitalisation on the day of the takeover announcement to book value of assets, and EMB is EBITDA/market capitalisation. RUNUP is the market-adjusted target return for day –63 to day –6 relative to announcement day (day 0), and ARET is the same for day –250 to day –63. The row marked 'Wilcoxon p-value' is the p-value for a two-tailed Wilcoxon rank sum test for the difference between the private equity acquirer variable and the public company acquirer variable.

Figure 1 250-day CAAR for all target firms

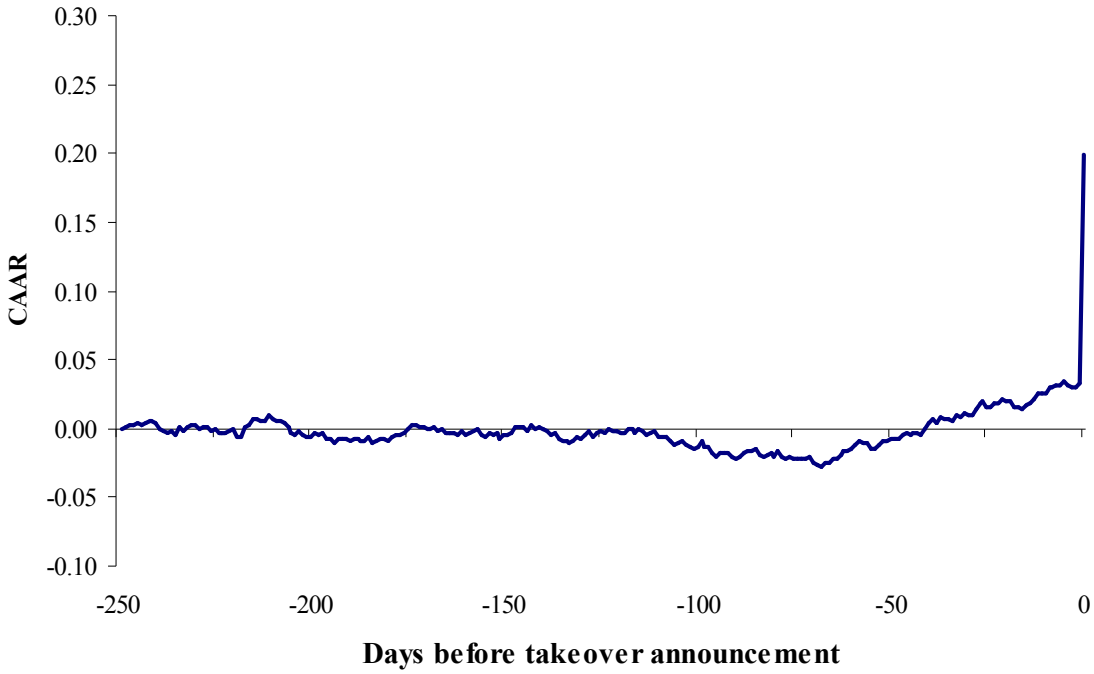

Figure 2 250-day CAAR for targets of public companies

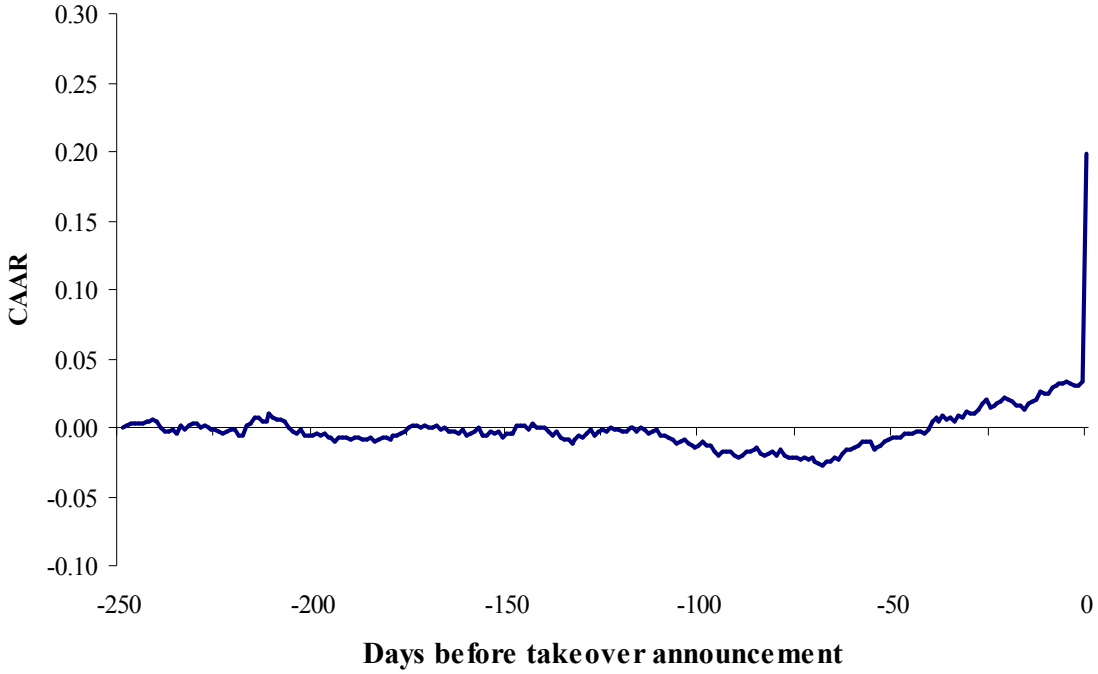

Figure 3 250-day CAAR for targets of private equity firms

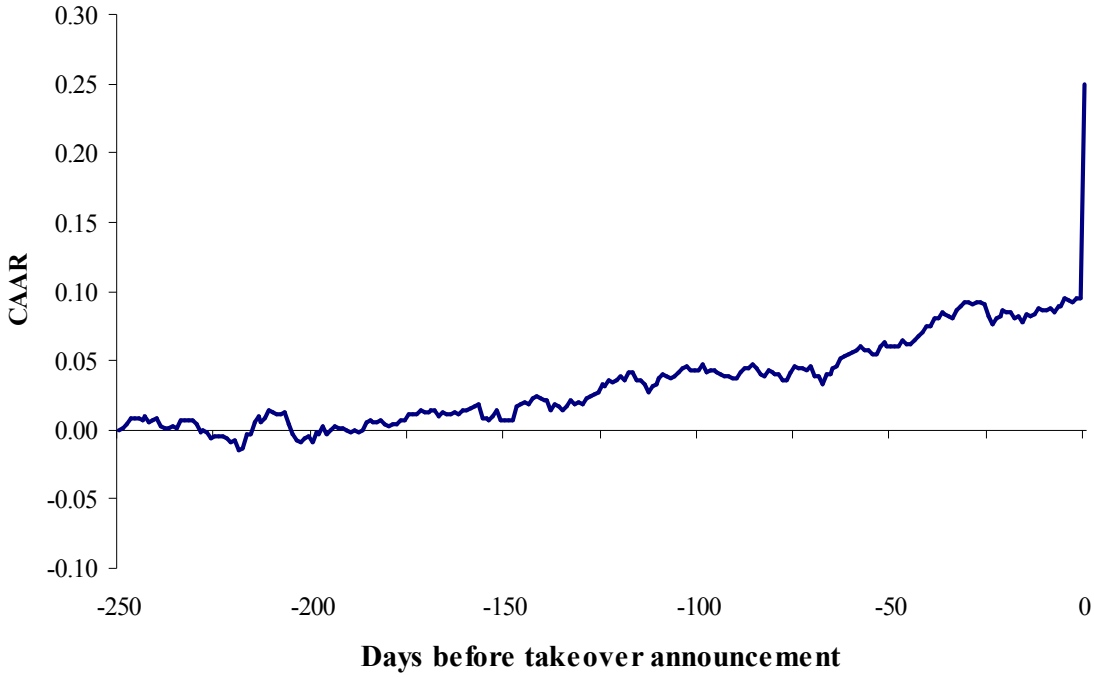

Figure 4 AR1 premiums versus acquirer officers' and directors' shareholdings