

“Board Interlocks and the Propensity to be Targeted in Private Equity Transactions”*

Toby E. Stuart
Harvard Business School

Soojin Yim
Harvard Business School

NOTE: Early and incomplete draft, probably with a number of errors.

* The authors would like to thank Rakesh Khurana for some initial, provocative discussions on this project. In addition, we acknowledge Erika McCaffery’s assistance in locating data for this project. Direct correspondence to yim@fas.harvard.edu or tstuart@hbs.edu.

Abstract

In this paper, we examine the propensity for U.S. public companies to become targets for private equity-backed, take-private transactions. We consider the characteristics of 447 private equity-backed deals in the 2000-2007 period relative to public companies, and find that, in addition to the financial drivers studied in previous works, board characteristics and director networks are also associated with deal generation. We also examine how the drivers of private equity-backed deals have been changing in more recent years, with an eye to the role of networks in the sourcing of deals.

In this paper, we examine the propensity for U.S. public companies to become targets for private-equity-led, take-private transactions. We consider all publicly listed companies to be at risk of a private equity buyout and we examine a set of factors that influences the hazard of receiving a buyout offer in the period 2000 to 2007. A total of 447 public companies garnered one or more PE-led offers in this time period.

Private equity activity reached new highs in recent years, with 86 public deals worth \$350B announced in the first half of 2007 alone. The sustained rise in activity in the post-2000 period had been referred to as a new wave of private equity, and even as early as 2006 commentators were warning that the industry was reaching bubble-like heights, before the market abruptly dried up in August 2007 with the disruption of credit markets. The new wave was characterized by cheap and loose debt, large industry inflows, increasing prevalence of auctions as private equity firms vied to disburse ever growing funds, and the emergence of club deals to fund transactions of an unprecedented scale. However, this new wave has not been systematically studied, and given these new dynamics, previous work that studied LBOs in the context of the wave of the 1980s seems dated. This earlier wave exploited the gains to leverage made possible by the then-new financial innovation of high-yield bonds; but private equity firms have had to seek other sources of value. In particular, as inflows into funds increase and the low hanging fruit of gains through leverage become spent, we posit that deal sourcing becomes an increasingly important driver of value in the returns to private equity. This motivates our interest in the role of boards within the firm and the role of director interlocks between firms in attracting private equity deals.

Boards are seen mainly as bodies of corporate governance, but given that directors often sit on multiple boards, they also represent points of knowledge transfer between companies. Buyouts are seen primarily as financial transactions, but the amount of financial gain to be realized is conditional on the deal going through. Thus boards can play a role beyond that of stewards of the firm: they can influence company-wide financial transactions by being the gateway for outside players who seek to engage the firm.

In general, we find three sets of influences that shape the likelihood of becoming a target. First are financial measures that may indicate the feasibility and profit potential of a deal, most notably firm size, return on equity, market to book, and beta. Second and third are two sets of measures that are indicative of the likelihood that a take private bid will be welcomed by, respectively, shareholders and directors. In the former case, we proxy for the conduciveness of a firm's capital structure for gaining approval for a deal by the proportion of shares held by institutions and the level of insider ownership. Regarding directors, we measure the size of the board and the predispositions of directors based on their standing in the inter-firm director "interlock" network.

The novel contributions of the paper are twofold. First is our detailed examination of how characteristics of companies' boards of directors affect their propensities to become PE targets. Our central variable in this regard is whether directors of at-risk firms are interlocked—meaning that the firms share one or more directors—with other companies that previously were targets of attempted take-private transactions (whether or not the transaction closed). We find that firms that are connected by one or more directors to previous take-private targets are, depending on the specification, approximately 50

percent more likely to become targets themselves. Our argument is that firms with directors with prior exposure to take private transactions are more likely to attract the attention and interest of private equity firms. This finding is robust to a number of potential alternative explanations. In addition, we show that the size of the board negatively affects the propensity to become targets, while the “centrality” of the board in the overall director interlock network increases the hazard of becoming a target. The former is indicative of coordination costs, while the latter measures both the experience of the board and the employability of directors that lose their positions in take-private transactions.

A second contribution of the paper is to document that even within the 2000 to 2007 time period, there appears to be significant heterogeneity in the characteristics of targeted firms. Relative to the earlier, 2000 to 2004 period, offers for take-private transactions in the years 2005 to 2007 begin in certain characteristics to approximate the typical firm in the population of U.S. public companies. In 2000-2004, PE-targeted firms were small, in select industries, had low market capitalizations, and were governed by heavily interlocked boards. In the later period, the mean size of PE-led deals is near to the average size for all public companies, and an entropy index for industry concentration indicates greater dispersion of deals across Fama-French industry codes in the later period. In addition, firms with less interlocked boards became targets. We interpret these results as possibly suggesting that disciplined adherence to the traditional correlates of PE activity may have been replaced by a new set of desired deal characteristics, perhaps because of pressures to deploy very large pools of capital or due to changes in the business model of private equity investors.

In addition to these findings, our paper offers a more general comparison of the correlates of targeted companies in the current-period private equity wave relative to those documented in the existing literature on leveraged buyouts (largely based on pre-1990 datasets).

Data & Methodology

- **Sample selection**

We construct our sample of going private deals in 2000-2007 from Thomson’s SDC Platinum M&A database and Capital IQ. We identify 845 deals announced on January 1, 2000 to July 4, 2007 (pending update through end of year) flagged as “Going Private” by SDC or Capital IQ, which we could verify traded on the New York, American, or Nasdaq stock exchanges on the announcement date. We then eliminate 30 transactions considered doubtful for various reasons (i.e. distressed firms in bankruptcy auction, rumored but not publicly announced transactions, transactions not validated by Factiva), but augment the sample by 21 transactions (mainly from SDC flagged as “LBO” but appropriately considered to be Going Private upon reading descriptions of the deal). The result is a sample of 836 going private transactions announced in 2000-2007.

Deals are categorized as “PE” if a private equity firm is part of the acquiring party, “MBO” if the deal is a management-led buyout without private equity involvement, or “Other,” which includes private companies that are strategic buyers, powerful individuals investors (i.e. Carl Icahn) or other unaffiliated investor groups. Table 1 shows that PE deals comprise 447 of 836 deals, and constitute \$800B of \$950B

of value in going private activity in 2000-2007. The MBO category is much smaller in total deal value and average deal size, and as PE activity has expanded in recent years the share of going private activity in the MBO category has fallen—especially as management itself increasingly turns to private equity firms to help finance deals it originates. PE deals are approximately 6.5 times (mean) and 12.5 times (median) the size of take private transactions that are management led. These transactions are then collapsed into firm-years to fit the logit regression framework. The 447 PE deals then reduce to 429 firm-years in which a public firm receives an offer to go private from an acquiring group that includes a private equity firm.

- Comparison of PE target vs Public firm characteristics

To explain the propensity of firms to be targeted with private equity-backed going private offers, we collected data on the characteristics of public companies broadly relating to firm financials, ownership and governance structure, and networks. Stock price data such as market capitalization, stock beta, and volatility was retrieved from CRSP. Using data on company financials from Compustat, we constructed measures of valuation, cash flow, profitability, leverage, and asset efficiency. We collected these variables for the year preceding the year “at risk”—the year in which the public firm received or could have received a going private proposal—to assess whether such ex ante factors have predictive value for going private. Table 2 lists the variables collected in this paper and details their construction.

Previous papers have also shown the importance of ownership and governance structure for going private transactions. Institutional ownership data comes from Thomson Financial CDA/Spectrum 13F database, compiled from SEC filings of institutional money managers who control over \$100M of 13F securities. Data on ownership by insiders (officers and directors of the firm) come from Compact Disclosure, which collects the data from proxy statements. The Directors Database provides board composition data for all public firms in 2000-2007, and we construct variables related to board structure such as board size, fraction of independent directors, and CEO-chairman duality.

Table 3 shows basic differences in characteristics of the companies receiving private equity-backed going private offers, relative to those receiving management-led offers and companies remaining public. Differences between the PE and Public groups are significant for most of the financial variables, but the differences in measures of size (market capitalization, revenues, assets) become much less pronounced using median comparisons; this reflects the greater right skew of the size of public firms. The PE and public samples do show very strong differences in ownership and board structure, with PE firms having higher institutional and insider ownership, smaller boards, and a lower proportion of inside directors. Consistent with one of our core contentions, one-fourth of PE targets have one or more directors that was previously associated with a public firm that was targeted for a take-private transaction, whereas only 12 percent of all public companies has such a board-level connection. Relative to MBOs, PE targets are bigger, less undervalued, more liquid, and show significant differences on almost all financial measures; not surprisingly, MBO firms also have high insider representation as both shareholders and directors. MBO firms as a group appear to be substantively different from PE target firms and public firms that do not receive going private offers.

- Network measures

The major novel contribution of our paper derives from the incorporation of network measures to explain the propensity of receiving a going private offer. The Directors Database provides data on all public board directorships occupied by a director over the period 2000-2007—and thus we can construct measures of interlocking relationships between boards, across time. Two companies A and B are said to be interlocked if a single director serves the boards of both A and B (simultaneously or at different points in time). A variable of primary interest in our paper is “GP interlock”—whether an “at risk” firm is interlocked with another firm that in the past received a going private offer—and whether this relationship makes the firm more likely to itself receive a going private offer. For example, Phillip Beekman sat on the board of Linens ‘N Things in 2005 when it received an LBO offer from Apollo Management and affiliates. But in 2006 and 2007 he also served as director of M&F Worldwide. So in those years M&F Worldwide would have PE interlock=1, due to the relationship it has with the Linens ‘N Things buyout via Mr. Beekman.

Table 4 shows the number of public firms that have identified interlock relationships with take private targets in prior years, based on the director composition data we have for 2000-2007. The table reveals a limitation of our data: the truncation of GP interlock data in earlier years. For example, for a public firm “at risk” in 2003, we identify the directors that sit on the board of that firm that year, and consider the other boards that they served on in 2000, 2001, and 2002. If any of the firms that these directors served on in those years receives a going private proposal, then GP interlock=1. This naturally means that firms at risk in 2000 cannot have identified links to going private deals, since we do not have data on director composition prior to that year. The major implication of this data truncation is that the effect of GP interlock on propensity to receive private equity-backed going private proposals is less precisely estimated in the earlier years of the sample; however, because the effect is also possibly time-varying so it is not possible to compare the effect of GP interlock across years. However, it is also clear that the sample interlock average of 12% for all public firms and 24% for all firms receiving private equity-backed offers understates the true interlock rate for the board of directors, since by 2007, these percentages grows to 27% and 48%, respectively.

Other network variables of interest include a board’s total centrality (the total number of directorships occupied by the directors on a company’s board), the company’s geographical proximity to other public firms, and geographical proximity to private equity deals that have occurred in the past. The geography proximity measures for a company i capture the number of firms j “near” i , by scaling firm j ’s count by its distance from i , where distance is computed using the latitudinal and longitudinal coordinates of the zip code in which the firms i, j are located.

Results

Table 5 shows the logit regression results of factors that explain the probability of a firm becoming a PE-backed target. In the baseline regression, we find that the probability declines with the size of the firm, its market-to-book, beta, and liquidity. Consistent with the literature, PE targets are often smaller, undervalued companies that are less actively traded in the market. Also, they are often less risky, likely related to the

stability of earnings required to service debt. For a sense of economic magnitudes of these drivers: a one standard deviation increase in size, market-to-book, beta, or liquidity decreases the odds of becoming a target by 22%, 55%, 16%, or 21%, respectively. Turning to the ownership covariates, we find that both institutional and insider ownership increase the hazard of becoming a target. A 10% increase in insider shareholdings raises the odds of a deal by 23%, while an equivalently sized increase in institutional ownership raises the odds by 10%. The positive effects of these ownership variables could arise for a number of reasons. First, PE firms may be most attracted to firms with concentrated shareholder bases because mobilizing support for transactions involving firms with concentrated ownership is comparatively simple. Second, because executives of the company are typically bought out at a premium to the current market price and then (assuming their continued involvement with the firm) are reloaded with equity in the private company, insiders with large ownership stakes may have a particularly strong incentive to secure PE-led bids. Third, large institutional owners—particularly those that are unsatisfied with a company’s share price performance—often pressure directors and managers of the firm to consider a change of control transaction.

Board-level covariates are also included in the first regression. Here, we find that the total number of interlocks of the directors on the board—the number of other boards that members of a focal firm’s board have served on—increases the probability of being targeted. In contrast, firms with large boards are less likely to be targeted. Regarding the size of the board, conditional on the level of connectedness, there are likely to be coordination costs associated with large boards that may deter a PE offer. Alternatively, board size may simply capture some other, unobserved characteristic of the firm, such as the diversity or complexity of its business mix, which negatively correlates with the probability of a deal.

We offer two interpretations of the effect of total interlocks. First, it is possible that total interlocks proxies for the value that current directors place on their current positions, and hence their likely level of opposition to a transaction. Directors who have served on multiple boards can anticipate future offers to join new boards. This may be of relevance because when a PE-led take private transaction occurs, the directors of the formerly public company are generally replaced by a new roster of directors put in by the PE sponsor. Second and more plausibly, interlocked directors by definition have more experience. Our conversations with industry insiders suggested that private equity firms strongly prefer to work with “professional” directors. Moreover, connected directors are almost by definition situated near the center of the board-based information network. These directors are more likely to be visible to PE investors; more likely to have second hand experience with PE transactions; more likely to be influential members of their boards; and more concerned about their reputations as directors. We anticipate that these factors are likely to positively stimulate PE interest in a company, and vice versa.

Turning to the direct measure of interlocks, we find that a given firm is 50 percent more likely to become a PE target when it has one or more directors that previously served on the board of a company that has attracted a take private offer. There are a number of potential explanations for this effect. First, through a previous transaction, interlocked directors may have formed close relationships with partners at PE firms, which may provide an opening for the PE firm at the new company. Second, in many cases, exposure to a prior transaction is likely to make a director more open to (less

concerned about) a take private transaction. Third and related, directors who have previous PE experiences are almost by definition better informed about the process and the players. This information, in turn, may help convince other members of the board to adopt a positive view of a potential transaction.

Clearly identifying the influence of interlock ties on the diffusion of private equity-led transactions is not simple. At the moment, we lack a persuasive instrument for the prior existence of a “take private” board interlock tie, so our second best approach is to directly explore likely alternative explanations and to examine contingencies in the effect of the interlock variable to assess its consistency with our story. The most obvious alternative explanations center around the possibility that firms that are similar on some unobserved dimensions are more likely than two randomly chosen firms to be interlocked. If this is the case, the effect we are attributing to the board network may in fact arise from firm-level, rather than relational characteristics. In our view, there are two particularly worrisome omitted attributes that may correlate with interlock ties: industry and geography.

One concern is that both interlock ties and take private transactions cluster within industries. If this is the case, the interlock coefficient merely could be capturing omitted industry effects. To address this possibility, we run three additional regressions that appear in Table 5. First, in column (2) we include the lagged number of announced take private transaction in each firm’s industry in the previous year. While this variable does strongly predict becoming a target, the interlock effect is robust to its inclusion. In column (3), we include fixed effects for all 48 Fama-French industries. Once again, the interlock effect holds up. In Column (4), we separate the interlock variable into board ties within industry versus interlocks with companies that were in a different industry from the focal firm. We include only the second covariate in the regression and find that interlocks to firms *outside* of a given company’s industry still strongly predict the probability of becoming a target. As column (5) shows, the result continues to hold even when we include only extra-industry interlocks and the full set of industry dummy variables.

In column (6), we include the geographic proximity of a given firm to all previous take private transaction. This variable is defined to be the sum of the inverse continuous distances between each firm’s headquarters location and the locations of all firms that have previously received a take private bid. Thus, its highest values are achieved for firms that are physically located nearest to the largest volume of prior take-private transactions. This covariate is included to address the fact that there are documented geographic proximity effects in the board interlock network, and although not previously shown, it also may be possible that there are concentrated geographic pockets of take private transactions. Here, we find no evidence of geographic clustering in PE targets—special proximity to past targets does not increase the predicted hazard of becoming a target—and the interlock variable continues to hold.

Further analysis

In Table 6, we bore deeper into the effects of board interlocks by isolating where these relationships have biggest impact. Columns 2-4 present regressions based on sub-samples of the data that are based on splits by company size. Interestingly, these regressions indicate that both network variables—having a tie through a current director

to a previous take private target (GP interlock) and having directors that serve on multiple boards (total interlocks) have their greatest effect among smaller companies. For firms above \$800 million in market capitalization, the interlock variables are statistically indistinguishable from zero. Our interpretation of the size dependence in the interlock effect is that, as has been shown to be generally the case in studies of social network effects in financial markets, the network matters most for firms that are more peripheral and about which less is known. Insofar as the network traced through overlapping memberships on boards serves either to disseminate information among directors about take private transactions or contributes to the behind-the-scenes networks over which private equity firms search for deals, the network's effect is more pronounced among firms that otherwise are less visible.

Columns 5-7 in Table 6 report a set of interactions with the GP interlock variable. Carrying on the theme of substitution in sources of information, column 5 presents an interaction between GP interlocks and “low total interlocks”, which is defined to be one for firms in the bottom quartile of the total interlock variable. When interacted with the GP interlock variable, we see that the effect of GP interlocks concentrated among firms that are otherwise more peripheral in the directors network. Specifically, column 5 shows that director interlocks to prior take private targets has no statistical effect for firms above the bottom quartile in total interlocking directorships. By contrast, low total interlock firms have a much lower probability of becoming targets, but the negative effect of being in the bottom quartile of total interlocks is more than offset for firms that have a direct tie to a take private target. Thus, there appears to be substitution between being generally central in the director network, in which case direct ties do not matter, and being peripheral in the overall network. In the latter case, direct ties to a past target have a pronounced effect on the hazard.

In addition, we have included a “high liquidity” variable, which indicates being in the top quartile of all equities in terms of monthly trading volumes scaled by shares outstanding. The regressions consistently show that highly liquid firms are less likely to become takeover targets. However, being directly interlocked to a prior target has its greatest effect among low (beneath the 75th percentile) liquidity companies. Once again, we see that the interlock effect is greatest for companies that are somewhat under the standard radar screens of a large group of market participants.

In column 7, we have created a “low market reaction” covariate to sort firms by the relative success of the previously announced take-private transactions with which the current firm's director(s) were associated. This dummy is set equal to one for all past take private announcements that fell in the bottom quartile of the distribution of market reactions to the deals in the data. We then interact this variable with GP interlock to determine whether the effect of have an interlock to a previously targeted company depends on the success of the previous deal. We find that this is precisely the case: having an interlock to a low performing take private transaction (based on market reactions) completely offsets the positive effect of GP interlock. Thus, it seems that only positive experiences produce an over-the-network change in the risk of becoming a target. More generally, this result supports the idea that directors carry predispositions formed from prior experiences across their directorships and that these individualized experiences matter. In future revisions, we would like to push this idea further by also considering whether director influence or position also affects the impact of the interlock,

or whether experience with a specific private equity firm carry forward in the propensity to interact with that firm again at a different target firm in a future point in time.

The final column in Table 6 considers whether there is temporal variation in the effects of board centrality, market size, and market to book.¹ To explore whether characteristics of sought-after targets vary across the time period of the data, we created sub-samples for the years 2000 to 2004 and 2005 to July 2007 (pending a 2007 year-end update). Reflecting the heating up of private equity activity during the past few years, the announced transaction volume, both in terms of deal count and size, is greater in the second period (226 deals) than in the first (165 deals). Of particular interest are the three reported interactions in column 8. We observe a general trend toward the convergence of PE-targeted firms and the typical publicly listed corporation. Notably, there is a negative interaction between the late period dummy variable and firm market capitalization, market to book, and total interlocks. Thus, the archetypical PE target no longer appears to be a relatively small, undervalued (relative to book) entity. Either because of the great fundraising success of PE funds during the past few years, which has perhaps created pressure for funds to invest in increasingly larger and more central targets, or because of a change in the business model of PE firms, the “average” publicly held firm in the economy now appears to be much more likely to become a PE target. Moreover, the statistically significant disappearance in the effect of total interlocks indicates that the general board network no longer appears to play a role in elevating the risk of becoming a target. This too is consistent with either a change in business model or a capital push explanation, in which the criteria for selecting deals no longer screens out the average company.

¹ We cannot estimate the across-period change in the effect of GP interlock because missing data hampers the precision of the estimate in the 2000 to 2004 period.

Table 1: Going Private Transactions, 2000-2007

Data on going private transactions for firms trading on the NYSE, American, and Nasdaq stock exchanges, publicly announced between January 1, 2000 and July 4, 2007 [to be updated to end of year]. "PE" deals are transactions in which a private equity firm led the acquiring party or was identified as providing financing. "MBOs" are deals identified as management-led with no private equity involvement. "Other" includes offers made by privately-held companies and other strategic or financial buyers (i.e. Carl Icahn, powerful families such as the Pritzkers of Chicago, etc.)

Year	Number of deals				Total deal value (\$MM)			
	PE	MBO	Other	All	PE	MBO	Other	All
2000	48	22	59	129	23,278	2,969	9,714	35,960
2001	25	31	34	90	5,141	1,562	15,012	21,714
2002	26	23	28	77	10,118	2,538	1,756	14,412
2003	49	18	36	103	8,989	525	4,511	14,024
2004	36	16	22	74	32,167	552	14,724	47,442
2005	69	7	29	105	68,051	9,313	24,107	101,471
2006	108	11	27	146	311,616	13,913	12,300	337,829
2007	86	5	21	112	347,259	5,295	21,089	373,643
All years	447	133	256	836	806,619	36,665	103,213	946,497

Year	Mean deal value (\$MM)				Median deal value (\$MM)			
	PE	MBO	Other	All	PE	MBO	Other	All
2000	485	135	170	283	154	34	74	93
2001	214	52	442	247	54	22	71	43
2002	389	115	65	192	236	22	42	57
2003	191	29	133	142	68	18	46	51
2004	894	34	669	641	405	14	28	78
2005	986	1,330	927	995	347	263	193	295
2006	2,968	1,265	473	2,379	464	306	222	431
2007	4,134	1,059	1,004	3,397	1,223	1,335	428	866
All years	1,837	280	418	1,159	342	27	76	124

Table 2: Variable definitions

For any company "at risk" in year t: stock-related data are from December of year (t-1); director-related data are from the beginning of the "at risk" year; and other financial and ownership data are from year (t-1).

<u>Variable</u>	<u>Definition</u>	<u>Source</u>
Market capitalization	Stock price x Shares outstanding	CRSP
Market to book	(Market cap + Book liabilities) / Book assets	CRSP, Compustat
Liquidity	Trading volume / Shares outstanding	CRSP
Volatility	Standard deviation of monthly returns over preceding year	CRSP
Beta	Stock's beta (from market model)	CRSP
Total capitalization	Market cap + Long-term debt	CRSP, Compustat
Assets	data6 in Compustat	Compustat
Sales	data12 in Compustat	Compustat
EBITDA	data13 in Compustat	Compustat
Cash flow / Total capitalization	(EBITDA - Interest - Taxes - Dividends) / Tot cap	CRSP, Compustat
Cash flow / Sales	(EBITDA - Interest - Taxes - Dividends) / Sales	Compustat
Operating margin	EBIT / Sales	Compustat
Debt ratio	Long-term debt / Total capitalization	CRSP, Compustat
Asset turns	Sales / Assets	Compustat
ROE	Net income / Book equity in (t-1)	Compustat
Institutional ownership	Total equity ownership reported by institutional money managers required to file form 13F with the SEC	Thomson CDA / Spectrum
Insider ownership	Total equity ownership by officers and directors as reported in	Compact Disclosure
Board size	Number of directors on board	Directors Database
Inside directors %	Percent of directors who are insiders	Directors Database
Dual CEO-chairman	=1 if board chairman is also the CEO; =0 otherwise	Directors Database
Board interlocks	Total number of other firms whose boards this company's directors	Directors Database
Board centrality	Total number of board seats occupied by directors in this company	Directors Database
Firm proximity	Measures the number of public firms j "near" this company i, by scaling firm j's count by its distance from i, where distance is computed using the latitudinal and longitudinal coordinates of the	Zip code correspondence
GP interlock	=1 if company if company has a board member who previously sat on the board of another company that received a going private	Directors Database, SDC, Capital IQ

Table 3: Characteristics of Private Equity-Backed Target Firms

This table compares the characteristics of all public firms in 2000-2007 receiving private equity-backed going private offers against firms that received no offers or received management-led offers (with no private equity backing). Market-related statistics and company financials are winsorized at the 1st and 99th percentile by year.

Note: ^a indicates differences in mean between PE and Public firms are significant at 5%

^b indicates that PE and Public sample distributions are different at 5% significance level using the Mann-Whitney-Wilcoxon nonparametric test.

^c indicates differences in mean between PE and MBO firms are significant at 5%

^d indicates that PE and MBO sample distributions are different at 5% significance level using the Mann-Whitney-Wilcoxon nonparametric test.

	PE		Public		MBO	
	Mean	Median	Mean	Median	Mean	Median
<u>Market statistics</u>						
Market capitalization (\$MM)	1,225	206	1,858 ^a	218	220 ^c	25 ^d
Market to book	1.48	1.23	2.20 ^a	1.28 ^b	1.05 ^c	0.92 ^d
Liquidity	1.09	0.81	1.39 ^a	0.81	0.72 ^c	0.38 ^d
Volatility	0.13	0.11	0.15 ^a	0.12 ^b	0.16 ^c	0.14 ^d
Beta	0.72	0.66	0.74	0.64	0.42 ^c	0.29 ^d
<u>Company financials</u>						
Total capitalization (\$MM)	1,891	329	2,770 ^a	333	477 ^c	60 ^d
Assets (\$MM)	1,900	337	3,947 ^a	340	442 ^c	102 ^d
Sales (\$MM)	1,163	253	1,912 ^a	168 ^b	392 ^c	115 ^d
EBITDA (\$MM)	200	34	347 ^a	21 ^b	54 ^c	7 ^d
Cash flow / Total capitalization	0.03	0.07	0.02	0.06 ^b	0.05	0.09
Cash flow / Sales	(0.08)	0.07	(0.47) ^a	0.08 ^b	(0.18)	0.05 ^d
Operating margin	(0.14)	0.03	(0.57) ^a	0.04	(0.27)	0.01 ^d
Debt ratio	0.26	0.19	0.23	0.12 ^b	0.37 ^c	0.37 ^d
Asset turns	1.05	0.94	0.85 ^a	0.67 ^b	1.41 ^c	1.15 ^d
ROE	0.05	0.08	(0.08) ^a	0.08	(0.03) ^c	0.03 ^d
<u>Ownership / Governance Structure</u>						
Institutional ownership	0.48	0.50	0.36 ^a	0.30 ^b	0.21 ^c	0.13 ^d
Insider ownership	0.17	0.08	0.15 ^a	0.06	0.39 ^c	0.39 ^d
Board size	7.87	7.00	8.41 ^a	8.00 ^b	6.85 ^c	7.00 ^d
Inside directors (%)	0.20	0.17	0.23 ^a	0.20 ^b	0.29 ^c	0.29 ^d
Dual CEO-chairman	0.50	1.00	0.47	-	0.57	1.00
<u>Networks</u>						
Board interlocks	5.06	4.00	4.95	3.00 ^b	2.68 ^c	2.00 ^d
Board centrality	16.28	14.00	15.83	14.00	11.32 ^c	10.00 ^d
Firm proximity	184	170	194 ^a	181 ^b	202 ^c	187 ^d
GP interlock	0.24	-	0.12 ^a	- ^b	0.13 ^c	- ^d
Observations	447		50,146		133	

Table 4: Interlock with Previous Going Private Transactions, by Firm-Year

Based on board composition data in 2000-2007 and our sample of going private transactions, we determine whether a company has an interlock with a firm that has in the past received a going private offer--i.e., whether the company currently has a director serving on the board who previously sat on the board of another firm in the year that it received a going private offer. Note that no interlock data is available for public companies in 2000, as interlocks are determined by transactions in preceding years and director composition data is available only starting in 2000. For any public firm in year t , interlocks are determined by directorships of take private targets in years 2000 to $t-1$. Table A shows the number of interlocked firms by year, for all public firms; Table B shows the number of interlocked firms only for the subset of firms that actually received private equity-backed offers

Note: unit of observation is the firm-year, such that there are 429 firm-years in which a private-equity backed going private offer was made (compare with 447 PE announced deals), which is appropriate to the logit regression setup.

Year	A. All public firms				B. Firms receiving PE offers			
	Interlocked	Not interlocked	All	% Interlocked	Interlocked	Not interlocked	All	% Interlocked
2000	0	7,609	7,609	0%	0	47	47	0%
2001	365	7,013	7,378	5%	3	22	25	12%
2002	569	6,157	6,726	8%	2	24	26	8%
2003	748	5,471	6,219	12%	9	39	48	19%
2004	853	4,999	5,852	15%	3	32	35	9%
2005	987	4,800	5,787	17%	18	46	64	28%
2006	1,229	4,445	5,674	22%	29	75	104	28%
2007	1,563	4,121	5,684	27%	38	42	80	48%
All years	6,314	44,615	50,929	12%	102	327	429	24%

Table 5. Propensity to Receive Private Equity-Backed Going Private Offer

Table shows results of logit regressions where the independent variable =1 if a firm receives a private-equity backed going private offer. Observations are at the firm-year, and include public firms in 2000-2007. Regression (2)-(5) explore industry effects of interlocks, where industry is defined at the Fama-French 48 Industries level. "Industry tx in t-1" is the lagged number of transactions in the firm's industry. "Outside ind interlock"=1 if GP interlock=1 and those interlocked firms are outside the "at risk" firm's industry. Regressions (6)-(7) control for the geographic proximity of previous private-equity-backed take private activity, by weighting each previous take private deal by its distance from the firm at risk. Standard errors are Huber-White heteroskedasticity-consistent, and are clustered at the firm level.

Variable	(1) Baseline	(2) Lagged industry tx	(3) Industry FEs	(4) Interlocks outside industry only	(5) Interlocks outside industry only	(6) Geographic proximity to previous PE deals	(7) Geographic proximity to previous PE deals
GP interlock	0.388*** [0.133]	0.370*** [0.134]	0.310** [0.134]			0.323** [0.137]	0.246* [0.137]
Outside ind interlock				0.367** [0.143]	0.332** [0.144]		
Size	-0.121** [0.049]	-0.107** [0.049]	-0.084 [0.051]	-0.109** [0.049]	-0.085* [0.051]	-0.099* [0.057]	-0.076 [0.059]
Market to book	-0.299*** [0.095]	-0.312*** [0.098]	-0.341*** [0.105]	-0.312*** [0.098]	-0.341*** [0.105]	-0.328*** [0.116]	-0.357*** [0.125]
Beta	-0.280*** [0.103]	-0.289*** [0.105]	-0.280*** [0.108]	-0.290*** [0.105]	-0.281*** [0.108]	-0.214* [0.110]	-0.204* [0.111]
Liquidity	-0.130** [0.053]	-0.130** [0.054]	-0.139** [0.055]	-0.129** [0.053]	-0.139** [0.055]	-0.110** [0.055]	-0.121** [0.058]
Asset turns	0.184*** [0.057]	0.190*** [0.056]	0.038 [0.076]	0.190*** [0.055]	0.038 [0.075]	0.161*** [0.060]	-0.037 [0.082]
Debt ratio	0.410* [0.244]	0.463* [0.242]	0.412 [0.252]	0.463* [0.242]	0.406 [0.252]	0.486* [0.286]	0.485 [0.299]
Operating margin	0.024 [0.025]	0.023 [0.025]	0.023 [0.025]	0.023 [0.026]	0.024 [0.026]	0.026 [0.027]	0.027 [0.028]
Institutional ownership	2.034*** [0.237]	2.014*** [0.239]	1.747*** [0.246]	2.035*** [0.238]	1.760*** [0.246]	1.664*** [0.283]	1.259*** [0.300]
Insider ownership	0.960*** [0.279]	0.932*** [0.281]	0.796*** [0.278]	0.941*** [0.281]	0.804*** [0.278]	0.757** [0.317]	0.503 [0.315]
Board size	-0.118*** [0.025]	-0.116*** [0.025]	-0.079*** [0.026]	-0.115*** [0.025]	-0.078*** [0.026]	-0.109*** [0.029]	-0.055* [0.032]
Total interlocks	0.023* [0.013]	0.022* [0.013]	0.008 [0.014]	0.023* [0.013]	0.009 [0.014]	0.019 [0.015]	0.001 [0.017]
Industry tx in t-1		0.037*** [0.008]	-0.002 [0.015]	0.039*** [0.008]	-0.001 [0.015]	0.035*** [0.008]	-0.012 [0.019]
PE geog proximity						0.005 [0.012]	-0.004 [0.012]
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	Yes	No	Yes	No	Yes
N obs	45240	45040	43573	45040	43573	33471	32509
N PE deals	391	389	389	389	389	338	338
Pseudo R2	0.08	0.08	0.11	0.08	0.11	0.08	0.11

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Effect of Director Interlocks on Private Equity-Backed Going Private Offer

Table shows results of logit regressions where the independent variable =1 if a firm receives a private-equity backed going private offer. Observations are at the firm-year, and include public firms in 2000-2007. Regressions (2)-(4) subset the sample by size (market capitalization), into first quartile, interquartile, and fourth quartile groups. Regressions (5)-(7) study the interaction effects of the GP interlock variable. "Lo interlocks"=1 if the total number of firms currently interlocked with the board are in the lowest quartile of interlocks of public firms. "Hi liquidity"=1 if the firm's liquidity (stock turnover) is in the highest quartile of turnover of public firms. "GP interlock, lo market reaction" =1 if a GP interlocked firm was interlocked with a firm that received a going private offer that was received poorly by the market--where the announcement day returns of the deal were in the lowest quartile of going private deal announcement day returns. Regression (8) compares the effect of ex ante factors in the 2000-04 vs 2005-7 time periods. Standard errors are Huber-White heteroskedasticity-consistent, and are clustered at the firm level.

Variable	(1)	(2) (3) (4)			(5) (6) (7)			(8)
	Baseline	Effect by size of firm			GP interlock interactions			Time pd
		<\$50MM	>\$50MM, <\$800MM	>\$800MM	Lo interlock	Hi liquidity	Lo mkt reaction	2000-04 vs 2005-07
GP interlock	0.388*** [0.133]	0.514 [0.339]	0.537*** [0.177]	-0.101 [0.238]	0.216 [0.135]	0.512*** [0.140]	0.530*** [0.142]	0.384*** [0.135]
Size	-0.121** [0.049]	0.349** [0.158]	-0.218* [0.115]	-0.042 [0.127]	-0.117** [0.046]	-0.122** [0.049]	-0.119** [0.049]	-0.232*** [0.069]
Market to book	-0.299*** [0.095]	-0.077 [0.156]	-0.358** [0.153]	-0.389*** [0.129]	-0.303*** [0.096]	-0.300*** [0.094]	-0.297*** [0.094]	-0.481* [0.265]
Beta	-0.280*** [0.103]	-0.161 [0.227]	-0.231* [0.137]	-0.570*** [0.204]	-0.310*** [0.104]	-0.277*** [0.102]	-0.279*** [0.103]	-0.318*** [0.106]
Liquidity	-0.130** [0.053]	-0.047 [0.074]	-0.168* [0.086]	-0.092 [0.092]	-0.130** [0.053]		-0.128** [0.053]	-0.127** [0.054]
Asset turns	0.184*** [0.057]	0.258*** [0.094]	0.164** [0.082]	0.169 [0.139]	0.168*** [0.058]	0.186*** [0.057]	0.183*** [0.057]	0.187*** [0.057]
Debt ratio	0.410* [0.244]	0.396 [0.378]	0.331 [0.355]	0.355 [0.629]	0.413* [0.242]	0.412* [0.244]	0.409* [0.245]	0.358 [0.243]
Operating margin	0.024 [0.025]	0.014 [0.036]	0.071 [0.045]	0.353 [0.336]	0.03 [0.026]	0.025 [0.025]	0.024 [0.025]	0.022 [0.025]
Institutional ownership	2.034*** [0.237]	1.521*** [0.578]	2.083*** [0.342]	2.321*** [0.540]	1.841*** [0.243]	2.048*** [0.234]	2.014*** [0.237]	2.019*** [0.241]
Insider ownership	0.960*** [0.279]	0.68 [0.444]	0.711* [0.414]	2.565*** [0.636]	0.971*** [0.278]	0.974*** [0.278]	0.967*** [0.279]	0.920*** [0.280]
Board size	-0.118*** [0.025]	-0.036 [0.042]	-0.155*** [0.038]	-0.134*** [0.044]	-0.113*** [0.025]	-0.117*** [0.025]	-0.119*** [0.025]	-0.121*** [0.025]
Total interlocks	0.023* [0.013]	0.098*** [0.031]	0.044* [0.023]	0.003 [0.023]		0.021 [0.013]	0.024* [0.013]	0.050*** [0.016]
GP interlock, lo market reaction							-0.621** [0.273]	
GP interlock * Lo interlocks					1.062*** [0.346]			
GP interlock * Hi liq						-0.831** [0.371]		
Lo interlocks dummy					-0.708*** [0.152]			
Hi liquidity dummy						-0.312* [0.163]		
Size * 2005-07 time dummy								0.234*** [0.075]
M/B * 2005-07 time dummy								0.251 [0.262]
Tot interlocks * 2005-07 time dummy								-0.058** [0.024]
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N obs	45240	10932	21813	12495	45240	45240	45240	45240
N PE deals	391	95	197	99	391	391	391	391
Pseudo R2	0.08	0.07	0.09	0.13	0.08	0.08	0.08	0.08