Leveraged buyouts of private companies

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Abstract

Over the last three decades, the number (enterprise value) of leveraged buyout transactions involving privately held targets has totaled about 10,013 deals ($855 billion), accounting for 46% (21%) of the worldwide leveraged buyout market. Yet the vast majority of academic studies focus on the buyouts of publicly held targets. This paper investigates the motives and consequences of leveraged buyouts involving 169 private firms in the U.K. I find that private firms with large growth and investment opportunities seek partnership with private equity sponsors to change the ownership structure and capitalize on those opportunities: In contrast to the buyouts of public firms, private targets sponsored by private equity firms grow in size through larger investments in fixed assets and acquisitions subsequent to the buyouts. However, private targets undergoing leveraged buyouts without private equity sponsors do not experience substantial changes in ownership structure and do not increase in firm size and investments ex post. The evidence is consistent with the view that private equity sponsored leverage buyouts not only serve as an exit for owners, but also relieve private firms' investment constraint by diffusing ownership structure and providing financing for new investments and growth.

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I. Introduction

The volume of leveraged buyouts involving privately held targets far exceed that of publicly held targets. Strömberg (2007) documents that over the last three decades about 65% (42.4%) of the worldwide buyout deals are the acquisitions of private companies, whereas those of public companies account for 7% (28.2%) in terms of the number of deals (targets' enterprise value).[2] Even during the late 1980s which was, arguably, the heyday of private equity, private-to-private buyouts made up almost 70% (33%) of the leveraged buyout market, while public-to-private deals accounted for 8.6% (49%).[3] Yet the voluminous existing studies have dominantly examined public-to-private leveraged buyouts[4] and, in some studies, leveraged buyouts are even viewed equivalent as "going private" transactions. Importantly, the argument for the economic gains of leveraged buyouts largely bears on the assumption that targets of buyouts are public companies with diffused ownership structure.[5]

The goal of this paper is to shed light on this unexplored but economically important sector of the buyout market. To infer the motivations and goals of a leveraged buyout, I examine the ex ante characteristics and the ex post restructuring process of privately held target companies. Specifically I investigate the leveraged buyouts of privately held targets in the United Kingdom (UK).[6] The UK market provides two advantages: First, the stringent disclosure and financial reporting environment in the UK

[2] Leveraged buyouts of private firms include both the acquisitions of independent private firms and those of portfolio firms owned by private equity firms.
[3] See Table 1 which I reproduced based on Table 2 in Strömberg (2007)
[4] This undue emphasis on public-to-private buyouts may be ascribed to several high profile deals involving public companies such as RJR Nabisco ($31.1b in 1988,), Beatrice ($6.1b in 1985), and, more recently, HCA ($32.7b in 2006), and TXU ($43.8b in 2007) - see http://dealbook.blogs.nytimes.com/2007/02/26/the-top-10-buyouts/ - and to the lack of publicly available financial data for privately held-targets and "gone" private companies through a leveraged buyout in the US.
[5] Notably, Jensen (1986, 1989) argues that going-private leveraged buyouts increase firm value by reducing agency costs arising from diverging goals of owners and professional managers in public companies. Subsequent empirical findings, usually based on the sample of public-to-private deals, also support this notion: Managerial compensation is restructured to align managers' interests with owners' and high leverage and close monitoring by investors reduce inefficient resource wastes (Baker 1992; Baker and Wruck; 1989). Firms with abundant free cash flow with low investment opportunities are more likely to engage in a leveraged buyout (Lehn and Poulsen, 1989, Opler and Titman, 1991) and, after a leveraged buyout, operating performance and plant productivity improve (Kaplan, 1988; Smith, 1989; Litchenberg and Siegel, 1989; Muscarella and Vetsuypens, 1990 among others).
[6] My sample does not include divisional buyouts and distressed buyouts primarily due to unavailability of information. Divisions of a larger corporation do not usually provide financial information before a buyout and bankrupt companies are struck off the registrar and stop publishing annual reports.

allow me to observe the characteristics of privately held targets and what companies actually "do" in the post-buyout period.[7] Second, the UK leveraged buyout market is the second largest market next to the US in the world, making it possible to examine a large sample.[8]

Obviously, and as I also show in this paper, the traditional agency problem associated with the separation of ownership and control is less likely found in a private company because ownership is highly concentrated and managers own substantial shares of the company. Therefore, unlike public firms, increasing firm value through the reduction of inefficiencies arisen from agency problem is not an important motivation and goal of a leveraged buyout for private firms.

However, leveraged buyouts can be an important tool for private firms with large current and future growth opportunities, but with investment constraints. Private firms could face investment constraint imposed by highly concentrated ownership and lack of financing. Leveraged buyouts can alleviate this investment constraint by providing a whole or partial exit for the owners and reducing owners' risk exposure to additional risky investments. Also private equity firms partnering with target companies can help alleviate financial constraint of the targets by direct capital injection, or mitigating information asymmetry through due diligence, close monitoring, and their reputation in the capital markets. In addition, private equity firms can bring in advanced management skills and industry networks, and help achieve growth and expansion strategies.

Using 266 leveraged buyouts from 1998 to 2007 in the UK of which 169 deals involve private target and 97 public targets, I find evidence largely consistent with this view. I first document that, not surprisingly, ownership is indeed highly concentrated in privately held targets. The average ownership of the largest owner prior to buyouts is 86% and most of these owners (97%) are also managers of the companies. Second, leveraged buyouts serve as an exit route for these owner-managers: the average ownership of the owner-managers drop to 7% after the buyouts. The median number of shareholders also

[7] The UK company laws require all limited liability companies (both private and public) to file periodic reports with the Companies House. See Ball et al (2005), Brav (2009), Roberts and Michaely (2007) for detailed explanation for disclosure regulation for U.K. companies. Also see the U.K. Companies House for the Companies Act.
[8] The leveraged buyouts involving UK companies account for 41% of all European deals (Strömberg, 2007)

increases from 2 to 6. Therefore, ownership structure substantially changes through leveraged buyouts. In particular, when target companies partner with private equity sponsors, these changes are more pronounced.

The evidence also suggests that when private firms have large investment opportunities (in terms of current sales growth and cash saving) but face restriction due to highly concentrated ownership, they invite private equity firms and alter the ownership structure through leveraged buyouts. Private targets sponsored by private equity firms are very profitable relative to peer private firms prior to leveraged buyouts: the earnings before interest, taxes, depreciation, and amortization (EBITDA) to sales ratio of private targets and peer private firms (median value) are 0.12 and 0.04, respectively. Also private targets are holding more cash and grow faster than peer private firms: the cash holding to sales ratio and sales growth of private targets (peer private firms) is 0.14 (0.05) and 0.17 (0.06). The propensity to cash saving which is defined as the ratio of the change in cash from year -2 to -1 (relative to the year of the buyouts) to cash flows during the same period is also higher among private targets than peer private firms: 0.30 vs. 0.04.

After the buyouts, private targets with private equity sponsors considerably grow in firm size by making large investments in fixed assets and acquisitions: Industry adjusted sales grow by 25%, the number of employees by 27%, and capital expenditures by 87% from one year before the buyouts to one year after the buyouts. This finding is distinctively different from the post-buyout restructuring and value creation process involving publicly held targets (Kaplan, 1988; Smith, 1989; Wiersema and Liebeckind ,1995 among others). By comparison, 30% of private targets complete the buyouts without partnering with private equity firms. Owner-managers of these private targets simply transfer ownership to existing managers or family successors without substantially changing the ownership structure. After the buyouts, these private targets do not show as much growth in firm size and investments as private targets sponsored by private equity firms.

To see the extent of acquisitions and disposals activities of target companies, I compute the sum of all cash outflows (inflows) associated with acquisitions (disposals) under leveraged buyout ownership

and divide this sum by tangible assets at the most recent fiscal year-end before the buyouts. There is a statically and economically significant difference between private and public targets: The median acquisition related cash outflow to tangible fixed assets ratio of private targets is 0.644 and that of public targets is 0.039; the median disposal related cash inflow to tangible fixed assets ratios are 0.00 and 0.026 for private and public targets, respectively.

I also examine post-buyout operating performance. Though the level of EBITDA increases, operating efficiency does not improve among private targets after the buyouts. However, when I compare private targets with private equity sponsors and those without sponsors, I find a stark difference between the two groups. Operating performance and efficiency are increasing fast before the buyouts for private targets sponsored by private equity firms. However, though EBITDA continues to increase, operating efficiency decreases after the buyouts. On the contrary, targets without private equity partnership show the opposite behavior. The changes in operating performance and efficiency before the buyouts are smaller than peer private firms. Yet, after the buyouts, the targets improve operating efficiency substantially: By the end of second year after the buyouts, EBITDA to sales ratio increase by 47%.

On balance, private firms with large investment opportunities partner with private equity firms to change ownership structure and capitalize on growth opportunities. After the buyouts they grow in firm size, but they do not improve operating efficiency. By contrast, when owner-managers of private firms need to liquidate their ownership, they can also engage in leveraged buyouts to transfer ownership. In this case, targets improve operating efficiency after the buyouts but do not necessarily expand their businesses.

Lastly, I investigate why owner-managers of target firms choose leveraged buyouts rather than public offerings (IPOs) to exit their ownership. IPOs are alternative route through which owners can liquidate her stake and distribute equity share to large number of investors. Therefore, firms can lift up their investment constraint due to concentrated ownership. However, I find that the majority of private targets are considerably smaller than firms listing on the London Stock Exchange (LSE), suggesting that they are too small or informationally risky to distribute equity share to public.

The paper proceeds as follows: Section II develops testable hypotheses followed by Section III where I describe the data and some institutional background of UK buyout market. Section IV presents main results. Section VI concludes.

II. Hypotheses development

Private companies are different from public corporations in a number of dimensions. Particularly, in private companies, entrepreneurs or owners are usually the managers of the companies or the ownership structure is highly concentrated with a few hands such as founders, angel investors, and venture capitalists. These owners perform close monitoring on the management and managerial incentive mechanisms are tightly structured to protect the owners' wealth from the managers' expropriation (e.g. Sahlman, 1990; Kaplan and Strömberg, 2003). Therefore, the agency problems associated with the incentive misalignment between owners and managers are less likely found in private companies. Consequently, eliminating these agency costs (Jensen, 1986, 1989) is less likely an important cause and consequence of a leveraged buyout for a private company as it does for a public company.

Second, private companies, compared to public ones, have limited or costly access to public resources imposed by ownership structure and information asymmetry. Other things being equal, when facing an investment opportunity, managers of private companies will find it difficult to implement the investment because, first, owners with substantially undiversified wealth tied up with the firm do not want to take additional risks associated with the new investment. Second, the existing managers may not possess an intimate knowledge and expertise to execute the new investment (e.g. when entering into a new market). Lastly, the firm can be financially constrained in the sense that it does not have enough internal and external financing to capitalize on new investment opportunities.

Leveraged buyouts can help resolving these problems by providing the whole or partial exit for the owners (thereby lowering the ownership of and reducing the risk exposure to the owners), mitigating financial constraint by reducing information uncertainty through financial sponsors' due diligence and their reputation in the capital markets or directly injecting capital, and importing advanced management

skills (e.g. operational knowledge and the expertise on corporate control market) and industry and regional networks into the target companies.

By contrast, a public company taking the firm private through a leveraged buyout is less likely resource-constrained. One of the main reasons that a firm goes public is to tap public capital market and to exploit current and future investment opportunities (e.g. Kim and Weisbach, 2007). Hence, a public company may pursue a leveraged buyout and go private because it does not need public resources anymore. Also public status provides an opportunity to engage in mergers and acquisitions (which is a major investment for a company) by creating the currency of shares for acquisitions (Brau, Francis, and Kohers, 2005, Brau and Fawcett, 2006) or by establishing a market value for the firm (Zingales, 1995, Mello and Parsons, 2000, Brau and Fawcett, 2006). Therefore, these theories suggest that a firm without large growth investment opportunities, without need for large capital, and without demand for corporate control activities will more likely go private (Bharath and Dittmar, 2008).

In sum, consistent with the traditional argument in support of leveraged buyouts, public firms are more likely to pursue (or forced to pursue) leveraged buyouts in response to agency problem than private firms. On the other hand, private firms unlike public ones tend to engage in leveraged buyouts to relieve their resource constraint and capitalize on growth opportunities.

To put the discussion into perspective, consider the following model based on Stein (2001): A firm chooses the level of investment to maximize the net present value. The gross return to an investment, I, is given by a production function, $f(I)$, which is an increasing and concave function. Investment can be financed either with internal resources, w, or with external funds, e. Thus, the budge constraint is $I = e + w$. In a first-best world without agency problem and costly external financing, the firm would choose I to maximize,

$$\max\ f(I) - I. \qquad (1)$$

The optimal investment level is $I^* = (f')^{-1}(\cdot)$. Now assume that there are deadweight costs associated with the use of external funds given by $\theta C(e)$, where θ is a measure of financing friction and $C(\cdot)$ is

increasing and convex. Also assume that managers can enjoy private benefits from gross investment output by $\gamma f(I)$, where γ is a measure of the intensity of agency conflict. Then the firm chooses an investment level to maximize,

$$\max (1+\gamma)f(I) - I - \theta C(e). \qquad (2)$$

Case 1: Suppose that a public firm seeks to go private through a leveraged buyout because it has few new investment plans and no longer need to engage in the corporate control market (the costs of being public outweighs the benefits). This implies that the firm is not financially constrained since it does not need much external financing, i.e., $I < w$ or $e = 0$. Due to its diffused ownership and the separation of owners and managers (agency conflict is potentially severe), the manager chooses investment sub-optimally. Especially, if managers take private benefit of control from large investment output (or firm size), i.e., $\gamma > 0$, the company is making over-investment relative to the first-best optimal level of investment, I^*.

Case 2: Assume that a private company has $\gamma = 0$ (no agency problem) and, instead, faces greater financing friction, $\theta > 0$, due to its information opaqueness. In this case, the optimal investment level is less than the first-best optimal investment, I^*. If the owner is risk averse towards additional risky investment because her wealth is under-diversified (negative γ in (2)), the underinvestment problem worsens.

Therefore, after the buyout, companies with greater agency problem and without much further need for external financing (Case 1) can correct investment distortion and increase firm value by reducing γ, whereas those with greater external financing costs and less agency problem, but with risk-averse owners (Case 2) may increase firm value by reducing θ or increasing γ (i.e. reducing the absolute value of negative γ).

I expect that public targets (which represent companies replete with agency problem and without much extra investment opportunities) could correct overinvestment problem by increasing managerial ownership (reducing γ). This group of companies, hence, tends to engage in restructuring process of reducing investment inefficiencies arising from agency problem such as reversing previous investment through divestitures and reducing capital expenditures after the buyouts. On the other hand, private targets (which represent companies with ownership and financial constraints and without much agency problem) would be able to correct underinvestment problem by reducing owners' ownership or by receiving financial sponsors' certification in the capital markets through a leveraged buyout. Therefore, more acquisitions and more investment are expected in post-buyout period. The discussion leads us to the following set of testable hypotheses.

Hypothesis 1: Privately held targets are more likely to increase investment and acquisitions after buyouts than publicly held targets.
Hypothesis 2: Publicly held targets are more likely to engage in asset sales and divestment of operating after buyouts.

In particular, when leveraged buyouts are sponsored by private equity firms, private targets will be able to grow more after the buyouts. In other words, private firms with large growth opportunities and need for large financing to fund the growth could alleviate ownership and financial constraint by partnering with financial sponsors through leveraged buyouts.

Hypothesis 1b: Privately held targets more likely to increase investment and acquisitions after buyouts when they partner with private equity sponsors.

III. Data sources and sample description

1. Data sources and some institutional background

Leveraged buyout transactions are collected from Zephyr (published by Bureau van Dijk) and the deal information is cross-checked using SDC Platinum and Capital IQ. The primary reason that I rely on Zephyr to identify targets of leveraged buyouts is because Zephyr provides UK company registration number which can be used to find companies' information from company filings on the Companies House or from Amadeus.[9]

I collect pre- and post-buyout financial information of these target companies from three sources[10]: Amadeus, Worldscope (for public targets), and annual accounts filed with the Companies House. This process is complicated by significant changes in corporate structure after buyouts. In Figure 1, a typical leveraged buyout transaction is depicted. Usually one or more acquisition vehicles are created for the purpose of the transaction. After NewCo is incorporated by management and/or private equity firms, it acquires Target and its subsidiaries. Concurrently or subsequently, TopCo is created and acquire NewCo. After the buyout, these acquisition vehicles continue to serve as holding companies of Target and its subsidiaries.

In the UK, when a company becomes a wholly owned subsidiary of another company, the subsidiary does not have to prepare group account – consolidated financial statements (Section 228 of the Companies Act in 1985). In a leveraged buyout, when a target company has significant subsidiaries and it becomes, again, a subsidiary of an acquisition vehicle, the target's financial statements do not usually include its subsidiaries' financial information. Therefore, target's pre-buyout financial statements and its post-buyout financial statements can be significantly different although the entity is materially same throughout. Hence, for each buyout transaction, I trace and identify target' parent company whose annual accounts consolidate the target and its subsidiaries' financial information, and use this parent company's

[9] SDC, Capital IQ, CorpFin, and Dealogic do not provide target's company registration number. Matching by company names is cumbersome since substantial number of companies has changed their names during the sample period.

[10] Not all companies provide detailed annual accounts: public companies disclose substantially greater amount of information than private companies. Small or medium sized private companies can provide abbreviated accounts where only minimal company and financial information is contained (Section 248 of the Companies Act in 1985). Also cash flow statements are not filed if the company is a wholly owned subsidiary of another company (Financial Reporting Standards 1). I collect financial data wherever the data is available.

annual account as a comparison with pre-buyout target's annual account. I exclude the cases where acquisition vehicles (i.e. parent company) acquire other businesses along with the target because, in this case, it is not straightforward to compare pre-buyout and post-buyout targets.[11]

2. Sample description

The annual distribution of 266 leveraged buyouts from 1998 to 2007 is reported in Panel A, Table 2. Public-to-private transactions account for about 36% and private-to-private and secondary buyouts account for the rest. The number of transactions is more concentrated towards the end of the sample period, peaking in 2006. Panel B in Table 2 shows the industry distribution of the buyout transactions. Not surprisingly, the majority of targets of leveraged buyouts are in manufacturing or services sectors.

Panel C of Table 2 presents the median and sum of transaction values by year and by transaction type (public-to-private and private-to-private). The median transaction value involving public companies is about £58.32 million and the median transaction value involving private companies is much smaller, £11.98 million. The total transaction value from 1998 to 2007 is £42 billion. However, these values are lower bounds because only 69% of 266 buyouts provide transaction value information through Zephyr, SDC, or Capital IQ. For private company buyouts, only 54% out of 169 transactions disclose transaction value information.

Panel D provide exit information. The most popular exit route is trade sales – selling a portfolio company to other operating companies. Secondary buyouts come next – selling a portfolio company to other private equity firms. Only a small fraction of portfolio companies were able to go public (1 to 2%). About 6 to 7% of targets ended up bankruptcy or liquidation. Surprisingly the majority of target companies are still in leveraged buyout ownership. For deals completed before 2004, 33 to 39% of the targets sponsored by private equity firms are under leveraged buyout ownership, whereas 63 to 67% of the targets without private equity sponsors have not exited from leveraged buyout ownership. Among deal

[11] These cases usually occur when private equity or venture capital firms form "Newco as a "platform" to assemble a significant presence in a fragmented industry." (Levine, 2001).

eventually, the average length of time under exited leverage buyout ownership is between 40 to 50 months (Panel E).

IV. Empirical results

1. Pre-buyout ownership and owners' characteristics

In this section, I examine the ownership structure of private target companies before the buyouts and how the structure changes through leveraged buyouts.

Panel A Table 3 reports the ownership structure of 114 private targets prior to buyouts where ownership information can be identified from companies' annual return documents.[12] As expected, the ownership is highly concentrated to a few shareholders. The average (median) number of shareholders of private targets is 3.51 (2). Thirty one percent of 141 private targets are owned by single owners.[13] The average (median) ownership of the largest owners is 86% (100%). In 110 firms out of 113 targets, the largest owners are also directors (chairman or managing director) of the firms. In one case, the founder family member who has the largest ownership is not involved in the management. In two cases, venture capital firms are the largest owners. Therefore, the majority of the private target firms are the Jensen-Meckling's (1976) zero-agency cost firms.

The table also reports departing owner-managers' age and incoming managers' (who led the leveraged buyouts) age. In median, departing owner-managers are 11 years older than incoming managers: 56 vs. 45. I also compare owner-managers' age in target with and without private equity firms. Among 169 deals, 112 deals (66.2%) are sponsored by private equity firms and 57 deals (33.7%) are completed by managers without private equity firms' sponsoring. Owner-managers of private targets sponsored by private equity are 6 years younger than those of private targets without private equity sponsors: 55 vs. 61. This may imply that when firms need to transfer ownership for some strategic

[12] All companies in the UK must submit an annual return form (363) to Companies House each year: It provides a snapshot of general information about the company, including details of key personnel, the registered office, share capital and shareholdings.

[13] In counting the number of shareholders, I treat family members as one shareholder.

reasons (not for owner-managers' retirement), they partner with private equity firms to complete leveraged buyouts.

2. Pre-buyout financial characteristics

2.1 Private targets vs. public targets vs. industry peer firms

I investigate how private and public targets are different from each other and from their respective peer companies in terms of financial characteristics prior to leveraged buyouts.

Peer companies are constructed as follows: First, among all UK companies in Amadeus, I select firms providing consolidated financial statements. I drop firms where only unconsolidated statements are available because, first, unconsolidated statements do not provide the fair view of the whole business and, second, I collect financial data of leveraged buyouts firms mostly from their consolidated statements. I collect information from unconsolidated statements only when the target companies do not have materially important subsidiaries. Therefore, to make an apple-to-apple comparison, I select firms with consolidated accounts. Next, I exclude firm-year observations where a firm-year is involved in acquisitions or initial public offerings within two-year window surrounding the firm-year. Lastly, using first two digits of SIC number, I match each firm-year of leveraged buyout firms with peer firms in the same industry.

Panel A in Table 4 shows various measures of firm size and firm age. Not surprisingly, private targets are considerably smaller and younger than public targets. All firm size measures (total assets, sales, property, plant, and equipment (PPE), and the number of employees) are greater in public firms than in private firms at fiscal year-end before the buyouts. Private targets are also smaller than their industry peer private firms, but older than peer private firms. Private targets are about the half the size of peer private firms and slightly older than peer firms by 2 years.

Panel B in Table 3 presents targets' profitability, cash holding, sales growth, and cash saving. Profitability and growth measures suggest that private targets are outperforming both their peer private companies and public target companies in the period leading to buyouts: Private targets' operating income

and cash flow (EBITDA) far exceed those of peer private companies. Operating income to sales ratio of private targets at fiscal year-end prior to buyouts is 0.09 and the median of operating income to sales ratios of peer private firms is 0.03. Also EBITDA to sales ratios of private targets and peer private firms are 0.11 and 0.04, respectively. Both differences are statistically significant at the 1% level. Private targets are also holding more cash than peer firms: cash holding to sales ratios are 0.13 and 0.04, respectively. Also private targets are growing faster than peer companies in terms of sales growth from year -2 to year -1 (0.13 vs. 0.05).

Private targets prior to leveraged buyouts save 30% of the generated cash flows, while peer private firms save only 4% of cash out of cash flows. On the contrary, the cash flow sensitivity of cash of public targets is not statistically different from their respective peer companies. The cash saving is defined as the ratio of the change in cash holding from year -2 to year -1 (relative to completion of buyout) to cash flow during the same period (based on Almeida, Campello, and Weisbach, 2004). Higher propensity to cash investment in pre-buyout period may imply that private targets expect to face greater future financing needs. Though this may also imply higher income uncertainty and low capital productivity (Riddick and Whited, 2009), the examination of post-buyout investment behavior of target companies in the following section supports the view that targets save cash in the face of future financing friction

With regard to capital structure (debt to sales ratios in Panel C), private targets are less leveraged compared to their peer private firms before the buyout transactions: Total debt to sales ratios are 0.26 and 0.37, respectively. Also private targets make slightly less investments than peer companies in terms of capital expenditure to sales ratio (0.01 vs. 0.02 in Panel D).

In sum, private targets are considerably different from their peer private firms as well as public targets. After making industry adjustment, private targets are not significantly different from public targets with regard to firm size, leverage, and capital expenditure. However, private targets are more profitable, save more cash, grow faster, and save more cash than public targets after industry adjustment. To confirm this conjecture on future financing needs for growth, I examine post-buyout investment and restructuring process in the next Section.

2.2 Private targets with private equity sponsors vs. private targets without private equity sponsors

In Table 5, I compare financial characteristics of private targets with private equity sponsors and without private equity sponsors.

In terms of firm size and capital structure, there is not much difference between the two groups of private targets (Panel A and C). However, Panel B shows that targets with private equity sponsors are much more profitable, growing fasters, and saving more cash out of cash flows. The industry adjusted EBITDA to sales ratio of targets with sponsors is 0.09 and that of targets without sponsors is 0.01. Also the industry adjusted sales growth of targets with sponsors and those without sponsors are 0.13 and -0.02, respectively. Though statistically insignificantly different, sponsored targets save more cash than non-sponsored targets: 0.31 vs. 0.08. To the extent that current sale growth and cash saving predict future growth and investment opportunities, the evidence suggests that private targets with large investment opportunities are more likely to partner with private equity sponsors to transfer ownership from owner-manager to other investors and reshape ownership structure. In the next section, I investigate whether this inference based on ex-ante target characteristics is consistent with ex-post restructuring and investment behavior.

Panel A of Table 6 reports the estimate of logistic regression to predict being leveraged buyout targets. Dependent variable in the logistic regression in Panel A is a binary variable equal to 1 for target firms and 0 for industry peer non-target firms. Consistent with the univariate statistics in Table 4, smaller, fast growing, and more profitable firms are more likely to be targets of leveraged buyouts. In Panel B I estimate logistic regression only for private targets to predict the likelihood of being sponsored by private equity firms. Again the results are largely consistent with the univariate statistics in Table 5. Larger, more profitable, and more cash saving targets are more likely to partner with private equity sponsors.

3. Post-buyout organizational changes and restructuring processes

3.1. Ownership structure

Table 3 also shows how ownership structure changes after leveraged buyout transactions. There is a substantial change in the ownership structure. The average (median) number of shareholders increases from 3.51 (2) to 7.33 (6). The average (median) ownership of the largest owner-managers drops from 86% (100%) to 7% (0%). In 89 firms out of 111 targets (80%), the largest owner-managers leave the management (Panel D). Also 79 (71%) owner-managers completely liquidate their ownership through leveraged buyouts.

Though not reported, the incoming management almost always includes existing (subordinated) managers of the target companies. In 8 cases (4.7%), incoming managers are family successors of the previous owner-managers. Twenty three transactions (13.6%) are buy-in management buy-outs (BIMBOs) where existing management buys out the targets along with outside managers. And 9 transactions (5.3%) are classified as management buy-ins (MBIs) where outside managers lead the buyout transactions. However, even in an MBI, the existing management team is not completely replaced. Though existing management is not involved in the transaction, they continue to engage in the management even after the buyouts.

It is obvious that leveraged buyouts provide liquidity ("exit") for the owners. Though we cannot directly observe why the owner-managers want to exit from the business, a modest fraction (23.5%) of owner-managers is older than 65 years, suggesting that they seem to want to retire. Through the transactions, ownership is transferred to the larger number of shareholders including existing managers and private equity firms. This change in the ownership structure is distinctively different from the change in public firms undergoing leveraged buyouts.

Panel B and C report the changes in ownership structure for targets without and with sponsors separately. The median number of shareholders increases by 2 among private targets without sponsors and by 5 among private targets with sponsors. The 1st quartile and 3rd quartile number of shareholders also show the same pattern. It seems when private equity firms sponsor the leveraged buyouts, ownership structure becomes modestly more diffused among larger number of investors.

3.2. Firm size, capital expenditure, and acquisitions and disposals

Table 7 provides summary statistics for the changes in firm size, capital expenditure, and capital structure from two years before the buyouts to three years after the buyouts.

Measuring firm size surrounding the time of a leveraged buyout is complicated due to fair value adjustment to the book value of assets. Tangible fixed assets and current assets including stocks (inventories) and creditors (account payable) are fair-value adjusted on completion of the buyouts. Also, typically, positive goodwill is generated to reflect the purchase price paid for the target's assets (as a result, intangible fixed asset size increases) and, subsequently, these write-ups are depreciated or amortized over the ensuing years.

Therefore, to make a fair comparison between assets in pre-buyout period and those in post-buyout period, I adjust the book value of total assets by subtracting write-ups and goodwill generated at the time of the buyout transactions. One limitation of this approach is that I can understate the size of assets after the buyouts. Since write-ups and goodwill are depreciated or amortized after the buyouts, subtracting write-ups and goodwill generated at the time of the transaction from the book value of assets at each fiscal year-end will underestimate the book value of assets. Adding back depreciation and amortization to the book value of assets in each year will not do justice because depreciation and amortization also include those not associated with write-ups and goodwill due to the buyouts. Hence, to give as fair a view as possible, I also provide other measures of firm size such as sales and the number of employees.

Table 7 shows that private targets substantially increase total assets, sales, PPE, and the number of employees after the buyouts. For example, from year -1 to year +1, the industry adjusted sales and the number of employees of private targets increase by 17 and 22%, respectively. Public targets, on the other hand, reduce firm size. Industry adjusted sales and the number of employees are -22 and -16 percent, respectively.

I also examine the changes in capital expenditure. Capital expenditure is the net cash flows from the purchases and sales of fixed assets. Private targets markedly increase capital expenditure especially

during the first year after the buyouts, whereas public targets reduce investments on fixed assets in general. During the first year after the buyouts, industry adjusted capital expenditures of private targets increase by 51%, but those of public targets decrease by 49%. The median total debt increases by 83, 105, and 112% from year -1 to year +1, +2, and +3, respectively.

Lastly, to see the extent of acquisitions and disposals activities of target companies, I compute the sum of all cash outflows (inflows) associated with acquisitions (disposals) from the time of a leveraged buyout to exit (when the firm exited private equity ownership) or to the fiscal year where the targets publish financial statements, and divide this sum by PPE at the most recent fiscal year end before the buyouts. Also, importantly, I exclude cash outflows associated with the leveraged buyouts. In other words, the intensities of acquisitions and disposals activities are estimated by the following measures:

$$Acquisition\ intensity = \frac{\sum_{year\ 0}^{exit\ or\ present}(Cash\ outflows\ from\ acquisitions)}{PPE\ in\ year-1} \quad (3)$$

$$Disposal\ intensity = \frac{\sum_{year\ 0}^{exit\ or\ present}(Cash\ inflows\ from\ disposals)}{PPE\ in\ year-1} \quad (4)$$

Table 8 presents the results. The median acquisition related cash outflow to PPE ratio of private targets is 0.66 and that of public targets is 0.043, and the difference is statistically significant at the 1 percent level. Also the median disposal related cash inflow to PPE ratios are 0.00 and 0.017 for private and public targets, respectively. Therefore, private targets engage in active add-on acquisition activities after the buyouts than public targets do.

In Table 9, I again compare the changes in firm size, investment, and capital expenditures for private targets with and without sponsors. I find that private targets sponsored by private equity firms go through more substantial increase in firm size and investment after the buyouts. For example, during the first year after the buyouts, the industry adjusted sales and the number of employees grow by 7 and 4% for private targets without sponsors. However, the respective values increase by 25 and 27% for private targets with sponsors. The changes in capital expenditure also shows similar pattern after the buyouts.

Table 9 also reports that targets with sponsors increase leverage greater than those without sponsors. During the first year after the buyouts, total debt increases by 74 and 120%, respectively, for targets without sponsors and those with sponsors.

3.4. Median regression of firm growth on firm characteristics

Table 12 reports the median regression estimates of various measures of firm growth on predictor variables including a binary variable equal to 1 if the target is a private firm, industry firm growth, firm size prior to buyouts, profitability before buyouts, and a binary variable equal to 1 if the deal is sponsored by private equity firms. In Panel A and B, the percentage firm growth is measured from year -1 to year +1 and from year -1 to exit year (if exited) or the most recent fiscal year end (if not exited). Median regression estimates the change in median of dependent variables produced by one unit of change in the predictor variables, therefore the estimates are less affected by extreme outliers. Also this specification is consistent with previous univariate statistical tests where median values are used for the tests.

Consistent with the univariate statistical tests, private targets are associated with larger growth in firm size after the buyouts. Also the median firm size growth of industry peer firms is significantly positively associated with target firm's firm growth. Firm size at the most recent fiscal year end before the buyouts does not explain various measures of post-buyout firm growth except the percentage growth in the number of employees. More profitable targets are associated with larger growth after the buyouts. Targets sponsored by private equity firms also grow more after the buyouts than targets without private equity sponsors.

3.5. Operating performance after buyouts

In this section, I examine the operating performance after the buyouts to see whether different restructuring processes of private and public targets have different implications for operating performance in post-buyout period. The main variable of interest is EBITDA. I exclude the year when leveraged buyouts occurred in the analysis because buyout related expenses can understate operating performance in

year 0 and, typically due to fiscal year-end changes, the first annual accounts after the buyouts provide information on the business from the time of buyout to new fiscal year-end which is shorter than twelve months. This makes the pre-buyout and post-buyout comparison difficult.

Table 10 reports the results. The level of EBITDA decreases after the buyouts among public targets, while it increases among private targets. From year -1 to year 1, industry adjusted EBITDA decreases by 54% for public targets and increases by 10% for private targets. This is probably because public targets reduce and private targets increase operating assets after the buyouts.

I also examine the EBITDA to operating assets (the average of fiscal year-beginning and end current and tangible fixed assets), EBITDA to sales, and EBITDA to the number of employees. The reason I normalize EBITDA by sales or the number of employees is to mitigate the bias due to write-ups in operating assets. As firm size significantly increases after the buyouts, these measures of operating efficiencies drop for private targets. Most of the changes of operating efficiency measures are negative and not statistically significantly different from zero after controlling for industry EBITDA. For public targets, operating efficiency by and large improve after the buyouts. However, when adjusted for industry peer public firms' performance, operating efficiency improvement is not significant.

Table 11 presents the changes in operating performance by two groups of private targets: one with financial sponsors and the other without financial sponsors. There is a stark difference between the two groups. Operating performance and efficiency are increasing fast before the buyouts for private targets sponsored by private equity firms. However, though EBITDA continues to increase, operating efficiency decreases among targets with private equity sponsors. On the contrary, targets without private equity partnership show the opposite properties. The changes in operating performance and efficiency before the buyouts are smaller than peer private firms. Yet, after the buyouts, the targets improve operating efficiency substantially: By the end of second year after the buyouts, EBITDA to sales ratio increase by 47%.

3.5. Summary of the findings and interpretation

First, there is a striking difference between private targets and public targets with regard to post-buyout investment policy. Consistent with previous studies based on the sample of public-to-private leveraged buyout (Kaplan, 1988; Smith, 1989), public firms reduce firm size and investment after the buyouts. The evidence is consistent with the view that public firms reduce agency costs after leveraged buyouts by reversing previously made inefficient investments. By contrast, private targets markedly increase firm size and investment after the buyouts, a finding which suggests that these firms were investment-constrained before the buyouts.

In principle, leveraged buyouts serve as an exit strategy for owner-managers. Owner-managers and incoming managers can complete the transaction either by themselves or with private equity sponsors. Managers of target companies with larger profitability and growth opportunities tend to invite private equity to complete leveraged buyouts and to further finance future investment plans. Ownership structure becomes more diffused in these targets. After the buyouts, these targets grow in firm size and make greater investments, rather than improving operational efficiency. This could also imply that private equity firms sponsor profitable and efficient targets with large growth opportunities. Therefore, private targets partner with private equity firms and engage in leveraged buyouts for strategic reasons.

On the other hand, target companies which complete ownership transfer through leveraged buyouts without private equity sponsors do not experience considerable changes in ownership structure. Based on departing owner-managers' age, it seems leveraged buyouts simply serve to transfer ownership from retiring owners to new owners. These targets do not increase firm size or investment after the buyouts, but they improve operating efficiency substantially. This could be because existing managers with favorable inside information on future performance become new owners. Alternatively, high leverage might have played a role to improve organizational efficiency after the buyouts.

The increase in firm size and investment after the buyouts among private targets is not likely due to time-varying investment opportunities. In other words, new managers find new investment opportunities after the buyouts simply because the opportunities came after the buyouts. However, these increases in firm size and investment persist even after controlling for industry peer firms' firm growth

and investments. To the extent that peer firms share similar investment opportunities, time-varying investment opportunities cannot explain the results.

It could be that incoming owners and managers are more competent in identifying investment opportunities. However, new management teams almost always include previous managers. In this sense, managers' ability is same before and after the buyouts. Lastly, it is possible that new owners and managers are less risk-averse, so they are more willing to take risky investment plans. For example, I find that new owner managers are about 11 year younger than departing owner-managers. To the extent that age can explain a person's risk taking attitudes, this may explain why investments increase after the buyouts for private firms. However, I find a systematic difference between private equity sponsored deals and non-sponsored deals, but owner-managers' age in the two groups of targets is, in fact, very similar: 45 vs. 48.

Hence, the evidence is most consistent with the view that private equity sponsors relieve investment constraints of private firms by resolving highly concentrated ownership through leveraged buyouts and by providing financing for growth after the buyouts.

4. Choice between private equity and public equity

In this section, I investigate whey owner-manager of private firms choose leveraged buyout instead of initial public offerings (IPOs) to liquidate their ownership and relieve investment constraints due to concentrated ownership structure and lack of financing. To this end, I examine financial characteristics of firms underwent leveraged buyouts and those went public on stock exchanges.

Table 13 presents the annual distribution of IPOs from 1997 to 2009. The transactions are collected from Zephyr. I examine IPO firms listing on the LSE or AIM in the analysis and exclude carve-outs. Table 14 provides firms' characteristics at the most recent fiscal year-end before leveraged buyouts or IPOs. I find that leveraged buyout target companies are substantially smaller than IPO firms listing on the LSE. In a logistic regression to predict leveraged buyouts vs. IPOs in Table 15, again, I find that firm size significantly explains firm's choice between a leveraged buyout and. IPO. Mostly likely, leveraged

buyout target firms are too small or informationally risky to distribute equity share to large number of investors. In addition, IPO firms are younger, less profitable, and more in high tech industry. However, it seems leveraged buyout targets could have gone public on the AIM. The AIM's listing requirement is very minimal. There is no minimum trading record requirement and no minimum public shares requirement. A firm only needs the support of a nominated advisor. Therefore, it seems firms listing on the AIM face similar informational costs as leveraged buyout targets do, but face greater risk of losing private benefits of control.

V. Conclusion

I study the motivations and consequences leveraged buyouts of private companies. Though the buyouts of private companies account for the majority of deals in the leveraged buyout market, most academic studies base their analysis on a sample of public-to-private buyout transactions. In this respect, our understanding on leveraged buyouts – of why they occur and how firms restructure and perform after the buyouts – is still limited. This paper, by investigating private firm buyout transactions, expands our understanding on leveraged buyouts.

The most striking difference between private targets and public ones with regard to post-buyout restructuring process is found in firm growth and investments. Private targets considerably grow in firm size and make greater investments in fixed assets and acquisitions after the buyouts, which is the opposite of public targets' investments policy after the buyouts. In fact, the growth in firm size and investments are attributable to private targets with private equity sponsors. Private firms transferring ownership through leveraged buyouts without private equity firms' engagement do not show substantial increases in firm size and investment after the buyouts. I also find that though owners change, the structure of ownership does not change much for these deals without private equity firms. Therefore, for these targets, leveraged buyouts simply serve as an exit route for owners.

On the other hand, when private firms are facing large investment and growth opportunities but they are investment-constrained due to highly concentrated ownership and lack of financing, private

equity sponsored leveraged buyouts can relieve these constraints and help capitalize on targets' investment opportunities. The evidence is most consistent with the view that private equity sponsoring leveraged buyouts reshape the ownership structure of private firms and provide financing to better serve future growth and investment opportunities

To the best of my knowledge, this is the first study to show the importance of private equity sponsors and leveraged buyouts in alleviating investment constraints for private firms with large growth opportunities.

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Table 1: Leveraged buyouts by transaction type

This table reports the distribution of leveraged buyouts by transaction type. The table is reproduced based on Table 2 in Strömberg (2007). Public-to-private is the leveraged buyouts of public firms; private-to-private is those of private firms. Divisional is the buyouts of division or subsidiary of bigger corporations. Secondary is private equity firms' buying a portfolio company owned by other private equity firms. Lastly, distressed is the buyouts of firms in bankruptcy or liquidation.

Panel A: The number of deals by transaction type and by year

# of deals	1969 - 1979	1980 - 1989	1990 - 1999	2000 - 2007	Total
Public-to-private	3	82	280	1,033	1,398
Private-to-private	24	537	3,862	5,590	10,013
Divisional	4	186	1,233	5,283	6,706
Secondary	0	22	369	2,364	2,755
Distressed	0	8	75	442	525
Total	31	835	5,819	14,712	21,397

Percentage	1969 - 1979	1980 - 1989	1990 - 1999	2000 - 2007	Total
Public-to-private	0.01%	0.38%	1.31%	4.83%	6.53%
Private-to-private	0.11%	2.51%	18.05%	26.13%	46.80%
Divisional	0.02%	0.87%	5.76%	24.69%	31.34%
Secondary	0.00%	0.10%	1.72%	11.05%	12.88%
Distressed	0.00%	0.04%	0.35%	2.07%	2.45%
Total	0.14%	3.90%	27.20%	68.76%	100.00%

Panel B: Enterprise value by transaction type and by year (in $ million)

# of deals	1969 - 1979	1980 - 1989	1990 - 1999	2000 - 2007	Total
Public-to-private	1,451	144,184	138,649	820,243	1,104,526
Private-to-private	1,377	92,563	326,633	434,930	855,503
Divisional	267	51,212	203,702	912,331	1,167,511
Secondary		7,051	83,807	656,442	747,299
Distressed		1,095	6,548	39,412	47,055
Total	3,095	296,105	759,337	2,863,357	3,921,894

Percentage	1969 - 1979	1980 - 1989	1990 - 1999	2000 - 2007	Total
Public-to-private	0.04%	3.68%	3.54%	20.91%	28.16%
Private-to-private	0.04%	2.36%	8.33%	11.09%	21.81%
Divisional	0.01%	1.31%	5.19%	23.26%	29.77%
Secondary	0.00%	0.18%	2.14%	16.74%	19.05%
Distressed	0.00%	0.03%	0.17%	1.00%	1.20%
Total	0.08%	7.55%	19.36%	73.01%	100.00%

Table 2: Distribution of leveraged buyouts in the U.K. from 1998 to 2007

This table presents the number of leveraged buyout transactions by year and by transaction type – private-to-private and public-to-private (Panel A). Leveraged buyout transactions are identified from several sources: Zephyr, SDC, and Capital IQ. Panel B shows LBO transactions by industry. The industry classification is based on SIC division structure. Panel C presents the median and total deal values by year and by transaction type for the transactions where deal values are available from the three sources. The last row of each year (%available) shows the fraction of deals where deal values are available from one of the three data sources – Zephyr, SDC, and Capital IQ. Deal value is the total consideration paid for actual stake acquired.

Panel A. The number of leveraged buyouts by year and by transaction type

Year	Private	Public	Total
1998	7	0	7
1999	3	10	13
2000	8	11	19
2001	18	16	34
2002	13	3	16
2003	19	23	42
2004	29	13	42
2005	14	8	22
2006	41	13	54
2007	17	0	17
Total	169	97	266
	63.53%	36.47%	

Panel B. Leveraged buyouts by industry (the numbers in parentheses are in percentage)

Industry (by SIC classification)	Private	Public	Total
Agriculture, Forestry, And Fishing	0	1	1
	(0)	(1.03)	(0.38)
Construction	19	6	25
	(11.24)	(6.19)	(9.4)
Finance, Insurance, And Real Estate	4	10	14
	(2.37)	(10.31)	(5.26)
Manufacturing	64	29	93
	(37.87)	(29.9)	(34.96)
Retail Trade	21	16	37
	(12.43)	(16.49)	(13.91)
Services	36	20	56
	(21.3)	(20.62)	(21.05)
Transportation, Communications, Electric,	10	9	19
Gas, And Sanitary Services	(5.92)	(9.28)	(7.14)
Wholesale Trade	15	6	21
	(8.88)	(6.19)	(7.89)
Total	169	97	266
	(63.53)	(36.47)	(100)

Table 2 – (Continued)

Panel C. Median and sum of transaction values by year and LBO type (£ million)

Year	Statistics	Private	Public	Total
1998	Median	3.28		3.28
	Sum	14.64		14.64
	% available	57.14%		57.14%
1999	Median	10.00	85.22	61.16
	Sum	10.00	937.02	947.02
	% available	33.33%	90.00%	76.92%
2000	Median	7.98	71.28	25.00
	Sum	59.51	2,391.04	2,450.55
	% available	75.00%	100.00%	89.47%
2001	Median	13.45	74.73	20.12
	Sum	147.85	1,773.26	1,921.12
	% available	66.67%	93.75%	79.41%
2002	Median	6.04	498.78	7.03
	Sum	56.92	1,487.57	1,544.49
	% available	53.85%	100.00%	62.50%
2003	Median	7.49	25.94	15.39
	Sum	98.69	1,482.42	1,581.12
	% available	47.37%	95.65%	73.81%
2004	Median	12.00	154.94	14.01
	Sum	596.44	4,742.08	5,338.52
	% available	62.07%	100.00%	73.81%
2005	Median	12.11	47.95	26.00
	Sum	127.87	2,737.38	2,865.26
	% available	57.14%	100.00%	72.73%
2006	Median	18.97	129.65	30.35
	Sum	1,366.98	24,720.59	26,087.57
	% available	48.78%	100.00%	61.11%
2007	Median	15.99		15.99
	Sum	184.72		184.72
	% available	41.18%		41.18%
Total	Median	11.98	58.32	21.74
	Sum	2,663.64	40,271.37	42,935.01
	% available	54.44%	96.91%	69.92%

Table 2 – (Continued)

Panel D. Exit types

		Trade sales	SBO	IPO	Bankruptcy	Unknown	No Exit	Total
All sample	Private	15.98%	10.06%	0.59%	5.92%	3.55%	63.91%	169
	Public	18.56%	13.40%	2.06%	7.22%	3.09%	55.67%	97
With sponsors	Private	16.96%	13.39%	0.89%	6.25%	5.36%	57.14%	112
	Public	21.67%	16.67%	3.33%	5.00%	5.00%	48.33%	60
Without sponsors	Private	14.04%	3.51%	0.00%	5.26%	0.00%	77.19%	57
	Public	13.51%	8.11%	0.00%	10.81%	0.00%	67.57%	37
Leveraged buyout prior to 2004								
With sponsors	Private	21.88%	18.75%	1.56%	9.38%	9.38%	39.06%	64
	Public	26.19%	21.43%	4.76%	7.14%	7.14%	33.33%	42
Without sponsors	Private	21.21%	6.06%	0.00%	9.09%	0.00%	63.64%	33
	Public	14.71%	5.88%	0.00%	11.76%	0.00%	67.65%	34

Panel E. The length of time under LBO ownership for targets which eventually exited

	Sponsor	N	Minimum	Mean	Median	Maximum
Private	No	11	12.37	38.71	36.83	58.77
	Yes	42	7.20	40.34	37.98	87.70
Public	No	10	18.27	51.81	51.87	99.77
	Yes	29	10.40	50.08	51.63	95.17
Leveraged buyout prior to 2004						
Private	No	11	12.37	38.71	36.83	58.77
	Yes	33	7.20	44.46	43.00	87.70
Public	No	9	28.90	55.54	52.43	99.77
	Yes	26	10.40	52.26	57.08	95.17

Table 3: Target ownership characteristics prior to a leveraged buyout

The table reports the ownership structure of private targets before the buyouts. Panel B and C presents the ownership information for targets without private equity sponsors and with private equity sponsors, respectively. Ownership information (the number of shareholders, the ownership of the largest owners, and owners' age) is collected from form 363a (annual return). Panel D reports other owners' information in pre-buyout – whether the largest owners are founder or founder family members, whether the largest owners are also managers of the targets, whether the largest owners are venture capital, whether owner-managers leave the management after the buyouts, whether offspring of the owners succeeded the owners through the buyouts, and whether owner-managers completely sold ownership through the buyouts.

Panel A. All private targets

Variable		N	1st Quartile	Mean	Median	3rd Quartile
# of shareholders	Before buyouts	141	1	3.51	2	3
	After buyouts	124	4	7.33	6	8
Ownership of the largest owner(s)	Before buyouts	113	75.92%	86.20%	100.00%	100.00%
	After buyouts	108	0.00%	7.47%	0.00%	5.07%
Owner-manager age	Before buyouts	119	51	56.92	56	63
Incoming manager age	After buyouts	112	41	46.17	45	50

Panel B. Private targets without private equity sponsors

Variable		N	1st Quartile	Mean	Median	3rd Quartile
# of shareholders	Before buyouts	48	2	3.31	2	4
	After buyouts	43	2	4.47	4	5
Ownership of the largest owner(s)	Before buyouts	19	56.92%	83.24%	98.44%	100.00%
	After buyouts	16	0.00%	9.02%	0.00%	6.25%
Owner-manager age	Before buyouts	21	57	62.71	61	68
Incoming manager age	After buyouts	21	41	48.52	48	55

Panel C. Private targets with private equity sponsors

Variable		N	1st Quartile	Mean	Median	3rd Quartile
# of shareholders	Before buyouts	93	1	3.61	2	3
	After buyouts	81	5	8.85	7	10
Ownership of the largest owner(s)	Before buyouts	94	76.00%	86.80%	100.00%	100.00%
	After buyouts	92	0.00%	7.20%	0.00%	5.07%
Owner-manager age	Before buyouts	98	49	55.68	55.5	60
Incoming manager age	After buyouts	91	41	45.63	45	50

Table 3 – (Continued)

Panel D. Other departing owners' information

	N	Percent
Owner = Founder, Family	47	41.59%
Owner = Manager	110	97.35%
Owner = VC	2	1.77%
Available obs.	113	
Leave management	89	80.18%
Succession	8	7.21%
Complete ownership exit	79	71.17%
Available obs.	111	

Table 4: Target financial characteristics prior to a leveraged buyout

This table presents financial characteristics of target companies before the buyouts. Financial information is at fiscal year-end before the buyouts. Panel A shows the median value of total assets, sales, property, plant and equipment, the number of employees, wages, and firm age (from the year of incorporation to the year of the leveraged buyout). Panel B presents operating income, EBITDA, cash holding, cash saving, and sales growth. Panel C reports the median values of current debt, long-term debt, total debt, and interest expenses. Panel D presents the median values of capital expenditures. Wilcoxon signed rank sum test p-values are presented for the difference between targets' median value and industry peer firms'. Wilcoxon-Mann-Whitney Z-stat is also presented for the difference between private targets' median value and public targets'. *, **, and *** denote statistical significance at the 10%, 5%, and 1% respectively

Panel A. Firm size, employees, and firm age

	Private	Public	Median test
Book value of total assets (£ million)	4.244	85.741	11.806 ***
Industry median	11.354	76.246	12.265 ***
Industry-adjusted median	-6.511	-3.550	0.237
Wilcoxon signed rank sum test p-value	0.000 ***	0.945	
Sales (£ million)	9.575	83.791	8.947 ***
Industry median	18.841	75.736	10.402 ***
Industry-adjusted median	-4.811	-13.962	-1.263
Wilcoxon signed rank sum test p-value	0.010 **	0.298	
PPE (£ million)	0.640	26.159	11.051 ***
Industry median	2.581	19.319	10.321 ***
Industry-adjusted median	-1.482	-0.725	0.462
Wilcoxon signed rank sum test p-value	0.000 ***	0.985	
Employees	94	732	8.160 ***
Industry median	164	691	8.493 ***
Industry-adjusted median	-48	-11	-0.031
Wilcoxon signed rank sum test p-value	0.013 **	0.681	
Employee costs (£ million)	2.627	18.377	9.020 ***
Industry median	4.122	16.298	9.809 ***
Industry-adjusted median	-0.795	-1.428	-0.145
Wilcoxon signed rank sum p-value	0.018 **	0.709	
Firm age	15.000	28.000	4.693 ***
Industry median	15.000	24.000	7.552 ***
Industry-adjusted median	1.500	0.500	-0.432
Wilcoxon signed rank sum p-value	0.002 ***	0.389	

Table 4 – (Continued)

Panel B. Profitability, sales growth, and cash flow sensitivity of cash

	Private	Public	Median test
Operating income / Sales	0.090	0.060	-1.858 *
Industry median	0.030	0.050	4.743 ***
Industry-adjusted median	0.060	0.010	-3.471 ***
Wilcoxon signed rank sum p-value	0.000 ***	0.122	
EBITDA / Sales	0.110	0.110	-0.416
Industry median	0.040	0.060	4.664 ***
Industry-adjusted median	0.070	0.040	-1.738 *
Wilcoxon signed rank sum p-value	0.000 ***	0.000 ***	
Cash / Sales	0.130	0.140	0.830
Industry median	0.040	0.060	2.747 ***
Industry-adjusted median	0.070	0.080	-0.463
Wilcoxon signed rank sum p-value	0.000 ***	0.000 ***	
Sales growth	0.130	0.020	-3.635 ***
Industry median	0.050	0.060	1.192
Industry-adjusted median	0.060	-0.040	-3.875 ***
Wilcoxon signed rank sum p-value	0.000 ***	0.078 *	
ΔCash / Cash flow	0.300	0.090	-2.423 **
Industry median	0.040	0.010	-2.063 **
Industry-adjusted median	0.270	0.050	-2.085 **
Wilcoxon signed rank sum p-value	0.000 ***	0.206	

Panel C. Capital structure and interest expense

	Private	Public	Median test
Current debt / Sales	0.230	0.270	2.586 ***
Industry median	0.280	0.290	2.819 ***
Industry-adjusted median	-0.050	-0.010	1.939 *
Wilcoxon signed rank sum p-value	0.003 ***	0.763	
Non current debt / Sales	0.010	0.040	2.176 **
Industry median	0.050	0.130	6.551 ***
Industry-adjusted median	-0.030	-0.030	-0.175
Wilcoxon signed rank sum p-value	0.000 ***	0.328	
Total debt / Sales	0.260	0.340	3.972 ***
Industry median	0.370	0.470	4.725 ***
Industry-adjusted median	-0.110	-0.050	1.256
Wilcoxon signed rank sum p-value	0.000 ***	0.341	
Interest expense / Sales	0.000	0.010	5.906 ***
Industry median	0.010	0.010	3.798 ***
Industry-adjusted median	0.000	0.000	3.340 ***
Wilcoxon signed rank sum p-value	0.000 ***	0.171	

Table 4 – (Continued)

Panel D. Capital expenditure

	Private	Public	Median test
Capital expenditure / Sales	0.010	0.030	1.178
Industry median	0.020	0.040	7.039 ***
Industry-adjusted median	-0.010	-0.010	-0.860
Wilcoxon signed rank sum p-value	0.410	0.384	
Expenditure on total fixed asset / Sales	0.010	0.040	3.171 ***
Industry median	0.020	0.050	7.032 ***
Industry-adjusted median	-0.010	0.000	-0.115
Wilcoxon signed rank sum p-value	0.880	0.795	

Table 5: Target financial characteristics prior to a leveraged buyout: PE sponsors vs. Non PE sponsors

This table presents and compares financial characteristics of "private" target companies which are sponsored by private equity firms and those which are not sponsored by private equity firms. Financial information is at fiscal year-end before the buyouts. Panel A shows the median value of total assets, sales, property, plant and equipment, the number of employees, wages, and firm age (from the year of incorporation to the year of the leveraged buyout). Panel B presents operating income, EBITDA, cash holding, cash saving, and sales growth. Panel C reports the median values of current debt, long-term debt, total debt, and interest expenses. Panel D presents the median values of capital expenditures. Wilcoxon signed rank sum test p-values are presented for the difference between targets' median value and industry peer firms'. Wilcoxon-Mann-Whitney Z-stat is also presented for the difference between private targets' median value and public targets'. *, **, and *** denote statistical significance at the 10%, 5%, and 1% respectively

Panel A. Firm size, employees, and firm age

	Non PE sponsor	PE sponsor	Median test
Book value of total assets (£ million)	3.558	5.213	-2.157 **
Industry median	11.616	10.930	0.811
Industry-adjusted median	-7.232	-5.337	-2.251 **
Wilcoxon signed rank sum test p-value	0.000 ***	0.000 ***	
Sales (£ million)	9.413	10.419	-0.357
Industry median	20.390	18.543	1.847 *
Industry-adjusted median	-6.629	-4.011	-1.391
Wilcoxon signed rank sum test p-value	0.011 **	0.148	
PPE (£ million)	0.701	0.623	-0.492
Industry median	2.508	2.654	0.431
Industry-adjusted median	-1.901	-1.356	-0.914
Wilcoxon signed rank sum test p-value	0.000 ***	0.000 ***	
Employees	92	94	-0.976
Industry median	166	160	0.239
Industry-adjusted median	-53	-45	-0.297
Wilcoxon signed rank sum test p-value	0.006 ***	0.197	
Employee costs (£ million)	2.545	2.731	-1.083
Industry median	4.258	3.830	1.238
Industry-adjusted median	-0.871	-0.636	-1.077
Wilcoxon signed rank sum p-value	0.005 ***	0.289	
Firm age	17.000	14.500	1.956 *
Industry median	15.000	15.000	1.021
Industry-adjusted median	0.500	2.000	0.970
Wilcoxon signed rank sum p-value	0.027 **	0.029 **	

Table 5 – (Continued)

Panel B. Profitability, sales growth, and cash flow sensitivity of cash

	Non PE sponsor	PE sponsor	Median test
Operating income / Sales	0.030	0.110	-4.197 ***
Industry median	0.020	0.030	-0.330
Industry-adjusted median	0.000	0.080	-4.291 ***
Wilcoxon signed rank sum p-value	0.234	0.000 ***	
EBITDA / Sales	0.050	0.120	-3.956 ***
Industry median	0.040	0.040	-1.423
Industry-adjusted median	0.010	0.090	-3.932 ***
Wilcoxon signed rank sum p-value	0.063 *	0.000 ***	
Cash / Sales	0.090	0.140	-1.802 *
Industry median	0.040	0.050	-2.574 ***
Industry-adjusted median	0.040	0.100	-1.271
Wilcoxon signed rank sum p-value	0.000 ***	0.000 ***	
Sales growth	0.020	0.170	-3.415 ***
Industry median	0.040	0.060	-1.770 *
Industry-adjusted median	-0.020	0.130	-3.262 ***
Wilcoxon signed rank sum p-value	0.546	0.000 ***	
ΔCash / Cash flow	0.180	0.320	-0.593
Industry median	0.040	0.040	-0.047
Industry-adjusted median	0.080	0.310	-0.757
Wilcoxon signed rank sum p-value	0.118	0.000 ***	

Pnale C. Capital structure and interest expense

	Non PE sponsor	PE sponsor	Median test
Current debt / Sales	0.230	0.220	-0.294
Industry median	0.270	0.280	-0.353
Industry-adjusted median	-0.060	-0.050	-0.745
Wilcoxon signed rank sum p-value	0.016 **	0.038 **	
Non current debt / Sales	0.000	0.010	-0.192
Industry median	0.050	0.050	0.175
Industry-adjusted median	-0.030	-0.020	-0.734
Wilcoxon signed rank sum p-value	0.000 ***	0.001 ***	
Total debt / Sales	0.250	0.270	-0.768
Industry median	0.360	0.380	-0.845
Industry-adjusted median	-0.130	-0.110	-1.076
Wilcoxon signed rank sum p-value	0.000 ***	0.004 ***	
Interest expense / Sales	0.000	0.000	0.134
Industry median	0.010	0.010	-0.363
Industry-adjusted median	0.000	-0.010	0.549
Wilcoxon signed rank sum p-value	0.017 **	0.000 ***	

Table 5 – (Continued)

Panel D. Capital expenditure

	Non PE sponsor	PE sponsor	Median test
Capital expenditure / Sales	0.010	0.010	0.213
Industry median	0.020	0.020	-0.626
Industry-adjusted median	-0.010	-0.010	0.504
Wilcoxon signed rank sum p-value	0.980	0.303	

Table 6: Logistic regression to predict being LBO targets and being sponsored by PE firms

Panel A presents the estimate of logistic regression of being a target on firm characteristics. Dependent variable is a binary variable equal to 1 for target firms and 0 for industry peer firms. For each independent variable, I select the median value of industry peer firms. Panel B reports the estimate of logistic regression of having PE sponsorship on firm characteristics. Dependent variable is a binary variable equal to 1 for target firms sponsored by PEs and 0 for targets without PE sponsors.

Panel A. Logistic regression to predict being leveraged buyout targets

	Private Firms			Public Firms			All Firms		
Variable	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value
Total assets	-1.95	0.40	0.000	-0.67	0.25	0.007	-0.84	0.18	0.000
Firm age	2.02	0.52	0.000	0.11	0.24	0.664	0.57	0.22	0.008
Sales growth	6.52	1.76	0.000	0.29	0.93	0.752	3.13	0.93	0.001
Capex	0.19	0.15	0.200	0.46	0.19	0.014	0.43	0.14	0.002
Cash flow/sales	30.26	6.41	0.000	4.35	1.39	0.002	7.78	1.28	0.000
Cash/sales	7.74	2.63	0.003	5.33	1.40	0.000	9.66	1.23	0.000
ΔCash/Cash flow	0.66	0.26	0.013	-0.02	0.03	0.455	-0.02	0.02	0.518
Constant	19.39	5.29	0.000	3.45	2.56	0.177	4.25	1.65	0.010
Pseudo R2 =	0.54			0.15			0.28		
Log likelihood =	-76.90			-91.99			-199.63		
Number of obs =	258			160			418		

Panel B. Logistic regression to predict being sponsored by private equity firms

	Private Firms			Public Firms			All Firms		
Variable	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value
Total assets	0.93	0.42	0.026	0.74	0.38	0.052	0.44	0.20	0.028
Firm age	-0.54	0.54	0.317	-0.53	0.35	0.132	-0.72	0.26	0.006
Sales growth	1.27	1.00	0.206	-0.17	0.91	0.851	0.74	0.64	0.251
Capex	-0.42	0.27	0.114	-0.03	0.27	0.917	-0.16	0.15	0.278
Cash flow/sales	17.24	5.96	0.004	-0.32	1.36	0.813	2.06	1.18	0.081
Cash/sales	-0.70	1.96	0.720	-0.22	1.06	0.834	1.36	0.94	0.150
ΔCash/Cash flow	0.71	0.29	0.016	0.01	0.03	0.732	0.02	0.04	0.535
Constant	-8.86	4.73	0.061	-10.41	4.57	0.023	-2.75	2.00	0.170
Pseudo R2 =	0.26			0.18			0.12		
Log likelihood =	-39.94			-35.48			-85.87		
Number of obs =	90			67			157		

Table 7: Changes in firm characteristics after a leveraged buyout

The median values and (industry adjusted) percentage changes of median values of total assets, sales, PPE, the number of employees, capital expenditures, current debt, long-term debt, and total debt are presented from year -2 to year +3 relative to the year of LBO completion. *, **, and *** indicate that the median change is significantly different from zero at the 10%, 5%, and 1% level, respectively, as measured by two-tailed Wilcoxon signed rank sum statistics.

	Private					Public				
Year relative to buyout	-2	-1	1	2	3	-2	-1	1	2	3
Total assets (£ million)	3.86	4.24	8.06	7.15	7.06	84.74	85.74	88.66	95.61	75.44
Industry	11.55	11.35	11.81	11.39	11.44	76.51	76.25	97.85	79.08	97.93
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.12 ***	0.57 ***	0.75 ***	0.80 ***		0.02	0.05 *	-0.01	0.08	
Industry adjusted change (%)	0.12 ***	0.59 ***	0.83 ***	0.81 ***		-0.06	-0.11	-0.15	-0.31 ***	
Sales (£ million)	11.17	9.57	14.68	15.67	15.62	75.08	83.79	68.57	68.13	60.60
Industry	18.25	18.84	18.03	16.52	19.29	75.21	75.74	97.25	69.05	71.11
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.13 ***	0.28 ***	0.37 ***	0.35 ***		0.02 *	0.02	0.01	-0.06	
Industry adjusted change (%)	0.09 ***	0.17 ***	0.37 ***	0.29 ***		-0.04	-0.22 ***	-0.28 ***	-0.49 ***	
PPE (£ million)	0.76	0.64	0.85	0.99	1.04	29.79	26.16	11.44	11.82	6.81
Industry	2.74	2.58	2.71	2.60	2.59	17.97	19.32	24.07	19.76	21.53
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.00	0.07 ***	0.19 ***	0.19 **		-0.01	-0.16 ***	-0.18 ***	-0.25 ***	
Industry adjusted change (%)	0.04	0.18 ***	0.23 ***	0.30 ***		0.00	-0.21 ***	-0.26 ***	-0.35 ***	
Employees	100	94	109	110	115	1101	732	723	759	462
Industry	161	164	161	156	161	723	691	787	698	761
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.07 ***	0.14 ***	0.29 ***	0.34 ***		-0.06 ***	-0.09 ***	-0.18 ***	-0.23 ***	
Industry adjusted change (%)	0.05 **	0.22 ***	0.30 ***	0.26 ***		-0.07 **	-0.16 ***	-0.24 ***	-0.39 ***	
Capital expenditure / Sales	0.02	0.01	0.02	0.01	0.01	0.04	0.03	0.01	0.01	0.02
Industry	0.02	0.02	0.02	0.03	0.02	0.05	0.04	0.04	0.04	0.04
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.11	0.26 ***	0.27 ***	0.51 **		-0.30 *	-0.16	-0.06	0.12 *	
Industry adjusted change (%)	0.04	0.07 **	0.15 *	0.46		-0.31 *	-0.07	-0.02	-0.04	
Capital expenditure (£ million)	0.15	0.11	0.21	0.17	0.13	4.81	1.41	0.75	1.12	0.03
Industry	0.32	0.32	0.32	0.33	0.32	2.15	2.52	2.18	1.89	0.16
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.03 **	0.64 ***	0.70 ***	0.70 ***		-0.28 *	-0.36	-0.24	-0.21	
Industry adjusted change (%)	0.00 *	0.51 ***	0.66 ***	0.99 ***		-0.21 **	-0.49	-0.36	-0.07	
Current debt (£ million)	1.92	1.85	3.39	3.57	3.72	24.36	23.93	23.30	20.36	2.43
Industry	4.85	4.88	4.93	4.68	4.42	19.57	20.61	25.20	21.90	3.15
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.09 ***	0.46 ***	0.57 ***	0.66 ***		-0.05	0.14 *	0.05	0.11	
Industry adjusted change (%)	0.09 **	0.36 ***	0.46 ***	0.54 ***		-0.08 **	-0.04	-0.12	-0.36 **	
Long term debt (£ million)	0.10	0.05	0.79	1.13	1.09	12.82	11.48	35.11	47.90	3.21
Industry	0.78	0.78	0.74	0.72	0.71	9.78	13.46	14.27	12.97	1.88
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	-0.13 ***	1.89 ***	2.56 ***	2.36 ***		0.06	0.79 ***	0.89 ***	1.42 ***	
Industry adjusted change (%)	-0.20 ***	1.41 ***	2.22 ***	2.53 ***		-0.10 *	0.25 **	0.48 *	-0.17	
Total debt (£ million)	2.29	2.01	5.26	5.08	5.22	38.11	41.11	78.04	87.06	6.57
Industry	6.63	6.48	6.75	6.38	6.26	35.76	39.70	45.72	38.64	4.71
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.03 **	0.83 ***	1.05 ***	1.12 ***		0.05	0.73 ***	0.78 ***	0.99 ***	
Industry adjusted change (%)	0.05	0.85 ***	1.04 ***	1.35 ***		-0.04	0.60 ***	0.61 ***	0.32	

Table 8: Acquisitions and disposals of businesses and operations after a leveraged buyout

This table presents the total cash outflows and inflows associated with acquisitions and disposals of operations during leveraged buyout ownership. Specifically, I compute the sum of all cash outflows (inflows) associated with acquisitions (disposals) from the time of a leveraged buyout to exit (when the firm exited private equity ownership) or to present otherwise and divide this sum by PPE at the most recent fiscal year end before the buyouts. Also I exclude cash outflows associated with the leveraged buyouts.

$$Acquisition\ intensity = \frac{\sum_{year\ 0}^{exit\ or\ present}(Cash\ outflows\ from\ acquisitions)}{PPE\ in\ year-1} \quad (3)$$

$$Disposal\ intensity = \frac{\sum_{year\ 0}^{exit\ or\ present}(Cash\ inflows\ from\ disposals)}{PPE\ in\ year-1} \quad (4)$$

Industry adjustment is made by the median value of the changes in each variable among companies in the same 2-digit SIC code. That is (Industry adjusted change in X)=(Change in X from year -1 to year Y)-(Median value of the change in X from year -1 to year Y in industry peer companies), where X is the variable of interest and Y is -2, 1, 2, or 3 relative to year -1 (one year before buyouts). *, **, and *** denote statistical significance at the 10%, 5%, and 1% respectively for Wilcoxon signed rank sum test.

		Lower Quartile	Median	Upper Quartile
Private	Acquisitions	0.309	0.660	2.170
	Disposals	0.000	0.000	0.000
Public	Acquisitions	0.000	0.043	0.302
	Disposals	0.000	0.017	0.446
Median (Z-stat)	Acquisitions		Disposals	
Difference (public - private)	3.543 ***		-2.666 ***	

Table 9: Changes in firm characteristics after a leveraged buyout: PE sponsors vs. Non PE sponsors

The median values and (industry adjusted) percentage changes of median values of total assets, sales, PPE, the number of employees, capital expenditures, current debt, long-term debt, and total debt are presented from year -2 to year +3 relative to the year of LBO completion for targets with PE sponsors and those without PE sponsors. *, **, and *** indicate that the median change is significantly different from zero at the 10%, 5%, and 1% level, respectively, as measured by two-tailed Wilcoxon signed rank sum statistics.

	Non PE Sponsors					PE Sponsors				
Year relative to buyout	-2	-1	1	2	3	-2	-1	1	2	3
Total assets (£ million)	3.28	3.56	4.61	5.13	5.11	4.56	5.21	12.83	10.57	10.78
Industry	11.77	11.62	11.23	11.43	11.62	11.39	10.93	12.81	11.29	11.11
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.05 ***	0.23 ***	0.25 ***	0.25 ***		0.16 ***	0.81 ***	0.91 ***	0.94 ***	
Industry adjusted change (%)	0.07 **	0.32 ***	0.37 ***	0.34		0.15 ***	0.78 ***	0.94 ***	1.15 ***	
Sales (£ million)	9.05	9.41	13.50	13.95	16.05	12.68	10.42	18.38	17.84	15.62
Industry	18.71	20.39	18.23	17.67	21.93	17.83	18.54	18.03	15.66	17.01
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.02	0.14 ***	0.20 ***	0.13		0.17 ***	0.32 ***	0.50 ***	0.71 ***	
Industry adjusted change (%)	-0.04	0.07	0.33 ***	0.09		0.14 ***	0.25 ***	0.42 ***	0.45 ***	
PPE (£ million)	0.80	0.70	0.78	0.82	0.85	0.66	0.62	0.86	1.03	1.19
Industry	2.73	2.51	2.47	2.50	2.59	2.76	2.65	2.74	2.77	2.66
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.00	-0.07	-0.16	-0.01		0.00	0.23 ***	0.46 ***	0.26 ***	
Industry adjusted change (%)	0.01	0.03	0.03	0.21		0.06	0.32 ***	0.44 ***	0.50 ***	
Employees	78	92	85	109	87	111	94	111	111	123
Industry	161	166	158	154	146	164	160	164	163	165
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.02	0.04	0.02	-0.02		0.09 ***	0.21 ***	0.33 ***	0.41 ***	
Industry adjusted change (%)	-0.02	0.04	0.19 **	0.07		0.09 ***	0.27 ***	0.44 ***	0.42 ***	
Capital expenditure / Sales	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.02
Industry	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.03	0.03
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.54 *	-0.37	0.38 *	1.02 *		-0.11	0.40 ***	0.18 **	0.38	
Industry adjusted change (%)	0.28	-0.29	0.47 *	1.26 *		-0.06	0.31 **	-0.12	-0.12	
Capital expenditure	1.51	0.64	0.96	1.37	1.18	1.62	1.40	3.15	2.40	0.17
Industry	3.16	3.24	2.88	3.03	2.67	3.19	3.13	3.59	3.65	0.36
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.03	-0.18	0.53 **	0.62 **		0.01 *	0.92 ***	0.76 ***	0.76 ***	
Industry adjusted change (%)	-0.13	-0.13	0.31 *	1.15		0.04 *	0.87 ***	0.72 **	0.81 **	
Current debt	16.36	16.68	25.64	32.19	30.76	20.53	19.06	42.85	36.80	3.93
Industry	49.36	48.93	48.37	47.82	51.78	48.26	47.97	49.47	46.27	4.25
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.09 **	0.39 ***	0.35 ***	0.31 ***		0.09 ***	0.48 ***	0.67 ***	0.80 ***	
Industry adjusted change (%)	0.08	0.51 ***	0.45 ***	0.01		0.10 *	0.32 ***	0.46 ***	0.97 ***	
Long term debt	0.92	0.58	3.34	2.58	0.92	1.19	0.49	27.01	20.62	2.10
Industry	8.62	7.72	7.33	7.40	7.10	6.98	7.79	7.52	7.16	0.72
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	-0.08	0.60 ***	0.94 **	0.06		-0.14 **	3.18 ***	3.78 ***	3.60 ***	
Industry adjusted change (%)	-0.16 *	0.45 *	1.39 ***	-0.21		-0.28 ***	2.60 ***	2.80 ***	3.25 ***	
Total debt	17.41	17.21	29.60	39.58	37.80	25.02	24.83	81.44	63.03	6.18
Industry	68.07	69.33	63.53	61.89	62.57	65.17	62.32	69.35	66.25	6.24
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.03	0.74 ***	0.69 ***	0.36 ***		0.04 *	1.20 ***	1.37 ***	1.43 ***	
Industry adjusted change (%)	0.05	0.67 ***	0.93 ***	0.24		0.05	0.90 ***	1.11 ***	1.67 ***	

Table 10: Operating performance after a buyout

This table presents the median changes in operating performance surrounding the year of leveraged buyouts. Operating performance is measured in several ways. 1) Percentage changes in EBITDA, 2) Percentage changes in EBITDA to operating assets (the average of current assets and tangible fixed assets) ratio, 3) Percentage changes in EBITDA to sales ratio, and 4) Percentage changes in EBITDA to the number of employees ratio. Industry adjustment is made by the median value of the changes in each variable among companies in the same 2-digit SIC code. That is (Industry adjusted change in X)=(Change in X from year -1 to year Y)-(Median value of the change in X from year -1 to year Y in industry peer companies), where X is the variable of interest and Y is -2, 1, 2, or 3 relative to year -1 (one year before buyouts). *, **, and *** denote statistical significance at the 10%, 5%, and 1% respectively for Wilcoxon signed rank sum test.

	Private					Public				
Year relative to buyout	-2	-1	1	2	3	-2	-1	1	2	3
EBITDA (£ million)	0.86	0.93	1.19	0.96	0.96	8.71	8.87	5.76	6.89	6.09
Industry	0.59	0.58	0.64	0.59	0.59	4.39	4.57	5.90	4.97	5.60
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.16 ***	0.15 ***	0.36 ***	0.17 **		0.04	-0.07	-0.05	-0.21	
Industry adjusted change (%)	0.10 ***	0.10 *	0.13 *	0.06		0.01	-0.54 ***	-0.49 *	-0.47 ***	
EBITDA / Operating assets	0.18	0.22	0.18	0.16	0.16	0.12	0.10	0.11	0.10	0.14
Industry	0.07	0.07	0.07	0.08	0.08	0.09	0.09	0.10	0.09	0.11
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.02	-0.07	0.06	-0.20		-0.04	-0.07	0.09 *	-0.02	
Industry adjusted change (%)	0.02	-0.17	-0.09	-0.30		-0.04	-0.13	0.00	-0.15	
EBITDA / Sales	0.09	0.11	0.08	0.08	0.08	0.11	0.11	0.08	0.10	0.09
Industry	0.04	0.04	0.05	0.05	0.05	0.06	0.06	0.07	0.08	0.08
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	0.01	-0.11	-0.08	-0.16		-0.06	-0.01	0.04	-0.11	
Industry adjusted change (%)	0.01	-0.16	-0.14	-0.33		0.03	-0.20	-0.16	-0.36	
EBITDA / Employees ('000)	8.28	8.76	8.86	7.89	6.83	6.89	7.47	7.47	9.62	11.24
Industry	4.35	4.35	4.81	4.87	4.77	6.25	6.25	6.79	7.14	8.06
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	-0.03	-0.07	-0.08	-0.17		0.13 ***	-0.01	0.21 **	0.10 *	
Industry adjusted change (%)	0.04	-0.07	-0.26	-0.34		0.20 ***	-0.19	-0.11	-0.06	

Table 11: Operating performance after a buyout: PE sponsors vs. Non PE sponsors

This table presents the median changes in operating performance surrounding the year of leveraged buyouts for private targets with PE sponsors and those without PE sponsors. Operating performance is measured in several ways. 1) Percentage changes in EBITDA, 2) Percentage changes in EBITDA to operating assets (the average of current assets and tangible fixed assets) ratio, 3) Percentage changes in EBITDA to sales ratio, and 4) Percentage changes in EBITDA to the number of employees ratio. Industry adjustment is made by the median value of the changes in each variable among companies in the same 2-digit SIC code. That is (Industry adjusted change in X)=(Change in X from year -1 to year Y)-(Median value of the change in X from year -1 to year Y in industry peer companies), where X is the variable of interest and Y is -2, 1, 2, or 3 relative to year -1 (one year before buyouts). *, **, and *** denote statistical significance at the 10%, 5%, and 1% respectively for Wilcoxon signed rank sum test.

	Non PE Sponsors					PE Sponsors				
Year relative to buyout	-2	-1	1	2	3	-2	-1	1	2	3
EBITDA (£ million)	0.59	0.45	0.56	0.73	0.82	1.08	1.31	1.54	1.44	1.13
Industry	0.59	0.58	0.63	0.54	0.59	0.56	0.58	0.68	0.68	0.56
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	-0.04	0.42 ***	0.45 **	0.13		0.27 ***	0.07 **	0.29 ***	0.27 **	
Industry adjusted change (%)	-0.07	0.42 **	0.65 **	-0.30		0.22 ***	0.03	0.05	0.14	
EBITDA / Operating assets	0.15	0.13	0.14	0.13	0.13	0.24	0.27	0.20	0.19	0.17
Industry	0.07	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	-0.05	0.16 **	0.38 **	0.07		0.03 **	-0.19	-0.16	-0.28	
Industry adjusted change (%)	-0.22	0.05	0.30 **	0.20		0.07 *	-0.21	-0.31	-0.36 **	
EBITDA / Sales	0.05	0.05	0.06	0.06	0.05	0.10	0.12	0.10	0.09	0.10
Industry	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.05	0.05	0.05
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	-0.11 *	0.19	0.34 **	0.20		0.06 **	-0.18	-0.16	-0.27	
Industry adjusted change (%)	-0.14	0.21	0.47 *	0.14		0.02	-0.28 *	-0.30	-0.36 **	
EBITDA / Employees ('000)	6.66	5.80	6.37	6.04	6.53	9.35	11.32	10.74	10.37	7.45
Industry	4.68	4.76	5.14	5.18	5.63	4.15	4.26	4.62	4.71	4.35
	-2 to -1	-1 to 1	-1 to 2	-1 to 3		-2 to -1	-1 to 1	-1 to 2	-1 to 3	
Percentage change (%)	-0.10	0.26 **	0.47 **	0.37		0.10 **	-0.12	-0.22 *	-0.21	
Industry adjusted change (%)	-0.06	0.30 *	0.43 *	0.45		0.07 **	-0.30 **	-0.45 **	-0.36 *	

Table 12: Quantile (Median) regression of firm growth on firm characteristics

This table presents the estimates of median regression of firm growth rates on firm characteristics. The regression estimates the change in median of firm growth rates produced by one unit of change in the predictor variable. The dependent variable in Panel A is the firm growth rate from year -1 to year +1 and the dependent variable in Panel B is the firm growth rate from year -1 to exit year if the target exited LBO ownership or the most recent fiscal year-end if the targets is still under LBO ownership.

Panel A. Dependent variable: percentage firm growth from year -1 to year +1

Dependent	Total asset growth			Sales growth			PPE growth			Employees growth			Capex growth		
	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value
Private firm	0.53	0.19	0.006	0.26	0.10	0.009	0.35	0.15	0.019	0.23	0.09	0.009	0.27	0.36	0.445
Industry growth	0.02	0.02	0.337	0.03	0.02	0.086	0.03	0.01	0.006	0.01	0.00	0.029	0.02	0.01	0.031
Sales at year -1	-0.09	0.06	0.150	-0.03	0.03	0.376	-0.04	0.05	0.361	-0.07	0.03	0.007	-0.07	0.11	0.514
CF at year -1	0.37	0.17	0.033	0.01	0.09	0.897	0.30	0.13	0.030	0.25	0.07	0.001	0.42	0.43	0.328
PE sponsor	0.32	0.18	0.076	0.13	0.09	0.165	0.19	0.14	0.191	0.36	0.08	0.000	0.10	0.34	0.774
Constant	1.41	1.03	0.175	0.38	0.53	0.468	0.31	0.78	0.694	0.89	0.46	0.057	0.62	1.90	0.744
Pseudo R2 =	139			135			138			116			136		
N =	0.088			0.052			0.003			0.081			0.006		

Panel B. Dependent variable: percentage firm growth from year -1 to exit year or most recent fiscal year-end

Dependent	Total asset growth			Sales growth			PPE growth			Employees growth			Capex growth		
	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value
Private firm	0.35	0.17	0.042	0.23	0.07	0.002	0.19	0.08	0.027	0.25	0.07	0.000	0.20	0.61	0.736
Industry growth	0.01	0.00	0.104	0.01	0.00	0.002	0.00	0.00	0.054	0.01	0.00	0.000	-0.08	0.08	0.361
Sales at year -1	-0.07	0.05	0.160	-0.02	0.02	0.435	-0.02	0.02	0.409	0.00	0.02	0.963	-0.08	0.18	0.639
CF at year -1	0.40	0.17	0.016	0.23	0.07	0.001	0.32	0.08	0.000	0.11	0.07	0.085	1.43	0.81	0.081
PE sponsor	0.59	0.15	0.000	0.22	0.06	0.001	0.15	0.07	0.038	0.12	0.06	0.055	0.10	0.53	0.854
Constant	1.05	0.91	0.253	0.12	0.37	0.755	0.10	0.44	0.820	-0.18	0.37	0.617	1.11	3.16	0.725
Pseudo R2 =	177			166			175			163			164		
N =	0.105			0.066			0.001			0.090			0.003		

Table 13: Annual distribution of initial public offerings on the London Stock Exchange (LSE) and the Alternative Investment Market (AIM)

This table reports the number of initial public offerings (IPOs) on LSE and AIM by IPO year from 1997 to 2009. IPOs are identified from Zephyr published by Bureau van Dijk. Carve-outs are IPOs of divisions or subsidiaries of public companies.

IPO year	All IPOs	Carve-outs	LSE	AIM
1997	77	35	73	4
1998	49	23	42	7
1999	46	25	26	20
2000	218	80	64	154
2001	95	30	24	71
2002	89	29	24	65
2003	86	24	23	63
2004	228	56	29	199
2005	329	57	42	287
2006	267	41	49	218
2007	165	36	39	126
2008	48	5	14	34
2009	2	0	0	2
Total	1,699	441	449	1,250

Table 14: Firm characteristics of targets which underwent leveraged buyouts and firms which went public on the LSE or AIM

The table reports and compares the median values of total assets, sales, firm age, EBITDA, and capital expenditures at the most recent fiscal year-end before LBOs or IPOs. Accounting information is collected from Zephyr, Amadeus, and companies' annual reports.

	LBO		LSE		AIM	
	Median	N	Median	N	Median	N
Total assets (£m)	4.341	183	49.479	153	4.820	585
Sales (£m)	9.591	131	32.963	132	2.489	442
Firm age	15.000	181	2.000	133	1.000	505
EBITDA (£m)	1.050	137	4.063	127	-0.132	474
EBITDA/Sales	0.086	127	0.079	123	0.009	412
Sales growth	0.121	115	0.283	39	0.250	120
Capex (£m)	0.121	164	1.877	46	0.000	120
Capex/Sales	0.015	128	0.077	40	0.053	129
# of firms	183		153		589	

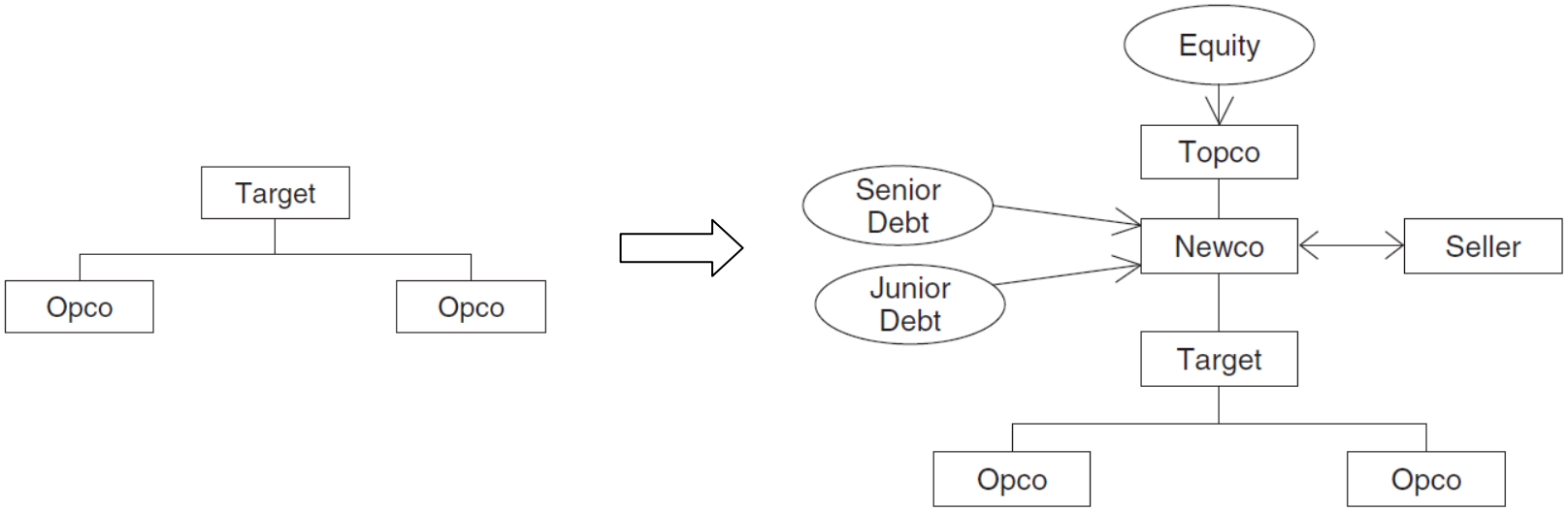
Table 15: Logistic regression to predict LBO vs. IPO

This table presents the estimates of logistic regression of going public on firm characteristics. Dependent variable is a binary variable equal to 1 if the firm goes public either on the LSE or AIM and 0 if the firm undergoes leveraged buyouts. Transaction (IPO or LBO) year indicator variables are included.

	LBO vs. LSE-listing			LBO vs. AIM-listing		
	Coef.	Std.Err.	p-value	Coef.	Std.Err.	p-value
Total assets	0.52	0.11	0.000	-0.15	0.10	0.137
Firm age	-0.11	0.02	0.000	-0.18	0.02	0.000
Employee	0.00	0.00	0.566	0.00	0.00	0.099
CF/sales	-1.54	0.60	0.010	-1.37	0.38	0.000
High tech	1.10	0.57	0.053	0.21	0.54	0.704
Constant	-7.54	2.04	0.000	3.42	1.72	0.047
Year dummy	Yes			Yes		
Pseudo R2 =	0.40			0.53		
Log likelihood =	-115.21			-190.26		
Number of obs =	340			595		

Figure 1: Typical corporate structure after a buyout

This figure depicts the change in corporate structure after a leveraged buyout. Typically one or more acquisition vehicles (TopCo and NewCo in this figure) are created for the purpose of the transaction. After NewCo is incorporated by management and/or private equity firms, it acquires Target and its subsidiaries. Subsequently, TopCo is created and acquire NewCo.Usually TopCo issues equity capital (private equity) and NewCo finances the transaction with debt.



(Source: Speechley, Acquisition Finance, 2008)