

Phase 4 Private Equity Development: Reshaping Buyout Industry

Dynamics and Review of Ethics

Eric J. Oh¹

Pennsylvania State University, Schreyer Honors College

Abstract

I analyze changing dynamics in the private equity industry following the 2008 financial crisis using empirical evidence collected from 261 leveraged buyouts completed between 2008 and 2017. By comparing the pre-crisis literature and data on private equity LBOs to that of post-crisis, trends in the environment of private equity fundraising, net-IRR, and leverage capacity is measured. I also investigate the following deal characteristics of post-crisis LBOs: exit strategy, holding period, valuation, as well as the role of investment bankers. The cross-sectional analysis provides supporting evidence of operational efficiency improvement and disciplined cost management of leveraged buyouts hypothesis.

¹ I am grateful to Dr. Mark Gruskin for his continued support and help throughout the development of this paper. I also thank Dr. Brian Davis.

I. Introduction

The LBO provides appealing financial returns for private equity investors if potential targets possess restructuring opportunities. To obtain the expected return on investment, the PE firm appoints a Board of Directors to monitor what was regarded as a previously inefficiently-managed firm (Wright *et al.*, 1992; Amess and Wright 2012) and to oversee a restructuring of the business. After a successful turnaround, private equity sells the business at a higher valuation compared to that at the time of LBO. To maximize returns, more leverage is critical in executing an LBO (Kaplan and Strömberg, 2009). During the early 2000's before the 2008 financial crisis, LBO deal volume, size, and leverage were at all-time high. According to Thomson Reuters, average PE equity contribution in an LBO was approximately 30 percent in 2007, just before the financial crisis.² This suggests that in a \$1 billion LBO transaction, only \$300 million in equity is sponsored by the PE firm with the remaining \$700 million being borrowed. Assuming that the transaction was valued at 10.0x EV/EBITDA, TargetCo's EBITDA is assumed to be \$100 million. If so, newly raised debt of \$700 million to EBITDA of \$100 million represents a Debt/EBITDA ratio of 7.0x, which is clearly over-leveraged. In fact, Thompson Reuters also reports that the 2nd quarter of 2006 average Debt/EBITDA ratio on an LBO was 5.8x, which increased to 6.8x in fiscal 2007 when LBOs were peaking in volume. With this degree of leverage, a sponsor's ability to secure term loan financing is limited. A significant portion of LBO debt has to come from more junior debt such as the mezzanine debt or subordinated notes, which increases TargetCo's cost of debt and default risk significantly.

² <https://www.reuters.com/article/marketo-equity/lpc-private-equity-firms-put-more-capital-less-debt-into-lbos-idUSL1N1B70MD>

Because of the high leverage and increased risk taken on by acquiring TargetCo, both academia and the business media have questioned the private equity industry's ethicality in LBOs and other various corporate activities during the private period. Warren Buffet in an interview with *Business Insider Magazine* criticized buyout companies that often see acquisition targets as a "piece of merchandise".³ During the 2012 presidential election, former Texas governor Rick Perry criticized Mitt Romney, one of the founding partners of private equity firm Bain Capital, as a "vulture capitalist".⁴ A Forbes article cites a notable columnist in Washington D.C., Byron York, in that poll data in key swing states finds that 47 percent of the public believe private equity firms only chase after profits by laying off employees, cutting benefits and pensions. According to the poll, only 38 percent of people believe private equity is contributing to the American economy and job growth.⁵

To validate public criticism and to test whether or not private equity LBOs create economic value, I investigate the post-LBO impact on corporate governance, employment, operations, and stakeholder wealth transfers using previous studies on LBOs, and adding my own observations gathered from a sample of 261 LBOs post-2008. Furthermore, by comparing pre-2008 studies to the evidence found in my post-2008 sample, the changing dynamics of private equity is analyzed.

³ <http://www.businessinsider.com/warren-buffett-on-conglomerates-and-private-equity-2015-2>

⁴ https://www.washingtonpost.com/blogs/election-2012/post/rick-perry-doubles-down-on-vulture-capitalist-criticism-of-mitt-romney/2012/01/11/gIQAziWqqP_blog.html?utm_term=.365fcb79bba4

⁵ <https://www.forbes.com/sites/nathanvardi/2012/06/08/the-obama-romney-war-over-private-equity-is-just-beginning/#293ff829224c>

II. Extant Literature Review

2.1 Corporate Governance

Leveraged buyouts typically result in an increased equity stake of management (12.8 percent ownership by managers on average), an increased amount of debt secured against buyout companies' future cash flows and assets, and more intense scrutiny on corporate activities by private equity ownership (Guo *et al.*, 2011). The current generally accepted hypothesis on the corporate governance of LBO firms is that private equity involvement in corporate decisions reduce agency problems. Agency costs in a publicly-traded company arise when managers (principals) make corporate decisions that are contrary to public stockholders' (agents) interest (Jensen and Meckling, 1976). Pindur (2007) identifies four agency issues in publicly traded companies: (1) without incentives, managers' effort to maximize outside equity holders' wealth creation is limited, (2) managers' pursuit of "perks" such as private jets, luxurious company cars, office furniture, art work, etc. will reduce shareholder value, (3) managers tend to be more risk-averse especially for low leveraged firms as there are lower incentives for risk taking, and thus, (4) managers tend to shy away from investing in new projects, causing the "underinvestment problem" of Myers (1977). The collapse of Enron in 2001 and WorldCom in 2002 are extreme examples of agency costs.

Because managers are incentivized to make self-centered corporate decisions, the Board of Directors fulfills an internal corporate governance function to protect public shareholders' interests. If handled correctly, this corporate governance function provides a powerful checks and balance between managers and stockholders thereby ensuring the firm is more effective and value maximizing to all stakeholders. However, such theory is only true in an ideal world. If we were living in that ideal world, Enron, Arthur Andersen, and Lehman Brothers would still exist. This is

the reason why Amess and Wright (2012) argue that LBO governance is more effective than the governance structure of publicly traded companies. They reason that a Board of Directors appointed by private equity owners enable closer corporate monitoring on TargetCo's corporate activities. PE-led Board of Directors (holding 50 percent of seats on average according to Guo *et al.*, 2011) also heavily influence TargetCo managers to maximize profits, which is also the managers' best interest due to their increased equity stake. Kaplan (1989), Jensen and Murphy (1990), and Jensen (2010) provide empirical evidence in that following an LBO, the typical diversified companies' CEO Pay/Performance Sensitivity of \$3.25 per \$1,000 change in equity value sharply increases to a \$64 per \$1,000 change. Their studies conclude that for every \$100 million increase in firm's equity value, a CEO's Pay/Performance bonus jumps to \$6.4 million from \$325,000. Likewise, for the obvious reasons, private equity firms also have substantial financial incentives when TargetCo's equity value increases since they can sell the business at a higher valuation and realize a greater internal rate of return (IRR) following an LBO exit.

In conclusion, when the financial incentives of managers and a PE-appointed Board of Directors are aligned, this provides more effective corporate governance and reduces agency problems (Jensen 1986; Thompson and Wright 1995; Amess and Wright 2012). Kaplan (1989) concludes that managers' effort to maximize operating efficiency (by eliminating unnecessary perks and wasteful capital expenditures) result in more robust cash flows available to service LBO debt and creates value (operating efficiency following an LBO will be discussed more in section 2.3 Operation). Finally, LBO governance mechanisms resolve Pindur's (2007) four agency issues typically found in publicly traded companies, and dismiss public criticism of "LBOs are value destroying" in terms of corporate governance.

2.2 Employment

One of the most heavily criticized aspects of the private equity LBO is the resulting post-deal corporate restructuring, which involves personnel reductions and cuts in compensation (Shleifer and Summers, 1988). It is important to note that previous studies have shown it is more common for privately-held companies to enter into corporate restructuring as private owners do not have to worry about public disclosure and more extensive media coverage, which ultimately results in a more volatile stock price in the case of publicly-traded firms (Amess and Wright, 2012). It is also more likely for LBO companies to enter into corporate restructuring as private equity firms commonly screen targets based on restructuring opportunities. In other words, ideal LBO targets have divestable assets (Seth and Easterwood, 1993; Wiersema and Liebeskind, 1995; Amess and Wright, 2012).

While dislocation of assets (including disposure of human capital assets) during corporate restructuring is inevitable, it is necessary to investigate and determine if such layoffs help LBO companies create long-term value. Unlike “white-collar” sophisticated investors and C-level executives, the life impact on less well-off employees following a plant closure, etc. is greater. In addition, Jones and Hunt (1991) criticize that retained employees tend to experience increased pressure to perform at a higher level leading to psychological stress and demoralization post-LBO. They go on and say changes of ownership through Going to Private (GTP) transactions also extend risks to suppliers, customers, and retired employees as it is possible that new owners abandon pre-existing supply contracts, warranty claims, and pension obligations. In addition, mass layoffs and plant closures may transfer losses to communities and local governments as dropped local tax revenue directly affects infrastructure around the corporate plant, such as roads, schools, and local

businesses. Considering these claims, negative public/academia criticism of LBO layoffs is understandable.

However, Amess' and Wright's (2012) findings are counter to Jones' and Hunt's (1991) in that, private equity firms are more likely to target firms with restructuring opportunities and those with excess staffing (Williams, 1964). Thus, an LBO provides a strategic opportunity to decrease TargetCo's employment to an optimal level (Jensen, 1989), which creates incentives for managers by conserving cash to service the incremental debt. The argument is that downsizing employment levels is necessary to enhance operating efficiency (see the empirical studies on operating efficiency performed by Kaplan, 1989) and inside management cannot easily handle this for fear of increased stock price volatility when the restructuring becomes public (Amess and Wright, 2012). In essence, the LBO allows managers to "pull the trigger" and finally execute a downsizing needed to be done. After a successful turnaround, private equity owners are able to exit the LBO with optimal employment levels. In his LBO samples, Kaplan's (1989) studies show that the median changes in employment involving asset sales/divestitures was only -0.9 percent from 1980-1986. Kaplan (1989) also found an increase of 4.9 percent in employment for LBOs that do not involve divestitures.

Operating efficiency is also the reason why even large publicly traded corporations divest non-core divisions/assets that distract managers' focus. This is the reason why it is more likely for LBOs of large corporations to engage in larger scaled divestiture and more sizeable employee layoffs. On the other hand, smaller scale LBOs incentivize the firm to hire more employees, rather than dismissing them in order to exploit growth opportunities as smaller companies do not typically have non-core divisions that diminish managers' discipline level (Wright *et al.*, 2000, 2001; Meuleman *et al.*, 2009). The argument of decreased employee morale and increased pressure

lacks empirical evidence. In addition, no empirical studies exist on wage cuts following an LBO due to difficulties in data collection.

2.3 Operation

As discussed in section 2.1 Corporate Governance on reductions in agency problems, higher leverage creates more performance incentives for managers following an LBO and provides effective internal corporate governance. This more enhanced governance structure should lead to a more efficient operation. Indeed, Kaplan (1989) estimates that the market value of firms increased 96 percent on average and 77 percent in median (adjusted for market returns) from two months before the LBO announcement to LBO exit, primarily due to increases in operating efficiency. His study shows that 48 out of 76 buyouts between 1980 and 1986 experienced an average 24 percent increase in operating income three years after the buyout. Furthermore, the median change in net cash flow (change in operating income minus capital expenditures) measured against the pre-LBO level was 22.0 percent in year 1, 43.1 percent in year 2, and 80.5 percent in year 3.

Supporting Kaplan's (1989) result, Smith (1990) also observes a noticeable growth in operating income and net cash flows in her 58 buyouts from 1977 to 1986, after adjusting for industry growth. Her study also finds improvements in profit margin, sales per employee (median increase of 27 percent), and working capital such as inventory turnover and receivable collections. Smith (1990) also notes that these improvements in operating metrics were not present before the buyout, and thus are attained as a result of the buyout.

A study employing a more recent LBO sample (94 deals up to 2005) by Guo *et al.* (2011) also suggests improvement in operating performance and shareholder value. They find a positive

correlation of these improvements in operating performance with cash flow improvements from robust tax shields, reduced agency costs, more effective corporate monitoring by private equity firms, better management incentives, and more disciplined corporate activities and cash flow control due to higher leverage. Guo *et al.* (2011) also find that “monitoring” fees paid to private equity ownership did not significantly impact the company’s operating cash flow or other operating efficiency measures. This contradicts the public’s view that private equity firms “suck the blood out of the company” by collecting excessive management fees. Smith (1990) finds no evidence of delays in payments to suppliers, contradicting Jones’ and Hunt’s (1991) assertion of risks transferred to suppliers which was mentioned earlier in this paper. Smith’s (1990) study does not find any evidence of a correlation between operating efficiency improvements and employee layoffs, reductions in investment, advertising, or property, plant and equipment.⁶ But rather, she, as well as Guo *et al.* (2011), concludes that managers’ readjustment of working capital and a better incentive structure are the primary evidence of improvements in operations. This, again, further supports the hypothesis of LBO value creation through more effective corporate governance (Jensen, 2010) and active managers (Kaplan, 1989).

III. Data Construction

3.1 Sample Collection and Criteria

When investigating modern leveraged buyouts, there is a limitation to the previous post buyout studies cited in the earlier sections, such as Kaplan’s (1989) study from 1980 to 1985, Smith’s (1990) buyouts between 1977 to 1986, and Amess’ and Wright’s (2012) sample between 1993 to 2004. These studies were performed on buyouts during phases 1, 2 and 3 of the private equity

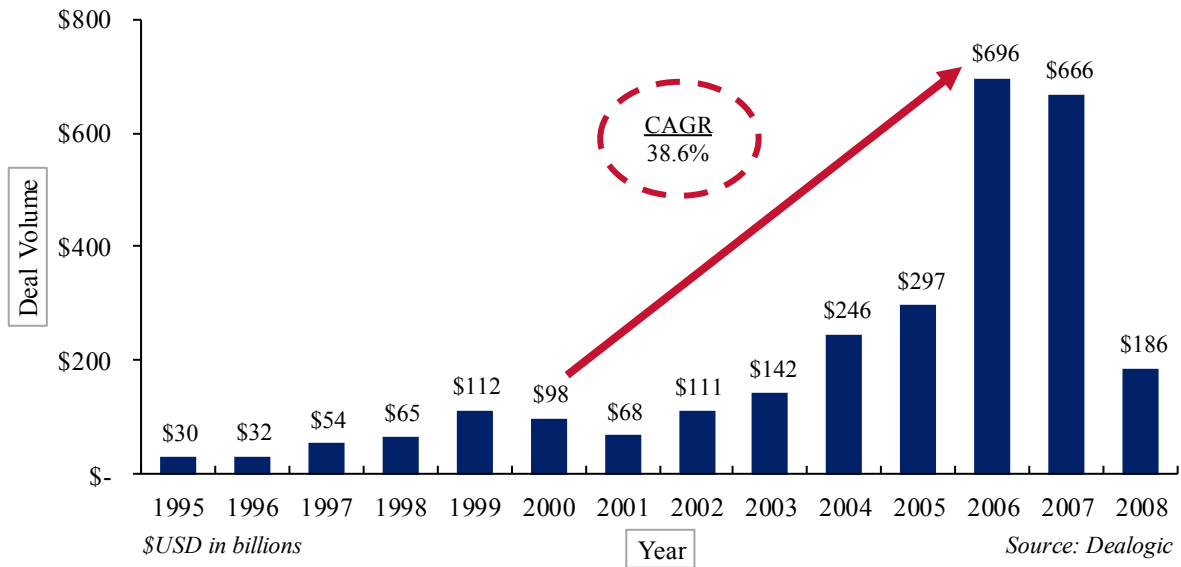
⁶ See Smith (1990) for detailed sample analysis

industry development. The phase 1 of private equity development is from 1970 to 1990, when some of today's biggest private equity firms were established. For example, KKR, Blackstone, Carlyle, and Bain Capital were founded during this period. Along with the explosive growth in the high yield credit market led by "junk bond king" Michael Milken and his investment bank Drexel Burham Lambert ("Drexel"), the LBO market flourished in the late 1980s. Phase 1 of PE development decelerated with the savings and loan crisis, as well as Drexel's bankruptcy in 1990 which negatively impacted the high yield credit market. Phase 2 is from 1990 to 2000, and ended with another disruption of financial markets following the dot-com bubble bust. Firms like Apollo, TPG, Ares, Silver Lake, and Cerberus Capital Management were founded during this period. After the U.S. economic recovery from the dot-com crash and 9/11 attacks, the golden era for private equity (phase 3) commenced. During this era, deal volume, leverage ratios, and raised capital were at all-time highs along with the development of the collateralized debt obligation (CDO) and collateralized loan obligation (CLO) markets, which allowed private equity companies to secure cheap, abundant LBO financing. See Figure I and Figure II for private equity development over time.

My data was collected from deals that were completed after 2008 due to the dynamics of today's LBO market which is materially different from that of phase 1, phase 2, and phase 3, during which the previous studies were investigated. Unlike the pre-2008 era, banks are now heavily regulated under the Dodd-Frank Act of 2010, making lending activities on risky deals more difficult. This results in buyout firms putting more equity in (more skin in the game) to acquire businesses. Valuation multiples have gone up as there are many more bidders from newly started private equity firms with increasing dry powder.

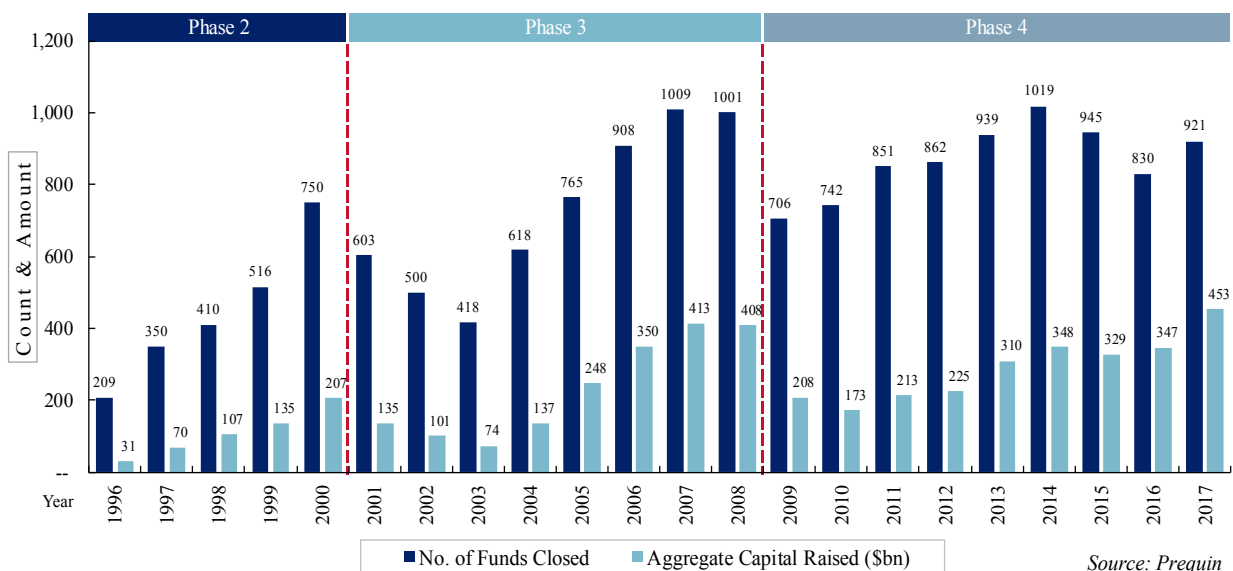
At the same time, the stock market has recovered from the 2008-2009 low point. In fact, the stock market has reached a series of new highs with an increased investor risk-appetite resulting from today's low rate environment, making companies more expensive to acquire (although such a low rate environment has helped private equity fund raising as institutional investors have adjusted their capital allocation into higher returning alternatives: see Figure II and Figure III). Finally, higher equity contribution and an increased competition in acquisition bidding have forced private equity companies to be very disciplined and strategic in order to achieve high IRRs that used to be more attainable during phase 1 and phase 2. Figure IV exhibits the lower IRR statistics since 1992. Using FactSet's MergerMetrics and the Bloomberg Terminal's M&A database, I initially collected 261 deals involving U.S. publicly-traded targets from 2008 to 2017. I excluded terminated and pending deals, and LBOs with a total transaction value of less than \$100 million. Included in the sample are 10 deals that were announced earlier but completed in 2008 (Figure V reports buyout counts and deal volume by year for LBOs over 2008 to 2017). Apollo, AXA, and TPG's joint \$27 billion buyout of hotel/casino giant Caesar Entertainment, as well as Bain Capital and Thomas H. Lee's joint \$25 billion buyout of iHeartCommunications, are two examples.

Figure I: Global Buyout Deal Volume



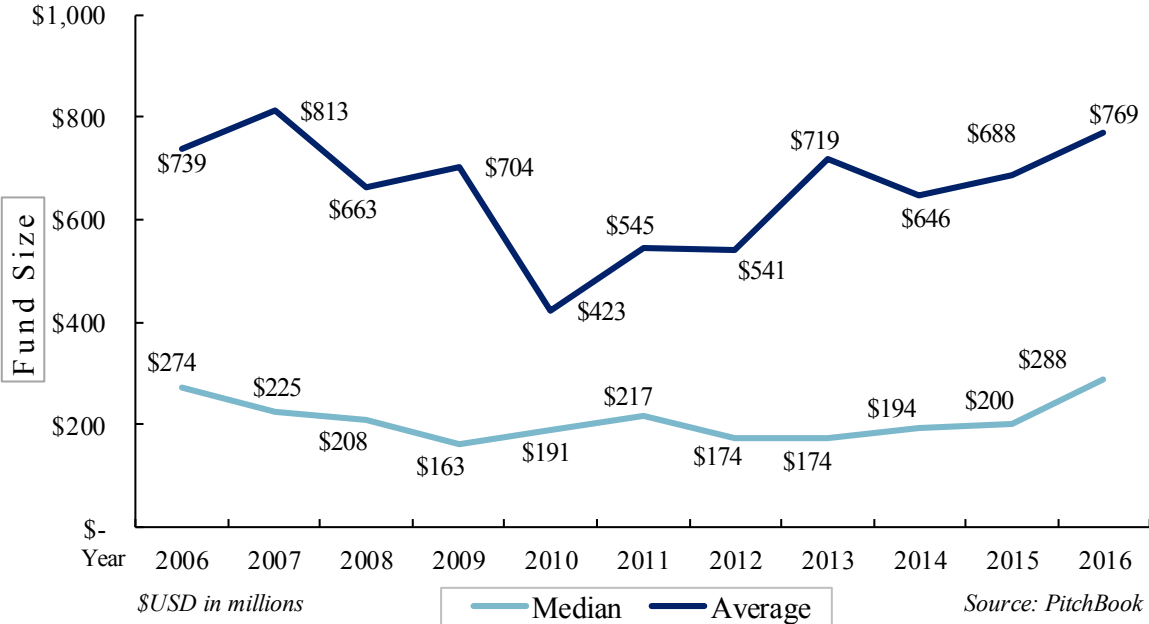
Note: From 1995 to 1999, a steady growth in global buyout deal volume is observed (phase 2). After two consecutive drops during the 2000-2001 recession from the tech bubble bust and 9/11 attacks, deal volume grew rapidly until 2007 (phase 3), followed by a steep decline in 2008.

Figure II: Global Private Equity Fundraising



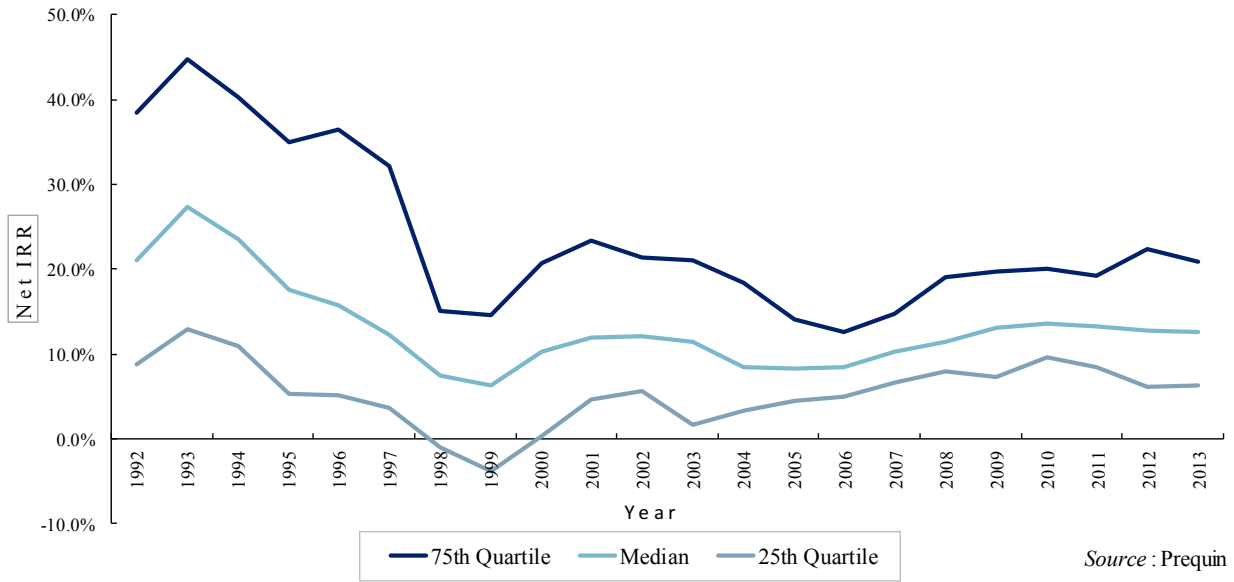
Note: Global private equity fundraising statistics show a similar trend to those reported in Figure I. The pattern of a boom in private equity capital raising during economic recoveries following recessions confirms that the cycle of private equity is positively correlated to the economy.

Figure III: Private Equity Fund Size



Note: Figure III shows an upward sloping PE fund size following the 2008-2009 crisis. Even though net-IRRs are flattening after 2008 (see Figure IV) and are substantially lower than the returns achieved during 1990s (phase 2), this upward slope in PE fund size explains a constant demand of private equity investment. This phenomenon may be explained by lower yielding investment-grade bonds and U.S. Treasuries, attracting insurance companies and pension funds seeking higher return.

Figure IV: U.S. Private Equity Net-IRR Historicals



Note: Figure IV shows historical rates of return that U.S. private equity achieved from buyout investments.

3.2 Pre-buyout data

Since I limit sample LBOs to publicly traded companies listed on the United States stock exchanges, pre-buyout financials and acquisition terms were gathered from annual/quarterly reports (10-K/10-Q), proxies (8-K), and merger agreements (DEF14A) which also include fairness opinion documents and credit agreements.

3.3 Post-buyout data

While gathering non-performance statistics such as the acquisition offer price, financing, and exit information on my sample was straightforward as they could be pulled from the Bloomberg Terminal and FactSet, collecting firm fundamentals during the private period was challenging. Despite limited public data on private firms, there were two approaches I took to search for private period financials. My first approach was to identify buyout targets that used a public offering as the means for an LBO exit (re-IPO). There were 6 re-IPOs, of which 5 provided enough data to measure the abnormal performance following the buyout. The historical financial data was found on IPO prospectuses (S-1). One re-IPO firm (Performance Food Group, PFGC-US) was taken public after eight years of private holding. Its IPO prospectus only provides historical financials for the previous 5 years. Therefore, I was not able to find its financials for the first three years after the buyout. The second approach was to identify buyout targets that offer publicly traded bonds. There were 19 additional companies, of which 10 are still owned by the original sponsor, which disclosed financials as they have publicly traded debt and filed 10Ks with bond prospectuses. The remaining 236 companies did not disclose any financials because they remain private on both equity and debt side. The remaining firms' bonds were issued through private placement where only the group (rather than public) buying these bonds was provided detailed financial information.

IV. Statistical Findings

Table 1 presents summary statistics on selected sample buyout firms. In comparison with the average 70 percent debt to transaction value ratio (30 percent equity contribution) peak in 2007⁷, the median leverage as a fraction of total transaction value is 63.5 percent. This finding is important to modern LBO studies in that private equity sponsors are paying more cash up front and are no longer leveraging up as much as they used to during phase 1, phase 2, and phase 3. One possible explanation for this observation is that the Dodd-Frank Act of 2010 prohibits banks from financing high levered deals as they are riskier and more speculative. Therefore, private equity firms' ability to maximize leverage (such as a 97 percent debt to transaction value ratio in the case of KKR's buyout of Safeway in 1986) has become limited. Another possible explanation is that overall decrease in net-IRR across the industry (see Figure IV) does not induce private equity firms to structure 25~35 percent IRR LBOs that were once common during phase 1 and phase 2, which resulted from high leverage (think of return sensitivity on hedge funds' 2x leverage vs. 3x leverage). The median premium paid to average price of the previous 1 day, 1 month, 3 months, and 1 year are 21.2, 24.8, 27.4, and 31.0 percent respectively. This result supports a view that a significant pre-buyout shareholder gain is realized upon leveraged buyouts as documented by DeAngelo *et al.* (1984), Kosedag, Mehran, and Qian (2009), and Jensen (2010).

I also note that the median transaction value to EBITDA multiple is 10.8x. The median post-buyout Debt/EBITDA ratio is 6.9x, up from a median 3.2x pre-buyout ratio. This equals a 117 percent nominal increase in debt. This increasing leverage ratio was expected as LBOs are mostly financed through debt. Current hypothesis is that M&A advisers (investment bankers) have financial

⁷ <https://www.reuters.com/article/marketo-equity/lpc-private-equity-firms-put-more-capital-less-debt-into-lbos-idUSL1N1B70MD>

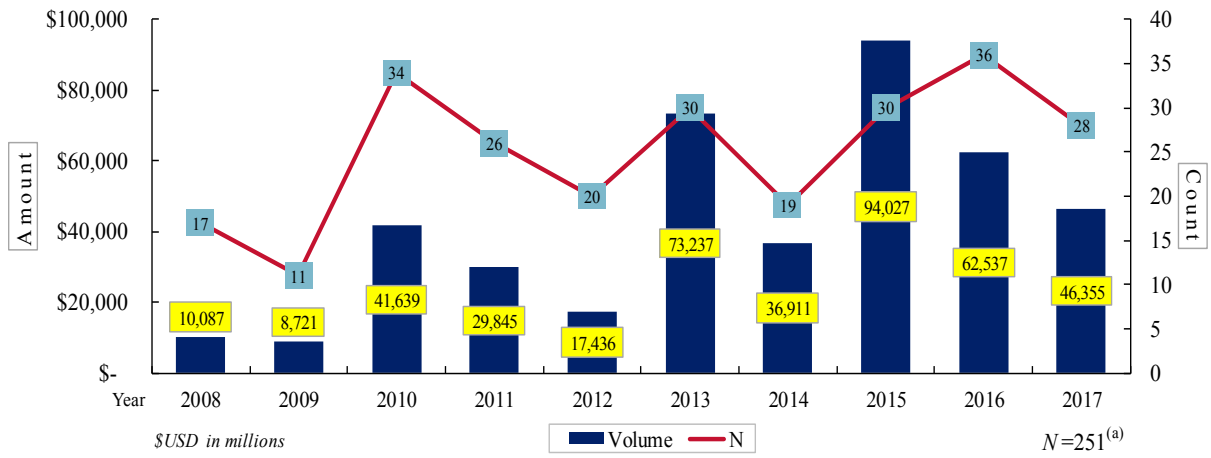
incentives to support the LBO since they can also offer debt financing (“staple financing”), allowing them to collect both advisory fees and financing fees. I confirm that about 70 percent of investment banks advising on control sample deals were also involved in LBO financing.

Table 1: Summary Statistics of Phase 4 LBOs

Variable	Mean	Median	Std. dev.	<i>N</i>
Leverage ^(a)	63.3%	63.5%	18.5%	160
	25th Quartile	Median	75th Quartile	<i>N</i>
Premium (%) to ^(b)				
1-Day Avg Price	10.1%	21.2%	36.8%	226
1-Month Avg Price	13.0%	24.8%	37.9%	226
3-Month Avg Price	16.0%	27.4%	41.1%	226
1-Year Avg Price	15.0%	31.0%	46.0%	226
TV / EBITDA ^(c)	7.8x	10.8x	16.2x	214
Debt / EBITDA				
Pre-buyout	1.2x	3.2x	5.2x	150
Post-buyout	5.1x	6.9x	10.5x	150
<i>Change in Debt</i>	338%	117%	101%	
			Yes	<i>N</i>
Deal Adviser = Lender, Book Runner ^(d)			72.5%	149

- (a) I excluded deals that do not provide financing information which reduces the sample size to 160. When collecting financing information, I added revolving credit facilities regardless of them being actually taken out due to difficulties of tracking down each credit activity. It is appropriate to add these revolving credit facilities since being approved for it means the sponsor was able to maximize leverage capacity for transaction financing as they could be drawn on at any time when liquidity is needed. Other than revolvers, I observed that multiple tranches of debt using term loans, bridge loans, senior unsecured notes, and subordinated notes were common debt securities used in LBO financing.
- (b) I initially excluded 10 deals that were announced earlier than 2008 since offers were made prior to the Crisis. Among the remaining 251 deals, I eliminated buyouts that involved hedge funds or financial holding companies doing private equity like leveraged acquisitions (Bloomberg Terminal misleadingly assigns deal attribute as “buyout”). I also excluded two deals that were “remaining stake buyouts” as minority (or majority) investments were already made prior to the control date range.
- (c) 37 deals do not provide TV/EBITDA multiple data. Transaction value (TV) equals offered equity value plus net debt. EBITDA represents trailing twelve-month (TTM) value.
- (d) Among 160 deals that provide financing information, 149 deals disclosed financing agents, lenders, and book runners. See Appendix B for league table information.

Figure V: Phase 4 LBO Deal Volume & Count Statistics



(a) Excludes 10 deals that were completed after 2008 but announced earlier than 2008

Note: Figure V shows deal volume and deal count statistics on 251 buyouts from fiscal year 2008 to 2017. A substantial increase in LBO activities following the 2008-2009 crisis is observed.

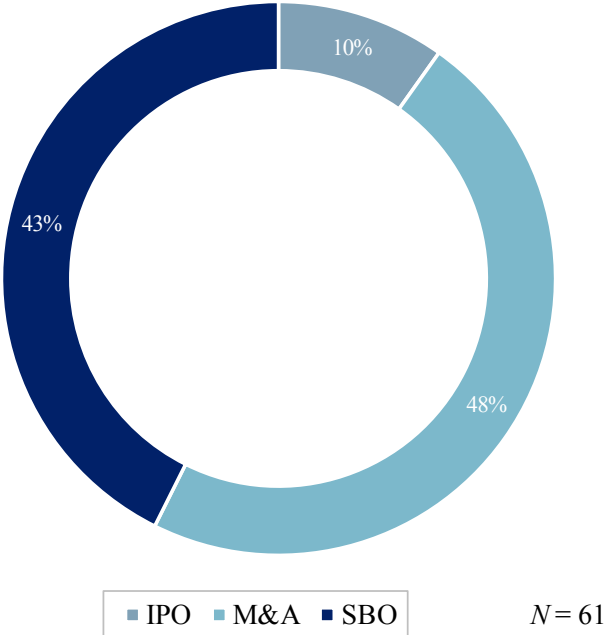
Table 2 reports exit statistics on 234 sample firms. From 2008 and 2009, there are 20 buyouts, of which 5 are still held by their original buyer. Among 105 buyouts completed during 2010 to 2013, 42 deals underwent an SBO, IPO, or M&A. In other words, 60 percent of deals are still held by their original buyer. For more recent deals that were completed between 2014 and 2017, only 4 target firms exited the LBO, and the remaining 105 firms are still held private. Figure VI shows a statistical distribution of sponsor exit on 61 deals. It is observed that the IPO, at only 10 percent, was the least preferred option for private equities to exit. On the other hand, a sale of company was a dominant exit strategy with M&A and SBO being almost evenly split (48 and 43 percent each).

Table 1: Phase 4 LBO Exit Statistics of Control Samples

Year	IPO	M&A	SBO	Still Held	<i>N</i>
2008	3	3	6	1	13
2009	0	3	0	4	7
2010	1	9	8	14	32
2011	1	6	3	15	25
2012	0	3	4	13	20
2013	1	4	2	21	28
2014	0	0	3	16	19
2015	0	1	0	27	28
2016	0	0	0	34	34
2017	0	0	0	28	28
Total	6	29	26	173	234 ^(a)

- (a) From initial 261 samples, I eliminated 27 deals involving hedge funds and financial holding companies mimicking private equity style buyout because their investment motivation and exit strategies are materially different from traditional buyout companies.

Figure VI: Phase 4 LBO Exit Type Distribution



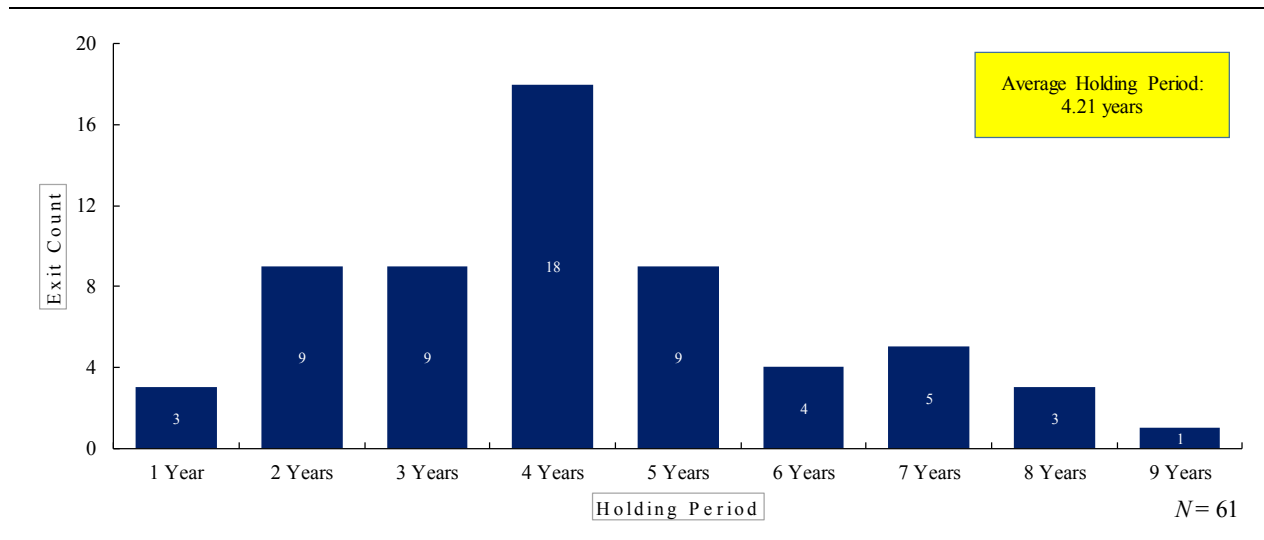
Note: Sponsor exit data on sample LBOs shows that the IPO is the least preferred exit strategy for private equity firms.

Figure VII displays the weighted average holding period statistics on 61 sample RLBO deals. On average, private equity firms held target companies private for 4.21 years before they exited with a re-IPO or a sale. The weighted average holding period on 173 still privately held companies (as of January 2018) is 3.97 years. Table 3 shows entry transaction value, exit transaction value (TV), and simple dollar return statistics on 40 RLBOs where adequate information was available. Median entry TV and exit TV on these 40 control samples are \$616 million and \$1,310 million each. This represents an exit/entry TV multiple of 2.1x, nominally. Assuming a 5 year holding period, this implies a 21 percent IRR (this is not equal to a sponsor's equity IRR). I broke out these statistics for firms that were sold to public buyers (25 sample size) and firms that were sold to another financial sponsors (15 sample size). For 25 M&A exit deals, median entry TV and exit TV are \$491 million and \$1,250 million each, or 2.5x nominal return multiple. Assuming a 5 year holding period, this implies a 26 percent IRR (not equal to a sponsor equity IRR). For 15 SBO exit deals, median entry TV and exit TV are \$744 million and \$1,500 million each, or a 2.0x nominal return multiple. Assuming a 5 year holding period, this implies a 19 percent IRR (this is not a sponsor's equity IRR). Based on these results, selling target firms to public buyers (M&A) delivered a 0.5x higher nominal dollar return and a 7 percent greater IRR. One possible explanation is that public buyers (normal companies) tend to bid a higher offer price due to synergy opportunities. It is important to note that the nominal dollar return (exit/entry TV multiple) and implied IRR here (not shown on the table) are only intended to demonstrate how significantly more expensive sample firms were able to be re-sold.

There were 15 deals that provided both entry TV/EBITDA and exit TV/EBITDA multiple data. I observe that 80 percent of the sample deals were able to re-sell at a higher TV/EBITDA valuation (multiple expansion) than the multiple that was originally paid at the time of buyout. This supports

Datta, Gruskin, and Iskandar-Datta (2013) in that more effective private equity management leads to a higher valuation on RLBO firms.

Figure VII: Sponsor Holding Period Statistics on Phase 4 LBOs



Note: On average, sample LBO targets were held 4.21 years before they went through exit.

Table 2: Phase 4 LBO Exit Deal Terms and Sponsor Return Analysis

	25th Quartile	Median	75th Quartile	N
Transaction Value, aggregate				
Entry	\$363	\$616	\$1,014	40
Exit	\$734	\$1,310	\$2,325	40
<i>Exit / Entry Multiple</i> ^(a)	2.0x	2.1x	2.3x	
Transaction Value, M&A exit				
Entry	\$235	\$491	\$1,046	25
Exit	\$500	\$1,250	\$2,450	25
<i>Exit / Entry Multiple</i> ^(a)	2.1x	2.5x	2.3x	
Transaction Value, SBO exit				
Entry	\$527	\$744	\$939	15
Exit	\$1,170	\$1,500	\$2,050	15
<i>Exit / Entry Multiple</i> ^(a)	2.2x	2.0x	2.2x	
<i>\$USD in millions</i>			Yes	N
TV/EBITDA Multiple Expansion			80.0%	15

(a) The Exit/Entry Multiple is calculated by dividing each firms' nominal exit transaction value by nominal entry transaction value. This does not take into account the time value money or inflation. This is not intended to be used as a proxy for sponsor's multiple on invested capital (MOIC).

V. Empirical Analysis

5.1 Variables and Methodology

Part I: Operating Efficiency

- A. EBITDA margin: The EBITDA margin is calculated by taking EBITDA as a percentage of total sales. EBITDA equals earnings before interest, taxes, depreciation, and amortization. Essentially it is an operating income (EBIT) plus depreciation and amortization, which are not cash flows. I use the EBITDA margin instead of the EBIT margin as EBITDA is a more reliable proxy of firms' true cash flow from operations and is not biased by inconsistent accounting treatments on property, plant, & equipment (PP&E) and intangible assets across sample firms.
- B. Profit margin: Profit margin is calculated by taking net income as a percentage of total sales. Since dividends that are paid to the equity ownership are determined by target firm's net income, profit margin is an important measure for potential equity return efficiency via dividends during the private period. Note that regardless of dividends, private equity still can achieve a high IRR through growth in EBITDA and a corresponding multiple expansion.
- C. Return on Assets (ROA): Return on Assets is calculated by taking net income as a percentage of total assets. This measure shows how efficiently assets are deployed to generate net income to equity holders. This measure is limited in its usefulness in that TargetCo's assets are usually written up at the time of acquisition, affecting the firm's deferred tax assets, depreciation, and amortization.
- D. Sales per Employee: This statistic is calculated by dividing total sales by total employees. The primary purpose of this ratio is to measure the efficiency of personnel utilization. Since

employment reduction is a commonly discussed topic in LBOs, it is important to capture how changes in employment level can affect the firm's top-line performance.

Part II: Cost Control

- A. CapEx / Sales: By taking capital expenditures as a percentage of total sales, the firm's investment policy is measured.
- B. R&D / Sales: Dividing research and development expenses by total sales measures the level of investment in product innovation.
- C. SG&A / Sales: Selling, general, and administrative expenses (SG&A) is an important line item on the income statement. Generally, it measures a firm's spending on non-production related costs including salaries of salespeople, managers, administrative staffs, advertising/marketing, office supplies, rent, utilities, insurance, licenses, and so on. By taking these costs as a percentage of total sales, the effectiveness of cost-cutting (and therefore a higher operating margin) and the effectiveness of restructuring activities can be measured. SG&A analysis is also common in the case of mergers and acquisitions since significant cost synergies are often possible.
- D. Employee Headcount (implied): By calculating year to year percentage changes in implied employee headcount, the post-LBO impact on employment can be measured. Because of difficulties in gathering the exact annual number of staff that are hired/terminated, implied employee headcount is derived by dividing sales by sales per employee (this data is available on FactSet).

I collected these ratios ("control variables") for the following periods: one year before buyout (-1), buyout year (0), one year after buyout (+1), two years after buyout (+2), and three years after buyout (+3). As described in section 3.3, the majority of the LBOs were either still held or went

through an SBO, making it difficult to gather financial data to calculate control variables. Among my initial sample of 261 buyouts, only 24 targets provided detailed financial information because they filed an IPO prospectus (S-1) or have publicly traded debt. To analyze industry-adjusted performance on these 24 deals, I identified three to five publicly traded peers (“public comparables”) via FactSet (108 companies in total) for each deal in order to collect industry data on my control variables. I intentionally left out the Revenue & EBITDA growth of LBO firms as one of my control variables as most LBO sample firms go through some sort of asset sales after the buyout. This will depress overall earnings growth nominally, and adjusting for implied WholeCo revenue by tracking down divested assets’ financial performance is not practical.

First, I calculated the median value of my control variables using each target’s corresponding public peers. For margins that are negative due to a sub-zero EBITDA and net income, I assigned a value of 0 percent. If data is not available for certain year(s), I assign a “--” (hard coded value) that ensures that Excel functions do not compute median statistics.

Second, I compute the difference between year 0 control variables and year -1. This provides final year performance of target companies before they were taken private. I also subtract control variables from year +1 to 0, +2 to 0, and +3 to 0. Therefore, year 1, year 2, and year 3 performance compared to year 0 is measured. These calculations were done on both the control sample companies and their respective public comparables.

Third, I compared each sample firm’s percentage change in control variables during -1 to 0, 0 to +1, 0 to +2, and 0 to +3 to the five public comparables. Accordingly, industry-adjusted abnormal performance during the above periods on each of the 24 control sample firms is measured. I follow the methodology of DeAngelo (1988), Healy and Palepu (1988), and Kaplan (1989) used in their empirical studies of the phase 1 (~1990) buyout development.

Finally, I calculated the median of 24 industry-adjusted abnormal performance measured in step three. I note that in order to appropriately adjust by industry, I compute the median difference between sample and control on each deal as opposed to subtracting median changes in control firms to the corresponding aggregate median changes sample firms. The latter method will provide an inaccurate measure as it is likely that a sample target firm in the industrial sector is partially compared to the performance of all other companies in different industries that were originally meant to be compared to their respective sample targets.

5.2 Analysis Results

Table 4 reports the results of *Part I: Operating Efficiency*. Panel A shows that after a 5.4 percent decline in industry-adjusted EBITDA margin during the year before buyout, LBO target companies experienced abnormal outperformance compared to their industry peers of about 3.5, 0.6, and 2.4 percent in post-buyout year 1, year 2, and year 3, each. This finding is similar to Kaplan's (1989) findings on his 1979 to 1985 sample. Kaplan (1989) found that after a sub-industry level EBITDA margin during the -1 to 0 period, LBO target companies' operating income margin improve and surpass their public peers' margin post-buyout. This finding is also consistent with Smith (1990) and Guo *et. al* (2011).

On the other hand, Panel B (profit margin) reports a different result. Although not significant, LBO target companies' profit margin fell in comparison with their corresponding public peers during year 1 and year 2 by about 0.9 percent and 1.5 percent respectively (industry-adjusted). The year 3 results are more in-line with the industry level. One explanation is that incremental interest expense from LBO financing debt does not offset post-buyout incremental sales or cost savings, resulting in a profit margin decrease. A decrease in net income is most likely an explanation for

ROA underperformance to industry (see Table 4, Panel C). Only a few companies provided sales per employee information. Year 1, year 2, and year 3 industry-adjusted change in sales per employee is -14.7, -3.1, and 2.3 percent. The first year's sharp drop is heavily skewed by private equity firm Apax Partners buyout of Acelity, which declined 24.7 percent. The median change excluding that sample is -4.7 percent. It is observed that after abnormal underperformance in sales per employee over the first two years post-buyout, it slightly outperformed its industry peers in year 3. However, this data lacks credibility as very few companies disclosed sales per employee data, making the sample size too small.

Table 4: Post-LBO Impact on Operating Efficiency

I. Operating Efficiency	From year <i>i</i> to year <i>j</i>			
	-1 to 0	0 to +1	0 to +2	0 to +3
A. EBITDA Margin	<i>N</i> =19	<i>N</i> =21	<i>N</i> =18	<i>N</i> =15
Percentage change	-4.1%	2.3%	-0.8%	3.4%
Industry adj. percentage change	-5.4%	3.5%	0.6%	2.4%
B. Profit Margin	<i>N</i> =19	<i>N</i> =21	<i>N</i> =18	<i>N</i> =15
Percentage change	-3.5%	-2.0%	-2.4%	-1.3%
Industry adj. percentage change	-3.1%	-0.9%	-1.5%	0.1%
C. Return on Assets ^(a)	<i>N</i> =18	<i>N</i> =19	<i>N</i> =16	<i>N</i> =13
Percentage change	-2.6%	-2.1%	-2.2%	-2.2%
Industry adj. percentage change	-1.8%	-1.0%	-1.5%	-2.3%
D. Sales per Employee ^(b)	--	<i>N</i> =6	<i>N</i> =4	<i>N</i> =3
Percentage change	--	-3.3%	0.4%	-1.7%
Industry adj. percentage change	--	-14.7%	-3.1%	2.3%

(a) As reported on sample companies' balance sheet rather than fair market value of hard assets.

(b) Lacks credibility due to small sample size.

Note: Table 4 displays industry adjusted performance measure on sample firms' operations during buyout year -1 to 0, 0 to +1, 0 to +2, and 0 to +3.

Table 5 reports the results of *Part 2: Cost Control*. Panel A shows that the median industry-adjusted percentage changes on capital expenditures as a fraction of sales are essentially flat (0.0, 0.2, and -0.4 percent in year 1, year 2, and year 3). While the median percentage change for aggregate target samples (not adjusted for industry peers) shows a substantial drop in capital expenditures, public peers also decreased their spending on capital expenditures by a similar amount. This can be interpreted as buyout targets do not aggressively cut long term investment in order to service LBO debt as this will harm the firm's long term growth. Similarly, Rosenbaum and Pearl (2009) suggest that ideal LBO candidates do not require a significant amount of capital expenditures. It can be interpreted that private equities tend not to invest in companies requiring high capital expenditures since a substantial downsizing in asset investment cannot be achieved. In Panel B the R&D/Sales data availability is very limited since many sample firms do not split out R&D expense on the income statement. With limited information, I observe that the unadjusted and industry-adjusted change in median R&D/Sales is essentially flat in all years. Datta, Gruskin, and Iskandar-Datta (2013) also find no evidence of reductions in R&D for their RLBO sample. In Panel C the SG&A/Sales data is more reliable in that a higher percentage of firms provided SG&A data. In the final year before buyout the median change in SG&A/Sales was +4.3 percent unadjusted and +2.9 percent industry-adjusted. This shows that before buyout, target firms were spending more on operating expenses than what their peers were spending. In year 1, year 2, and year 3 following the buyout, target firms decreased their SG&A/Sales to 2.9, 3.3, and 0.0 percent (industry-adjusted) each. This shows that during the first two years, target firms were better able to control their operating expenses which eventually become in-line with their public peers in year 3. This finding is consistent with Jensen (2010) in that LBOs provide better management discipline on costs.

Panel D measures changes in employment. In year 1 and year 2, industry-adjusted employee reductions were 1.6 percent and 1.3 percent. In year 3 however, it is observed that staffing was expanded 1.4 percent (industry-adjusted). This can be interpreted that after headcount adjustments to an optimal level (Williamson, 1964), operating efficiency is achieved (Datta, Gruskin, and Iskandar-Datta, 2013). As successful cost cuts in SG&A and the resulting EBITDA margin improvement are achieved during the first two years after buyout, target firms are able to hire employees for long-term growth. However, this finding may be skewed due to the small sample size. I was not able to find salary expenses per employee, pension, and benefits information for any of my sample companies. Therefore, Shleifer's and Summers' (1988) and Jones' and Hunt's (1991) claim of reduction in wage, pension, benefits as well as employee demoralization and increased pressure cannot be tested due to lack of empirical data.

Table 5: Post-LBO Impact on Cost Control Measure

II. Cost Control	From year <i>i</i> to year <i>j</i>			
	-1 to 0	0 to +1	0 to +2	0 to +3
A. CapEx / Sales	<i>N</i> =16	<i>N</i> =20	<i>N</i> =17	<i>N</i> =14
Percentage change	4.1%	-10.1%	-11.4%	-7.9%
Industry adj. percentage change	0.0%	0.0%	0.2%	-0.4%
B. R&D / Sales	<i>N</i> =8	<i>N</i> =10	<i>N</i> =9	<i>N</i> =9
Percentage change	0.0%	-0.1%	0.0%	0.0%
Industry adj. percentage change	0.1%	0.0%	0.0%	0.0%
C. SG&A / Sales	<i>N</i> =16	<i>N</i> =19	<i>N</i> =16	<i>N</i> =14
Percentage change	4.3%	-2.9%	-2.9%	-1.3%
Industry adj. percentage change	2.9%	-2.9%	-3.3%	0.0%
D. Employee Headcount (implied) ^(a)	--	<i>N</i> =6	<i>N</i> =4	<i>N</i> =3
Percentage change	--	-7.3%	-12.3%	4.5%
Industry adj. percentage change	--	-1.6%	-1.3%	1.4%

(a) By dividing sales by sales per employee (both data available on FactSet), implied employee headcount is derived.

Note: Table 5 displays industry adjusted performance measure on sample firms' cost spendings during buyout year -1 to 0, 0 to +1, 0 to +2, and 0 to +3.

Table 6 provides post-buyout leverage statistics during the private period. Panel A shows the industry-adjusted percentage change in free cash flows as a fraction of total sales. Free cash flow (FCF) is calculated in equation (1) as:

$$\text{FCF} = \text{EBIT} * (1 - \text{tax rate}) + \text{depreciation \& amortization} - \text{capital expenditures} - \text{changes in net working capital} \quad (1)$$

It is a metric that examines target companies' availability to pay down incremental debt raised to fund the LBO. Median industry-adjusted changes for companies that disclosed free cash flows are -2.4, -2.3, and -3.7 percent in year 1, year 2, and year 3. This finding suggests that within 3 years after buyout, sample companies were not able to start the de-levering process since free cash flows margin did not improve.

This is further evidenced by Panel B, Panel C, and Panel D which show median Debt/EBITDA, EBITDA/Interest Expenses, and Debt/Assets statistics during the first three years. Pre-buyout median Debt/EBITDA for 22 sample firms that disclosed sufficient information is 1.8x. After the buyout, this multiple increased to 5.6x. In year 1, year 2, and year 3, sample companies remained highly levered as median Debt/EBITDA for these periods are 4.7x, 4.8x, and 7.1x each. Similarly, pre-buyout median EBITDA/Interest Expenses is 9.5x. This means that for every \$100 million in EBITDA, total interest expenses are only \$11 million. Therefore, the higher the EBITDA/Interest ratio the better. However, median EBITDA/Interest Expenses multiples during year 0, year 1, year 2, and year 3 sharply drop as they are 3.0x, 1.7x, 2.1x, and 2.3x. This equals total interest expenses of \$33 million, \$58 million, \$48 million, and \$44 million spent on every \$100 million in EBITDA, compared to an \$11 million level a year before the buyout. The Debt/Assets ratio statistics also confirm that significant leverage that is being retained 3 years from the buyout. Median pre-buyout Debt/Assets is 29.0 percent. Following the buyout, it increases to 35.2, 44.8, 52.2, and 54.7 percent

in year 0, year 1, year 2, and year 3. Year 0 median Debt/Assets of 35.2 percent is lower than year 1, year 2, and year 3 median as Debt/Assets is calculated as the average of beginning fiscal year and ending fiscal year debt and asset balances. Therefore, the year -1 ending balance that is used as year 0 beginning balance brings down the year 0 Debt/Assets ratio. These findings are supportive to Datta's, Gruskin's, and Iskandar-Datta's (2013) study in that LBO firms remain highly levered with de-levering starting post-RLBO when ownership concentration declines. In addition, Datta, Gruksin, and Iskandar-Datta (2013) suggest that private equity firms are not necessarily motivated by firms' debt underutilization when screening buyout targets. My finding confirms their view in that my sample firms Leverage in year -1 (pre-buyout year) is higher compared to industry peers.

Table 6: Post-LBO Impact on Leverage

III. Leverage	From year <i>i</i> to year <i>j</i>				
	-1 to 0	0 to +1	0 to +2	0 to +3	
A. Free Cash Flow / Sales	<i>N</i> =16	<i>N</i> =19	<i>N</i> =16	<i>N</i> =13	
Percentage change	-4.6%	-1.7%	-2.8%	-3.8%	
Industry adj. percentage change	-1.3%	-2.4%	-2.3%	-3.7%	
	-1 ^(a)	0	+1	+2	
	+3				
B. Debt / EBITDA	<i>N</i> =22	<i>N</i> =19	<i>N</i> =22	<i>N</i> =20	<i>N</i> =17
Control median	1.8x	5.6x	4.7x	4.8x	7.1x
Public comparables median	1.2x	1.3x	1.7x	1.7x	1.9x
Unadj. abnormal leverage ^(b)	0.5x	4.3x	3.0x	3.1x	5.2x
C. EBITDA / Interest Expenses	<i>N</i> =19	<i>N</i> =21	<i>N</i> =24	<i>N</i> =20	<i>N</i> =17
Control median	9.5x	3.0x	1.7x	2.1x	2.3x
Public comparables median	12.2x	11.3x	12.2x	11.6x	13.5x
D. Debt / Assets ^(c)	<i>N</i> =22	<i>N</i> =19	<i>N</i> =22	<i>N</i> =20	<i>N</i> =17
Control median	29.0%	35.2%	44.8%	52.2%	54.7%
Public comparables median	17.2%	18.0%	18.7%	18.9%	23.3%

(a) Higher leverage on LBO targets compared to public peers a year prior to buyout is observed.

(b) Simply calculated as aggregate median on sample companies minus aggregate median on all companies used as public comparables. Therefore, it is industry unadjusted.

(c) As reported on sample companies' balance sheet rather than fair market value of hard assets.

VI. Conclusions

I investigate phase 4 private equity development and modern LBO characteristics by analyzing 261 deals completed between 2008 and 2017. It is an extensional and distinguishable study from existing research in that modern LBO markets have changed materially from the pre-2008 buyout boom era (most previous studies use pre-2008 samples). In contrast to LBOs that were done before 2008, leverage ratios on total transaction value are lower for phase 4 LBOs. This may result from a changing regulatory environment for investment banks which execute and finance LBOs. Nonetheless, investment banks are financially incentivized to complete LBOs as most of them act as an M&A adviser and an arranger for financing, collecting fees on both sides. Diminishing leverage ratios during phase 4 has forced private equity firms to use more of their own cash (equity) to take companies private through LBOs. Moreover, there are more private equity firms today than there were during phases 1~3, which means there are more dry powder chasing deals. As a result, private equity firms' sourcing and acquisition of companies at the lower price have become more competitive and difficult since there are more bidders driving up the valuation. Finally, lower leverage and higher acquisition prices have dragged down private equity's rate of return on LBOs compared to returns achieved during phases 1~3. I find that top quartile private equity companies' average IRR fell from 25.2 percent (1992~2007) to 20.2 percent (2008~2013). Similarly, the average multiple on invested capital (MOIC), which measures nominal cash return not taking into account the time value of money, fell from 2.3x (1992~2007) to 1.6x (2008~2013). However, lowering LBO returns does not necessarily result in diminishing demands on private equity investing. Since a steep drop in 2009, private equity fund-raising has grown at a 10.2 percent annual compound growth rate (CAGR). Fiscal 2017 fund-raising amounts were \$453 billion, which surpasses the \$413 billion peak in 2007. This strong demand may stem from institutional

investors that have become more risk-averse due to a historically low yield environment and poor performing hedge funds. These investors have long been major private equity limited partners in order to diversify their portfolios by getting exposure to multi-asset alternatives.

The literature on phases 1~3 LBOs suggest that private equity management provides more disciplinary effects on firm operations in order to service debt. In addition, better aligned financial incentives for managers provide more powerful corporate governance and motivation to maximize firm value. I hypothesize that LBO firms are likely to be even more disciplined with firm operation and value maximization since private equity sponsors now have to put up more equity in the transaction structure (shifting more risk from LBO creditors to private equity owners). Supporting the previous literature, my sample firms during phase 4 demonstrate noticeable improvements in cost-cutting and thus, EBITDA margins. These cost-cuts are mainly from selling, general, and administrative (SG&A) rather than capital expenditures and R&D. This means that LBO firms do not aggressively curtail investing activities in hard assets and product innovation as this will harm the firm's growth in the long-term. Negative changes in employee headcount is observed in the first two years following the buyout. Consequentially, SG&A margins improved during the same period on an industry-adjusted basis. Three years after the buyout, positive changes in employee headcount is observed while the EBITDA margin still improved in comparison to non-LBO firms. In conclusion, evidence found on phase 4 LBOs supports the evidence found on previous studies in that temporary reductions in staffing to an optimal level results in enhanced productivity and efficiency. When optimal employment and improvement in margin is achieved, firms hire more employees to exploit growth. This contradicts the ethical stigma and public criticism of a wealth transfer from employees to private equity owners in that temporary employment reductions are necessary for firm restructuring and more employees are hired once LBO firms become more

efficient through better corporate monitoring. This is value-creating to the economy in the long-term.

Leverage retention post-LBO is also an explanation for continuous efficiency improvements during the private period. I find that LBO firms remain highly levered and incur high interest expenses consistently throughout the private period. Datta, Gruskin, and Iskandar Datta (2013) suggest that LBO firms' deleverage starts after LBO is exited (RLBO). Therefore, LBO firms remain closely monitored (to service debt) and more efficient until private equity exits. I do not investigate post-RLBO firm performance under new ownership in this paper (and this is the area to be explored more when dealing with phase 4 samples). High interest payments associated with retention of leverage results in industry-adjusted underperformance on a net income basis (profit margin and return on assets). It is likely that cost savings on firm's operation do not offset high interest payments from incremental LBO debt. Although LBO firms underperform on a bottom-line level, valuation is normally quoted using an Enterprise Value to EBITDA multiple, which is a pre-interest earnings measure. Therefore, private equity companies are likely to focus on EBITDA growth and EV/EBITDA multiple expansion so long as interest expenses are not pushing them to negative free cash flow territory, and private equity companies do not plan on de-levering during the holding period.

My sample also provides evidence on firm value maximization through enhanced cost structure and business efficiency as 80 percent of phase 4 LBOs were re-sold at a higher Enterprise Value/EBITDA multiple than that paid at the time of acquisition (multiple expansion). Therefore, better aligned management's financial incentive (suggested by Jensen, 2010) is realized through more equity ownership than that during the pre-buyout public period. I also find that the IPO is the least preferred option for LBO exit as private equity firms can achieve better valuation from a

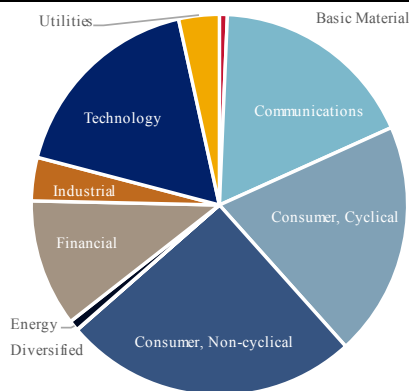
more competitive acquisition bidding environment. In this environment, strategic buyers seeking growth through M&A by allowing private equity companies to compete to strike a merger agreement. I also find that average private equity holding period is 4.21 years for phase 4 buyouts. It can be concluded that an LBO exit after a holding period of less than 3 years is not value maximizing as successful restructuring and efficiency improvements takes at least 4 years. On the other hand, too long a holding period will likely lower the internal rate of return (IRR) private equity firms can achieve.

VII. Appendices

Appendix A: Sector Distribution of Sample LBO Firms

\$USD in millions

Target Industry	Volume	Percent ^(a)	<i>N</i>
Basic Materials	\$3,300	0.7%	5
Communications	85,870	17.7%	47
Consumer, Cyclical	96,970	19.9%	52
Consumer, Non-cyclical	123,170	25.3%	53
Diversified	160	0.0%	1
Energy	4,240	0.9%	5
Financial	52,560	10.8%	25
Industrial	17,890	3.7%	24
Technology	84,980	17.5%	44
Utilities	16,970	3.5%	5
Total	\$486,110	100.0%	261



(a) Calculated as a percentage of total deal volume

Note: Table 3 provides a sector distribution of 261 sample firms based on total transaction value. The statistics supports the view that private equity firms do not tend to invest in businesses that are heavily regulated (Utilities) and that require significant amount of capital expenditures (Rosenbaum and Pearl, 2009) such as Basic Materials, Energy, and Industrials due to the free cash flows needed to service additional debt. Consumer & Retail companies were the most common buyout target in my sample, representing 45.2 percent. This may be a proxy to Amazon's continued disruption of the traditional person-to-person sales model, causing retail businesses to underperform. This underperformance leads to low stock prices which attracts private equity companies to buy low, restructure the business to the optimum efficiency level, and exit at a profit. Technology, Media, and Communication (TMT) companies were the second most likely targeted by PE firms at 35.2 percent. Financials came at third with 10.8 percent.

Appendix B: Leveraged Buyout Advisory League Table

USD in millions

Rank	Adviser	Market Share (%)	Total Deal Value
1	BofA Merrill Lynch	15.6%	\$262,800
2	Goldman Sachs	14.4%	242,637
3	JP Morgan	12.5%	210,304
4	Morgan Stanley	10.8%	181,519
5	Citi	10.2%	172,546
6	Barclays	9.2%	154,541
7	Deutsche Bank	8.6%	145,172
8	Credit Suisse	8.6%	144,116
9	Centerview Partners	5.1%	86,784
10	Wells Fargo	5.0%	\$85,110

Rank	Adviser	Market Share (%)	Deal Count
1	Goldman Sachs	15.5%	68
2	BofA Merrill Lynch	14.2%	62
3	Barclays	12.1%	53
4	Morgan Stanley	10.5%	46
5	Credit Suisse	9.4%	41
6	JP Morgan	9.1%	40
7	Citi	8.0%	35
8	Deutsche Bank	8.0%	35
9	Jefferies	7.1%	31
10	RBC Capital Markets	6.2%	27

Note: It is often that both acquirers and targets hire multiple investment banks for deal advisory. Such overlaps are the reason why total deal value and total deal count exceed the actual LBO volume and deal count of 261 samples displayed in Figure V.

Appendix C: Sample Buyout Firm List

\$USD in millions

Rank	Buyer Name	Deal Count	Average Size
1	Apollo Global Management	16	\$3,921
2	Blackstone Group	12	2,538
3	TPG Capital	11	4,057
4	Thoma Bravo	11	1,447
5	Vista Equity Partners	9	1,876
6	Neuberger Berman Group	8	1,960
7	Golden Gate Capital	8	1,814
8	Siris Capital Group	8	764
9	Leonard Green & Partners	7	2,569
10	Canada Pension Plan Investment Board	6	\$6,945

Rank	Buyer Name	Total Value	Average Size
1	Apollo Global Management	\$62,743	\$3,921
2	TPG Capital	44,622	4,057
3	Canada Pension Plan Investment Board	41,668	6,945
4	Bain Capital Private Equity	36,744	6,124
5	3G Capital	31,337	15,669
6	Blackstone Group	30,453	2,538
7	Berkshire Hathaway	27,403	27,403
8	AXA	27,160	27,160
9	Thomas H Lee Partners	26,547	13,274
10	BC Partners Holdings	\$26,458	\$13,229

Note: This table shows top 10 most active private equity firms in terms of deal count and average deal size. It is notable that Canada Pension Plan Investment Board, which is a pension fund, direct invests in buyout rather than through private equity.

References

- Amess, K., and Wright, M., 2012, "Leveraged buyouts, private equity and jobs." *Small Business Economics* 38(4), 419-430.
- Datta, S., Gruskin, M., and Iskandar-Datta, M., 2013, "Lifting the veil on reverse leveraged buyouts: What happens during the private period?" *Financial Management* 42(4), 815-842.
- DeAngelo, L., 1988, "Managerial competition, information costs, and corporate governance: The use of accounting performance measures in proxy contests." *Journal of Accounting and Economics* 10(1), 3-36.
- DeAngelo, H., DeAngelo, L., and Rice, E., 1984, "Going private: Minority freezeouts and stockholder wealth." *Journal of Financial Economics* 27(2), 367-401.
- Guo, S., Hotschkiss, E., and Song, W., 2011, "Do buyouts (still) create value?" *Journal of Finance* 66(2), 479-517.
- Healy, P., and Palepu, K., 1988, "Earnings information conveyed by dividend initiations and omissions." *Journal of Financial Economics* 21(2), 149-175
- Jensen, M., 1986, "Agency costs of free-cash-flow, corporate finance, and takeovers." *American Economic Review* 76(2), 323-329.
- Jensen, M., 1989, "Eclipse of the public corporation." *Harvard Business Review* 67(5), 61-75.
- Jensen, M., 2010, "Active investors, LBOs, and the privatization of bankruptcy." *Journal of Applied Corporate Finance* 22(1), 77-85.
- Jensen, M., and Meckling, W., 1976, "Theory of the firm: Managerial behavior, agency costs and ownership structure." *Journal of Financial Economics* 3(4), 305-360.
- Jensen, M., and Murphy, K., 1990, "Performance pay and top-management incentives." *Journal of Political Economy* 98(2), 225-264.

- Jones, T., and Hunt, R., 1991, "The ethics of leveraged management buyouts revisited." *Journal of Business Ethics* 10(11), 833-840.
- Kaplan, S., 1989, "The effects of management buyouts on operating performance and value." *Journal of Financial Economics* 24(2), 217-254.
- Kaplan, S., and Strömberg, P., 2009, "Leveraged buyouts and private equity." *Journal of Economic Perspectives* 23(1), 121-146.
- Kosedag, A., Qian, J., and Mehran, J., 2009, "Reverse-LBOs, re-LBOs and informational asymmetry hypothesis of LBO transactions." *Managerial Finance* 35(8), 716-728.
- Meuleman, M., Wright, M., Manigart, S., and Lockett, A., 2009, "Private equity syndication: Agency costs, reputation and collaboration." *Journal of Business Finance & Accounting* 36(5-6), 616-644.
- Myers, S., 1977, "Determinants of corporate borrowing." *Journal of Financial Economics* 5(2), 147-175.
- Pindur, D., 2007, *Value creation in successful LBOs, 2007 edition*. (Wiesbaden: Deutscher Universitäts-Verlag).
- Rosenbum, J., and Pearl, J., 2009, *Investment banking: valuation, leveraged buyouts, and mergers & acquisitions*. (Hoboken, NJ: John Wiley & Sons, Inc.).
- Seth, A., and Easterwood, J., 1993, "Strategic redirection in large management buyouts: The evidence from post- buyout restructuring activity." *Strategic Management Journal* 14(4), 251-273.
- Shleifer, A., and Summers, L., 1988, "Breach of trust in hostile takeovers." *National Bureau of Economic Research*.

- Smith, A., 1990, "Corporate-ownership structure and performance - the case of management buyouts." *Journal of Financial Economics* 27(1), 143-164.
- Thompson, S., and Wright, M., 1995, "Corporate governance: The role of restructuring transactions." *Economic Journal* 105(430), 690–703.
- Wiersema, M., and Liebeskind, J., 1995, "The effects of leveraged buyouts on corporate growth and diversification in large firms." *Strategic Management Journal* 16(6), 447-460.
- Williamson, O., 1964, *The economics of discretionary behavior: Managerial objectives in a theory of the firm*. (Englewood Cliffs, NJ: Prentice Hall).
- Wright, M., Hoskisson, R., and Busenitz, L., 2001, "Firm rebirth: Buyouts as facilitators of strategic growth and entrepreneurship." *Academy of Management Executive* 15(1), 111–125.
- Wright, M., Hoskisson, R., Busenitz, L., and Dial, J., 2000, "Entrepreneurial growth through privatization: The upside of management buy-outs." *Academy of Management Review* 25(3), 591–601.
- Wright, M., Thompson, S., and Robbie, K., 1992, "Venture capital and management-led leveraged buyouts: A European perspective." *Journal of Business Venturing* 7(1), 47-71.