

Bank Affiliation in Private Equity Firms: Distortions in Investment Selection

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ABSTRACT

Private equity firms that are affiliated with banks have become major players in the leveraged buyout (LBO) market, raising billions of dollars in funds. In this paper, I investigate value creation of these LBOs through operating performance, leverage, and pricing. I find that bank-affiliated LBOs fail to create operating performance gains, on average. Moreover, I find that targets of bank-affiliated and independent LBOs are systematically different. While I find no difference in operating performance gains between bank-affiliated and independent LBOs with matched target characteristics, all firms that share the target characteristics of bank-affiliated LBOs show worse post-buyout operating performance. Combined with no difference in leverage and deal pricing, the overall results suggest that bank affiliation negatively affects the economic benefit of LBOs due to differing objectives that result in distortions in investment selection.

JEL Classifications: G23, G24, G34

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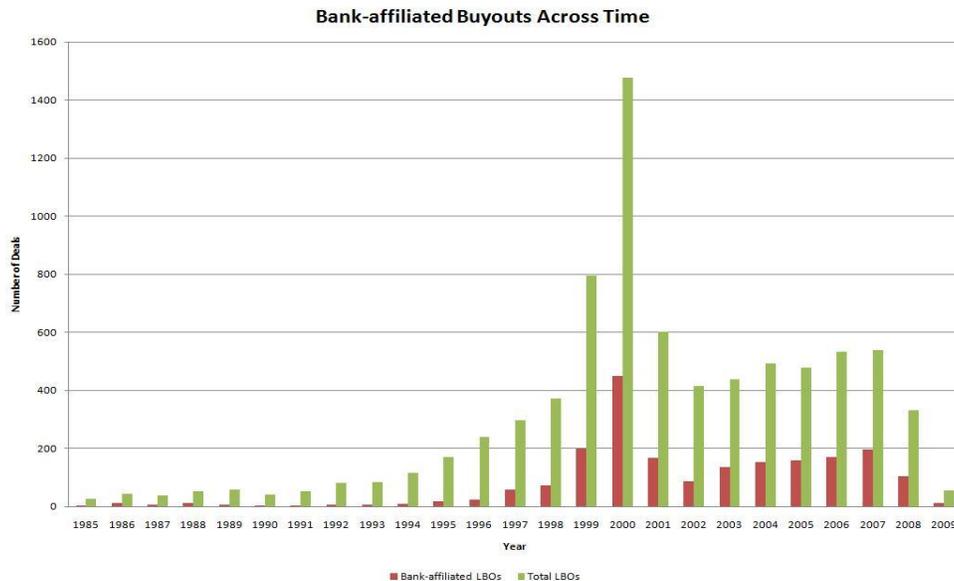
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I. INTRODUCTION

The past three decades have seen significant changes in the role banks play in financial markets. Banks have expanded their activities from being financial intermediaries to directly participating in the market. The recent financial crisis, in particular, has sparked a heightened interest on the part of policy-makers in understanding the involvement of traditional financial institutions in alternative investment assets. Take the leveraged buyout (LBO) market for example. Banks, through their asset management divisions, have carried out a large volume of LBOs. LBOs sponsored by private equity firms affiliated with banks account for up to 30% of all buyouts, annually (see Figure 1), and some of the largest private equity firms are investment arms of banks. For example, Goldman Sachs, JP Morgan, HSBC, and Citigroup have together raised over \$180.6 billion in private equity funds since 1990.¹

Figure 1
Bank-affiliated buyouts across time

The figure shows the number of total buyouts and bank-affiliated buyouts across time from 1985 to 2009. Bank-affiliated LBOs are leveraged buyouts sponsored by the private equity units of banks. Total LBOs represent the total number of leveraged buyouts in a given year. The x-axis is the buyout year. The y-axis is the number of deals in a given year. The numbers, taken from Fang et al. (2013), are restricted to the syndicated loan market.



Despite banks' direct involvement in the private equity market, we have only a limited understanding of their impact on subsidiary private equity firms. In general, being part of a large financial conglomerate provides an information advantage to associated firms (Massa and Rehman, 2008; Ritter and Zhang, 2007; Bodnaruk et al., 2009) and can potentially reduce conflicts of interest between debt and equity holders (Fang et al.,

2013). However, a parent-subsidary structure also creates distortions (e.g. distortions in incentives and objectives), which may lead to problems in selecting or managing portfolio companies (Gompers and Lerner, 1998). Fang et al. (2013) provide more specific arguments on the distorted objectives of bank-affiliated LBOs. Using a U.S. LBO sample on deal financing and exits, they find that bank-affiliation influences deal financing terms but have worse exits if deals are carried out at the peak of the market. Industry observers seem to share these concerns about the impact of having a parent bank. According to some practitioners, investors are overwhelmingly cautious about bank-affiliated private equity firms.

This paper expands the negative view of bank-affiliated LBOs that was first reported by Fang et al. (2013). First, I highlight real economic problems with bank-affiliated LBOs by studying value creation through operating performance, leverage changes, and deal pricing, instead of deal exits. Second, having detailed accounting data, I further identify target selection as the source of the performance difference between bank-affiliated and independent LBOs. Third, I confirm the negative view of bank-affiliated LBOs in a U.K. sample, which is free of the selection problem a U.S. sample may face. The U.K. is the second largest buyout market worldwide, and unlike U.S. firms, all U.K. firms are required to submit annual financial information.

Using this U.K. sample, I first examine target characteristics, using univariate tests and Probit regressions to identify characteristics associated with targets of each type of LBO. Targets of bank-affiliated LBOs tend to be larger, more profitable, and more liquid firms. There is also some evidence showing that they tend to have lower risk. These results are robust to controlling for industry trends, the overall buyout market conditions, and the exclusion of club deals.

Turning to operating performance, I do not find that bank-affiliated LBOs have any positive impact on target firms' operating performance within three years of the LBOs. In particular, target firms' post-buyout profitability and productivity show a significant decline. The results are robust to industry-wide changes, firms' post-buyout expansions, and potential bias from successful firms exiting early.

These results are in direct contrast to the traditional literature that shows LBOs, including those in the U.K., create value by improving target firms' post-buyout operating performance. This lack of operating performance gains combined with the criticisms of bank-affiliated LBOs imply an underperformance of these LBOs compared to independent LBOs. To investigate this difference in performance and its source, I first use propensity score matching (PSM) based on industry and pre-buyout firm characteristics to find independent LBOs that are similar to bank-affiliated LBOs. The problems created by having a parent company, including banks, can be generalized to problems in either selecting or managing investments (Gompers and Lerner, 1998). While both can adversely affect operating performance, the empirical patterns of underperformance resulting from these sources differ. If problems occur in managing investments, then post-buyout operating performance should differ within the set of firms that share similar pre-buyout characteristics. On the other hand, if distortions in investment selection cause an underperformance, then we should observe worse post-buyout performance to be related to pre-buyout firm characteristics.

I find results supporting the view that bank-affiliated LBOs face problems in investment selection. Specifically, I find that within the set of matched affiliated and independent firms, post-buyout operating performance does not vary based on sponsor

affiliation. However, the same set of firms shows significantly worse post-buyout operating performance compared to independent firms that do not share these target characteristics. To check the robustness of these results, I use an alternative performance-adjusted benchmark and exclude LBOs carried out in a “hot” buyout market. The results do not change meaningfully. To mitigate the concern of using a short event window, I examine target firms’ exits and restructuring efforts. I do not find evidence showing that affiliated LBOs are more likely to exit or take longer to restructure compared to unmatched independent LBOs.

Given these operating performance patterns, bank-affiliated LBOs would need to rely on other channels to create as much value as independent LBOs. I then investigate whether bank-affiliated LBOs create more value through higher leverage, which provides a better disciplinary effect, a higher tax shield, and increases returns for equity holders by increasing risk. I find that bank-affiliated LBOs do not carry higher total debt or a higher proportion of bank debt compared to independent LBOs.

Following Achleitner and Figge (2014), I examine deal pricing as a third driver of value creation. Deal pricing is measured by estimated buyout discounts/premiums based on enterprise value as multiples of earnings before interest, depreciation, and amortization (EBITDA) and sales. However, I also do not find any difference in deal prices between bank-affiliated and independent LBOs. Therefore, bank-affiliation does not give private equity firms the advantage of acquiring targets at cheaper prices.

The combined evidence on operating performance, leverage, and deal pricing points to less value creation of bank-affiliated LBOs due to selecting targets that do not maximize the benefits of LBOs. This can occur due to the differing objectives problem pointed out by critics of affiliated LBOs. However, there is also a benign explanation based on a lack of skilled managers, an indirect result of the lower compensation of affiliated firms.

In the absence of data on fund managers’ skill and pay, I investigate whether the cross-sectional variation in operating performance is related to the reputation of the parent banks, a signal for fund managers’ abilities. Presumably, more prestigious banks would attract more skilled managers. I create an indicator variable for the top 25 banks as of the end of the sample period. Assuming skill is reflected in the reputation of the parent bank, this indicator variable should be positively associated with operating performance, if better performance were driven by skill. However, I do not find any significant relationship between reputation and the cross-sectional variation in operating performance. I interpret this result as being inconsistent with the skill-based explanation.

Results in this paper contribute to our understanding of LBOs in several ways. First, while the traditional literature on private equity emphasizes how buyouts can create value (Jensen, 1986; Kaplan, 1989), results in this paper show that bank-affiliated LBOs do not improve target firms’ operating performance, and that they create less value compared to independent LBOs. Second, more specifically on bank-affiliated LBOs, Fang et al. (2013) show that these LBOs have worse exit outcomes during the peaks of the private equity market. Results in this paper build on the existing negative view of bank-affiliated LBOs but further highlight real economic problems with bank affiliation in private equity. Moreover, detailed accounting data of a U.K. sample reveals that the source of the problem is target selection.

More generally, this paper contributes to the larger literature on financial conglomerates and firms’ organizational structures. Large financial institutions have

attracted much controversy in recent years. Some studies show that financial conglomeration provides benefits (Bodnaruk et al., 2009; Massa and Rehman, 2008); others argue that bank-affiliated mutual funds underperform due to conflicts of interest (Hao and Yan, 2012; Massa, 2003). My results add to the field by suggesting that financial conglomeration does not benefit the private equity industry or the target firms.

This paper proceeds as follows. Section II presents hypothesis development. Section III describes the sample and target characteristics. Section IV presents the empirical results on value creation of bank-affiliated LBOs. Section V concludes.

II. HYPOTHESIS DEVELOPMENT

The literature generally shows that LBOs, including those in the U.K., create value by improving target firms' post-buyout operating performance (Jensen, 1997; Lehn and Poulsen, 1989; Kaplan, 1989; Smith, 1990; Baker and Montgomery, 1994; Baker and Wruck, 1991; Harris et al., 2005; Weir et al., 2008; Acharya et al., 2013). Following the conventional view of LBOs, one would expect bank-affiliated LBOs continue to improve target firms' post-buyout operating performance and increase firms' efficiency.

However, there are reasons to expect that bank-affiliated LBOs may not create as much value, as being affiliated with a financial conglomerate can change the economics of LBOs. While this close relationship can benefit associated firms (e.g., Massa and Rehman, 2008; Ritter and Zhang, 2007; Bodnaruk et al., 2009; Hellmann et al., 2008; Fang et al., 2013), a parent-subsidiary structure in private equity gives rise to concerns over the stability of the program, the effectiveness of the incentive structure, and consistency of objectives on value maximization (Gompers and Lerner, 1998). Fang et al. (2013) argue that having a bank parent can subject the private equity firm to three differing objectives with negative consequences: the incentive to maximize growth and volatility; making poor investments due to cross-selling opportunities; and, if the deals are financed by parent banks, they face banks' incentive to originate and distribute the debt of their own risky deals. Using a U.S. sample of financing terms and exit outcomes, the authors find that while bank-affiliated LBOs have preferential access to debt, they have worse exit outcomes if they are carried out during peak buyout years.

While exit outcomes may not translate to the economic value of LBOs, the negative view of bank-affiliated LBOs implies that bank-affiliated LBOs may create less value compared to independent LBOs, particularly if they are carried out during peak of the buyout market. This lower value could manifest itself through post-buyout operating performance, leverage changes, and deal pricing, as LBOs create economic value through these channels (Kaplan and Stromberg, 2009).

More importantly, the problems faced by affiliated private equity firms can be characterized as either problems in selecting or managing portfolio companies (Gompers and Lerner, 1998). Bank-affiliated sponsors' differential access to debt, ineffective incentive structure, and different exit incentives, which can result from concerns over program stability, are distortions in managing companies. Thus, if they cause an underperformance, firms' post-buyout operating performance should vary with sponsor affiliation within a set of firms' that share similar pre-buyout characteristics. On the other hand, banks' problems in investment selection (e.g. the incentive to maximize volatility, promote cross-selling opportunities, and distribute their own risky debt) could lead their affiliated firms to identify deals of a different profile. If they select companies that are

not ideal for maximizing operating performance or value creation, then worse post-buyout operating performance should be associated with target characteristics, holding everything else equal. Since the two types of problems (i.e. selection and management) result in different empirical patterns in performance, we can identify the source of any performance difference by investigating target firms' post-buyout operating performance.

III. DATA AND SAMPLE STATISTICS

A. Sample Description

I base my sample on completed LBOs in the U.K. for two reasons. First, a U.S. sample potentially faces the selection problem, since public data is only available for U.S. firms that subsequently went public or have public debt outstanding. Unlike the U.S. firms, all firms in the U.K. are required to submit annual financial reports. This allows for the collection of detailed accounting data on operating performance changes, instead of relying on noisy measures such as exits. Second, the U.K. has the second most active LBO market in the world, after the U.S., and the U.K. market is still growing in size, making it an ideal source for studying buyouts.

I follow Wang (2012) and Chung (2011) and use Zephyr to identify buyout transactions,² because it has better coverage of deals in Europe than SDC does, and it offers better coverage of smaller transactions (LexisNexis). I start with all completed U.K. deals in Zephyr from 1997 to 2007. I choose 2007 as the end of the sample period to avoid potential impact from the recent financial crisis. In addition, Acharya et al. (2013) use a similar sample period, and they argue that this time period is well suited for studying value creation through operational engineering. I drop cases where a stake of less than 50% was acquired. This gives me a total number of 4,652 LBOs. I also eliminate 946 deals with no registration number, and I restrict my cases to private-to-private and public-to-private buyouts³, resulting in a total of 1,866 transactions. I further drop 813 deals without identifiable private equity sponsors. I classify a transaction as bank-affiliated (277 deals) if the private equity sponsor is a subsidiary of a bank. If a transaction has multiple sponsors, I classify the transaction as bank-affiliated if at least one of the sponsors is bank-affiliated. Out of the 776 non-bank LBOs, 693 of them are carried out by independent private equity firms. The other 83 non-bank LBOs are dropped from the sample. The initial sample has 970 LBOs carried out by bank-affiliated and independent private equity firms.

I hand-collect firms' accounting information from their annual financial reports. Because target firms' accounting information are often consolidated under a new shell company after the buyout, I identify holding companies from each target firm's annual financial statements. I drop add-on acquisitions and cases where consolidated statements are not available. These include very small target firms and firms whose parents are consolidated outside of the U.K.⁴ Although this process excludes a large number of LBOs from the final sample, unconsolidated accounting information may misrepresent firm performance. The final sample contains 102 bank-affiliated and 207 independent LBOs. The number of LBOs by year in the initial and final sample is presented in Table 1. The large percentage of bank-affiliated private equity firms is evident in this table. The average annual percentage of bank-affiliated LBOs is close to 30% and remains relatively stable over time in both the initial and final sample.

Table 1
Bank-affiliated buyouts across time

The table shows the number of bank-affiliated and independent leveraged buyouts (LBOs) identified from Zephyr from 1997 to 2007. A buyout is classified as bank-affiliated if the sponsors is a private equity division or a subsidiary of a bank. Independent buyouts represent the cases where all of the buyout sponsors are independent private equity firms without a parent company. If an LBO has multiple sponsors, the buyout is classified as bank-affiliated if one or more sponsors are affiliated with a bank, otherwise it is classified as an independent LBO. The initial sample is restricted to: 1) target companies in the U.K. and complete cases where a more-than-50% stake was acquired (4,652 deals), 2) target companies with registration numbers (3,706 deals), 3) private-to-private and public-to-private buyouts (1,866 deals), 4) deals with identifiable sponsors (1,053 deals), and only deals sponsored by bank-affiliated or independent private equity firms (970 deals). Panel A shows the number of deals in the initial sample. The final sample shown in Panel B is further restricted to cases where 1) the pre- and post- buyout consolidated financial statements are available, and 2) the buyout is not an add-on acquisition.

Panel A: Initial Sample

Buyout year	Total	Bank-affiliated	Independent
1997	44	8	36
1998	42	14	28
1999	85	29	56
2000	62	18	44
2001	75	37	38
2002	60	18	42
2003	80	24	56
2004	108	23	85
2005	118	31	87
2006	148	40	108
2007	48	35	13
Total	970	277	693

Panel B: Final Sample

Buyout year	Total	Bank-affiliated	Independent
1997	8	1	7
1998	12	4	8
1999	15	3	12
2000	19	8	11
2001	33	18	15
2002	19	6	13
2003	35	13	22
2004	41	8	33
2005	47	18	29
2006	65	19	46
2007	15	4	11
Total	309	102	207

For a breakdown of the buyout types in the final sample, Panel A of Table 2 divides the buyouts to public-to-private (Public) and private-to-private (Private) deals. Consistent with existing literature, most LBOs, regardless of acquirer affiliation, are buyouts of private firms⁵. Panel B of Table 2 shows deal outcomes by acquirer affiliation. A majority of the deals, both bank-affiliated and independent deals, have not achieved an exit. While IPOs are often considered the most successful exits for LBOs, only close to 1% of both bank-affiliated and independent LBOs exited through IPOs. Across both acquirer affiliations, the most common exit route was acquisition by strategic buyers, followed by secondary buyout.

Due to the small sample size, I use Fama-French's 10 industry classification. Table 3 shows the industry distribution by acquirer affiliation. Compared to independent LBOs, bank-affiliated LBOs have a higher concentration in Manufacturing, Wholesale and Retail, and a lower concentration in HiTech and Business Equipment. The distribution of firms in other industries is similar across acquirer affiliations.

Table 2
Buyout types and outcomes

The table presents the number of LBOs by their types and exit routes across acquirer affiliations and buyout year. In Panel A, buyout types are divided into public-to-private (Public) and private-to-private (Private). In Panel B, IPO shows the number of firms that eventually went public. Acquired and SBO indicate that the target was sold to a strategic buyer and another private equity firm, respectively. Bankruptcy represents the number of firms that eventually filed for bankruptcy, and No Exit shows buyouts that have not reached an exit as of 2010. Buyout types and outcomes for the full sample of LBOs are shown in Table A1 in the Appendix.

Panel A: Deal types across time in the final sample

Buyout year	Bank-affiliated			Independent		
	Total	Public	Private	Total	Public	Private
1997	1	0	1	7	0	7
1998	4	1	3	8	0	8
1999	3	1	2	12	8	4
2000	8	2	6	11	5	6
2001	18	7	11	15	3	12
2002	6	1	5	13	3	10
2003	13	4	9	22	7	15
2004	8	0	8	33	3	30
2005	18	4	14	29	6	23
2006	19	2	17	46	13	33
2007	4	2	2	11	4	7
Total	102	24	78	207	52	155

Panel B: Deal outcomes

Affiliation	IPO	Acquired	SBO	Bankruptcy	Other / unknown	No exit	Total
Bank	1 (0.98%)	17 (16.67%)	9 (8.82%)	1 (0.98%)	1 (0.98%)	73 (71.57%)	102 (100%)
Independent	2 (0.97%)	30 (14.49%)	15 (7.25%)	3 (1.45%)	1 (0.46%)	156 (75.36%)	207 (100%)

Table 3
Target industry distribution

The table shows the number and percentage distribution of target firms in each industry in the final sample. Industries are categorized according to the Fama-French 10 industry classification, based on the target firm's primary business. Others includes firms that operate in mines, construction, building material, transportation, hotels, bus services, entertainment, and finance. Bank-affiliated and Independent deals are defined in Table 1.

Fama-French 10 Industry	Bank-affiliated		Independent	
Consumer Nondurables	10	(9.8%)	17	(8.21%)
Consumer Durables	5	(4.9%)	3	(1.45%)
Manufacturing	13	(12.75%)	34	(16.43%)
Energy, Oil, Gas, and Coal	0	(0%)	0	(0%)
HiTech and Business Equipment	8	7.84%	17	8.21%
Telecom	1	(0.98%)	2	(0.97%)
Wholesale and Retail	29	(28.43%)	37	(17.87%)
Health, Healthcare, Medical Equipment, and Drugs	0	(0%)	7	(3.38%)
Utilities	1	(0.98%)	3	(1.45%)
Others	35	(34.31%)	87	(42.03%)
Total	102	(100%)	207	(100%)

To reduce the concern of sample representativeness, the appendix describes deal types, outcomes, and industry distribution of firms in the full sample not restricted to firms with consolidated financial statements. The patterns shown in Tables A1 and A2 are similar to those in the final sample, and therefore should reduce the concern of an unrepresentative sample.

B. Target Characteristics

In this subsection, I compare the target characteristics of bank-affiliated LBOs with those of independent LBOs. I divide target characteristics into four categories: size, profits, profitability, and liquidity and risk. Table 4 displays the numbers of observations, means, and median values of variables in each category. All variables are measured at one year before the buyout. Due to the small sample size, two-tailed Wilcoxon rank-sum tests are performed to determine whether median values are statistically different.

To measure pre-buyout size, I use both sales and the natural logarithm of total assets. Because the sample includes both public-to-private and private-to-private buyouts, there are considerable differences between the means and medians. Both size measures show that targets of bank-affiliated LBOs are larger firms, compared to targets of independent LBOs.

I use two measures for profits: EBITDA to account for cash flows and earnings to account for returns to investors. I use EBITDA/sales, EBITDA/plant, property, and equipment (PP&E), profit margin, and return on assets (ROA) to measure profitability. Targets of bank-affiliated LBOs have higher profits, consistent with their larger size. However, they do not seem to be significantly more profitable than targets of independent LBOs.

Finally, I examine liquidity and risk of the target firms. Fang et al. (2013) point out that banks may have the incentive to maximize volatility and distribute loans of their

risky deals. If so, one would expect the targets of bank-affiliated LBOs to be riskier. In the absence of historical prices for private firms in my sample, I estimate targets' liquidity and risk using current assets/total assets⁶, three-year EBITDA volatility, and three-year EBITDA/sales volatility. There is some evidence showing that targets of bank-affiliated LBOs are more liquid, while three-year EBITDA volatility shows significantly higher risk for these firms.

Since univariate comparisons show some differences between targets of bank-affiliated and independent LBOs, I proceed with regression models to account for macroeconomic conditions and industry-wide changes. I use Probit models to estimate the likelihood of a bank-affiliated LBO conditioning on an LBO taking place. The dependent variable equals one if the buyout is a bank-affiliated buyout, and zero if it is an independent buyout. The control variables include pre-buyout firm characteristics, industry and the overall buyout market conditions. To absorb residual variation related to time trend, all regressions include year dummies. Because the same industry condition enters the equation multiple times whenever firms fall in the same industry, I also cluster standard errors by industry. All firm characteristics listed in Table 4 are tested individually. However, for brevity, I only report estimated results for four variables in Table 5.

Table 4
Pre-buyout target characteristics

The table shows the target characteristics of bank-affiliated and independent LBOs. The number of observations, the means and median values are reported. All acquirer affiliations are defined in Table 1. The means and medians are calculated as of the last full fiscal year before the buyout completion year. Sales, Total assets, EBITDA, and Earnings are measured in £ million. EBITDA volatility and EBITDA/sales volatility are the standard deviation of EBITDA and EBITDA/sales within three years before the buyout, respectively. Two-tailed Wilcoxon rank-sum tests are performed to test whether the median values are significantly different. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Bank-affiliated (1)			Independent (2)			Diff (1-2)
	N	Mean	Median	N	Mean	Median	
Size							
Sales	96	200.20	31.77	187	93.26	17.67	14.1***
Total assets	102	284.55	15.99	203	113.26	10.24	5.75**
Profits							
EBITDA	100	16.94	3.31	189	13.45	1.73	1.58***
Earnings	100	7.32	4.58	189	4.81	0.88	3.70*
Profitability							
EBITDA/sales	95	1.79	0.11	183	0.12	0.10	0.01
EBITDA/PP&E	100	0.31	0.78	188	2.31	0.85	-0.07
Profit margin	95	0.09	0.05	183	0.04	0.05	0.00
ROA	100	0.16	0.08	189	0.08	0.07	0.01
Liquidity and risk							
Current assets/total assets	102	0.66	0.70	203	0.60	0.65	0.05*
EBITDA volatility	94	3.77	1.04	184	4.99	0.56	0.48**
EBITDA/sales volatility	90	0.23	0.02	172	0.05	0.03	-0.01

Table 5
Conditional probability of a bank-affiliated buyout

The table shows the probability of a firm being a bank-affiliated buyout target, conditional on the firm undergoing an LBO. The dependent variable equals one if the buyout is a bank-affiliated buyout, and zero if the buyout is an independent buyout. Log sales is the natural logarithm of sales at one year before the buyout. Current assets/total assets and EBITDA/sales at one year before the buyout measure firms' liquidity and profitability, respectively. EBITDA volatility is the volatility of EBITDA during the three years prior to the buyout. 1-year Industry sales growth is the 1-year median sales growth of all firms in the same Fama-French 10 industry in the buyout year. Log aggregate PE inflow is the logarithm of the total size of the private equity industry for the buyout completion year. Other variables from Table 4 that are significantly associated with the probability of a bank-affiliated buyout but not reported in this table (to be brief) include the logarithm of total assets, earnings, EBITDA, EBITDA/PP&E, ROA, EBITDA/sales volatility. Year dummies are included in all regressions. Marginal effects are reported. Robust standard errors clustered by industry are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Log sales	0.047*** (0.010)					0.096*** (0.003)
EBITDA/sales		0.030* (0.016)				0.051* (0.027)
Current assets/total assets			0.216** (0.092)			0.395*** (0.132)
EBITDA volatility				-0.001* (0.001)		-0.005*** (0.001)
1-year industry sales growth	0.494* (0.253)	0.441 (0.279)	0.534** (0.252)	0.484* (0.293)	0.557** (0.261)	0.448* (0.271)
Log aggregate PE inflow	0.134 (0.095)	-0.006 (0.093)	-0.026 (0.111)	0.169* (0.091)	-0.009 (0.102)	0.009 (0.099)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by industry	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	283	273	284	273	284	259
Adjusted R ²	0.057	0.038	0.060	0.038	0.043	0.109

Probit regressions reveal further differences in target characteristics⁷. In addition to size, higher profitability is also significantly associated with a higher conditional probability of a bank-affiliated LBO. Moreover, different from what the arguments about banks' incentives to maximize volatility and distribute loans of their risky deals would predict, the evidence shows some support for bank-affiliated LBOs having less risky targets. Both three-year EBITDA volatility and EBITDA/sales volatility (untabulated for brevity) before the buyout are correlated (at the 10% significance level) with a lower probability of a bank-affiliated LBO.

In short, detailed information on firms' pre-buyout characteristics shows that targets of bank-affiliated and independent LBOs are systematically different. This comparison, moreover, is an integral part of the later analysis on value creation.

IV. VALUE CREATION

A. Operating Performance

The empirical evidence generally shows that LBOs create value by improving target firms' operating performance. Therefore, I first examine whether bank-affiliated LBOs have any positive impact on their target firms. To minimize noise from potentially interfering events, I restrict my post-buyout window to three years.

Panel A of Table 6 reports the effect of bank-affiliated LBOs on firms' size, profits, profitability and productivity. Because of accounting write-ups related to mergers and acquisitions, PP&E, instead of total assets, along with sales are used to proxy for size. Profits are measured by EBITDA and earnings. Median percentage changes from year *i* before the buyout to year *j* after it are reported. Wilcoxon rank-sum tests are performed to determine whether the median percentage changes are significantly different from zero. To account for industry-wide shocks and offer a direct comparison with the classic literature on post-buyout operating performance, I follow prior studies and adjust performance changes by subtracting industry median values.

Table 6

The effect of bank-affiliated buyouts on target firms

The table presents the median percentage changes in the targets' operating performance from year *i* before the buyout to year *j* after it. Industry-adjusted changes are computed by subtracting the corresponding industry median from each variable. Industry medians are based on all firms in the U.K. in the same Fama-French 10 industry classification. Panel A reports operating performance changes from two years before the buyout to three years after it. Panel B presents results with sales and PP&E fixed at their levels at one year prior to the buyout. Wilcoxon rank-sum tests are performed to test whether the changes are significantly different from zero. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Operating performance changes from year <i>i</i> to year <i>j</i>				
Variable	-2 to -1	-1 to +1	-1 to +2	-1 to +3
Size				
Tangible Fixed Assets (PP&E)				
Median change	6.2%***	1.3%*	3.8%	-17.2%
Industry-adjusted median change	0.6%	-4.0%	-2.10%	-11.9%
Sales				
Median change	14.6%***	15.3%***	16.5%**	6.5%
Industry-adjusted median change	18.0%***	17.7%**	14.6%	13.9%
Profits				
EBITDA				
Median change	16.8%***	7.6%	13.5%	-19.0%
Industry-adjusted median change	16.9%***	11.2%	14.1%	-18.7%
Earnings				
Median change	20.0%***	-93.5%***	-95.9%***	-107.7%***
Industry-adjusted median change	21.7%***	-94.4%***	-72.5%***	-134.5%***

Profitability				
EBITDA/Sales				
Median change	0.4%	-1.6%***	-1.0%*	-3.7%**
Industry-adjusted median change	0.1%	-3.3%***	-1.9%*	-6.4%***
Profit Margin				
Median change	0.3%	-5.1%***	-5.6%***	-5.7%***
Industry-adjusted median change	0.2%*	-5.3%***	-4.4%***	-5.4%***
EBITDA/PP&E				
Median change	3.3%**	-8.30%	-11.0%**	-20.0%**
Industry-adjusted median change	2.5%*	-20.7%**	-11.8%*	-40.6%**

Panel B: profitability and productivity changes with fixed firm size

Variable	-1 to +2	-1 to +3
EBITDA/Sales		
Median change	0.9%	-2.2%
Industry-adjusted median change	-0.7%*	-2.8%**
Profit Margin		
Median change	-5.8%***	-5.0%***
Industry-adjusted median change	-3.3%***	-4.2%***
EBITDA/PP&E		
Median change	10.5%	-14.3%
Industry-adjusted median change	0.8%	-5.2%

Industry-adjusted size and EBITDA do not show much significant change. The significant drop in earnings in all three years after the buyout is due to a combination of a lack of significant improvements in operating cash flows and high interest payments from increase leveraged after the buyout.

I do not find bank-affiliated target firms to be more profitable or productive after the buyout either. EBITDA/sales and profit margin both show a significant decline for all three years after the buyout. Changes in EBITDA/PP&E further show that the productivity of firms' tangible assets decreased significantly.

One possible explanation for the observed deterioration in efficiency and productivity is that the pattern is mechanically driven by changes in firm size. To address this issue, I fix sales and PP&E at their levels at one year before the buyout. The results are reported in Panel B of Table 6. While the magnitude of the performance changes decreases, industry-adjusted changes in EBITDA/sales and profit margin continue to show significant drops. Therefore, the declines in efficiency and productivity are not entirely driven by a larger size. Another potential concern is survivorship bias. If successful firms exit before the end of the event window, the results could be biased downward. Therefore, I exclude all firms that have exited. If survivorship bias were the cause of the observed drops in operating performance, I would expect to find a bigger performance drop after excluding exited deals. However, the results (table untabulated) show a similar magnitude in operating performance changes.

Contrary to what would be expected of LBO targets based on previous literature, including U.K. findings, all results here show that bank-affiliated LBOs fail to create

post-buyout operating performance gains. Based on these results and the existing view of these LBOs, we should expect bank-affiliated buyouts to show worse operating performance compared to independent LBOs. Furthermore, this underperformance could be either due to distortions in either selecting or managing companies.

To better disentangle these two sources of problems, I match bank-affiliated LBOs to independent LBOs using a one-on-one propensity score matching (PSM) process based on observable firm characteristics and industry classification. All firm characteristics that are associated with a significantly higher/lower conditional probability of bank-affiliated LBOs, as determined from Probit regressions in Section 3, are included in the matching criteria. This process identifies 89 targets of independent LBOs that are the most similar to targets of bank-affiliated LBOs in the sample. T-tests of the mean values and Wilcoxon tests of the median values of the matched firms show that the matching yields good results (i.e., a close match). The results are reported in Panel A of Table 7.

Panel B of Table 7 then reports regression results comparing operating performance changes of bank-affiliated LBOs to those of their matched independent LBOs. To account for industry-wide changes, all profitability and productivity measures are industry-adjusted. The dependent variables are industry-adjusted EBITDA/sales, EBITDA/PP&E, and profit margin in levels and changes. The levels are computed as of three years after the buyout; the changes are computed as the percentage changes from one year before the buyout to three years after it. The natural logarithm of the firm's tangible assets in the third year after the buyout is used as a proxy for firm size. Guo et al. (2011) show that leverage is an important factor in explaining post-buyout operating

Table 7
Operating performance changes of propensity score matched sample

The table reports operating performance comparisons based on a propensity score matched sample. Using target firms' industry classification and pre-buyout characteristics, a one-on-one nearest neighborhood propensity score matching is used to find independent LBOs that are similar to bank-affiliated LBOs. All pre-buyout firm characteristics that are found to be systematically different between bank-affiliated and independent LBOs are used for the matching. This process matches 89 independent LBOs that are closest to bank-affiliated LBOs. Panel A reports an assessment of the quality of the matching. Both t-tests and Wilcoxon rank-sum tests are performed to determine whether the mean and median values of the matched groups are significantly different. All variables are defined in previous tables. Panel B reports the comparison of operating performance changes based on the matched sample. The independent variables in Columns 1, 3, and 5 are firms' industry-adjusted operating performance three years after the buyout. The independent variables in Columns 2, 4, and 6 are industry-adjusted operating performance changes from one year before the buyout to three years after it. Bank-affiliated is an indicator variable that equals one if the buyout is bank-affiliated, and zero if it is a matched independent LBO. Board size is the number of directors three years after the buyout. The Public-to-private indicator equals one if the target of the buyout is a public corporation and zero if it is private. Club PE is also an indicator variable that equals one if the buyout is sponsored by a consortium of private equity firms, and zero otherwise. Except for Pre-buyout EBITDA/sales volatility, all pre-buyout firm characteristics are measured at one year before the buyout. Pre-buyout EBITDA/sales volatility is the three-year EBITDA/sales volatility leading up to the buyout. Year fixed effects are included in all regressions. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Assessing the quality of matching

Matching Variable	Bank-affiliated (1)		Independent (2)		Mean Diff (1-2)	Median Diff (1-2)
	Mean	Median	Mean	Median		
Fama-French 10 industry	8.03	10.00	8.24	10.00	-0.21	0.00
Log sales	3.76	3.59	3.70	3.48	0.06	0.12
Log total assets	3.32	2.96	3.09	2.80	0.23	0.15
EBITDA	18.88	3.68	14.79	3.66	4.09	0.02
Earnings	8.21	1.67	6.01	1.53	2.20	0.14
EBITDA/sales	0.28	0.12	0.13	0.10	0.15	0.01
ROA	0.09	0.08	0.10	0.08	-0.01	0.00
Current asset/total asset	0.71	0.70	0.66	0.65	0.05	0.05
EBITDA volatility	3.97	1.11	3.70	0.79	0.27	0.32
EBITDA/sales volatility	0.24	0.02	0.04	0.02	0.20	0.00

Panel B. Industry-adjusted operating performance

Dependent variable:	(1) EBITDA/ sales	(2) EBITDA/ sales Δ	(3) EBITDA/ PP&E	(4) EBITDA/ PP&E Δ	(5) Profit Margin	(6) Profit Margin Δ
Bank-affiliated	0.026 (0.020)	0.073 (0.055)	0.049 (0.124)	0.299 (0.260)	0.036* (0.021)	0.093 (0.057)
Log PP&E	0.016 (0.010)	0.051 (0.031)	-0.081 (0.082)	-0.283** (0.119)	0.010 (0.010)	0.036 (0.031)
Pre-buyout leverage	-0.016 (0.012)	-0.031 (0.030)	-0.009 (0.097)	0.133 (0.161)	-0.022* (0.013)	-0.048 (0.033)
Leverage change	-0.002 (0.002)	-0.004 (0.005)	0.009 (0.016)	0.010 (0.018)	-0.002 (0.002)	-0.005 (0.005)
Board size	0.012* (0.006)	0.037* (0.020)	0.046 (0.036)	0.045 (0.058)	0.013* (0.007)	0.040* (0.021)
Public-to-private indicator	0.011 (0.051)	0.118 (0.167)	-0.256 (0.172)	-0.387 (0.321)	0.001 (0.053)	0.093 (0.176)
Club PE	-0.061 (0.068)	-0.252 (0.217)	-0.022 (0.176)	0.157 (0.402)	-0.053 (0.071)	-0.221 (0.220)
Pre-buyout EBITDA/sales volatility	-0.159** (0.067)	0.493 (0.750)	-0.063*** (0.024)	0.331 (2.701)	-0.203 (0.127)	0.040 (0.936)
Pre-buyout EBITDA/sales	0.462 (0.298)	-1.471 (0.945)				
Pre-buyout EBITDA/PP&E			0.093*** (0.014)	0.000 (0.135)		
Pre-buyout profit Margin					-0.112 (0.229)	-1.527** (0.767)
Intercept	0.333* (0.186)	0.720 (0.541)	1.139*** (0.334)	0.905 (0.617)	0.692*** (0.098)	-0.194 (0.328)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	143	142	136	110	143	142
Adjusted R ²	0.435	0.350	0.254	0.179	0.146	0.288

performance, so I control for the level of leverage at one full year before the buyout and the percentage changes in leverage. I also use indicator variables for club deals and public-to-private deals. To proxy for post-buyout governance and monitoring, I control for the size of the board after the buyout⁸. To account for pre-buyout risk, I include pre-buyout three-year EBITDA/sales volatility as an independent variable. All regressions also use buyout-year fixed effects to account for time variation.

The indicator variable Bank-affiliated equals one if the buyout is sponsored by a bank-affiliated private equity firm, and zero if it is a matched independent LBO. If bank-affiliated LBOs have worse post-buyout operating performance compared to their matched independent counterparts, the coefficient for this indicator variable should be negative. However, the results do not support this hypothesis⁹. In all regressions, the coefficient estimate is positive, but it is not significant except for one.

Other variables that seem to be associated with post-buyout operating performance include board size, pre-buyout risk, and pre-buyout profitability. A larger board, which is a rough proxy for better post-buyout monitoring, is positively associated with EBITDA/sales and profit margin changes. The results are significant at the 10% level. Lower pre-buyout firm risk and higher pre-buyout operating performance also show some association with greater operating performance improvements.

The results in Table 7 indicate that given similar pre-buyout characteristics, targets of bank-affiliated and independent LBOs do not show any difference in post-buyout operating performance. In other words, this suggests that potential distortions in managing investments do not cause bank-affiliated LBOs to have a worse effect on operating performance. However, this comparison cannot draw any conclusion on problems in investment selection. One way to test for the selection problem is to compare post-buyout operating performance of bank-affiliated LBO targets with those of unmatched independent LBOs. Alternatively, to improve the statistical power of the test, we can compare all firms that share the same target characteristics as bank-affiliated LBOs to the rest of the unmatched independent LBOs.

I create a new indicator variable, Bank-affiliated and similar firms, that equals one if the buy-out is either a bank-affiliated LBO or a matched independent LBO, and zero if the buyout is an unmatched independent LBO. I run the same regressions as those reported in Table 7 but with the full sample of LBOs. Results are reported in Table 8. This table shows that all firms that share similar characteristics as the targets of bank-affiliated LBOs have worse post-buyout operating performance. Except for Column (3), the coefficient for Bank-affiliated and similar firms is negative and significant in all regressions. The estimate is also economically large. The target characteristics of bank-affiliated LBOs are associated with approximately 10% lower EBITDA/sales and profit margin, and a 35.7% lower EBITDA/PP&E change from one year before the buyout.

Table 8 also reveals that having more debt before the buyout and higher percentage changes in debt are both associated with a better post-buyout operating performance. Pre-buyout profitability and productivity also affect post-buyout EBITDA/sales, EBITDA/PP&E, and changes in profit margin. The better the pre-buyout performance, the less room there is for post-buyout improvements. Similar to Chung (2011), I find that private-to-private buyouts are also associated with lower operating performance gains.

Table 8
Operating performance of bank-affiliated and similar LBOs vs. unmatched independent LBOs

The table shows comparisons of firms' industry-adjusted operating performance three years after the LBO. The full sample of bank-affiliated and independent LBOs, both matched and unmatched, is used. Columns 1, 3, and 5 report comparisons of operating performance in levels. Columns 2, 4, and 6 report comparison results based on the percentage changes from one year before the buyout to three years after it. Bank-affiliated and similar firms is an indicator variable that equals one if the buyout is a bank-affiliated or PSM matched independent buyout. All other variables are defined in Table 7. Year fixed effects are included in all regressions. Robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	(1) EBITDA/ sales	(2) EBITDA/ sales Δ	(3) EBITDA/ PP&E	(4) EBITDA/ PP&E Δ	(5) Profit Margin	(6) Profit Margin Δ
Bank-affiliated and similar firms	-0.097*** (0.031)	-0.079** (0.034)	-0.178 (0.176)	-0.357** (0.180)	-0.097*** (0.037)	-0.083** (0.041)
Log PP&E	-0.044* (0.023)	-0.051* (0.026)	-0.497*** (0.077)	-0.575*** (0.083)	-0.048* (0.026)	-0.048 (0.029)
Pre-buyout leverage	0.073** (0.036)	0.085** (0.040)	0.344*** (0.104)	0.399*** (0.112)	0.068 (0.043)	0.070 (0.047)
Leverage change	0.008*** (0.002)	0.007*** (0.002)	0.029*** (0.007)	0.040*** (0.006)	0.004*** (0.001)	0.003** (0.001)
Board size	0.004 (0.006)	0.001 (0.008)	0.099** (0.044)	0.067 (0.041)	0.005 (0.008)	0.008 (0.009)
Public-to-private indicator	-0.057* (0.030)	-0.072* (0.040)	-0.245 (0.200)	-0.322 (0.236)	-0.049 (0.042)	-0.096* (0.055)
Club PE	-0.094 (0.058)	-0.089 (0.096)	-0.043 (0.292)	0.099 (0.610)	-0.083 (0.070)	-0.023 (0.112)
Pre- buyout EBITDA/ sales volatility	0.554*** (0.126)	-0.352 (0.624)	0.048 (0.031)	-2.665 (2.396)	0.253 (0.249)	-1.045 (0.862)
Pre-buyout EBITDA/ Sales	-0.123*** (0.036)	-0.303 (0.312)				
Pre-buyout EBITDA/ PP&E			0.004* (0.002)	-0.012 (0.008)		
Pre-buyout profit margin					-0.452 (0.449)	-1.105* (0.618)
Intercept	-0.027 (0.066)	-0.013 (0.077)	0.239 (0.299)	0.224 (0.511)	-0.004 (0.074)	0.037 (0.079)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	222	221	204	166	222	220
Adjusted R ²	0.358	0.214	0.436	0.471	0.176	0.206

Overall, the combined evidence indicates that bank-affiliated LBOs select target companies that are fundamentally different, and this target selection ultimately leads to an underperformance of bank-affiliated LBOs. At first glance, this result seems to be at odds with the nature of the target characteristics, as bank-affiliated LBOs acquire larger and more profitable firms with less volatile cash flows. Compared to the universe of all firms, established low risk firms are the prototype of “good” LBO candidates. However, better pre-buyout operating performance is associated with less post-buyout operating performance gains, since there is less room for improvements.

B. Leverage and Deal Pricing

Worse operating performance does not necessarily indicate less value creation overall. In this section, I start with the question of whether bank-affiliated LBOs create more value through higher leverage. To measure leverage, I use total debt/PP&E and bank debt/total debt. Since the sample is not restricted to the syndicated loan market, the variables are measured at one year after the buyout.

Table 9 reports regression results predicting target firms’ post-buyout leverage for the matched bank-affiliated and independent LBOs as well as the full sample of LBOs. In Columns (1) and (2) under Matched sample, Bank-affiliated is an indicator variable that equals one if the buyout is a bank-affiliated LBO, and zero if it is a PSM matched independent LBO. In Columns (3) and (4) under Full sample, Bank and similar firms equals one if the buyout is either bank-affiliated or a matched independent LBO, and zero if it is an unmatched independent LBO. Other independent variables include firm size, profitability, club deals indicator, and pre-buyout debt level. Firm size is measured by the natural logarithm of firms’ sales, and profitability is measured by EBITDA/PP&E. Following Axelson et al. (2013), I also control for debt market condition measured by leveraged loans spread in the buyout year. All regressions include buyout year fixed effects and industry fixed effects, and all standard errors are clustered by year.

The results show that targets of bank-affiliated LBOs do not have higher leverage measured by total debt/PP&E. In fact, the coefficient estimate is negative although not significant for the matched sample. In terms of the type of debt, bank-affiliated LBOs and similar firms also do not show a higher proportion of bank debt either.

I then turn to the question of whether bank-affiliated LBOs create more value through deal pricing. To measure deal pricing, I follow the “comparable industry transaction method” described in Kaplan and Ruback (1995) and Officer et al. (2010) and use buyout discounts/premiums based on enterprise value as multiples of EBITDA (EV/EBITDA) and sales (EV/sales).

Table 10 reports regression comparisons of buyout discounts/premiums. To better account for firm characteristics and market conditions, I control for firm size, EBITDA one-year growth prior to the buyout, club deals indicator, debt ratio, and high-yield market interest rates. Standard errors are clustered by year. The results show that bank-affiliated LBOs are not priced differently compared to independent LBOs nor to similar independent LBOs.

Table 9
Post-buyout leverage comparisons

The table compares post-buyout leverage of bank-affiliated and independent LBOs. Pre- and post-buyout leverage is measured at one full fiscal year before and after the buyout, respectively. The dependent variable in each regression is a measure of debt at one full fiscal year after the buyout. Matched sample reports results for the matched sample of bank-affiliated and independent LBOs. The indicator variable Bank-affiliated equals one if the buyout is bank-affiliated, and zero if it is a matched independent buyout. Full sample presents results comparing bank-affiliated and similar firms with the rest of the unmatched independent LBOs. Bank and similar firms equals one if the buyout is either bank-affiliated or a PSM matched independent buyout, and zero if it is an unmatched independent buyout. Leveraged loans spread is the difference between the high-yield rate and the six-month LIBOR rate in the buyout year. All other variables are defined in previous tables. Robust standard errors clustered by year are reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

	Matched sample		Full sample	
	(1) Total Debt/PP&E	(2) Bank Debt/Total Debt	(3) Total Debt/PP&E	(4) Bank Debt/Total Debt
Bank-affiliated/ Bank and similar firms	-0.101 (0.156)	0.052 (0.034)	0.124 (0.175)	0.036 (0.034)
Log sales	-0.166** (0.055)	0.023 (0.014)	-0.187 (0.104)	0.012 (0.015)
EBITDA/PP&E	0.065** (0.024)	0.002 (0.003)	0.035 (0.022)	0.003*** (0.001)
Club deals	-0.132 (0.256)	-0.051 (0.093)	0.162 (0.455)	-0.023 (0.050)
Leveraged loans spread	-0.790*** (0.108)	-0.001 (0.036)	-0.896*** (0.094)	0.077*** (0.015)
Pre-buyout total debt/PP&E	0.029*** (0.007)		0.007 (0.006)	
Pre-buyout bank debt/total debt		0.185* (0.093)		0.191* (0.092)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Cluster by year	Yes	Yes	Yes	Yes
Number of observations	159	159	243	244
Adjusted R ²	0.319	0.047	0.254	0.075

Table 10
Deal pricing comparisons

This table presents results on deal pricing of bank-affiliated LBOs relative to independent LBOs. The dependent variables are buyout discounts/premiums based on EV/EBITDA and EV/sales. The buyout discount/premium is estimated as the percent difference between EV/EBITDA (EV/sales) for an LBO and the average EV/EBITDA (EV/sales) for a matched portfolio of non-buyout acquisitions of private firms within three years of the LBO in the same industry in the U.K. Whether firms are in the same industry is determined by the Fama-French 10 industry classification. Matched firms are allowed to re-enter portfolios. EV/EBITDA Diff and EV/Sales Diff each reports results on buyout discounts/premiums based on EV/EBITDA and EV/sales, respectively. Matched Sample only includes results for the bank-affiliated and their matched independent LBOs. Column Full Sample shows results using the full sample of bank-affiliated and independent LBOs. Bank-affiliated/ Bank and similar firms is defined in Table 9. Log total assets and Debt/EBITDA are measured at one full fiscal year before the buyout. EBITDA 1-year growth is the growth in EBITDA at one year before the buyout. HY market interest is the high-yield market interest rate in the buyout year. All other variables are defined in previous tables. Robust standard errors clustered by year are reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

	Matched sample		Full sample	
	(1) EV/EBITDA Diff	(2) EV/Sales Diff	(3) EV/EBITDA Diff	(4) EV/Sales Diff
Dependent variable:				
Bank-affiliated/ Bank and similar firms	-0.031 (0.049)	0.120 (0.126)	-0.000 (0.080)	0.010 (0.050)
Log (total assets)	-0.027 (0.030)	0.034 (0.053)	-0.019 (0.027)	0.039 (0.045)
EBITDA 1-year growth	0.049 (0.034)	-0.058 (0.091)	0.003*** (0.001)	-0.002 (0.004)
Club deals	-0.031 (0.062)	1.037 (1.191)	-0.010 (0.042)	0.877 (1.024)
Debt/EBITDA	0.007 (0.004)	0.013 (0.016)	0.006*** (0.001)	0.000 (0.000)
HY market interest	-0.006 (0.008)	0.057 (0.073)	0.006 (0.017)	0.032 (0.046)
Cluster by year	Yes	Yes	Yes	Yes
Number of observations	118	116	193	189
Adjusted R ²	0.172	0.043	0.836	0.027

C. Alternative Explanation and Robustness Checks

The overall empirical patterns so far are consistent with the notion that bank-affiliated LBOs target firms that do not maximize the potential for value creation. In other words, the evidence points to a selection problem. An alternative benign explanation for the same pattern is that man-agers in bank-affiliated firms are not as highly skilled at

identifying optimal targets. Private equity firms typically follow a pay structure with strong performance incentives¹¹. However, the affiliated private equity firms' fees are often siphoned away by their parent bank. In turn, the lower pay can cause some skilled managers to leave the affiliated firm for better opportunities in independent firms¹².

The main challenge for testing this alternative explanation is the lack of data. There is no direct measure of fund managers' skill, and private equity firms do not publish data on fund managers' pay. Therefore, I consider a subsample of only bank-affiliated firms, in which I expect the fund managers' skill to vary. Presumably, higher ranked and more prestigious parent banks are more likely to attract more highly skilled managers. To construct this ranking, I use parent banks' total assets as of 2007, the end of my sample period. If the parent bank is one of the 25 largest banks worldwide by total assets, the indicator variable, Top 25 bank, equals one, and zero otherwise.

If worse post-buyout operating performance is due to a lack of skilled fund managers in identifying ideal targets, then Top 25 bank should be positively associated with post-buyout operating performance, holding everything else equal. In the analyses presented in Table 11, I do not find results consistent with this hypothesis. The indicator variable does not show any significant difference in target firms' operating performance between prestigious and the rest of affiliated LBOs. Overall, the evidence based on the reputation of the parent bank is inconsistent with the notion that poor target selection can be attributed to a lack of skill.

The combined results thus far indicate that bank-affiliated LBOs create less value compared to independent LBOs, driven by their worse operating performance. Next, I perform a series of robustness checks on the operating performance results. All regressions are identical to those reported in Tables 7 and 8. Therefore, I only report coefficient estimates of Bank-affiliated and Bank-affiliated and similar firms.

First, the use of the industry-adjusted benchmark for operating performance follows prior re-search on this topic. One potential concern is that this benchmark does not capture abnormal operating performance, and Acharya et al. (2013) find evidence for positive abnormal operating performance for large UK buyouts. To account for this possibility, I follow Lie (2001) and Guo et al. (2011) and make adjustments based on benchmark firms with similar pre-buyout operating performance¹³. Results are presented in Table 12.

Panel A of this table shows that compared to matched targets of independent LBOs, targets of bank-affiliated LBOs have slightly better operating improvements. Coefficient estimates for EBITDA/sales, profit margin, and change in profit margin are all positive and significant at the 10% levels. However, Panel B shows that all firms sharing the same characteristics of bank-affiliated LBOs continue to show significantly worse operating performance. That said, taking abnormal performance into account seems to lessen the magnitude of this worse performance in EBITDA/sales and changes in EBITDA/sales, as coefficient estimates for these two variables are lower than those in Table 8.

I also replicate the results excluding LBOs carried out after 2004. Fueled by private equity firms' abilities to finance deals, LBO transactions increased substantially after 2004. An over-heated buyout market can lead to worse deal structures (Kaplan and Stein, 1993) and worse outcomes for bank-affiliated LBOs (Fang et al., 2013). Results reported in Table 13 do not support the argument that previously observed difference in post-buyout operating performance is driven by a "hot" buyout market.

Table 11
Operating performance of LBOs affiliated with prestigious banks

The table shows whether bank-affiliated LBOs under prestigious banks outperform other bank-affiliated LBOs in terms of target firms operating performance after the buyout. All bank-affiliated buyouts are included in the sample. Columns 1, 3, and 5 report industry-adjusted post-buyout operating performance in levels three years after the buyout. Columns 2, 4, and 6 report industry-adjusted operating changes from one year before the buyout to three years after it. Top 25 bank is an indicator variable that equals one if the buyout sponsor is affiliated with one of the largest 25 banks worldwide, and zero otherwise. The ranking of banks is determined by their assets as of 2007. All other variables are defined in previous tables. Year fixed effects are included in all regressions. Robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable:	(1) EBITDA/ sales	(2) EBITDA/ sales Δ	(3) EBITDA/ PP&E	(4) EBITDA/ PP&E Δ	(5) Profit Margin	(6) Profit Margin Δ
Top 25 bank	0.022 (0.047)	0.022 (0.046)	0.164 (0.414)	-0.445 (0.600)	0.074 (0.068)	0.067 (0.074)
Log PP&E	-0.016 (0.018)	-0.019 (0.020)	-0.295* (0.173)	-0.421** (0.212)	-0.040 (0.025)	-0.043 (0.028)
Pre-buyout leverage	0.015 (0.025)	0.022 (0.027)	-0.020 (0.283)	0.212 (0.251)	0.021 (0.041)	0.024 (0.044)
Leverage change	0.001 (0.004)	0.002 (0.004)	-0.019 (0.048)	0.016 (0.030)	0.001 (0.005)	0.002 (0.005)
Board size	0.018* (0.010)	0.021* (0.011)	0.169 (0.110)	0.097 (0.078)	0.019 (0.013)	0.022 (0.014)
Public-to-private indicator	-0.064 (0.065)	-0.061 (0.070)	-0.444 (0.438)	-0.675 (0.688)	-0.099 (0.093)	-0.104 (0.095)
Club PE	-0.194** (0.084)	-0.036 (0.591)	0.013 (0.057)	1.704 (4.008)	-0.288 (0.244)	-0.466 (0.840)
Pre- buyout EBITDA/ sales volatility	0.034 (0.051)	0.027 (0.059)	-0.004 (0.251)	-0.174 (0.579)	0.109 (0.088)	0.110 (0.091)
Pre-buyout EBITDA/ sales	0.740*** (0.286)	-0.386 (0.310)				
Pre-buyout EBITDA/ PP&E			0.085*** (0.025)	-0.013 (0.032)		
Pre-buyout profit margin					0.505 (0.438)	-0.741* (0.416)
Intercept	0.016 (0.115)	-0.006 (0.124)	1.023 (0.823)	1.151 (1.369)	0.091 (0.164)	0.091 (0.174)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	69	68	61	60	68	67
Adjusted R ²	0.118	0.018	0.224	0.101	0.011	0.025

Table 12
Operating performance comparisons using performance-adjusted benchmark

The table presents comparisons of adjusted operating performance using an alternative benchmark, instead of adjusting for industry median values. For each sample firm, a benchmark group is selected based on (1) the same Fama-French 10 industries, (2) return on assets (ROA) is between 80% and 120% of the level of the sample firms' ROA at one year prior to the buyout, and (3) changes in ROA is between 80% and 120% of the changes of the sample firms' ROA at one year prior to the buyout. The sum of absolute difference between sample firms' and matched firms' operating performance measures is computed and up to ten benchmark firms are selected. The median values from the benchmark firms are used to adjust for sample firms' operating performance. All regressions and variables used are the same as those reported in Tables 7 and 8. For brevity, only coefficient estimates for the variables of most interest are reported. Panel A presents results of performance comparisons between bank-affiliated and their PSM matched independent buyouts. Panel B shows operating performance comparisons between bank-affiliated and PSM matched firms and unmatched independent LBOs. Year fixed effects are included in all regressions. Robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Bank-affiliated vs. matched firms

Dependent variable:	(1) EBITDA/ sales	(2) EBITDA/ sales Δ	(3) EBITDA/ PP&E	(4) EBITDA/ PP&E Δ	(5) Profit Margin	(6) Profit Margin Δ
Bank-affiliated	0.035* (0.021)	0.068 (0.054)	0.072 (0.056)	-0.047 (0.062)	0.095* (0.057)	0.102* (0.060)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	143	132	116	110	143	142
Adjusted R ²	0.223	0.103	0.275	0.217	0.099	0.292

Panel B: Bank-affiliated and similar firms vs. unmatched firms

Dependent variable:	(1) EBITDA/ sales	(2) EBITDA/ sales Δ	(3) EBITDA/ PP&E	(4) EBITDA/ PP&E Δ	(5) Profit Margin	(6) Profit Margin Δ
Bank-affiliated and similar firms	-0.037** (0.018)	-0.062* (0.036)	-0.232** (0.106)	-0.051 (0.046)	-0.091** (0.042)	-0.099** (0.042)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	222	221	204	166	222	220
Adjusted R ²	0.293	0.223	0.251	0.264	0.230	0.194

Table 13
Operating performance comparisons of buyouts prior to 2005

The table presents operating performance comparisons based on buyouts completed before 2005. All LBOs completed between 2005 and 2007 are dropped from the sample. All regressions and variables used are the same as those reported in Tables 7 and 8. For brevity, only coefficient estimates for the variables of most interest are reported in this table. Panel A presents the results of performance comparisons between bank-affiliated and their PSM matched independent buyouts. Panel B shows operating performance comparisons between bank-affiliated and PSM matched firms and unmatched independent LBOs. Year fixed effects are included in all regressions. Robust standard errors are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Bank-affiliated vs. matched firms

Dependent variable:	(1) EBITDA/ sales	(2) EBITDA/ sales Δ	(3) EBITDA/ PP&E	(4) EBITDA/ PP&E Δ	(5) Profit Margin	(6) Profit Margin Δ
Bank-affiliated	0.027 (0.023)	0.081 (0.063)	0.002 (0.131)	0.211 (0.231)	0.036 (0.024)	0.130* (0.070)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	91	90	90	76	91	90
Adjusted R ²	0.341	0.253	0.548	0.417	0.133	0.244

Panel B: Bank-affiliated and similar firms vs. unmatched firms

Dependent variable:	(1) EBITDA/ sales	(2) EBITDA/ sales Δ	(3) EBITDA/ PP&E	(4) EBITDA/ PP&E Δ	(5) Profit Margin	(6) Profit Margin Δ
Bank affiliated and similar firms	-0.045** (0.021)	-0.098** (0.046)	-0.210* (0.123)	-0.262* (0.139)	-0.043* (0.022)	-0.120** (0.051)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	166	162	162	136	165	161
Adjusted R ²	0.371	0.267	0.490	0.492	0.173	0.176

All results thus far are based on operating performance observed within three years surrounding the buyout. I chose this short window to reduce noise from potential interfering events. However, a short event window may not fully capture the effect of a buyout, especially if targets of bank-affiliated LBOs take longer to restructure. To test this hypothesis, I examine firms' exits and restructuring efforts. When considering exits, I focus on the probability of exiting instead of the exit type. While IPOs are perceived to be the most successful exit type, a firm's ability to exit through an IPO depends on its fundamentals and life cycle. In addition, private equity firms are exit-focused, regardless of the exit type. I interpret a higher probability of exiting as an indicator of better performance. To measure restructuring efforts, I follow Cao (2011), who shows that LBO duration is a good proxy for buyout sponsors' restructuring efforts. I interpret a longer duration as more efforts spent on restructuring.

Table 14
Buyout exit probabilities and duration

The table presents results using Heckman's selection model to estimate buyout exit probabilities and duration. Stage one predicts the probability of exiting (Columns 1 and 3), and stage two estimates buyout duration, measured by the logarithm of holding period in months (Columns 2 and 4). Results reported in Columns (1) and (2) show comparisons between bank-affiliated and matched independent LBOs. Results reported in Columns (3) and (4) compare bank-affiliated and similar firms with the rest of independent LBOs. The indicator variable Bank-affiliated/ Bank and similar firms is defined in Table 9. Log (PP&E) is the logarithm of target firm's PP&E at exit. Industry IPO vol is the Fama-French 10 industry IPO volume in the year of exiting. EBITDA/PP&E and Number of directors are measured at their levels in the third year after the buyout. EBITDA/PP&E growth shows the increase in EBITDA/PP&E from one year before the buyout to three years after it. Acquirer reputation indicator equals one if the acquirer is one of the largest private equity firms as of 2007. Pre-buyout EBITDA/PP&E and Log (pre-buyout PP&E) each measures EBITDA/PP&E and logarithm of PP&E at one year before the buyout, respectively. Industry and year fixed effects are included in all regressions. Robust standard errors clustered by industry are in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Matched sample		Full sample	
	(1) (Exit)	(2) (Duration)	(3) (Exit)	(4) (Duration)
Dependent variable:				
Bank-affiliated/ Bank and similar firms	-0.135 (0.134)	0.047** (0.021)	0.046 (0.161)	-0.002 (0.069)
Log (PP&E)		-0.018 (0.032)		-0.021** (0.008)
Industry IPO vol		0.100 (0.086)		0.040 (0.045)
EBITDA/PP&E		-0.007 (0.021)		-0.023** (0.009)
Number of directors		0.006 (0.033)		0.001 (0.023)
EBITDA/PP&E growth		-0.017*** (0.005)		-0.000*** (0.000)
Acquirer reputation indicator	-0.362 (0.754)		-0.022 (0.176)	
Pre-buyout EBITDA/PP&E	-0.210 (0.017)		-0.018 (0.015)	
Log(pre-buyout PP&E)	-0.196*** (0.050)		-0.134*** (0.017)	
Intercept	-0.848*** (0.209)	2.937*** (0.531)	-1.291*** (0.191)	3.307*** (0.340)
Industry fixed effect		Yes		Yes
Year fixed effect		Yes		Yes
Number of observations		176		283
Wald test of independence of equations		0.04		0.71

Buyout duration can only be calculated once an exit has been observed. Therefore, I use the Heckman's two-stage selection model. In stage one, I investigate the probability of a firm exiting, controlling for acquirer type, buyout sponsor's reputation, and firms' pre-buyout size and profitability. In stage two, I examine the cross-sectional variation in buyout duration, controlling for acquirer type, firm fundamentals, and equity market condition at the time of exit. I report the findings in Table 14.

Results reported in Columns (1) and (2) show that compared to similar independent LBOs, bank-affiliated LBOs are not more likely to exit, although they take longer to restructure. Columns (3) and (4) show that compared to unmatched independent LBOs, bank-affiliated LBOs and similar firms are neither more likely to exit, nor do they have longer buyout duration. These results mitigate concerns about an unstable affiliated program and using a short event window. In each analysis, the Wald test of independence of the selection equation and principal equations shows that concerns over selection issue do not pose a problem here.

V. CONCLUSION

As the private equity industry grew, so did banks' direct involvement in private equity. As much as 30% of annual deals are sponsored by bank-affiliated private equity firms. In this paper, I use hand-collected accounting data of U.K. firms to study value creation of bank-affiliated LBOs and the source of their underperformance.

I first find that targets of bank-affiliated and independent LBOs are systematically different. Conditioning on firms going through LBOs, larger firms with higher profits, profitability, and liquidity are more likely to go through bank-affiliated LBOs. There is also some evidence showing that targets of bank-affiliated LBOs have lower risk.

While targets of bank-affiliated LBOs show some operating performance gains prior to the buyout, their profitability and productivity decrease significantly after the buyout. I further find that bank-affiliated LBOs have worse post-buyout operating performance compared to independent LBOs due to target selection. Specifically, I find that targets of affiliated LBOs have similar post-buyout operating performance compared to PSM matched targets of independent LBOs, whereas all firms that share the target characteristics of bank-affiliated LBOs show worse operating performance. Lastly, I find no evidence that bank-affiliated LBOs use more leverage or have lower deal pricing as value drivers compared to independent LBOs.

I also investigate a benign skill-based explanation for lower post-buyout operating performance. I use parent banks' reputation as an indicator for the affiliated fund managers' abilities and find that post-buyout operating performance does not vary with parent banks' reputation. This result is inconsistent with the notion that lower operating performance is due to a lack of skilled managers.

To summarize, bank-affiliated private equity firms manage billions of dollars of private equity investments. However, these LBOs fail to create operating performance gains, and compared to independent LBOs, they have a worse economics impact on the target firms due to target selection. This worse performance also holds regardless of the market cycle.

The findings in this paper also raise future research questions. First, the combined results on operating performance, leverage, and deal pricing cast doubt on the returns of bank-affiliated LBOs. However, how much this affiliation affects investors' returns

remains a question. Second, Fang et al. (2013) hypothesize that bank-affiliated LBOs have the objectives to maximize volatility, promote cross-selling opportunities, and distribute loans of their risky debt. While all these objectives can lead to the selection problem, the bulk of the evidence in this paper, the evidence on target characteristics in particular, suggests that bank-affiliated LBOs could be driven by banks' cross-selling activities. It would be useful for future research to provide more direct evidence on the relationship between these objectives and the success of deals.

ENDNOTES

1. The numbers are estimated by summing fund sizes by year in Preqin.
2. Zephyr, which is published by Bureau van Dijk, provides information on mergers and acquisitions, IPOs, and private equity deals worldwide since 1997. As of January 2009, it contained information on 703,327 deals. Zephyr does not cover deals involving equity stakes of less than 2 percent, unless the consideration for the stake is greater than GBP 15 million. When the bidder is an investment trust or pension fund, the threshold is raised to 5 percent. If the purchase is considered to be significant, then it is entered regardless of the deal value.
3. Divisional buyouts are excluded from the sample due to the lack of data distinguishing the performance of the division from its parent company. Secondary buyouts are also excluded, since they are motivated by the financial constraints of private equity firms and market conditions.
4. In the U.K., a parent company need not prepare group accounts or send them to the Registrar if the group is small or medium-sized and none of its member companies is: a public company, a person who has permission under Part 4 of the Financial Services and Markets Act 2000 to carry on a regulated activity, or a person involved in insurance market activity. To qualify as small, a group of companies must meet at least two of the following conditions: aggregate turnover must be £5.6 million net (£6.72 million gross) or less; the aggregate balance sheet total must be £2.8 million net (£3.36 million gross) or less; the aggregate average number of employees must be 50 or fewer.
5. A small number of deals are also club deals. 16 bank-affiliated LBOs are club deals, and 8 independent LBOs are club deals.
6. DeAngelo et al. (2002) argue that current assets is a better measure of asset liquidity compared to cash.
7. Given that some deals in the sample are sponsored by a consortium of private equity firms, it is possible that these differences in target characteristics are driven by club deals. Therefore, I re-estimate the probit models using a sample excluding club deals. The untabulated results do not change meaningfully.
8. Another potential proxy for post-buyout monitoring is the ratio of bank debt to total debt, as a higher ratio suggests more bank monitoring. However, since I do not find that bank-affiliated LBOs carry more bank debt than their matched independent LBOs (results reported in Table 9), this ratio is not included as a control variable in the regression analysis.
9. Here and in every other table in which I report operating performance results with fixed effects, results are similar if I also include parent-bank fixed effects. Therefore, the patterns in operating performance are not driven by a few large banks.

10. For every firm in my sample, I form a matching portfolio of non-buyout acquisitions in the same U.K. industry within three years of the buyout and compute the average EV/EBITDA (EV/Sales) for that portfolio. Then I calculate the percent difference between EV/EBITD (EV/Sales) for every deal in my sample and the average of EV/EBITDA (EV/Sales) of the matching portfolio. This percent difference is the buyout discount/premium. Essentially, this method is a difference-in-difference estimation that uses multiples calculated from portfolios of firms in the same industry involved in similar transactions.
11. GPs of private equity firms usually have a 2/20 pay structure: 2% management fee and 20% carried interest that is paid upon successful exits of deals.
12. Gompers and Lerner (1998) point out that the ineffective incentive structure of affiliated firms comes from profit sharing with the parent company. While this incentive structure can lead to ineffective management of portfolio companies, another side effect could be not retaining skilled managers. For an anecdotal example of fund managers leaving affiliated firms, please see Reuters' article, Exclusive: Morgan Stanley infrastructure fund hit by Volcker rule, published on September 18, 2012. The article notes that "the promise of higher pay elsewhere has played a role in at least some Morgan Stanley fund executives looking for opportunities outside the bank, the sources said. Independent firms, such as GIP and Alinda Capital Partners, do not have a bank owner they have to share profits with."
13. I modify their method slightly because market-to-book ratios are not available for private firms. Firms in the benchmark groups are selected based on the following criteria: (1) the same Fama-French 10 industry, (2) return on assets (ROA) is between 80% and 120% of the level of the sample firms' ROA at one year prior to the buyout, and (3) changes in ROA is between 80% and 120% of the changes of the sample firms' ROA at one year prior to the buyout. Then I compute the sum of absolute difference between sample firms' and matched firms' operating performance measures. I select up to ten benchmark firms and use the median values to adjust for sample firms' operating performance.

APPENDIX

The initial sample

In this appendix, I present a more detailed description of the 970 LBOs in the initial sample. Firms without consolidated financial statements in this sample are later dropped in the final sample. Panel A of Table A1 presents deal types cross LBO year and acquirer affiliations. Similar to the pattern observed in the final sample, the majority of all LBOs, both bank-affiliated and independent, is buyouts of private firms. This result is consistent with the overall buyout pattern (see Stromberg, 2008). Panel B of Table A1 shows exit outcomes by acquirer type. Also similar to the final sample, a majority of the firms has not reached an exit. Among firms that exited, most were sold to strategic buyers (*Acquired*), followed by other private equity firms (*SBO*). Among bank-affiliated LBOs, Only 18 (6.5%) of the firms exited through IPOs. This percentage is slightly lower than that of independent LBOs (7.7%). However, independent LBOs also have a higher percentage of firms with no exit.

Table A1
Initial sample buyout types and outcomes

The table presents different buyout types and outcomes of firms in the initial sample that is not restricted to firms with consolidated financial statements. The initial sample includes 970 LBOs, divided to two categories according to the acquirer type: 277 are bank-affiliated LBOs (Column *Bank-affiliated*); 693 are independent LBOs (Column *Independent*). Panel A shows deal types by acquirer type and the buyout year. Panel B presents LBO exit outcomes by the acquirer type. All deal types and exit outcomes are defined in Table 2.

Panel A: Deal Types across Time in the Initial Sample

	Bank-affiliated			Independent		
	Total	Public	Private	Total	Public	Private
1997	8	0	8	36	0	36
1998	14	1	13	28	0	28
1999	29	1	28	56	12	44
2000	18	4	14	44	12	32
2001	27	2	25	38	5	33
2002	18	3	15	42	7	35
2003	24	5	19	56	11	45
2004	23	1	22	85	5	80
2005	31	4	27	87	8	79
2006	40	5	35	108	16	92
2007	35	5	30	113	16	97
Total	277	41	236	693	92	601

Panel B: Initial Sample Deal Outcomes

Affiliation	IPO	Acquired	SBO	Bankruptcy	Other/unknown	No exit	Total
Bank	18 (6.50%)	48 (21.15%)	14 (5.05%)	2 (0.72%)	3 (10.83%)	192 (69.31%)	277
Independent	53 (7.65%)	86 (12.41%)	22 (3.17%)	5 (0.72%)	4 (0.58%)	523 (75.47%)	693

Table A2 further shows the Fama-French 10 industry distribution of LBOs in the initial sample by acquirer affiliation. Similar to the industry distribution observed in the final sample, most of the target firms, regardless of acquirer affiliation, fall in the Others category. Compared to independent LBOs, bank-affiliated LBOs have a higher concentration in Whole sale and Retail, and a lower concentration in HiTech and Business Equipment. A very small fraction of both bank-affiliated and independent LBOs has no industry classification. These firms are shown as Non-classified. Overall, the initial sample shows patterns similar to those observed in the final sample restricted to firms with consolidated financial statements. These similar patterns should mitigate the concern that the final sample is not representative of the market.

Table A2
Target industry distribution of firms in the initial sample

This table shows the number and percentage distribution of target firms in each industry in the initial sample not restricted to firms with consolidated financial statements. Industry distribution is classified according to Fama-French's 10 industries. *Non-Classified* includes firms with missing industry codes in Zephyr. Other industries and variables are defined in Tables 1 and 3.

Fama-French 10 Industries	Bank-affiliated	Independent
Consumer Nondurables	21 (7.58%)	63 (9.12%)
Consumer Durables	13 (4.69%)	18 (2.60%)
Manufacturing	54 (19.49%)	112 (16.21%)
Energy, Oil, Gas, and Coal	2 (0.72%)	7 (1.01%)
HiTech and Business Equipment	15 (5.42%)	81 (11.58%)
Telecom	6 (2.17%)	9 (1.30%)
Wholesale and Retail	60 (21.66%)	112 (16.06%)
Health, Healthcare, Medical Equipment, and Drugs	8 (2.89%)	27 (3.91%)
Utilities	3 (1.08%)	5 (0.72%)
Others	94 (33.94%)	257 (37.19%)
Non-classified	1 (0.36%)	2 (0.29%)
Total	277 (100%)	693 (100%)

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