Andrej Gill - Nikolai Visnjic

Performance Benefits of Tight Control

Non-Technical Summary

The choice between being a public or private corporation is one of the major economic questions surrounding the organization and the governance of firms. Furthermore, organizational form and ownership structure of a firm are closely interrelated. On the one hand, information costs for investors are considerably higher in the case of private firms. Owning small stakes in a private firm's equity therefore comes with large costs. On the other hand, one of the major advantages of being a public corporation for investors is liquidity. However, with concentrated ownership a majority of the equity is owned by a few large shareholders and liquidity among the remaining shareholders is accordingly low. As a consequence, private ownership is typically characterized by private contracting and concentrated ownership. Conversely, public ownership is characterized by a company's shares being traded on a public equity market and usually comes with a dispersed ownership structure. There is close to zero evidence for the existence of private firms with dispersed ownership or public firms with maximum ownership concentration. Given the fact that the transition from public to private only a few years after IPO is lately frequently observed, there appears to be an unresolved puzzle: Why do we observe that so many firms are frequently changeing their public or private ownership status and what does this transition mean to the subsequent operational performance of the company?

Literature acknowledges that the introduction of the corporate form and the resulting separation of ownership and control leads to severe agency conflicts between managers and shareholders. This can have negative effects on shareholder value. By applying an appropriate corporate governance structure, these issues can at least be mitigated. If the shareholders' stake in the company is large enough they have an incentive to monitor the actions of the management. This means that the firm is under tight control. Large shareholders have basically three options to intervene whenever they are dissatisfied with the management's decisions and the resulting operational performance: hold their shares and influence the management's decisions, sell their shares, or do nothing. This study therefore focuses on whether active monitoring through tight investor control impacts on the operational performance of the underlying company. We analyze performance differences among non listed private equity portfolio companies and comparable listed companies with public ownership. Empirical predictions come from the literature on value creation of shareholder activism. Recent empirical research on corporate governance and ownership structure questions whether shareholder activism leads on average to better performance.

In order to figure out relative performance, we create groups of comparable companies for every RLBO company using different matching methods. The control sample consists of 6000 US public companies. Both, the sample firms and comparable companies, are under public ownership at the time of the LBO. By matching right before the IPO, we make sure that every treated sample company has a comparable group of untreated companies as a

benchmark. We are then able to calculate "real" performance differences between companies with different governance structures. Due to tighter control and accompanied increased monitoring of management by the owners, agency conflicts should be reduced and we expect our treated companies to outperform their control group. PE investors influence management decisions with the aim of increasing equity value, which eventually depends on a company's ability to generate profits. They usually restructure their portfolio companies by focusing on the core business. We therefore expect to see an increase in profitability due to an increase in efficiency rather than strong top-line growth.

Results show that our PE sample companies outperform their matched group of untreated firms. Three of our six performance ratios show significantly higher growth rates for the treated firms, cumulated from entry to exit of the private equity investor. Sample firms on average strengthen their profitability and increase cash flow from operating activities. These efficiency gains are driven by concentrated ownership rather than from the organizational form. Results persist after various robustness checks.

Performance Benefits of Tight Control[*]

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Abstract

This study investigates the transition from being a listed company with a dispersed ownership structure to being a privately held company with a concentrated ownership structure. We consider a sample of private equity backed portfolio companies to evaluate the consequences of the corporate governance changes on operational performance. Our analysis shows significant positive abnormal growth in several performance ratios for the private period of our sample companies relative to comparable public companies. These performance differences come from the increase in ownership concentration after the leveraged buyout transaction.

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1 Introduction

The battle for Safeway raises an old but important question: is it better to be a private company than a public one?
The Economist (January 2003)

The choice between being a public or private corporation is one of the major economic questions surrounding the organization and the governance of firms. Furthermore, organizational form and ownership structure of a firm are closely interrelated. On the one hand, information costs for investors are considerably higher in the case of private firms. Owning small stakes in a private firm's equity therefore comes with large costs. On the other hand, one of the major advantages of being a public corporation for investors is liquidity. However, with concentrated ownership a majority of the equity is owned by a few large shareholders and liquidity among the remaining shareholders is accordingly low. As a consequence, private ownership is typically characterized by private contracting and concentrated ownership. Conversely, public ownership is characterized by a company's shares being traded on a public equity market and usually comes with a dispersed ownership structure. There is close to zero evidence for the existence of private firms with dispersed ownership or public firms with maximum ownership concentration.

Corporate governance characteristics without doubt influence firm performance. Many studies report impacts on operational and financial performance (Core *et al.* (1999), Gompers *et al.* (2003) and Core *et al.* (2006)). Yet, there seems to be no ultimate superior governance structure as corporations frequently switch from public to private ownership and vice versa. The fact that, after the decline in equity prices in the early 2000s, many firms whose initial public offering (IPO) was in the late '90s went private again illustrates the relevance of the quote above. Boot *et al.* (2008) report 83 such transactions for 1999, 86 in 2000 jumping to 262 in 2003 and 188 in 2004. In contrast, Kaplan (1991) documents that around one third of the 183 leverage buyouts between 1979 and 1986 he considers went public again. Hence there appears to be an unresolved puzzle: Why do we observe so many firms frequently changing their public or private ownership status and what does this transition mean to the subsequent operational performance of the company?

Recent empirical research on the topic has predominantly concentrated on the transition from private to public, i.e. analyzing the period after companies went public. This can be attributed to better data availability. It is however generally acknowledged that both organizational forms have their advantages and disadvantages (Maug (1998) and Bolton and von Thadden (1998)). Liquidity is most powerfully supplied by the capital market if a company lists its shares on a stock exchange. But, at the same time

corporate governance rules are relatively inflexible. Conversely, with a large shareholder and private ownership, corporate governance can be better calibrated to fit the needs of a particular company. Hence, better incentives schemes and monitoring practices can be implemented but liquidity is very low. There are however also companies with ownership structures in between these two extreme cases: public ownership with some degree of ownership concentration. For the following analysis we can therefore distinguish in general between private and concentrated ownership, public ownership with blockholders, and public and dispersed ownership.

Jensen and Meckling (1976) argue that the introduction of the corporate form and the resulting separation of ownership and control leads to severe agency conflicts between managers and shareholders. This can have negative effects on shareholder value. By applying an appropriate corporate governance structure, these issues can at least be mitigated. If the shareholder's stake in the company is large enough he has an incentive to monitor the actions of the management. This means that the firm is under tight control. Large shareholders have basically three options to intervene whenever they are dissatisfied with the management's decisions and the resulting operational performance: hold their shares and influence the management's decisions, sell their shares, or do nothing. This study therefore focuses on whether active monitoring through tight investor control impacts on the operational performance of the underlying company. We analyze performance differences among non listed private equity (PE) portfolio companies and comparable listed companies with public ownership. Empirical predictions come from the literature on value creation of shareholder activism. Recent empirical research on corporate governance and ownership structure questions whether shareholder activism leads on average to better performance.

Due to tighter control and accompanied increased monitoring of management by the owners, agency conflicts should be reduced and we expect our treated companies to outperform their control group. PE investors influence management decisions with the aim of increasing equity value, which eventually depends on a company's ability to generate profits. They usually restructure their portfolio companies by focusing on the core business. We therefore expect to see an increase in profitability due to an increase in efficiency rather than strong top-line growth.

Comparing the performance of firms under different ownership structures is a complicated task. This is true for several reasons: First, the decision regarding a change in the organizational form could happen a long time before the information becomes public. This leaves the starting point in time of the comparison open. Second, it is hard to know whether the performance differences stem from unobserved firm characteristics. Consequentially, there is room for a sample selection bias. Third, information availability on PE portfolio companies or private firms in general is poor. We overcome these issues by using data on reverse leveraged buyouts (RLBOs) and by using ade-

quate econometric methods to calculate performance differences. RLBOs are public companies, which are taken private by a PE investor in a leveraged buyout (LBO) only to be eventually taken public again in a second IPO (second IPO).[1] We take advantage of the fact that companies have to enclose historical financial data at the time of their second IPO dating back between three to five years. With this approach we are able to gather data for the private period of our sample firms and subsequently evaluate their operating performance.

In order to figure out relative performance, we create groups of comparable companies for every RLBO company using different matching methods. The control sample consists of 6000 US public companies. Both, the sample firms and comparable companies, are under public ownership at the time of the LBO. By matching right before the IPO, we make sure that every treated sample company has a comparable group of untreated companies as a benchmark. We are then able to calculate "real" performance differences between companies with different governance structures.

Results show that our PE sample companies outperform their matched group of untreated firms. Three of our six performance ratios show significantly higher growth rates for the treated firms, cumulated from entry to exit of the private equity investor. Sample firms on average strengthen their profitability and increase cash flow from operating activities. These efficiency gains are driven by concentrated ownership rather than from the organizational form. Results persist after various robustness checks. We are aware of the fact that PE portfolio companies are a special form of a privately held company with ownership concentration, because PE investors are professional investors with a limited investment horizon. However, we use these results as a proxy for a general conclusion about benefits from being closely held.

The rest of the paper is organized as follows. Section 2 reviews related literature. Section 3 gives an overview on our sample selection process and the data. Different matching methods are described in section 4. Empirical findings are presented in section 5 and robustness checks in section 6. Finally, section 7 concludes.

2 Related Literature

Theoretical studies analyzing the trade-off between dispersed and concentrated ownership, public and private corporations respectively, find arguments both for and against. Advocating private and concentrated ownership with tight monitoring are: Bhide (1993), who shows that liquidity reduces the costs for unhappy shareholders to exit and therefore reduces incentives to monitor properly. Boot *et al.* (2006) suggest that

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[1]In referring to private equity we mean (leveraged) buyout transactions. Venture capital transactions, which are also frequently counted towards private equity, are not considered in this study.

private ownership and in particular private equity firms can provide more flexible, and therefore more efficient, corporate governance compared to standardized governance structure under public ownership. The authors argue that a public firm going private will exhibit improved performance because of higher managerial effort under private ownership. In contrast, studies supporting public and dispersed ownership providing liquidity to shareholders are: Maug (1998), who shows that liquid stock markets are beneficial as they make corporate governance through buyouts and coexistent management replacements more effective, and based on that, lead on average to more monitoring. Burkart *et al.* (1997) in contrast argue that concentrated ownership does not necessarily imply closer alignment of management's and shareholders' interests. With excessive monitoring, managers are not able to pursue personal aims and invest too little effort. Value maximizing is a mix of tight control and freedom of choice for the manager to enhance intrinsic effort. Holmstrom and Tirole (1993) show that concentrated ownership reduces benefits of market monitoring by reducing market liquidity. Studies avoiding a clear stance towards either organizational form are: Bolton and von Thadden (1998), who argue that on the one hand concentrated ownership reduces liquidity but on the other hand it creates benefits from efficient management control. Bhide (1993) and Coffee (1991) share this liquidity versus control trade-off.

This study is related to empirical literature on LBOs and RLBOs. However in contrast to our paper most of these studies focus on operational performance around the IPO and on post-IPO stock price performance. Considering post-IPO performance of LBOs / RLBOs are: Cao and Lerner (2009) who find that the post-IPO stock price performance of previously PE backed LBOs is slightly better than market performance. [2] Mian and Rosenfeld (1993) find significant positive cumulative abnormal returns for the long-run stock performance following the second IPO of RLBOs. Analyzing operational performance of the last private year as well as operational and stock price performance subsequent to the second IPO are Holthausen and Larcker (1996). They find no abnormal stock performance after the second IPO but significantly better accounting performance for the last year under private ownership and the four years following the second IPO. Degeorge and Zeckhauser (1993) find that operational performance is significantly higher in the year prior to the second IPO and significantly lower one year after. However, they find no abnormal stock price performance after the second IPO. Muscarella and Vetsuypens (1990) consider the entire private period of their sample RLBO transactions and document significant improvements in profitability during the private period.

Literature concerning the activism of large shareholders primarily concentrates on public firms due to better data availability. Nevertheless, as shareholder activism is

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[2]They define a RLBO transaction as a LBO with a subsequent IPO. However, we and the remaining empirical studies define RLBOs as a buyout of a former public company followed by a second IPO.

possible only with a certain degree of ownership concentration, these studies are related to ours. Greenwood and Schor (2009), Klein and Zur (2009), Clifford (2008) and Brav *et al.* (2008) find positive abnormal stock price performance of the target firm around the investment announcement date. This could be due to investors realizing that the target is undervalued or the expectation that the activism is expected to create value. Positive abnormal operational performance is detected by Clifford (2008) and Brav *et al.* (2008). Greenwood and Schor (2009) find no abnormal operational performance whereas a negative abnormal performance is detected by Klein and Zur (2009). Gillan and Starks (2000) find significant wealth gains from institutional monitoring but only in the short term. Banerjee *et al.* (1997) find that large shareholders create significant shareholder wealth as long as the shareholder is not a holding company. Results are for non-controlling stakes only.

We are however not aware of any study that empirically analyzes operational performance of PE portfolio companies, or more generally private organizations, by matching to a group of comparable firms. Furthermore, no empirical study is able to disentangle the performance effects of being private and having concentrated ownership.

3 Sample Selection and Data Description

3.1 Sample Formation

Screening 893 LBO transactions between 1980 and 2006 in the Thomson One private equity and venture capital database "Venture Economics" resulted in a final sample of 57 full RLBOs (see table 1).

Source/Screen	Number of firms
Thomson One screening 1980-2006	893
Base sample	**893**
Less:	
Not public at the sample selection	-591
Not public at the LBO	-183
Not stand-alone at the LBO	-62
Final sample	**57**

Table 1: Statistics on the formation of the final sample size.

We limit our sample to companies that are public at the time of data collection to ensure better information availability. In order to check whether a transaction qualifies as a RLBO we did a one-on-one check for every transaction in the Lexis Nexis news search. We found that 119 of the 302 LBOs that were public at the time of the data collection were also public before their LBO, which is the definition of a RLBO transaction. However, only 57 of those met the criteria for a full RLBO, i.e. the company

is a stand-alone public corporation at LBO. We decided to exclude divisional spin-offs due to severe differences in corporate governance between a subsidiary and a stand-alone company. Our sample size is therefore not directly comparable to other empirical studies considering RLBOs, as these do include spin-offs.

3.2 Descriptive Data

Sample companies are mainly incorporated in North America (49). The remainders are from the United Kingdom (6), Ireland (1) and Belgium (1). With regards to industries, we have Standard Industrial Classification (SIC) codes available for all companies. Divisional distribution is as follows: 23 companies operate in the manufacturing business, 14 in services, 7 in retail trade, 5 in finance and insurance, 5 in transportation and communication, 2 in wholesale trade and 1 each in construction and mining.

Table 2 gives an overview of the time structure of our sample. LBO transactions concentrate around the late '90s and the early 2000s. IPOs concentrate in the years following 2004, when the overall equity market sentiment improved. The difference in time between LBO and IPO concentration is in line with the fact that PE portfolio companies typically stay private for three to five years; the average time our 57 sample firms are private is 50 months.

	RLBOs				IPOs			
Year	All	%	Full	%	All	%	Full	%
1980 - 1987	14	11.8	14	24.6	2	1.7	2	3.5
1988	7	5.9	5	8.8	–	–	–	–
1989	5	4.2	4	7.0	–	–	–	–
1990	2	1.7	1	1.8	2	1.7	2	3.5
1991	1	0.8	–	–	9	7.6	7	12.3
1992	1	0.8	–	–	4	3.4	4	7.0
1993	–	–	–	–	5	4.2	5	8.8
1994	1	0.8	–	–	3	2.5	3	5.3
1995	1	0.8	–	–	2	1.7	–	–
1996	3	2.5	1	1.8	1	0.8	–	–
1997	5	4.2	3	5.3	2	1.7	–	–
1998	9	7.6	5	8.8	1	0.8	–	–
1999	15	12.6	4	7.0	4	3.4	1	1.8
2000	8	6.7	4	7.0	5	4.2	–	–
2001	7	5.9	2	3.5	6	5.0	3	5.3
2002	14	11.8	4	7.0	5	4.2	3	5.3
2003	12	10.1	6	10.5	5	4.2	3	5.3
2004	9	7.6	2	3.5	21	17.6	9	15.8
2005	4	3.4	2	3.5	12	10.1	4	7.0
2006	1	0.8	–	–	22	18.5	8	14.0
2007	–	–	–	–	7	5.9	3	5.3
2008	–	–	–	–	1	0.8	–	–
Total	**119**	**100.0**	**57**	**100.0**	**119**	**100.0**	**57**	**100.0**

Table 2: RLBO and IPO calendar year distribution for all firms that were public at the time of data collection match the RLBO criterion (All) and firms that public stand-alone companies at the LBO (Full).

In general, it is very difficult to obtain financial data, i.e. income statements, balance sheets and cash flow statements on private equity portfolio companies throughout their private phase. However companies placing shares on a public equity market

must provide financial statements in their IPO prospectus dating back at least three years. We are therefore able to gather financial data for the entire private period for 51 of the 57 firms. We collect financial data from Bloomberg and amend with data from the IPO prospectus, which we obtained from the Thomson One database or otherwise directly from the company. Our approach is a large step in the direction of gathering exhaustive information on private firms. However an optimal data set would contain all financial and ownership data since incorporation and, probably most difficult to observe, all management decisions that affect the corporate governance of the firm.

In order to evaluate operational performance we use data from the company's financial statements including balance sheet, income statement and cash flow statement. Most of the 35 variables we selected come from the income statement. We calculate six efficiency ratios and corresponding year over year growth rates using data from the balance sheet and cash flow statement.

Variable	Calculation	Description
Asset Turnover	Sales / Total Assets	Measures a company's efficiency in using its assets in generating sales
CF from cont. Operations	Operating CF / Total Assets	Operating CF is the cash a company generates through running its business; the ratio is good for assessing a company's profitability because the CF figure cannot be manipulated by aggressive accounting practices
Operating Margin	EBIT / Sales	Measures how much profit a company makes on each dollar of revenue before interest and taxation
Return on Assets	EBIT / Total Assets Net Income / Total Assets	Measures the efficiency of a company in generating returns for capital invested, without being affected by financing decisions
Employee Productivity	Sales / Number of Employees	Measures how much revenue an employee generates on average

Table 3: Calculation of performance ratios

Performance ratios in table 3 are commonly used in evaluating companies' operational performance or valuation. Concerning profitability ratios building on net income, there are some drawbacks in the context of LBO transactions: Net income is calculated after interest paid on debt, which is considerably higher in the case of PE portfolio companies due to the high leverage ratio. Therefore comparability to public companies is problematic using net income. More suitable are ratios like asset turnover, cash flow from continuing operations over assets, operating profit margin, earnings before interest and taxation over total assets and employee productivity. Pure growth rates like sales growth, EBIT growth, etc. are less meaningful because they might easily be distorted by possible acquisitions or divestments during the private period. These growth rates may therefore not be comparable between periods. Hence, growth has to be measured relative to total assets, sales or employees. We predominantly build our analysis on growth rates in operational efficiency.

3.3 Summary Statistics

Summary statistics on absolute performance of the sample companies are supposed to give a first impression on growth of operational metrics after the LBO. However, more meaningful for a statement concerning performance impacts of going private transactions are growth rates relative to the matched control group presented in the next section.

		1st	2nd	3rd	4th	5th	private
Sales/TA	Mean	0.01	0.09	0.04	0.04	0.07	0.20
	Std.dev.	0.36	0.24	0.14	0.15	0.32	0.48
	Obs.	45	40	29	23	17	47
CFOA/TA	Mean	0.68	0.61	0.58	0.08	0.93	1.81
	Std.dev.	3.20	1.36	1.98	1.07	2.17	3.22
	Obs.	28	31	24	22	17	32
EBIT/TA	Mean	0.07	0.41	0.10	0.41	0.22	1.84
	Std.dev.	0.99	1.45	1.04	1.18	0.83	2.60
	Obs.	38	40	28	23	17	41
EBIT/Sales	Mean	0.06	0.14	0.07	0.19	0.11	0.77
	Std.dev.	0.83	2.14	0.98	1.17	0.62	1.52
	Obs.	40	40	29	24	18	41
Sales/EMP	Mean	0.74	-0.08	0.04	0.03	0.10	0.43
	Std.dev.	2.48	0.32	0.06	0.08	0.11	0.34
	Obs.	15	17	12	11	10	20
NI/TA	Mean	-2.15	-0.84	0.25	0.20	-1.82	7.93
	Std.dev.	8.61	4.96	7.40	3.90	3.60	47.86
	Obs.	45	40	29	23	17	47

Table 4: Absolute operational performance during the private period. Growth rates are calculated separately for the first five years and cumulated for the entire private period (last column).

Table 4 provides an overview of operational performance during the private time. There seems to be an overall positive trend except for the ratio using net income as an input. Asset turnover, operating cash flow over total assets, EBIT over total assets and EBIT over sales have positive growth rates in every single year. Growth over the entire private period (cumulated) is on average 20% for asset turnover, 181% for operating cash flow over total assets, 184% for EBIT over total assets and 77% for EBIT over sales. Employee productivity also rises every year except for the 2nd. However, due to poor data availability on workforce size the number of observations here is much smaller than for other ratios. Furthermore, as expected, growth in net income over total assets is negative in three out of five years, which can be attributed to higher interest payments on outstanding debt.[3] Observations are declining from the 1st to the 5th year due to several transactions lasting less than five years. Calculation of cumulative growth rates considers all transactions from LBO to IPO independent of the period's length.

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[3]In fact interest payments on average quadruple in the first year compared to pre LBO levels and rise an additional 24% in the second year.

4   Matching Methods

Note that growth rates presented in the previous section are absolute averages for the treated companies. As a consequence, industry or global economic trends play a role. Using a matched sample to calculate abnormal growth rates will reveal whether growth is really driven by increased ownership concentration or a change in the organizational form. For reasons of robustness we employ two alternative matching strategies for building the group of comparable companies for each treated firm. Two "hard" criteria are used to pre-select companies for the matching process:

1. Treated and untreated companies have to be operating in the same industry: at least the first two numbers of their SIC code has to be equal

2. Matching point in time for the treated company and the corresponding group of untreated company has to be equal to avoid distortion by market movement

The fact that companies have different fiscal year (FY) starting dates and differences in balance sheet (BS) and income statement (IS) data is problematic. We therefore decided to match at two different points in time. With this approach we make sure that our results do not rely too heavily on the particular matching year chosen. One alternative is matching at the last FY before the buyout transaction is reflected in the BS. The other alternative is the last FY before the impacts from the LBO can be seen in the IS. This way we can make sure we consider clean financials, i.e. before any impact of the LBO is reflected in the numbers. Hence BS matching year may be different to the IS matching year. Default matching year is the last FY with a "clean" BS.[4] We call this "BS matching year".
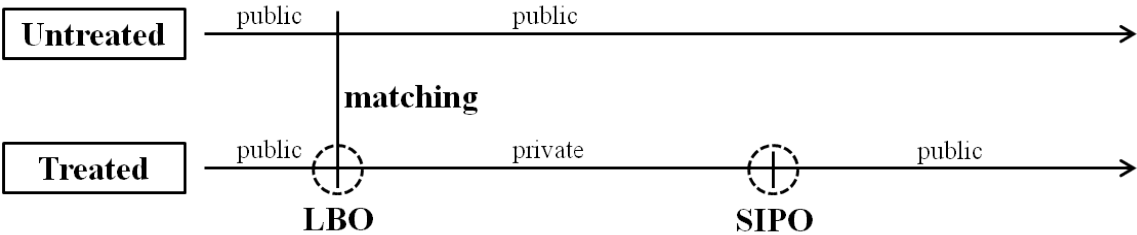
Figure 1: Organizational structure of treated and untreated firms with the matching point in time (LBO).

Matching right before the LBO date allows us to compare the treated companies directly with the control group. They have at least a similar corporate governance structure at the matching point in time. Combined with the remaining matching criteria

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[4]"Clean" meaning that the figures are not influenced by the subsequent LBO transaction.

like industry and operational characteristics, we make sure that both have equal performance ability at time of the LBO. The sample of comparable companies consists of over 6000 US listed companies. We obtained the sample from the Compustat database and collected financial data from 1975 to 2008.

4.1   Nearest Neighbor Matching

Our default matching method is the "Five Nearest Neighbor" method, meaning that a treated company is matched to its five nearest control companies. To select a comparable group of companies we used sales, total assets, EBITDA margin and number of employees as matching variables. Formally that is:

$$C(i) = \min_{j} ||p_i - p_j||$$

which is the set of all control units matched to treated unit i, where p_i represents the propensity score. The propensity score is calculated via the following probit model:

$$treated_{ij} = \beta_0 + \beta_1 sales_{ij} + \beta_2 totalassets_{ij} + \beta_3 ebitdamargin_{ij} + \beta_4 employees$$

This results in a group of five equal weighted companies being matched to every treated firm. Calculating mean differences in growth rates gives us the required relative performance figures.

4.2   Kernel Matching

Kernel matching is a special version of nearest neighbor matching. Every treated unit is matched to a weighted average of all control units. Weights are inversely proportional to the distance between treated and control unit. Weights are calculated in the following way:

$$w_{i,j} = \left\{ \frac{K\frac{(p_i - p_j)}{h}}{\sum_{j \in \{D=0\}} K\frac{(p_i - p_j)}{h}} \right.$$

where K is a Gaussian function that uses all non-treated units that match the hard criteria and h represents the bandwidth (in our case $h = 1$). Kernel matching can therefore be seen as a special version of the nearest neighbor matching with $n = N$, where N represents all possible matching candidates. Results using the alternative matching method are shown in section 6.

5 Results

Using matching techniques outlined in the previous chapter, we now derive relative operational performance of our sample companies. In contrast to the absolute performance presented in the summary statistics section this allows us to figure out whether the transition from public to concentrated private ownership subsequently benefits the portfolio company on an operational basis.

5.1 Relative Operational Performance during the Private Period

Table 5 gives an overview of the differences in operational performance between treated and untreated companies and summarizes these differences in growth rates one, two, three, four and five years after the LBO as well as the entire private period relative to the matched sample. For example, a rate of 0.04 means that the growth rate of a particular private firm's performance ratio is 4% higher than the corresponding average growth rate of the matched group of public firms in a certain period.

		1st	2nd	3rd	4th	5th	private
Sales/TA	Mean	-0.0187	-0.0096	0.0405	0.0208	0.0245	0.0249
	Std.dev.	0.0605	0.0743	0.0327	0.0333	0.0930	0.0791
	Obs.	45	39	28	22	15	51
CFOA/TA	Mean	0.3866	0.4183	0.3117	0.0747	0.1989	0.8660**
	Std.dev.	0.4460	0.2568	0.4831	0.3027	0.4237	0.3923
	Obs.	27	29	24	21	15	48
EBIT/TA	Mean	0.0492	0.5415**	-0.1511	0.4243*	0.0009	0.7264**
	Std.dev.	0.1704	0.2416	0.2993	0.2459	0.2575	0.2945
	Obs.	38	36	27	22	15	51
EBIT/Sales	Mean	0.0359	0.5044**	-0.2572	0.4524	-0.0442	0.6278**
	Std.dev.	0.1519	0.2162	0.2667	0.2894	0.2111	0.2651
	Obs.	40	38	28	22	16	51
Sales/EMP	Mean	-0.1569	-0.1209	0.0043	-0.0124	0.0634	-0.1759^*
	Std.dev.	0.1172	0.0969	0.0200	0.0359	0.0634	0.0915
	Obs.	15	16	12	10	8	24
NI/TA	Mean	-0.5826	0.0995	-0.1109	0.9107***	-0.5896	-0.0813
	Std.dev.	0.3589	0.3888	0.4591	0.3433	0.5207	0.5089
	Obs.	43	38	27	21	13	51

Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$

Table 5: Abnormal growth rates for single years after the LBO and for the entire private period matched to a group of comparable companies at the time of the LBO using the nearest neighbor method.

Considering single years, except EBIT/TA respectively EBIT/Sales figures in year two after the LBO and EBIT/TA and NI/TA in year four after the LBO, there is hardly any statistical significance for relative growth rates. This changes dramatically if cumulative growth rates for the entire private period are examined. As already indicated by the single year growth rates, our treated companies outperform their control groups in EBIT/TA and operating margin (EBIT/Sales) growth during the course of the private period. Cumulative average growth is 73% respectively 63% from LBO to

IPO. These figures suggest that companies considerably increase their operating profit (EBIT) compared to the control group which indicates efficiency increases due to reductions in costs of goods sold and / or selling, general and administrative costs.

Further confirmation of outperformance in operating efficiency is the significantly higher relative growth rate for CFOA/TA. Cash flow is without doubt a more reliable measure of a company's performance than earnings because management can show positive earnings and still not be able to pay its debt. However, even if earnings can be much easier manipulated by management than cash flow figures, looking at both is probably the most reliable approach. In our case both relative growth rates (using CFOA respectively EBIT as profit input) point in the same direction, namely that tightly held PE portfolio companies increase their productivity during the private period more than comparable public companies in the same period.

In contrast to the positive findings on operating efficiency, employee productivity shows relative weakness compared to the control groups. Abnormal growth in workforce efficiency measured by sales over employees is on average 18% lower. Yet, the number of observations for this ratio is by far the lowest due to poor data availability on workforce size in the private period.

Results for the entire private period can to some extent be compared with results from Muscarella and Vetsuypens (1990). Akin to our results, they find significant positive average growth in gross margins as well as operating margins. However the number of companies they have financial data on is much smaller than our sample and they include spin-offs in their analysis, which could distort results. Furthermore, they use a less sophisticated matching method as they only match their sample firms to a random sample and do not match to company characteristics to figure out performance differences.

5.2   Relative Operational Performance after the second IPO

In order to see whether the predominantly positive abnormal performance during the private period carries over to the period after the second IPO, we calculate relative growth rates for the five years following the second IPO using the same groups of comparable companies. We expect no significant abnormal performance once the sample companies and the matched control group again have similar governance structures. Otherwise our matching method would be debatable and the selection issue would not have been addressed properly.

		1st	2nd	3rd	4th	5th
Sales/TA	Mean	0.1652	0.0409	0.0357	0.0070	-0.0362
	Std.dev.	0.1633	0.0635	0.0430	0.0696	0.0700
	Obs.	49	50	44	38	30
CFOA/TA	Mean	0.5022*	0.0678	0.0798	-0.2499^*	-0.0095
	Std.dev.	0.2854	0.1948	0.2378	0.1444	0.2211
	Obs.	46	47	42	37	29
EBIT/TA	Mean	0.7050	-0.0597	-0.0697	-0.0150	-0.0106
	Std.dev.	0.6195	0.1360	0.3214	0.2460	0.2422
	Obs.	49	50	44	38	30
EBIT/Sales	Mean	0.1317	-0.1071	-0.0133	-0.1471	-0.0167
	Std.dev.	0.1059	0.0964	0.2872	0.1954	0.2322
	Obs.	49	50	44	38	30
Sales/EMP	Mean	0.0113	0.0898	0.0233	0.0268	-0.0960
	Std.dev.	0.0410	0.1781	0.0468	0.1110	0.0927
	Obs.	43	49	43	38	30
NI/TA	Mean	1.1951***	0.2812	-0.0027	0.1733	-0.4850
	Std.dev.	0.2955	0.3660	0.2783	0.2229	0.4444
	Obs.	42	47	41	36	29

Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$

Table 6: Abnormal growth rates for single years after the second IPO matched to a group of comparable companies at the time of the LBO using the nearest neighbor method.

Looking at the single year performance differences between our PE backed sample and the control group in table 6, only two performance ratios significantly differ during the five year period following the second IPO. CFOA/TA growth is positive in the first year and negative in year four after the second IPO. However, both are only statistically significant at the 10% level. Another ratio that shows positive significance is NI/TA in the first year after the second IPO. Although this ratio is significant at the 1% level, it is driven by declining leverage ratios after floating shares on the stock exchange. A capital increase to raise equity and pay back debt leads to declining interest payments and therefore rising net income. Private equity investors often use IPOs to bring down leverage in the wake of a former LBO. Muscarella and Vetsuypens (1990) find that for their sample of RLBOs over 80 percent of the companies that go public for the second time declare that they will use proceeds to retire debt. Hence abnormal growth for NI/TA comes from a change in capital structure after IPO rather than real operational change.

		2 year	3 year	4 year	5 year
Sales/TA	Mean	0.1492	0.1438	-0.0584	−0.1765**
	Std.dev.	0.1675	0.2007	0.0753	0.0922
	Obs.	49	43	37	29
CFOA/TA	Mean	0.5972**	0.5067	0.4584	0.5608*
	Std.dev.	0.2966	0.3735	0.4086	0.3357
	Obs.	46	39	32	25
EBIT/TA	Mean	0.5621	0.5690	0.1156	-0.0468
	Std.dev.	0.6668	0.6062	0.3712	0.4699
	Obs.	49	43	37	29
EBIT/Sales	Mean	0.1603	0.0045	0.0187	-0.0962
	Std.dev.	0.1620	0.2457	0.3741	0.4894
	Obs.	49	43	37	29
Sales/EMP	Mean	0.1282	0.1584	0.2145	0.1819
	Std.dev.	0.1877	0.1852	0.2589	0.3333
	Obs.	43	38	34	27
NI/TA	Mean	1.6238***	1.9924***	2.1364***	0.2475
	Std.dev.	0.5075	0.6373	0.7289	1.1812
	Obs.	39	32	27	19

Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$

Table 7: Cumulative abnormal growth rates for the two, three, four and five year period after the second IPO matched to a group of comparable companies at the time of the LBO using the nearest neighbor method.

Cumulative abnormal growth rates for the period after the second IPO are shown in table 7. Again, NI/TA is significant at the 1% level after the two, three, four and five year period. However, as described above, this is not related to operational factors. To further elaborate on this finding, we checked for when cumulative abnormal growth rates once year one is excluded. As a result, significance for the following years disappears. CFOA/TA is significant at the 5% level for the period two years after the second IPO. This effect diminishes for the three and four year period after the second IPO and is finally significant at the 10% level for the five year period. The Sales/TA ratio is significantly negative for the five year period of being public. However, as a couple of companies drop from our sample the number of observations is rather low for the five year period after the second IPO.

From an operational performance point of view, no clear trend can be determined after our sample companies go public again. Besides strengthening our results for the private phase, these results also reinforce our matching method, as treated and untreated firms show roughly equal operational performance once they have are back to a comparable corporate governance structure. Results from Holthausen and Larcker (1996), who find positive abnormal growth rates for the four year period after the second IPO cannot be confirmed by our analysis. Changing the matching year from balance sheet to income statement as well as changing the matching method from nearest neighbor to kernel matching does not alter the results of this section.

5.3   Stock Price Performance

In order to see whether stock prices of our treated firms track operational performance after the second IPO and the associated transition back to dispersed public ownership, we calculate abnormal stock returns. We start the performance evaluation one month after the second IPO[5] and use the same control group we obtained with matching at the time of the LBO. Data on security prices come from the Compustat database. We calculate 6, 12, 36 and 60 month abnormal stock returns. Observations range from 44 to 36 as we were not able to obtain stock prices for all of our treated companies. Furthermore, some IPOs were too young to calculate 36 or 60 month abnormal returns.

	6 Months	12 Months	36 Months	60 Months
Mean	0.0352	0.0528	-0.2009	-0.2163
Std.dev.	0.0463	0.0862	0.2155	0.2176
Obs.	44	44	43	36
Significance levels:	$*$: 10%	$**$: 5%	$***$: 1%	

Table 8: Abnormal stock returns for the six months, twelve months, three years and five years period after the second IPO matched to a group of comparable companies at the time of the LBO using the nearest neighbor method.

Table 8 shows that there is a slight outperformance of our sample of treated companies in the short run (for the 6 and 12 months period). In the long run (36 and 60 month period after second IPO), we find slight underperformance. However, these results are not significantly different from zero.

Empirical studies analyzing stock price performance of RLBOs mainly find positive abnormal returns after the second IPO. For the 24 month period following the second IPO, Degeorge and Zeckhauser (1993) find average excess return, although not statistically significant. Mian and Rosenfeld (1993) do also find slightly positive results for the 36 month period. However both studies include first day returns in their long run performance estimation. In the wake of underpricing, comparability of this result to our findings is limited. Cao and Lerner (2009) report for their sample that abnormal stock price performance deteriorates over time.

6   Robustness Checks

In order to further strengthen the results from the preceding section we employ various robustness checks to our analysis. Comparability of our sample firms and their untreated control groups is verified using a different matching year and a different matching method. Repeating the matching process against a sample of public companies with a certain degree of ownership concentration allows us to further verify our argumentation with respect to the origination of the performance differences.

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[5]In this way we make sure that underpricing does not affect our results.

6.1 Different Matching Year

Robustness checks in terms of a different matching year show that results from the previous section do not change dramatically if the matching point in time is shifted by one year.

		1st	2nd	3rd	4th	5th	private
Sales/TA	Mean	-0.0647	-0.0484	0.0458	-0.0134	0.0501	-0.0509
	Std.dev.	0.0621	0.0720	0.0327	0.0454	0.0914	0.0821
	Obs.	45	38	28	22	15	51
CFOA/TA		0.4297	0.4077	0.3109	-0.0259	0.5998	0.9928**
	Std.dev.	0.4652	0.2653	0.4818	0.2820	0.6599	0.4041
	Obs.	27	29	24	21	15	48
EBIT/TA	Mean	0.0684	-0.0319	-0.0287	0.40941*	0.0099	0.3998
	Std.dev.	0.1578	0.1815	0.2517	0.2373	0.2329	0.2599
	Obs.	38	36	27	22	15	51
EBIT/Sales		0.0392	0.4189**	-0.1395	0.5101	-0.0515	0.6552**
	Std.dev.	0.1409	0.2092	0.2173	0.2861	0.2003	0.2589
	Obs.	40	38	28	22	15	51
Sales/EMP	Mean	-0.1384	-0.1574	0.0151	-0.1172	0.0687	-0.2685**
	Std.dev.	0.1113	0.0991	0.0201	0.1146	0.0663	0.1103
	Obs.	16	17	12	10	8	25
NI/TA		-0.6996*	0.0291	-0.0111	0.8843**	-0.7745*	-0.2486
	Std.dev.	0.3524	0.3775	0.4379	0.3634	0.4697	0.5304
	Obs.	43	38	27	21	13	51

Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$

Table 9: Abnormal growth rates for single years after the LBO and for the entire private period matched to a group of comparable companies at the time of the LBO using the nearest neighbor method and the income statement matching year.

Until now, we matched at a point in time we call "balance sheet matching year". This is the last available balance before the company is taken private. The second alternative, for which results are presented in table 9, is called "income statement matching year". This refers to the last income statement during which the sample company was public for more than six months. In the following, an example makes clear why this distinction is important: Suppose that the LBO happens in the first half of the year. As a consequence the subsequent income statement will include more than six months concentrated private ownership and we therefore take the year before as IS matching year. Thus, the BS matching year and the IS matching year coincide. However if the buyout occurs in the second half of the year, the IS matching year and the BS matching year differ.[6] This may lead to other firms being matched to the treated ones. However as results only deviate slightly from the previous section (EBIT/TA), we can conclude that our findings are not driven by a specific matching point in time.

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[6]That means, the IS does not reflect a change in the governance structure of the company as quickly as the BS does. This is because BS figures are end of the period figures while IS figures are calculated for the entire period.

6.2 Kernel Matching

Besides matching at a different point in time we also employ a different matching method to figure out the dependence of our results on the particular matching method, and respective control group. As described in section 4, the kernel matching process assigns a different weight to every company that passes the hard criteria of the particular sample company. The weight then assigned to a control company is the higher the closer the company of the control group matches the set of operating characteristics of the sample company.

		1st	2nd	3rd	4th	5th	private BS	private IS
Sales/TA	Mean	-0.0446	0.0496	0.0257	-0.0039	0.0314	-0.0319	-0.0090
	Std.dev.	0.0568	0.0469	0.0312	0.0359	0.0997	0.0654	0.0665
	Obs.	45	39	27	22	15	50	51
CFOA/TA	Mean	0.0382	0.2789	0.3244	-0.1192	0.7263	0.5286	0.5357
	Std.dev.	0.3140	0.2453	0.4337	0.2606	0.5430	0.3396	0.3455
	Obs.	28	30	24	21	15	48	48
EBIT/TA	Mean	-0.0144	0.4548*	0.1782	0.4025	-0.0744	0.7912***	0.6143***
	Std.dev.	0.1566	0.2424	0.2636	0.2546	0.2090	0.2612	0.2274
	Obs.	38	36	26	22	15	50	51
EBIT/Sales	Mean	0.0314	0.4015*	0.0882	0.3939	-0.0814	0.7219***	0.7334***
	Std.dev.	0.1402	0.2152	0.2431	0.2562	0.1708	0.2365	0.2256
	Obs.	39	37	27	22	16	50	51
Sales/EMP	Mean	0.6421	-0.1631	-0.0254	-0.0738	0.0356	0.6331	0.6133
	Std.dev.	0.7003	0.1014	0.0362	0.0669	0.0426	0.5390	0.5398
	Obs.	14	15	12	10	8	23	23
NI/TA	Mean	-0.4679	-0.0628	-0.1094	0.6401*	-0.5290	-0.1176	-0.2431
	Std.dev.	0.3415	0.3738	0.4411	0.3310	0.4290	0.4760	0.4786
	Obs.	43	38	26	21	13	50	51

Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$

Table 10: Abnormal growth rates for single years after the LBO and for the entire private period matched to a group of comparable companies at the time of the LBO using the nearest neighbor method for both the balance sheet and the income statement matching year.

Results in table 10 show that during the first five private years, two abnormal growth ratios are significantly different from zero. In year two after the LBO takes place, growth rates for EBIT/TA and EBIT/Sales are positively significant at the 10% level. Cumulated for the entire private period, both performance ratios are significant at the 1% level. This affirms our result that profitability, respectively productivity rises during the private period relative to the control group. Growth of CFOA/TA, which is significant at the 5% level under nearest neighbor matching, is now only significant at the 15% level. Employee productivity is no longer significantly negative. Results do not change if the matching year is switched from BS to IS.

6.3 Blockholding

Hitherto, our results show that following a PE backed LBO transaction and concurrent transition from dispersed public ownership to concentrated private ownership, com-

panies outperform a group of matched public firms. However from this analysis it is not clear whether the exposed outperformance is driven by the change in organization, i.e. transition from public to private or by the change in ownership concentration, i.e. from dispersed to concentrated ownership. We address this issue by building a sub-sample out of our original 6000 US public firms, where only firms with a certain degree of ownership concentration are included. The criterion to be included in the blockholding control group is that the aggregated stake of management, directors and large shareholders (i.e. 5%+ equity stake) is at least equal to or greater than 30%. In other words, the free float has to be smaller than 70%.

This procedure is a crucial distinction in the research design of this study with respect to other empirical literature considering operational performance of PE backed companies. Our blockholding robustness check supposes that blockholding leads to increased monitoring of management and therefore tighter control by the shareholders, as is the case for the PE backed companies. If we find similar or even larger performance differences compared to our baseline case, our results would imply that the key point in our examination of performance differences is the organization of the company as a public or a private corporation.

		1st	2nd	3rd	4th	5th	private
Sales/TA	Mean	0.0094	-0.0350	0.0425	0.2114	-.0286	0.0410
	Std.dev.	0.0780	0.0844	0.0448	0.3245	0.0375	0.0966
	Obs.	28	23	15	12	9	30
CFOA/TA	Mean	-0.1261	0.2057	0.1270	0.3120	1.0987	0.5202
	Std.dev.	0.3366	0.2785	0.4859	0.3693	1.0206	0.3546
	Obs.	23	21	14	12	9	30
EBIT/TA	Mean	0.2986	0.4580	-0.1616	0.2114	-.4788	0.7877*
	Std.dev.	0.1946	0.3949	0.3687	0.3245	0.5257	0.4483
	Obs.	23	20	14	12	9	30
EBIT/Sales	Mean	0.1194	0.4141	-0.2122	0.1678	-0.4010	0.5113
	Std.dev.	0.1656	0.4057	0.3718	0.3133	0.4872	0.4167
	Obs.	23	20	14	12	9	30
Sales/EMP	Mean	1.1492	-0.35029	-0.0643	0.0071	0.0725	0.4851
	Std.dev.	1.2212	0.1914	0.0430	0.0553	0.0530	0.6099
	Obs.	8	9	7	7	6	15
NI/TA	Mean	-0.2947	0.0209	-0.2906	0.6926	-0.5651	-0.3601
	Std.dev.	0.4255	0.6386	0.5952	0.4410	0.5702	0.7623
	Obs.	27	22	14	12	8	30

Significance levels: $*: 10\%$ $**: 5\%$ $***: 1\%$

Table 11: Abnormal growth rates for single years after the LBO and for the entire private period matched to a group of comparable and tightly held companies at the time of the LBO using the nearest neighbor method.

However, table 11 shows that this is not the case. Almost all of the formerly significant higher growth rates of our sample firms diminish to levels that are no longer significant. This supports the hypothesis that the higher relative performance of the PE backed sample firms is due to the higher ownership concentration and associated higher levels of monitoring respectively tighter control. However the fact that we still see slightly positive (although insignificant) abnormal growth rates can be attributed

to the still existent difference degree in ownership concentration. While concentration in our blockholding control group is relatively high, PE backed companies have even higher levels of ownership concentration. PE investors typically hold stakes in excess of 80%. As a consequence they have even more bargaining power against management and can exert control much more easily than a number of smaller blockholders in a public firm.

7 Conclusion

This study adds to the literature on corporate governance and firm performance. We provide new insights into the operational performance of companies that are subject to severe corporate governance changes, i.e. transition from dispersed public to concentrated private ownership. We examine this issue using a sample of PE backed leveraged buyout transactions. To overcome the problem of omitted variables in the performance measurement of private companies, we take advantage of reverse leveraged buyout transactions. These firms are by definition public before the LBO and merge back to public after restructuring by PE investors takes place during the private period. This feature gives us the unique opportunity to match firms at the LBO date to comparable public companies and eliminates problems associated with comparing companies that differ with respect to important characteristics.

We find that our sample group of PE backed companies outperforms their matched peer group on an operational basis in several efficiency ratios: Relative growth in cash flows from operating activities over total assets, EBIT over total assets and EBIT over sales is on average significantly higher for our sample firms. This finding strongly supports our hypotheses that firms taken private in LBO transactions enhance their ability to generate profits during the period of high ownership concentration. Results are robust with respect to changes in the matching process. Furthermore we are able to disentangle the effect of the organizational form and the change in ownership concentration: the key driver of the reported superior performance is indeed the higher ownership concentration.

However we are not able to predict which ownership structure is superior at what point in time of a company's life-cycle. Nevertheless, our results show that high ownership concentration is beneficial for the operational performance of a company at least for a certain period of time. Regarding future research, in order to confirm our results a larger sample size is important. Furthermore it would be interesting to identify which particular transaction, company or restructuring characteristics constitute the exact performance drivers within a group of closely held PE backed companies.

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