Value creation of leveraged buyouts in the United Kingdom

Abstract

This thesis examines public-to-private buyouts in the United Kingdom announced between 1990 and 2007. I have collected data for a total of 148 buyouts. For a subsample of 94 firms with post-buyout information I analyse realized returns on the investments to capital and operating performance changes between the pre-buyout state and final investment year. I find high median market and risk adjusted returns for this subsample (60.3% to pre-buyout and 50.5% post-buyout capital). However, operating performance changes between the pre-buyout state and the last year of the investment period are overall negative.

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I.   Introduction

The rise of the public-to-private buyout wave began nearly thirty years ago in the U.S. and lasted for almost a decade. In this period, (parts of) public corporations thought to be unproductive were taken private by a group of investors, mostly consisting of the firm's management, who complemented their equity stake with a large portion of debt. This is the concept of a leveraged buyout. Academic research has mainly focused on this period (Kaplan 1989a, Smith 1990), reporting that these buyouts create significant value with high returns to capital and positive operating performance changes of the portfolio firms. Guo et al. (2010) have recently reinvestigated value creation of leveraged buyouts for the period after the 1980s. Once again, the U.S. buyouts are analysed. Kaplan and Strömberg (2008) show that the U.K. has the second largest leveraged buyout market of the world, with a share of approximately 15% of all global leveraged buyout transactions between 1990 and the first half of 2007. Therefore, I investigate the second wave of public-to-private buyouts of the U.K. to fill this gap in empirical research.

Figure 1 presents public-to-private buyouts completed in the U.K. in the last 25 years. It shows that the buyout market elevated in the second half of the 1980s but then slowed down in 1990. Also, this graph shows that starting the second half of the 1990s a new wave of buyouts appeared. These buyouts have not yet been analysed on the returns to capital and performance change methodology of the U.S. studies by Kaplan (1989a) and Smith (1990) for the 1980s and Guo et al. (2010) for the period afterwards.
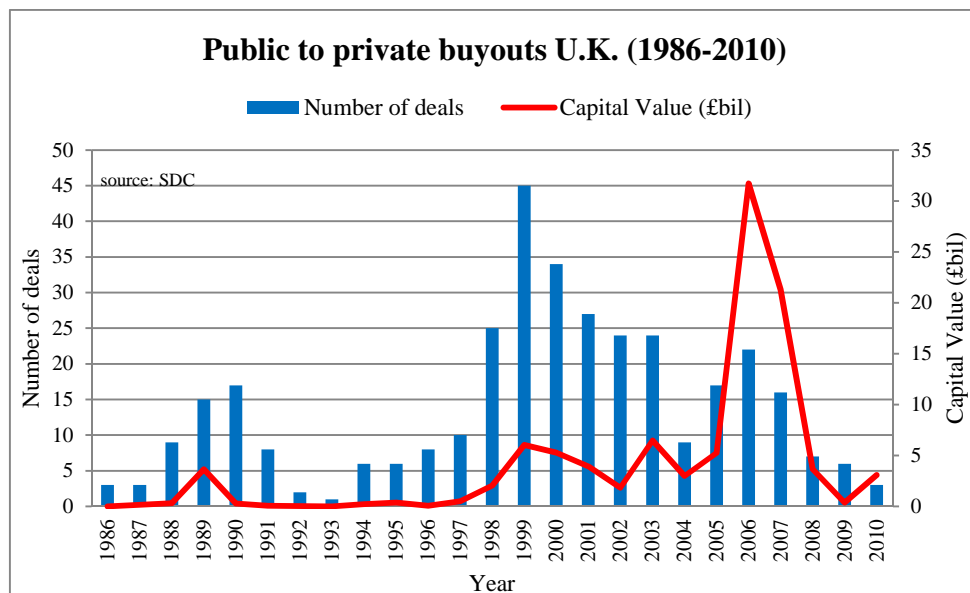

Figure 1

I investigate a total of 148 public-to-private buyouts announced between 1990 and 2007 and describe their characteristics. Indeed, I find a large alteration in leverage between the pre- and post-

buyout capital structures. In contrast to the U.S., the financing of the buyouts involves a lot lesser use of public bonds and equity is mostly provided by using a combination of shares and loan notes. Firms that are exited from the private equity firm's portfolio are divided into four categories, namely an exit through an initial public offering, sale to a strategic buyer, a secondary LBO or a form of distress. The remainder of the firms in the sample that are still private or have an unknown status are classified as a separate fifth group throughout this thesis.

Next, post-buyout information for 94 firms is gathered to calculate returns to capital and post-buyout operating performance changes. Returns to capital are overall large, positive and significant – the median market and risk adjusted returns to pre- and post-buyout capital are 60.3% and 50.5% respectively. Operating performance changes contradict the findings of the returns, though. These percentage changes show overall negative values for four proxies on profitability and return on assets. I then perform six regressions to address factors which possibly affect these operating performance changes. Overall, leverage change has a positive and significant effect on these ratios, which implies the disciplining effect of debt.

This thesis is structured as follows. Related literature on leveraged buyouts is provided in section II, where sources of value creation of buyouts and U.S. and U.K. empirical studies are discussed. Section III explains how I gathered data and describes the statistics of the buyouts on pricing, financing structure and outcome of the investments. Section IV explains the methods of return to capital and operating performance change calculations. This is followed by a discussion of the results on returns to capital, changes in operating performance of the portfolio firms and the six regressions on these operating performance changes in section V. Finally, section VI concludes the thesis.

II.   Literature review

This section reviews the relevant literature for this thesis. First, in section II.1 I summarise key papers on sources of value creation of leveraged buyouts. In section II.2, empirical studies regarding buyouts of the U.S. and U.K. will be discussed.

II.1 Sources of value in LBOs

Private equity theory, which is formed by empirical research, addresses several hypotheses for value creation. The pros and cons of leveraged buyouts w.r.t. value creation will be outlined in this subsection. First, the financial structure of the firm after the buyout, which involves more leverage relative to the pre-buyout capital structure, allows the firm to perform higher interest tax deductions from the income statement. The new debt thereby creates a greater tax shield, depending on the marginal tax rate of the country. Kaplan (1989b) estimates the tax benefits arising during leverage buyouts for a range of assumptions on the marginal tax rate and finds evidence on this tax shield hypothesis in the U.S. for the 1980s decade. Also, by performing a regression of the tax payments on the premiums paid to the pre-buyout shareholders, he finds a very significant value for this coefficient. Guo et al. (2010) also find evidence regarding the effect of tax benefits on realized returns to capital in the U.S. for the period between 1990 and 2006.

Furthermore, in public companies ownership and control are distanced from each other, with a large and diverse group of shareholders as owners of the company and management controlling it. According to the agency theory, the group of shareholders acts as a principal and management as an agent. Management may not always act in favour of creating shareholder value by e.g. investing in unproductive projects or building their own empires for their personal benefits rather than optimising the value of the firm (see Jensen and Meckling, 1976). When this agent only owns a small fraction of the company, it is more likely that his or her actions are driven by private benefits. However, when a company is bought out by a smaller and centralized group of investors, mostly involving management, ownership and control become reunited. The conflict of interest, according to the hypothesis, then mitigates. The agent, now also for a larger part acting as principal, will experience the effect of non-optimal managerial behaviour. Another advantage of a smaller and more concentrated group of investors is the monitoring and control activism. More efficient exchange of information between management and shareholders results in less agency costs and thus more value of the firm and its shareholders.

A key element of a leveraged buyout is the use of a lot of debt to finance the transaction. Higher leverage implies the obligation of higher interest and principal payments by the firm. This puts pressure on the earnings of the firm and may cause bankruptcy. This control function of debt is argued by Jensen (1986) to be an important factor for value creation in leveraged buyouts, as the buyout firm

afterwards is better organised to control the agency costs of free cash flow. In this case, management is disciplined and bound to focus more on operational efficiency, bound to prevent wasting money in unproductive assets or acquisitions and paying out the free cash flow to the shareholders. The free cash flow is defined as the "cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital". Moreover, he argues that popular targets of LBOs are stable and large companies with low growth opportunities, nevertheless, have high potential to generate large cash flows. This relates to another argument of the paper, namely that particularly these companies have the highest agency cost of free cash flow. Empirical support for the control function of debt and free cash flow is given by Lehn and Poulsen (1989). They find that U.S. public firms in the 1980s undergoing a LBO transaction had a large portion of undistributed free cash flow compared to their peers that remained publicly quoted and that the premiums paid to the pre-buyout shareholders was related to this free cash flow. Opler and Titman (1993) also conclude that firms with high cash flows but low growth prospects are good candidates for LBOs.

Still, not all empirical research on leveraged buyouts suggests that these transactions create value. Kaplan and Schoar (2005) analyse the performance of private equity funds between 1980 and 1997. Surprisingly, the average returns to LBO funds after deducting fees are below the S&P 500 and are positively related with fund size and the general partner's experience. Evidence for a bust and boom cycle is found due to the fact that during boom times more entry by investors occurs. However, these funds mostly have no subsequent fundraising and therefore probably have a lower performance. According to Phalippou (2009), the principal-agent conflict is not necessarily mitigated after a buyout. Similar to Kaplan and Schoar (2005), this paper states that buyout funds perform better than the stock market before the deduction of fees to managers, but underperform after. Also, he finds evidence that managers of the private equity firms are incentivised by the fee-based structure of the contracts, which is not aligned with creating value for the outside investor.

Gompers and Lerner (2000) analyse the relationship between capital flows into venture funds and the pricing of the investments made by those funds. This could imply that an abundant demand for capital investments and not the fundamentals of the assets themselves overvalue(s) the assets. Their data supports this relationship, especially in cases with the most venture capital activity and growth of venture capital commitments. Also, during high inflow periods it seems rather that demand pressure, instead of the future prospects of the investments or the ultimate successes of the firms, drives up the valuations. The hypothesis of an overheating buyout market in the late 1980s in the U.S. is true, according to Kaplan and Stein (1993). They investigate 124 buyouts taking place between 1980 and 1989. For the second half of the decade, they find the buyouts to be higher priced and levered. Moreover, these buyouts took place in riskier industries and especially buyouts financed with junk bonds were highly priced. In a reaction, banks became more reserved w.r.t. their financing positions for these later deals and demanded a quicker repayment of the debt they provided, while junk bonds

replaced private subordinated debt. They argue that the capital structure of the firms financed with junk bond were too vulnerable. This caused financial distress.

II.2 Empirical studies

United States

Kaplan (1989a) examines buyouts of public companies for the 1980-1986 period. By using a sample of 76 companies (48 with post-buyout data), evidence is found on certain aspects of these buyouts. Looking at all 76 public-to-private buyouts the paper shows a premium of 42.3% paid to pre-buyout shareholders.[1] Also, the increase in debt is shown by ratios of the mean and median pre- and post-buyout book values of debt to capital.[2] The median debt-to-capital ratio rises from below 20% to almost 90% after the buyout. Furthermore, high median investments returns to post-buyout debt and equity investors between the going-private and exit date are found (111.3% nominal and 28.0% market adjusted). These returns are explained by improvements in operating income, capital expenditures (decline, suggesting less empire building) and net cash flow. Looking at the net cash flow proxy for operating improvement, Kaplan (1989a) examines the percentage changes between the last full pre-buyout year and the first three post-buyout ones and shows a high median changes, even after controlling for divestitures.

For the period between 1977 and 1986, Smith (1990) finds an increase in operating returns of 58 buyouts in the U.S. by using the EBITDA (referred to as "operating cash flows before interest and taxes") to the number of employees and total asset value. He also proves these increases are not due to asset sales or employee layoffs. Similar results to Kaplan (1989a) are found – thirty-five MBOs appear in both samples. In addition, Smith (1990) shows working capital improvements and no rigorous cutbacks in research and development, advertising or other overhead expenses which could support short-run cash flow creation. The paper, on the other hand, concludes that it is more likely that better operating efficiency is a result of management incentives.

Guo et al. (2010) investigate 192 public-to-private buyouts announced between 1990 and 2006 and provide descriptive statistics about the buyout. They also find post-buyout information for 94 firms in their sample to calculate returns to capital and measure operating performance changes. They find more conservatively priced deals compared to the 1980s and leverage is also lower in their sample. Returns to capital are overall large and positive, for both the nominal and market and industry adjusted values. However, the operating performance changes seem to be equal to or slightly higher than the industry. Next, they look at which factors could explain the changes in operating performance

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[1] Here, the premium is defined as the percentage difference between the final offer price and the value of the equity two months before the buyout announcement.

[2] Capital is the aggregate of the market value of equity and the book values of preferred stock and total debt.

and find the leverage change and CEO replacement proxies as significant. Finally, they show that the returns in their sample are driven by operating performance, industry and market valuation multiples and tax benefits of debt.

United Kingdom

The main differences concerning public-to-private transactions in the U.S. and U.K., which affect the simple possibility to extrapolate empirical evidence from one country to another, are discussed by Toms and Wright (2004). First, the junk bond financing methods used in the U.S. never really took off in the U.K. and the buyouts were generally characterised by less leverage. Still, mezzanine debt and foreign senior debt providers arose in the market. Second, hostile bids are less common in the U.K. (also discussed in Renneboog et al. 2007). Third, since dividends are untaxed in the U.K. (see Renneboog and Simons, 2005), the advantage of tax benefits is argued to have a lower impact than in the U.S.. Another reason for why U.S. empirical research conclusions are difficult to extrapolate to the second wave of LBOs in the U.K. is the closer linkage of U.K. private equity firms and venture capitalists. Toms and Wright (2004) argue that the private equity firms in the U.K. focus more on growth opportunities. This is different than for the U.S.. This paper claims that U.S. LBOs more often take place in mature industries.

Renneboog et al. (2007) investigate 177 going-private transactions between 1997 and 2003 and find similar results to U.S. data for the 1980s regarding premiums paid (around 40%). Secondly, by measuring cumulative abnormal returns (CAARs) they prove shareholder wealth effects around the 11 day period of the announcement date of 30%. They argue a weak tax benefit support by finding higher premiums paid for companies with low pre-buyout leverage. Still, they find stronger support of the undervaluation hypothesis, by showing a positive relationship between the pre-buyout undervaluation and the expected shareholder wealth gains at the public-to-private transaction date. More importantly, undervaluation is especially stronger in the case of MBOs and IBOs in contrast to MBIs, which relates to the information asymmetry between outside and incumbent management. For the agency-cost related hypotheses, different evidence is found. Incentive realignment is proven to be an important factor for shareholder wealth effects with higher premiums and CAARs in the case of less managerial ownerships. Also, lower premiums and CAARs are found in cases of stronger outside blockholders by which they conclude a support for the control hypothesis (less scope for improvement in operating performance after the transaction). However, they find no evidence for the free cash flow hypothesis of Jensen (1989). Finally, managers do not displace potential raiders by paying more for the shares and in the case of multiple bidders more shareholder wealth is created.

According to Renneboog and Simons (2005), the second wave (1997-2003) of public-to-private LBOs in the U.K. was driven by the fact that smaller quoted firms were seeking new types of equity investors because of the lack of willingness by institutional investors to provide equity to these

companies. They argue that, due to its consolidation, the focus of the fund management industry was on large, more liquid stocks.

Similar to Guo et al. (2010), Weir et al. (2008) find that public-to-private buyouts in the U.K. also add value. They study a hand collected data sample containing 122 going-private firms in the 1998-2004 period with sufficient post-buyout data.[3] This paper makes a distinction between firms with private equity involvement (PEP) and non-private equity involvement (non-PEP) companies. They find different results for the two categories. First, PEP buyouts seem (unlike expectations) to have a negative impact on company performances – these performances are measured using the ROCE and ROE.[4] This is partly explained by the concentration towards larger targets in PEP investments, which are more challenging to restructure. However, these companies did perform better than their quoted peers and not significantly worse than non-PEP buyouts. Leverage was found to be higher than the industry average for PEP involvement and less for non-PEP buyout (which raises questions whether they could be referred to as LBOs). Lastly, efficiency is proven for the full data sample with lower expenses and higher per employee profit ratios.

Acharya et al. (2009) investigate abnormal returns of 110 multiple types of private equity transactions (minimum deal value €50mil) in Western Europe between 1995 and 2005 of mature private equity houses.[5] They also find a relationship between the operating (out)-performance of the portfolio companies and these abnormal returns. The first is measured by the EBITDA/Sales ratio evolvement (increase of 2% during ownership compared to peers) during the private phase of the respective company and its EBITDA/Enterprise Value (an 18% increase for deals with subsequent M&A events) compared to the market after exit. Furthermore, human capital (expertise and excellence) is proven to be an important factor in explaining these abnormal returns.

According to Harris et al. (2005), another way to find better performance measures is investigating MBO effects on the plant level of U.K. companies. Mainstream research on private equity is focused on public-to-private buyouts and this implies wrong methods, they argue. Not only do they claim that going-private MBOs are just a small portion of the total buyout market, they find economic efficiency measured using stock prices and accounting profits are problematic. They address the scepticism regarding the efficient market hypothesis in the world of economic science and argue an imperfect correlation of accounting profits with actual performance. Rather, they follow Lichtenberg and Siegel (1990) by assessing the total factor productivity (TFP) preceding and succeeding MBOs. They find MBO plants were less productive before their respective buyout and much more productive afterwards. Also, they find MBO plants "downsize their workforce even more dramatically" and "generate considerably less output" in the private period, driving up the TFP.

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[3] Financial accounts for the year of the buyout, one year prior to and after the buyout must be available [-1, 0, 1].
[4] ROCE and ROE stand for return on capital employed and return on equity respectively.
[5] They use a methodology that calculates unlevered returns for the sake of comparison with quoted peers.

Even though empirical research shows that leveraged buyouts generate economic value, public-to-private transactions are argued to be subjected to bust and boom cycles (Kaplan and Stromberg, 2008). Especially for buyouts of larger public firms, they find evidence on other factors besides returns driving up the activities, such as interest rates to earnings levels and stock market values. They also speculate on private equity activity after the recent economic crisis. The first and most plausible argument is the less leveraged investment expectations. Second, they discuss the transition to minority equity positions by private equity investors. Experience with venture capital can be used to add value without taking full control on the companies. Moreover, rather than 'barbarians at the gate' in the 1980s they are seen as saviours by top executives due to hostility of hedge funds and active shareholders. Third, they find it likely that returns on recent buyouts (2005 to mid-2007 boom) may fail to deliver ultimate returns because of the difficulty to exit at a lucrative price and the selection of these firms based on external market factors rather than their operating improvement potential.

Axelson et al. (2010) investigate a sample of 1157 buyouts between 1980 and 2008 on a global scale. Portfolio companies show a debt to enterprise value of 70%, while public companies have the same percentage for equity. Similar to Kaplan and Stromberg (2008), this paper addresses debt availability and interest rate market conditions as main factors for capital structures of buyout firms and the prices the private equity firms are willing to pay for the transactions.

III.   Data

The biggest challenge of this thesis was finding the necessary data in order to test if value creation has taken place. At first, I identify completed public-to-private buyouts of which the announcement dates took place between 1990 and 2007 in the United Kingdom using the sources SDC, Zephyr, and Bloomberg Finance.[6] For these 208 public-to-private buyouts, merger offer documents were searched in Thomson One Banker and Factiva. For 39 buyouts these documents were not found, therefore I exclude these firms from the data sample. Next, by reading the necessary parts of the merger offers and the synopses of the databases' output, more filters are appointed. Firms intended to be merged with another company, bought in a distressed state or bought using equity of another portfolio firm are eliminated from the sample. This gives a final sample of 148 firms with sufficient buyout information to be investigated.

Post-buyout information is also collected for the 1990-2006 period to calculate returns to capital and measure operating performance changes. Bureau van Dijk's databases Orbis and Amadeus show this historical information for 94 firms of the full sample.[7] Eight financial accounts are obtained from these databases, namely EBITDA, EBIT, Sales, Total assets, Interest paid, Shareholders funds, Long term debt and Short term loans. Financial information for private firms is easier to obtain in the U.K. than for the U.S. and does not depend on whether the firms have widely held public debt outstanding (Cressy et al. 2007). I compare the firms with post-buyout data to firms without post-buyout data information to verify if no major differences between them exist.

Details about buyout pricing and leverage are provided in Table I. This data is obtained using SDC for deal (capital) values and pre-buyout firm information. Hand collected information about deal financing is gathered by reading the merger offers and output from Dealscan.[8] For both the full and post-buyout information containing sample the buyout prices paid over time are shown. In my research, for the buyout price the 'Rank value' in SDC is used which according to the database "is calculated by subtracting the value of any liabilities assumed in a transaction from the transaction value and by adding the target's net debt (£mil). Net debt is Straight Debt plus Short-Term Debt plus Preferred Equity minus Cash and Marketable Securities as of the date of the most current financial information prior to the announcement of the transaction". Contrary to Guo et al. (2010), 'capital' in this paper does not include the fees paid during the transaction. Unfortunately, I have not been able to find the fees separately. Buyout activity was high between 1999 and 2001 and for the last two years of

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[6] SDC is integrated in Thomson One Banker (deal section, mergers), Zephyr is a M&A database of Bureau van Dijk.

[7] For one firm data is obtained from SDC/Thomson One Banker and for two firms financial account statements have been used.

[8] Not all buyout financing details were provided by Dealscan. Still, when provided they corresponded to the merger offer details.

Table I – Annual medians for deal pricing and aggregate debt levels

This sample consists of 148 leveraged buyouts announced between 1990 and 2007 in the United Kingdom. For 94 firms completed by 2006 there is also post-buyout data found. Capital is the Rank value in SDC, which is calculated by subtracting the value of any liabilities assumed in a transaction from the transaction value and by adding the target's net debt ($mil). Net debt is Straight Debt plus Short-Term Debt plus Preferred Equity minus Cash and Marketable Securities as of the date of the most current financial information prior to the announcement of the transaction. Premium is the percentage difference between the price paid for the firm's equity and the price four weeks prior to the buyout announcement. Pre-buyout debt information is obtained from SDC, while post-buyout debt information is hand collected by reading the merger offer documents and data from Dealscan. The significance of difference in medians is based on two-sample Wilcoxon rank-sum (Mann-Whitney) test. ***, **, and * indicate significance at the 1%, 5%, and 10 %, respectively.

Year	No. LBOs	Capital (£mil)	EBITDA to capital (%)	Premium (%)	Pre-buyout debt to capital (%)	Post-buyout debt to capital (%)	Change in debt to capital (%)	Pre-buyout debt to EBITDA ratio	Post-buyout debt to EBITDA ratio	Total equity to capital (%)
Full Sample										
1990-1998	14	82.6	18.9	31.6	11.8	61.7	47.1	0.5	4.8	41.6
1999	27	78.0	20.5	50.3	18.5	69.2	40.1	1.0	4.8	37.2
2000	18	181.1	25.3	35.9	22.4	78.0	50.7	1.4	4.4	22.9
2001	17	96.8	22.3	28.8	18.5	77.4	55.9	0.7	5.1	23.1
2002	6	117.1	32.0	46.8	25.6	69.3	43.7	1.2	4.2	36.8
2003	14	197.0	24.8	18.2	32.4	60.9	46.4	1.7	4.1	44.8
2004	7	207.3	26.1	38.8	39.7	76.2	47.7	2.3	4.7	25.2
2005	12	380.0	25.1	18.2	21.2	73.3	45.4	1.8	6.5	35.4
2006	19	237.0	17.6	18.7	21.1	67.9	39.4	1.9	7.2	41.3
2007	14	761.5	15.3	19.1	21.5	69.2	43.2	2.1	6.6	36.4
Total 1990-2007	148	132.6	22.3	28.8	21.0	69.9	46.3	1.5	5.0	35.7
Subsample with sufficient post buyout data										
1990-1998	6	90.2	16.6	55.1	11.2	66.3	46.8	1.1	5.8	38.5
1999	22	86.2	19.1	50.3	18.8	63.8	38.4	1.4	4.9	40.1
2000	13	164.4	26.0	36.7	22.1	73.2	54.0	1.0	4.0	26.8
2001	13	82.3	25.7	38.1	14.3	74.1	55.9	0.7	4.7	36.0
2002	4	147.8	36.3	30.1	32.5	67.0	33.8	1.6	3.6	43.1
2003	12	197.0	26.2	18.0	25.8	65.7	52.2	1.3	4.1	43.8
2004	4	168.2	25.4	30.7	25.0	66.5	39.6	1.8	5.7	27.1
2005	8	380.0	20.4	15.3	26.3	61.8	38.6	2.5	6.2	41.3
2006	12	252.6	17.3	19.0	23.4	69.6	49.5	2.6	8.3	35.5
Total 1990-2006	94	112.7	21.8	32.0	21.0	68.8	45.7	1.5	5.0	36.6
Total 1990-2006	130	113.6	23.7	32.3						
I. With post-buyout data	94	112.7	21.8	32.0						
II. No post-buyout data	36	129.6	24.5	32.7						
Difference in medians (I-II)		(-)	(-)	(-)						

the full sample. Moreover, for the full sample, capital has a median value of £132.6m for the 1990-2007 period and for the subsample between 1990 and 2006 I find a value of £112.7m. EBITDA expressed as a percentage of capital is a proxy to see how the buyouts are priced relative to the firms' pre-buyout operating performance. The median value for the full sample is 22.3% and subsample is only 0.5% lower. Also, the premium paid for the shares relative to their market value four weeks before the buyout announcement is provided. Table I shows median values of 28.8% and 32.0% for the full and subsample respectively. For both samples the premiums tend to decline over time from plus 50% before the year 2000 until below 20% starting 2005. This is close to the findings of Guo et al. (2010) who find a median value of 29.2% in the U.S. for approximately the same period. The evidence for the 1980s in the U.S. is higher; Kaplan (1989a) and Kaplan and Stein (1993) find median premiums of 42.3% and 43.0% respectively. It must be noted that their time span goes back two months before the buyout announcement, though. Renneboog et al. (2007) find median a premium value of 39.5% and 38.5% between the final offer price and the stock price 20 and 40 days prior to the buyout announcement. Their finding is probably higher due to their sample which covers buyouts between 1997 and 2003. Capital, EBITDA to capital and the premium show no significant difference in median when I compare the 130 firms with and without post buyout data announced between 1990 and 2005.

Leverage change is very high when one looks at the difference between the pre- and post-buyout debt to capital ratios. Both samples show a median of 21.0% for the pre-buyout ratio and a 69.9% (68.8% for subsample) debt level value after the buyout. The pre- and post-buyout debt to EBITDA ratios rise with 3.5 from 1.5 to 5.0 and are higher in the later years. The findings on leverage change are quite similar to those of Guo et al. (2010) for the U.S.. Kaplan (1989a) finds a percentage value near 90% for the post-buyout debt to capital ratio, implying that in the U.S. during the 1980s there was more aggressive debt use. As expected, the equity to capital ratios is relatively low after the buyout, 35.7% for the full sample and 36.6% for the subtype. This is in accordance with the idea that LBOs use little equity and a lot of debt to finance the transactions.

Compared to U.S. public-to-private transactions, buyout financing in the U.K. has different characteristics. Similar to what Weir et al. (2008) report, I find equity financing by a combination of share capital and loan notes.[9] As previously mentioned, Toms and Wright (2004) report that the (high yield) public bonds market has overall not been used as an instrument to finance the buyouts U.K. while private mezzanine finance types have been an important debt instrument next to senior bank debt.[10] Since the debt characteristics of U.K. buyouts differ from the U.S., I categorise debt types differently to report the deal financings. A good example to follow can be found in Axelson et al. (2010), where there is a distinction made between senior bank debt, subordinated debt, bonds, other

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[9] Out of the full sample of 148 firms, 78 buyouts are financed with investor loan notes.
[10] Subordinated private debt is found in 72 of the 148 buyouts, while public bonds are used in only 7 cases.

Table II – Deal financing: debt and equity characteristics

Deal financing with equity and debt are provided below using a hand collected sample obtained by reading the merger offers documents and Dealscan. Contingent debt is not part of the acquisition financing but rather for later stage projects. Significance levels are based on a two-tail t-test. ***, **, and * indicate significance level at 1%, 5%, and 10%, respectively.

Year	No. LBOs	Common Equity to capital (%)	Senior bank debt to capital (%)	Subordinated debt (% of deals)	Subordinated debt to capital (%)	Bonds (% of deals)	Bonds to Capital (%)	Investor loan notes (% of deals)	Investor loan notes to capital (%)	Contingent debt (% of deals)	Contingent debt to capital (%)
Full Sample											
1990-1998	14	12.7	45.2	57.1	11.1	7.1	4.7	64.3	28.2	71.4	15.4
1999	27	9.6	64.0	29.6	5.2	7.4	1.8	63.0	27.5	66.7	13.1
2000	18	10.7	72.6	38.9	6.2	11.1	3.9	50.0	14.4	83.3	16.1
2001	17	9.4	71.6	52.9	10.8	0.0	0.0	52.9	17.8	58.8	9.4
2002	6	13.7	69.5	33.3	3.9	0.0	0.0	50.0	19.4	83.3	11.0
2003	14	21.9	61.0	42.9	7.0	7.1	5.1	50.0	17.7	50.0	14.3
2004	7	17.6	69.0	57.1	8.7	0.0	0.0	28.6	9.5	42.9	10.3
2005	12	23.1	62.0	75.0	11.3	8.3	2.4	33.3	12.4	91.7	19.9
2006	19	22.0	55.7	63.2	9.9	0.0	0.0	52.6	18.5	73.7	12.5
2007	14	23.5	48.8	50.0	6.9	7.1	4.7	57.1	27.4	78.6	7.5
Total 1990-2007	148	15.7	61.6	48.6	8.0	5.4	2.4	52.7	20.4	70.3	13.1
Subsample with sufficient post buyout data											
1990-1998	6	20.6	39.2	50.0	11.6	16.7	10.9	66.7	23.5	83.3	22.5
1999	22	9.7	59.4	31.8	6.0	9.1	2.2	63.6	30.4	72.7	12.6
2000	13	10.6	70.5	46.2	8.1	7.7	3.1	69.2	19.9	92.3	20.2
2001	13	11.8	63.0	61.5	13.4	0.0	0.0	61.5	22.6	76.9	12.3
2002	4	17.8	61.1	50.0	5.8	0.0	0.0	50.0	21.1	75.0	13.5
2003	12	16.9	62.5	50.0	8.1	8.3	6.0	58.3	20.7	58.3	16.7
2004	4	19.7	60.6	50.0	9.6	0.0	0.0	25.0	11.7	50.0	5.7
2005	8	27.1	55.7	62.5	10.1	0.0	0.0	37.5	10.2	87.5	21.4
2006	12	18.7	62.2	58.3	8.9	0.0	0.0	50.0	19.6	83.3	8.8
Total 1990-2006	94	15.1	60.7	48.9	8.8	5.3	2.4	57.4	21.9	76.6	14.8
Total 1990-2006	130	14.8	63.6		8.0		2.2		19.4		13.3
I. With post-buyout data	94	15.1	60.7		8.8		2.4		21.9		14.8
II. No post-buyout data	36	14.0	71.2		6.0		1.6		12.9		9.5
Mean difference (I-II)		(+)	(-)**		(+)		(+)		(+)**		(+)*

13

debt and contingent debt.[11] Compared to their version, I replace 'other debt' with 'investor loan notes' which results in the report of Table II.

Here we can see an average senior bank debt to capital ratio of just above 60% for both samples. In nearly half of the buyouts, mezzanine subordinated debt is used having an average value to capital of 8.0% for the full sample and 8.8% for the subtype. Its subordination lies in the ranking of claimants in the event of a bankruptcy, in this case falling behind senior debt but not equity holders. The word mezzanine comes from architectural jargon, addressing intermediate floors in buildings. The table also shows the lacking presence of issued bonds as a financing instrument for these buyout, appearing only in approximately 5% of the deals. Furthermore, in more than half of the buyouts investor loan notes are used, overall comprising around one fifth of the acquisition financing. Interestingly, 'normal' shares amount up to a smaller part of the equity financing. Finally, contingent debt is used in 70.3% buyouts of the full sample and even 76.6% of the post-buyout data containing sample. Even though this is not part of the acquisition capital, it shows obvious presence during the buyout and a sign of willingness of the banks to provide extra possibly needed financing, despite the already high levels of leverage. Table III also shows the difference in means of the financing types between firms with and without post-buyout data. For the relative use of three instruments, there seems to be a significant difference between the groups. However, I find no apparent reason for this difference and therefore argue that the result of the tests is due to my sample selection.

In order to calculate the returns to capital, an important part is the terminal value. This is the total value received by the debt and equity investors when the buyout firm is exited through one of four possible ways. The investment stages can be terminated through an IPO reverting the firm to a public status, sale to a strategic buyer that is not a private equity firm, passed on to another private equity firm (secondary LBO) or turn distressed in which in the latter case the firm needs to be financially restructured. Then there is the possibility that there is no outcome since the firms is still private or that I was not able to trace the status of the firm. There are only six firms with an unknown status. For the remaining firms, the investment outcomes have been identified using the databases Zephyr, Factiva, Orbis, Amadeus and other news sources.[12]

Table III shows outcomes for the full and subsample respectively. The firms with an outcome are mostly exited through a secondary LBO or sold to a strategic buyer and this holds for both samples. Also, 47% of the full sample consists of firms without an outcome. Logically, the last two years of the sample period hold a large portion of this status. For the sample with post-buyout information this percentage is lower (35%). Guo et al. (2010) hold a higher portion of firms with a distressed outcome in their sample (12% of full sample). I, however, identified only 5 firms for which

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[11] Contingent debt contains future funding facilities such as working capital facilities and revolving line of credit. As described in the merger offers and claimed by Axelson et al. (2010), these facilities are not drawn at the time of the buyout and therefore excluded from return calculations.
[12] Bureau van Dijk's Orbis and Amadeus provide an ownership module in which ownership chains are provided.

Table III – Exits

The outcomes of the investmets for the full sample of 148 buyouts and the 94 buyouts with post buyout information are shown. This information is obtained in the second half of 2010. The data represents the number of observations found for the different outcome types.

Buyout announcement year	IPO	Sold	2nd LBO	Distressed	Still private or unknown	Total
Full Sample						
1990-1998	1	6	3	2	2	14
1999	4	9	8	0	6	27
2000	1	3	7	0	7	18
2001	0	2	6	1	8	17
2002	0	3	2	0	1	6
2003	3	4	2	0	5	14
2004	1	2	3	0	1	7
2005	0	2	1	0	9	12
2006	1	0	0	2	16	19
2007	0	0	0	0	14	14
Total 1990-2007	11	31	32	5	69	148
Percent of deals	7%	21%	22%	3%	47%	100%
Subsample with sufficient post-buyout data						
1990-1998	1	3	1	1	0	6
1999	4	8	8	0	2	22
2000	1	2	6	0	4	13
2001	0	2	5	1	5	13
2002	0	2	2	0	0	4
2003	3	3	2	0	4	12
2004	0	0	3	0	1	4
2005	0	1	1	0	6	8
2006	0	0	0	1	11	12
Total 1990-2006	9	21	28	3	33	94
Percent of deals	10%	22%	30%	3%	35%	100%

I found information regarding equity handed over to bondholder, rescue plans, cash crises, and etcetera.

Not all outcome findings have information about the corresponding terminal value. This value is important for calculating returns of the firms with post-buyout information, though. Of the 61 firms with an outcome and post-buyout information, 44 have containing an observed terminal value. In the case of IPO exits, the observed value of equity and debt is used in the full fiscal year following the exit date. For the three firms with post-buyout data becoming distressed, I assume no equity payment.

For the remaining 17 firms and the firms who are still private I follow Guo et al. (2010) by calculating EBITDA multiples to estimate the terminal value. If the EBITDA values are not available or applicable, I use revenue multiples. On Compustat Global, I perform a search for all firms with the same four digit SIC code and estimate the median ratio of debt plus equity to EBITDA or revenues.[13]

The necessary post-buyout information to calculate returns besides the terminal value are the interim payments. According to Guo et al. (2010), these are "the post-buyout cash payments to providers of debt and equity capital while the firm is private, and are calculated as the sum of cash interest, net debt principal paid, dividends, and net equity repurchased". Orbis and Amadeus databases provide sufficient information to calculate the interim payments. The values of shareholders' funds, long term debt and short term loans at the last fiscal year before the buyout, together with yearly interest paid while private are collected. For the first three observations their net values are calculated by looking at the difference from the hand collected data on financing of the buyout. The difference implies the net payments to investors. Unlike the interest payments, dividends paid as a separate value is not found in the two Bureau van Dijk's databases. I assume these payments are processed in to shareholders' funds, they may underestimate the returns if this is not the case.

Besides nominal returns, market and risk adjusted returns are calculated. To calculate the discount factor, I collected daily data for the market return, risk-free rate and pre-buyout stock prices of the firms from Datastream. The index of the FTSE250 and the return index of the three month U.K. T-bill are used for the market return and risk-free rate respectively. The pre-buyout stock prices and pre-buyout debt/equity ratio obtained from SDC are used to calculate the unlevered asset betas as part of the discount factor.[14]

Performance calculations are also obtained using Orbis and Amadeus. Information on EBITDA, EBIT, Sales and Total assets provide information on return ratios between the last pre-buyout year and the last post-buyout year. The percentage change over the years lets us know how the

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[13] On Compustat global, I uploaded the 148 SIC codes in order to match other firms in the same industry. When the SIC code is not matched on all four digits, I search for the closest one on three digits within the same output, and so on. For debt and equity values I use the variables "debt in current liabilities", "long term debt" and "stockholders equity" respectively.

[14] Similar to Gilson et al. (2000), I assume a debt beta of 0.25.

buyouts have affected returns to sales and assets.[15] In contrast to Kaplan (1989a) and Guo et al. (2010), the lack of available information forces me to use EBIT instead of net cash flow as a second proxy for return ratios to sales or assets. Next to the nominal performance changes, I calculate the median industry adjusted percentage change of all matching firms in Compustat Global based on the same four digit SIC code.[16] This benchmark is important to check if the operating performances relatively improved.

       This chapter discussed how I gathered data for my research. Next, the corresponding calculation methods are further explained.

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[15] Total assets in this paper is the observed value of the data output, which implies it is the end year values. Guo et al. (2010) state their version is the average between the beginning and the end of the year.
[16] See footnote 13 for further explanations on industry matching based on SIC codes.

IV.   Methodology

This chapter describes the return and operating performance calculation methods. I make a distinction between nominal and market and risk adjusted returns and between returns to pre- and post-buyout capital. Inspired by Kaplan (1989a; appendix), Figure 2 shows a timeline illustrating important moments w.r.t. leveraged buyouts for return and operating performance calculations.
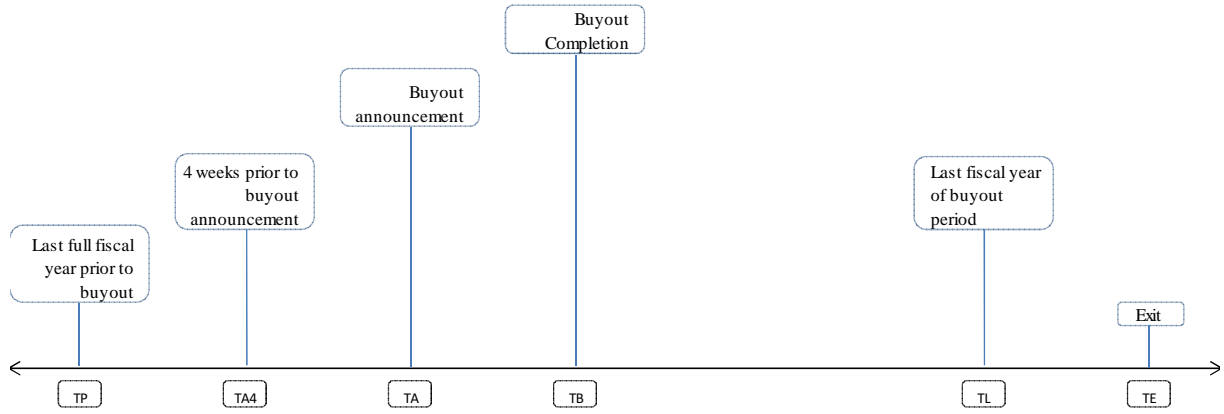

Figure 2

The four equations below show the nominal return to pre- and post-buyout capital and the market and risk adjusted return to pre- and post-buyout capital respectively:

$$NRPRE = \frac{(ED_{TB} - ED_{TL}) + IR_{[TB:TL]} + TV_{TE}}{Capital_{TP}} - 1,$$

$$NRPOS = \frac{(ED_{TB} - ED_{TL}) + IR_{[TB:TL]} + TV_{TE}}{Capital_{TB}} - 1,$$

$$MRPRE = \left(\frac{1 + NRPRE}{1 + DF_{[TP:TE]}}\right) - 1,$$

$$MRPOS = \left(\frac{1 + NRPRE}{1 + DF_{[TA:TE]}}\right) - 1,$$

where ED is the sum of the shareholders' funds, long term debt and short term loans, reflecting the interim payments to equity (incl. dividend) and principal payments of debt. $IR_{[TB:TL]}$ reflects the interim interest payment and TV_{TE} is the terminal value at exit date. The latter is the total pound value received by capital at the exit date. Missing terminal values are estimated by calculating EBITDA

multiples. If the EBITDA values are not available or applicable, I use revenue multiples. For $Capital$ two observations are used, namely pre-buyout capital being the sum of total debt in the last full fiscal year and market value equity four weeks prior to announcement and post-buyout capital being the buyout price.[17] DF is a CAPM discount factor, also used by Guo et al. (2010):

$$DF = R_f * (1 - \beta_u) + \beta_u * R_m.$$

β_u is the a weighted asset beta calculated by the method of Gilson et al. (2000). It is the beta of the stock return w.r.t. R_m using 1300 daily observations prior to the buyout announcement of each buyout and an assumed debt beta of 0.25.[18] The FTSE250 index is used for the R_m over the matching period to pre- or post-buyout returns using daily data. R_f is also calculated over the matching period to pre- or post-buyout returns using daily Return index data of the three month U.K. T-bill. The matching period covers the end of the last full fiscal pre-buyout year and the exit date for pre-buyout capital and the buyout completion date and exit date for post-buyout capital.

For the calculation of operating performance four proxies are used. The first two are returns on sales:

$$ROS_1 = \frac{EBITDA}{Sales}, \qquad ROS_2 = \frac{EBIT}{Sales},$$

and the two remaining proxies measure performance to total assets:

$$ROA_1 = \frac{EBITDA}{Total\ assets}, \qquad ROA_2 = \frac{EBIT}{Total\ assets}.$$

The changes in operating performance calculations for all four of the above proxies are:

$$\delta_{S1} = \frac{ROS_{1(TL)}}{ROS_{1(TP)}} - 1, \qquad \delta_{S2} = \frac{ROS_{2(TL)}}{ROS_{2(TP)}} - 1,$$

for the return on sales proxies and:

$$\delta_{A1} = \frac{ROA_{1(TL)}}{ROA_{1(TP)}} - 1, \qquad \delta_{A2} = \frac{ROA_{1(TL)}}{ROA_{1(TP)}} - 1,$$

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[17] Both value of $Capital$ are obtained from SDC. The buyout price is the Rank value obtained from SDC.
[18] In contrast to Gilson et al. (2000), I exclude preference shares from the weighted asset beta calculation due to the lack of available data.

for the changes in return on assets. Later on, the changes in operating performance will be calculated to see if the buyouts had an impact. These changes will be compared to the industry by subtracting the market change from the firm change in operating performance.

V.   Results

This section discusses the results of the return and operating performance calculations. Also, I will elaborate on the regressions in Table VII to see which evidence is found on possible factors influencing operating performance. The result of this paper will then be compared to previous research.

Returns to capital

Based on the methodology discussed in the previous section, return calculations for the 94 firms with post-buyout data are provided in Table IV. As stated earlier, returns are calculated based on the nominal and market and risk adjusted value, and subjected to pre- and post-buyout capital. The mean and median values are provided for the different types of outcome. The outline of my argumentation is based on the outcomes (exits) visible in table IV.

First, firms that are exited through an initial public offering show high positive and significant results. The nominal mean (median) returns are 175.3% (101.0%) to pre-buyout capital and 101.1% (56.7%) to post-buyout capital. As expected, the market and risk adjusted returns are somewhat lower than nominal returns but still high, implying excess returns. The outcome group 'sold' represents firms sold to a strategic buyer. For the 21 firms I also find high mean (median) returns to pre-buyout capital of 146.9% (150.6%) and 119.4% (113.0%) to post-buyout capital, all significant at the 1% level. Returns after market and risk adjustment are still high. In this sample, the highest returns are found for firms which have been exited through a secondary LBO. The mean (median) market and risk adjusted returns are 139.7% (131.0%) to pre-buyout capital and 104.7% (98.4%) to post-buyout capital. Firms that became distressed show, as expected, the lowest returns of the whole sample. Only the mean value to post-buyout capital is negative for nominal returns, which may imply a 'pre-packaged bankruptcy', which is also discussed in Guo et al. (2010). However, out of the sample of 94 firms with post-buyout data, only 3 firms have become distressed. The market and risk adjusted returns are all negative, but none of the results for this group are significant.

Still private/unknown state firms also show overall positive returns. Their terminal values are estimated based on EBITDA or revenue multiples of the industry in the year ending 2008. The EBITDA or revenue values of the corresponding years are then chosen. It is notable that, however positive, the returns for this group of firms are lower than the first three outcome groups. This can be the result of low performances by the firms (meaning low revenues or EBITDA) in the year 2008 or low multiples because the industry is performing relatively low in the corresponding year. One could argue that the recent financial/economic crisis has affected the results. However, it is difficult to statistically prove causality at this point because the financial crisis at the end of 2008 was not an economic crisis yet and not all industries are necessarily affected. Therefore, it is interesting to show a

Table IV – Nominal and adjusted returns to pre- and post-buyout capital

The nominal return is the sum of all interest payments to capital during the investment period, a terminal value, divided by capital, minus one. Terminal value is total pound value received by capital at the exit date, obtained from Zephyr, Factiva, Orbis, Amadeus and other news sources. Missing terminal values are estimated by calculating EBITDA multiples. If the EBITDA values are not available or applicable, I use revenue multiples. For Capital two observations are used, namely pre-buyout capital, being the sum of total debt in the last full fiscal year and market value equity four weeks prior to announcement and post-buyout capital being the buyout price. Interim payments to capital equals the sum of cash interest and debt principal repaid, dividends, and equity repurchased, net of proceeds from new debt and equity issues. The market and risk adjusted return is calculated using a discount factor $R_f * (1 - \beta_u) + \beta_u * R_m$, discounted to the pre- or post-buyout capital date. β_u is the a weighted asset beta, based on a R_m consisting of 1300 daily observations prior to the buyout announcement of each buyout and an assumed debt beta of 0.25. The FTSE250 index is used for the R_m and the daily Return index data of the three month U.K. T-bill is used for R_f. Significance levels are based on two-tail t-test for means and Wilcoxon signed-ranks test for medians. ***, **, and * indicate significance level at 1%, 5%, and 10%, respectively.

| Outcome | Capital | N | Nominal return (%) | | | Market and Risk Ajusted Return (%) | | |
			Mean	Median	# of positive returns	Mean	Median	# of positive returns
IPO	Pre	9	175.3 *	101.0 ***	9	88.8	41.0 **	7
	Post	9	101.1 *	56.7 ***	9	60.0	11.6	6
Sold	Pre	21	146.9 ***	150.6 ***	20	83.1 ***	79.3 ***	20
	Post	21	119.4 ***	113.0 ***	19	74.0 ***	59.8 ***	18
2nd LBO	Pre	28	203.0 ***	190.9 ***	26	139.7 ***	131.0 ***	26
	Post	28	145.6 ***	121.4 ***	26	104.7 ***	98.4 ***	26
Distressed	Pre	3	10.3	21.6	2	-17.3	-13.0	1
	Post	3	-8.0	7.7	2	-18.9	-6.9	1
Still Private/Unknown	Pre	33	132.2 **	49.3 ***	27	74.4	15.9 **	21
	Post	33	97.4 ***	44.0 ***	26	84.2 ***	41.6 ***	26
All	Pre	94	156.8 ***	102.5 ***	84	94.2 ***	60.3 ***	75
	Post	94	113.7 ***	75.9 ***	82	82.4 ***	50.5 ***	77
All with outcome	Pre	61	170.1 ***	148.4 ***	57	105.0 ***	83.5 ***	54
	Post	61	122.5 ***	101.2 ***	56	81.4 ***	59.7 ***	51

distinction between all 94 firms with post-buyout data another subsample with an actual outcome.

The group of 61 firms with an outcome indeed show higher returns than the group including all 94 firms. This group also shows overall higher returns than the directly comparable group in the U.S. for approximately the same period, see Guo et al. (2010). This difference is mainly affected by the higher returns found for firms sold or exited through a secondary LBO.

Operating performance change

The 94 firms with post-buyout information are also subjected to calculations of operating performance change. The median unadjusted and industry adjusted changes in the [-1,last year] period in Table V are shown in percentages for the different types of outcome, group of deals with outcome and all 94 firms. Overall, the highest performance changes are found for firms that are exited through an initial public offering. Both EBITDA/Sales and EBIT/Sales show changes close to 40% for the unadjusted industry ratios. The industry adjusted percentage changes have a value 54.24% and 67.68% for the first and latter return on sales ratio respectively. The industry adjusted percentage change for EBITDA/Total assets and EBIT/Total assets (both return on asset ratios) are somewhat lower than the return on sales ratios but still positive. This outcome group shows the highest percentage changes as the four other groups mostly show negative results. Especially the three firms with a distressed outcome show very negative results. The industry adjusted changes for EBITDA/Sales (EBIT/Sales) and EBITDA/Total assets (EBIT/Total assets) are -139.62% (-454.42%) and -139.85% (-366.55%) respectively. Firms that still private or have an unknown status show for similar ratios changes -24.49% (-57.71%) and -43.24% (-57.57%), these values are all significant.[19]

As before, Table V makes a distinction between firms with and without an actual outcome. The first group has an industry adjusted percentage changes of 3.27%, -2.68%, -14.18% and -12.65% for EBITDA/Sales, EBIT/Sales, EBITDA/Total assets and EBIT/Total assets, respectively. Though, none of these four percentage changes are significantly different from zero. The full sample of 94 firms shows lower percentage point values for all of the four operating performance change values.

The results on operating performance changes thus are not consistent with the findings of the returns. Where we find positive excess returns for deals with and without an outcome, operating performance changes overall seem negative for profitability and return on assets. The firms themselves show no operating improvement on their core activities but it is still managed to create value for equity and debt investors of the buyout. Though not investigated in this paper, possible other factors need to explain the high and positive returns to capital.

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[19] For firms in the still private/unknown category, the year 2008 is chosen as 'last' for performance change calculations.

Table V – Changes in operating performance between last pre-buyout year and last post-buyout year

This table shows the percentage difference in operating performances between the last pre-buyout year and the last post buyout year prior to exit. The number of observations # and positive observations # (+) is also shown. The changes are grouped by outcome and there is a distinction made between deals with outcome and still private companies. The industry adjusted change substracts the median change of all firms in Compustat with the same four digit SIC code. EBITDA and EBIT are deflated by sales and total assets respectively. All four types of financial accounts are obtained from Bureau van Dijks's Amadeus and Orbis. Significance levels are based on Wilcoxon signed-ranks test for medians. ***, **, and * indicate significance level at 1%, 5%, and 10%, respectively.

Performance Ratios	IPO		#	# (+)	Sold	#	# (+)	2nd LBO		#	# (+)	Distressed	#	# (+)	Still Private / Unknown		#	# (+)	Deals with outcome		#	# (+)	All deals		#	# (+)
Profitability																											
EBITDA / sales																											
Unadjusted percentage change	39.87%	*	9	7	-22.67%	21	10	-13.67%		28	13	-151.12%	3	0	-40.92%	***	33	6	-6.68%		61	30	-17.84%	**	94	36
Industry adjusted percentage change	54.24%		9	7	-12.05%	21	10	-0.38%		28	14	-139.62%	3	0	-24.49%	**	33	11	3.27%		61	31	-9.41%		94	42
EBIT / sales																											
Unadjusted percentage change	41.02%		9	6	-12.29%	21	8	-26.92%		28	12	-471.21%	3	0	-84.56%	***	33	2	-12.29%		61	26	-44.09%	***	94	28
Industry adjusted percentage change	67.68%	*	9	7	-0.40%	21	10	-12.87%		28	12	-454.42%	3	0	-57.71%	***	33	5	-2.68%		61	29	-22.09%	**	94	34
Return on assets																											
EBITDA / total assets																											
Unadjusted percentage change	-3.36%		9	4	-3.87%	21	10	-28.46%	**	28	9	-138.34%	3	0	-54.05%	***	33	3	-16.66%	*	61	23	-30.57%	***	94	26
Industry adjusted percentage change	10.05%		9	5	14.78%	21	12	-18.68%		28	10	-139.85%	3	0	-43.24%	**	33	9	-14.18%		61	27	-18.24%	**	94	36
EBIT / total assets																											
Unadjusted percentage change	5.45%		9	6	-29.01%	21	8	-45.22%	**	28	10	-378.40%	3	0	-85.75%	***	33	2	-41.18%	**	61	24	-57.39%	***	94	26
Industry adjusted percentage change	43.43%		9	6	-6.08%	21	10	-19.26%		28	11	-366.55%	3	0	-57.57%	***	33	7	-12.65%		61	27	-34.61%	***	94	34

Guo et al. (2010) also find negative or small positive changes in the operating gains between the last pre-buyout year and last investment year [-1, last]. Still, their findings are overall less negative, especially for the sample with all 94 firms. However, it is important to note that I use EBIT instead of Net cash flow and take Total assets as observed rather than calculating the average. Weir et al. (2008), in their performance investigation for the U.K. (1998-2004), also show a decline in performance measures over the holding period.[20] Guo et al. (2010) argue this negative result for the U.K. is due to a sample selection, where also smaller buyouts are included. They address the paper of Acharya et al. (2009) who focus on 110 large transactions (+€50mln) in Western Europe and find an EBITDA/Sales increase of approximately 2.0% above the industry average. As discussed earlier, I find a change of 3.27% for the same ratio. However, only 12 of the 110 buyouts in their sample are public-to-private buyouts.

Explaining post-buyout operating performance

In this subsection, I will try to identify possible explanatory variables for the observed operating performance results by performing a total of six regressions. Private equity theory addresses a few characteristics of a buyout that contribute to operating performance improvement. Similar to Guo et al. (2010), I find and discuss the following proxies by reading the merger offer documents to see if U.K. data matches with the hypotheses.

First, during buyouts management may participate in the equity financing of the buyout. This is certainly the case during a management buyout/in. Still, during institutional buyout this also occurs. The fact that management holds equity should result in an alignment of incentives with the possible other shareholders and the alignment should be stronger if its equity stake is higher. Table VI shows management equity participation in 70 of the 94 buyouts with post-buyout information, thus occurring in nearly 75% of the observations. The mean and median share of total common equity held by management is 26.2% and 17.0% respectively. This share is higher than in the U.S., described in Guo et al. (2010).

Second, Jensen (1986) also predicts that management will be disciplined by an increase in debt due to the threat of being unable to pay higher interest and principal payments. Table I already shows the pre-buyout debt to EBITDA ratio for the full sample, Table VI does the same for the subsample with post-buyout data and also shows the leverage change between the pre- and post-buyout capital structures. The mean (median) value is 2.88 (1.47) before the buyout but shows a large increase of 4.23 (3.29).

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[20] Quick comparison with Weir et al. (2008): Table 14. Part iii (pg. 67) of the paper shows an industry adjusted ebitda/total assets ratio of 39.7% and 34.8% for t0 and t+5 respectively. This represents a percentage change of -12.34%.

Third, the merger offers are investigated to find proxies for improved monitoring and governance mechanisms. For 19 firms the merger offers state that the CEO will be replaced and in 30 cases the post-buyout CEO is also the chairman of the board. CEO replacement can result in improvement of the performance of the firm. Guo et al. (2010) argue that if after the buyout the CEO is not replaced and also holds the position of chairman, this can reflect in the case of an institutional buyout the belief that pre-buyout management should stay in place.

Furthermore, when two or more private equity firms are involved in a buyout, it will be marked as a club deal. It is argued that in the case of club deals there is less incentive to monitor.[21] Club PE participation is present in 25 (26.6%) cases of the subsample.

Finally, private equity firms may also address human capital to join the board of the portfolio firms to enhance governance. Table VI shows a lower sponsor director ratio compared to the U.S., where in the U.K. for 62 of the 94 firms sponsor directors are involved with a ratio just below 0.30.

For the six regressions a distinction is made between firms with and without an actual outcome. For both groups three regressions are performed with ROS (EBITDA/Sales) at last buyout year, change in industry adjusted ROS and change in industry adjusted ROA (EBITDA/Total assets) as dependent variables. The regressions also control for the same industry adjusted ratios of the last pre-buyout year (year -1). This control variable is added because Guo et al. (2010) argue that pre-buyout underperforming firms have a bigger chance to show operating improvements. For the regressions with ROS last buyout year as dependent variable, the median industry last year ROS is included as explanatory variable. Moreover, ln(capital) is included in all six regressions to control for deal size.

First, I elaborate on the regression findings of the full sample. The first regression with the return on sales ratio (EBITDA/Sales) last year as dependent variable shows a positive sign and significant p-value for the industry ROS last year, the pre-buyout leverage and leverage change variables. The first significant variable suggests that the industry status in the last year affects the return on sales of the firm (for the same year). The positive leverage change sign is consistent with the assumption of the disciplining effect of debt. Moreover, the pre-buyout leverage variable suggests firms with already a high level of debt perform well during buyouts. One positive and significant p-value is found for the second regression where the change in the return on sales ratio (EBITDA/Sales) is explained. Again, this is the leverage change proxy. The change in return on assets ratio (EBITDA/Total assets) regression shows no explanatory variables with significant p-values. The subsample containing firms with an outcome has also pre-buyout leverage and leverage change as significant explanatory variables for the return on sales ratio (EBITDA/Sales) last year as dependent variable. Both the regressions 'changes in return ratios' as dependent variables have significant values for leverage change and the control variable 'industry adjusted ratio last pre-buyout year'. The

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[21] Guo et al. (2010) find one deal where no private equity firm is involved. My sample shows 5 deals, possibly due to the fact that my research includes smaller buyout.

negative value of this control variable in both regressions is consistent with the argument of Guo et al. (2010), that firms underperforming before the buyout have a bigger chance to show operating improvements. In the last regression, ln(capital) is negative and significant. This suggests that the return on assets improvement is smaller for the larger firms in the sample. One could argue that larger firms are value firms that create stable cash flows. However, these firms have less growth opportunities and are more difficult to restructure for improvements in operating performance than smaller growth firms.

The leverage change variable is most persistent in explaining the dependent variables. Regarding the disciplining effect of debt, evidence is found for the samples with and without an actual outcome. This corresponds with the paper of Guo et al. (2010). Unfortunately, I am unable to prove evidence on the possible effect of monitoring and governance proxies on the changes in operating performance. The absence of the explanatory effect of these proxies may be the reason why the operating performance changes are not positive. Logically, improvements in operating performance are made when the firm has a better management and governance staff on its side. The lack of evidence on monitoring and governance variables can also be explained by my use of the 'conventional' industry adjusted ratio for operating performance changes rather than the second adjustment of Guo et al. (2010) by matching on industry, pre-buyout level of performance, change in pre-buyout performance and market to book ratio of assets.[22]

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[22] As stated by Guo et al. (2010), the conventional industry adjustment provides most comparison to prior research. Still, they argue, the alternative adjustment yields better test results for samples with extreme pre-event performance.

Table VI – Summary statistics for deal characteristics

Panel A

Information on management participation in equity, management changes and private equity firms involved is obtained from the merger offer documents. Management equity participation is a dummy variable that equals 1 if management of the target contributes equity. Management change indicates there is a CEO change at or within a year of LBO completion. Post-LBO CEO is the chairman of the Board indicates the post-LBO CEO is also chairman. Club PE indicates there are two or more PE sponsors for the deal. The percentage of deals is based on the 94 deals with post-buyout data available.

Deal Characteristics	# of deals	% of deals
Management Equity Participation	70	74.5%
Club PE participation	25	26.6%
Management Change	19	20.2%
Post-LBO CEO is the Chairman of the Board	30	31.9%

Panel B

Management equity participation of the 94 firms with post-buyout data is shown, obtained from the merger offer documents. The number of observations is also included. Pre-buyout leverage is obtained from SDC at the last full fiscal year prior to the buyout. Leverage change is de debt to EBITDA at year -1 multiple change between the pre- and post-buyout leverage state. The merger offer documents also provide information on the board size and the sponsor director ratio. The sponsor director ratio is the percentage of directors taking place in the board of directors after the buyout. Duration measures the number of fiscal years from the completion of buyout to the exit date for deals with an outcome or the number of fiscal years until the end of 2008 if the firm is still private.

	# of obs.	mean	median
Management Equity/Total Equity	70	26.2%	17.0%
Pre-buyout Leverage (Total Debt/Ebitda)	94	2.88	1.47
Leverage Change	94	4.23	3.29
Board Size	94	5.28	5
Sponsor director ratio	62	0.284	0.286
Capital (£mil)	94	457.0	112.7
Ebitda/Capital	94	0.231	0.218
Duration (fiscal years)	94	4.48	4

Table VII – Regressions for post-buyout performance

Six regressions are performed using a multivariate regression to explain post-buyout performance changes. Two samples are used: all firms with post-buyout data and another sample of 61 firms that have reached an outcome. The industry operating performance changes are used for the calculations. ROS is the return on sales and ROA is the return on assets. For both samples, first the ROS at the last year is used as dependent variable and then the changes in ROS and ROA are regressed. The significant explanatory variables are in bold. Below the signs, the p-values are shown. Capital is the Rank value obtained from SDC. Significance levels are based on a two-tailed T-test. ***, **, and * indicate significance level at 1%, 5%, and 10%, respectively.

	Full Sample			Subsample with outcome		
	ROS at last year	Change in adjusted ROS (-1, last)	Change in adjusted ROA (-1, last)	ROS at last year	Change in adjusted ROS (-1, last)	Change in adjusted ROA (-1, last)
ln (capital)	-0.0344	2.4367	12.2221	-0.0360	-0.5711	**-0.6028****
	(0.1748)	(0.4056)	(0.3564)	(0.2769)	(0.1407)	(0.0310)
Adjusted ROS/ROA at year -1	-0.1319	-7.9841	14.3944	-0.0734	**-11.2848****	**-6.3100***
	(0.5364)	(0.3925)	(0.7546)	(0.7557)	(0.0473)	(0.0851)
Industry ROS at last year	**0.6309****			0.5472		
	(0.0382)			(0.2096)		
Mgmnt equity/ total equity	-0.0618	4.7459	22.5465	-0.0813	-1.3378	-0.1070
	(0.4540)	(0.5349)	(0.4382)	(0.4478)	(0.2677)	(0.9322)
Pre-buyout leverage	**0.0109*****	0.3120	0.8640	**0.0123*****	0.1365	0.0248
	(0.0093)	(0.3103)	(0.4185)	(0.0012)	(0.1337)	(0.6238)
Leverage change	**0.0124****	**0.3714****	0.8085	**0.0160*****	**0.2969*****	**0.1713*****
	(0.0189)	(0.0129)	(0.2980)	(0.0001)	(0.0000)	(0.0009)
Mgmnt chg	0.1278	-2.6751	-0.4798	0.1867	0.0579	1.1418
	(0.3052)	(0.5088)	(0.9553)	(0.4562)	(0.9707)	(0.5589)
CEO=Chairman	0.0002	-6.5640	-25.6486	-0.0137	0.5001	0.7760
	(0.9975)	(0.3821)	(0.3480)	(0.8906)	(0.6291)	(0.3996)
Mgmnt chg* CEO=Chairman	-0.0787	3.3689	-2.0554	-0.1088	-0.2346	-0.5034
	(0.4981)	(0.5469)	(0.3690)	(0.6260)	(0.9223)	(0.8056)
ln (board size)	0.0521	-0.8455	-7.2444	0.0971	2.3117	0.6672
	(0.4517)	(0.8061)	(0.5727)	(0.4864)	(0.1547)	(0.6168)
Sponsor dir. Ratio	-0.1625	-15.5829	-64.4203	-0.2930	-0.6383	-1.9549
	(0.4239)	(0.3109)	(0.3276)	(0.3752)	(0.7513)	(0.5126)
Club PE	-0.0363	-5.3597	-18.6265	0.0059	-1.6216	0.2652
	(0.4829)	(0.2256)	(0.3556)	(0.9160)	(0.2001)	(0.6367)
Constant	0.0887	-2.6875	-16.8388	0.0411	-1.1631	1.5105
	(0.5388)	(0.6653)	(0.5505)	(0.8235)	(0.6791)	(0.3977)
Observations	94	94	94	61	61	61
Adjusted R-squared	0.1502	-0.0758	-0.0840	0.2119	0.4558	0.2895

VI. Conclusion

This thesis has investigated the value creation of leverage buyouts for the U.K.. Much research concerning public-to-private LBOs has focused on the U.S. and especially the 1980s decade, the first and most notorious wave of private equity activity. However, since the second half of the 1990s a second wave in the U.K. has appeared and it demands economic research. By following the paper of Guo et al. (2010), I have investigated the buyouts in the U.K. announced between 1990 and 2007. For a total of 148 firms buyout data has been collected in order to provide their descriptive statistics.

Leverage changes for about half of the value of capital to around 70.0%, which is consistent with the concept of a leveraged buyout. The premiums paid for the shares are higher for the earlier years in the sample. The financing instruments of the U.K. buyouts differ from the U.S. as very little use of public debt is made. Moreover, the equity part of the financing is divided into shares and loan notes. Furthermore, the exits types of the buyouts have been investigated. Exit via a secondary LBO or a sale to a strategic buyer is most common for firms with a known outcome.

In addition to the (pre-) buyout statistics, financial information between the buyout and exit date is gathered for 94 firms. Based on this information, returns to capital have been calculated. Similar to the U.S. findings, I find overall large, positive and significant returns to pre- and post-buyout capital (even after correcting for market and risk adjusted returns). The highest median adjusted return value is found for firms that have exited through a secondary LBO. Consistent with one's expectations, the market and risk adjusted returns for firms that have become distressed are all negative. Operating performance changes between the last pre-buyout and last investment year are also examined using four ratios to see if profitability and return on assets have improved during the buyout. Inconsistent with the high returns to capital, the median operating performance changes – even after correcting for the industry change – are overall negative for this period. The median industry adjusted changes for the group with an outcome is not statistically different from zero, though. Firms in the sample that are still private or have an unknown status show significant negative results. The year 2008 is addressed to these firms as final year; a plausible reason for these results could therefore be the economic downturn.

Finally, to see which factors could explain the changes in the operating performance ratios, six regressions have been performed. The distinction is made between the sample of all 94 firms with post-buyout data and a part of that sample with an outcome (61 firms). Overall, the leverage change between the pre-buyout and post-buyout financing structure has appeared as most significant in explaining changes in these ratios and the variable has a positive sign. This suggests that the disciplining effect of debt has been proven for the U.K. leveraged buyouts, at least for this subsample. In contrast to Guo et al. (2010), monitoring and governance proxies failed to prove the changes in the operating performance, which may be the reason why I find no improvements for the ratios. The regressions of the subsample with an outcome also show evidence on the fact pre-buyout

underperforming firms have a greater chance to show post-buyout operating performance improvements. Also, larger firms in the sample show a lower improvement in the return on assets ratio.

So did public-to-private buyouts in the U.K. between 1990 and 2007 create value? This thesis has provided evidence on value creation for debt and equity investors of the buyouts. At the same time, it has addressed the inconsistency between these high returns to capital and the lack of improvements in operating performance of the portfolio firms. More research can be performed on these U.K. leveraged transactions to see why the returns to capital are inconsistent with the findings on operating performance. As the paper of Guo et al. (2010) shows, tax benefits and industry multiples in the U.S. also affect these returns proportionally large, the U.K. data could also be tested on these matters. It also may be interesting to see what eventually happens to the firms in my sample that are still private. In a few years, these firms are probably exited and for most of them returns to capital and operating performance improvements can be measured without possible estimation errors.

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