Leveraged Recapitalizations in the Private Equity Setting

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ABSTRACT

This paper investigates the motives behind leveraged recapitalizations in the private equity setting and the circumstances when they are more likely to occur. Whereas previous empirical studies have been biased towards studying the motives for leveraged recapitalizations in the public setting, this thesis is mainly focused on studying the phenomena after a leveraged buyout has occurred i.e. in the private equity setting. I evaluate 5 hypothesis related to potential motives for leveraged recapitalizations and circumstances when they are more likely to occur. My results indicate a more pronounced usage of leveraged recapitalizations among larger private equity funds. Furthermore some evidence indicate that larger leveraged buyouts, measured as the debt packages associated with them, are more likely to be followed by a leveraged recapitalization. However these results largely disappear when an attempt is made for controlling for differences in time and origin of the LBO. No support is found for holding periods being longer when a leveraged recapitalization has occurred or for more favourable real interest rates being a rationale for a leveraged recapitalization. In addition no evidence is found for a more well regarded reputation of the private equity funds that perform leveraged buyouts with subsequent leveraged recapitalizations compared to the private equity funds that perform leveraged buyouts without subsequent leveraged recapitalizations.

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1. Introduction

In July 2007 the private equity (henceforth PE) community was preparing for yet another huge buyout. The Blackstone Group and Kohlberg Kravis Roberts were bidding against each other for control of Cadbury Schweppes' U.S. drinks business. The asset looked like it was going to result in a purchase price of $16 Bn, but the deal never made it to the finish line. Each time Blackstone and KKR went to Morgan Stanley, Cadbury's adviser, the bank increased the interest rate on the stapled debt package it was offering. By August, Cadbury Schweppes had postponed the sale indefinitely (Fugazy 2007). The terminated deal was however not a one off event, reduced ability to borrow due to tightness in the credit markets led to a substantial drop in new PE acquisitions, recently announced PE-led deals became smaller, with less leverage and less favourable terms for the debt provided (Bogoslaw 2008). The PE industry's dependency on worldwide finance markets was suddenly evident. Certain groups of optimists turned the credit crisis into a positive occurrence, noting that the drop in leverage levels ultimately brought down pricing on deals, creating a rationality that has not been seen in some time (Fugazy 2007). It is however clear that the crisis on debt markets has made it harder for PE firms to be able to sell acquired companies for any profit or to recapitalize their investments (Thornton 2008). Some PE firms that have been able to conduct a leveraged recapitalization (henceforth LR) under current debt market conditions have been praised for being able to generate funds for dividends and investments without having to sell companies. Research on the concept of LRs, has to some extent been conducted in the public environment. The LR is on public markets mainly known as a tool for defending a company against a hostile takeover. However, relatively little research has been conducted on the phenomenon of LRs in the PE setting. In light of this issue, my aim is to examine the motives behind LRs in the PE setting and clarify when they are more likely to occur.

This study therefore intends to investigate the rationales behind LRs in the PE industry and under which circumstances they are more likely to occur. Indeed, previous studies regarding LRs have almost exclusively concentrated on LRs in the public setting; see for example Denis and Denis (1993) who examine the impact of highly leveraged transactions on managerial discretion over investment policy. However, there does not seem to be any deeper investigation or empirical evidence on LRs in the PE setting. Hence, my study is somewhat exceptional due to its focus on LRs in the PE setting. The aim is to identify and use a suitable theoretical framework and decompose the rational ground behind LRs in the PE setting. Through this process I try to uncover some possible explanations for transactions of this type and as far as I am aware, the project is the first of its kind covering LRs in the PE setting, which makes it somewhat unique.

The starting point of my thesis is an already existing dataset on transaction-level data on financial structures from LPC/ Dealscan covering deals from 1986-2008. Monthly interest rates and

inflations by country and quarterly market leveraged loan spreads for the U.S. and Europe was added to the dataset. In addition Capital IQ was used for adding PE fund families to the dataset.

I find some evidence that LRs are more likely to occur if the fund performing the original leveraged buyout (henceforth LBO) is larger. Reasons for this might be that larger PE firms might be more prone to engage in deals that are not optimally leveraged at the LBO. In addition I discover some evidence for LRs being more likely to occur when the original LBO is larger (measured using the debt package associated with the deal). Potential reasons for this might be that it is easier to increase leverage for larger companies. These findings are however related since larger funds naturally perform larger transactions. However as an attempt to address this problem a regression analysis is performed towards the end of the thesis, which supports the positive correlation between fund size and the occurrence of an LR.

No support that the interest rates are lower at the time of the LR compared with at the time of the LBO/ latest LR is found. This might be due to the existence of other rationales for LRs than lower interest rates e.g. reduction of agency costs. Furthermore no evidence is found for LRs being associated with longer holding periods than for similar holding periods without an LR. Lastly I am unable to find evidence for a more well regarded reputation of PE funds that perform LBOs with subsequent LRs compared to the PE funds that perform LBOs without subsequent LRs.

1.1 Outline

The paper proceeds as follows: key concepts that facilitate the reading and understanding of this thesis are presented in section 2, a theoretical foundation is presented in section 3 and the hypotheses I formulate based on that foundation in section 4. The methods used, data and sample collection are outlined in section 5. In section 6, the results from the tests are described and analyzed. In section 7 a regression analysis is presented in order to try to determine the relative importance of my hypotheses in explaining the occurrence of an LR. Conclusions are then drawn in section 8, where suggestions for further research are also presented.

2. Key Concepts

2.1 The LBO

An LBO occurs when a company takes control of a target company's equity, be it public or private, using an extensive amount of debt. The debt typically consists of a combination of bank loans, loans from other financial institutions and bonds with below investment-grade credit ratings, so called high-yield bonds. Assets of the acquired company act as collateral for the debt and interest and principal obligations are met through the cash flows of the target company. Since the assets of the target often are used as collateral for the loans, it enables the acquirer to invest in a company without having the assets-in-place of a strategic buyer. Furthermore the LBO allows companies to make large acquisitions without having to commit a lot of capital. The equity injection to an LBO typically accounts for only approximately 25% of the acquisition funding (Axelson 2008). Due to the high leverage in the refinanced target company, not all companies are suitable for an LBO; typically they should have an existing strong balance sheet, low initial debt levels and adequate stable cash flows.

Most LBOs are sponsored by PE funds, which have a limited life and therefore a limited investment horizon, after which they have to exit their investments. The acquiring entity in an LBO typically enters into the transaction with an aim to improve corporate efficiency and a planned exit strategy for the end of the holding period, which typically lasts between 3-7 years (Stromberg 2008). During the holding period actions are taken to improve the operating characteristics of the business and the cash flows generated by the target are used to pay down debt and serve interest payments. After the holding period the acquirer disposes of the asset, preferably at a higher price than paid in entry, thereby generating a return for its investors. The figure below summarizes the buyout process from investment to disposal.

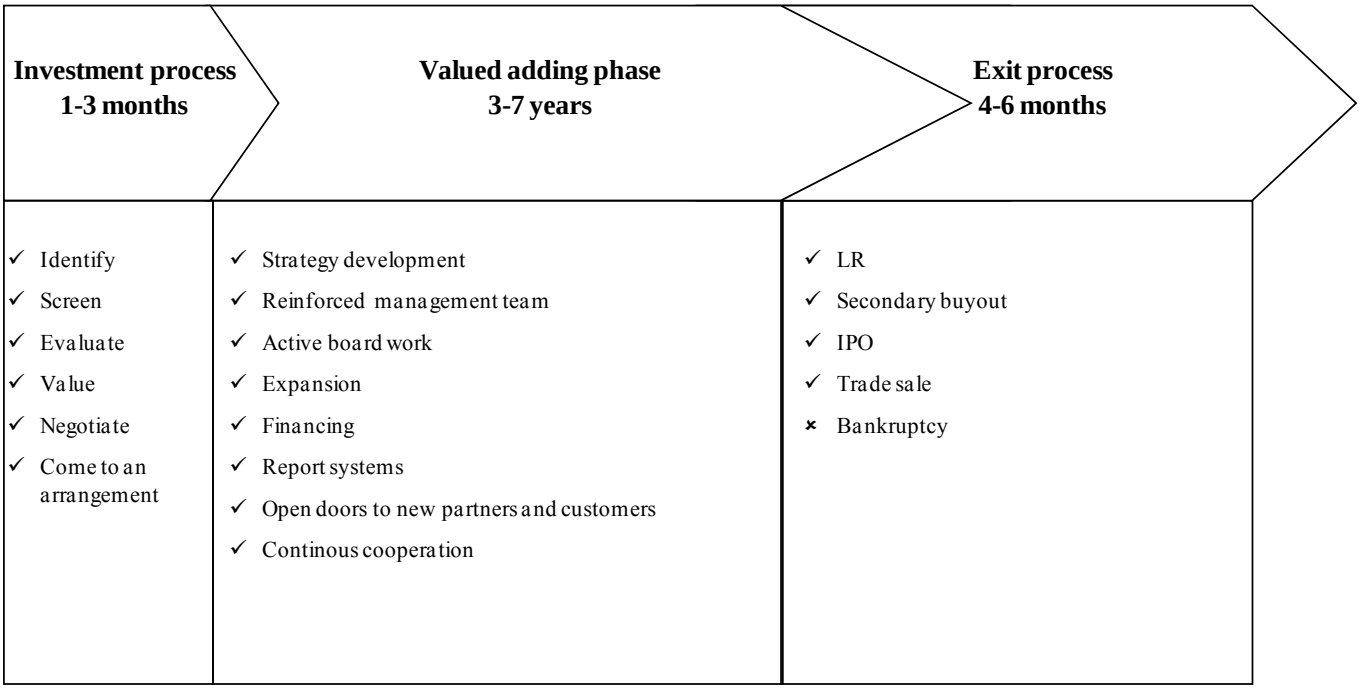

FIGURE 2.1.1: The Buyout Process (SVCA 2007)

3. Previous Research and Theoretical Framework

Due to the concentrated ownership in the PE setting the motives for an LR in the public setting are somewhat different than the potential motives for an LR in the PE setting. Therefore the theoretical framework used in this thesis is found elsewhere than in previous research regarding LRs in the public setting. However a short summary of previous research regarding LRs in the public setting can be found in the appendix of this thesis.

3.1 PE Exit Routes

Successful exit strategies of LBOs comprise a sale to an industrial player ("trade sale") or to another financial sponsor ("secondary buyout"), a flotation on the stock market in a public offering ("IPO") or an LR. The most common exit route, for PE and MBO deals alike are trade sales to another corporation. The second most common exit route is a secondary buyout, which has increased in importance over the last decade. The IPO as an exit route has decreased significantly in importance over time (Stromberg 2008). The end of an LBO is however not always a disposal of the asset. In the 1980s several prominent buyouts led to eventual bankruptcy of the acquired companies, interest payments were often so large that the company's operating cash flows were unable to meet the obligations, and the company had to file for bankruptcy.

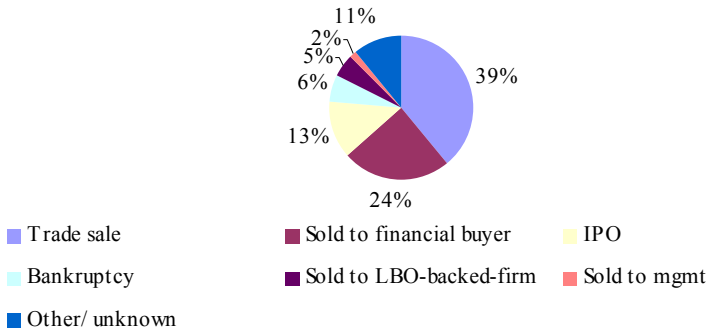

FIGURE 3.1.1: Exits of Individual LBO Transactions (1970-2007) (Stromberg, 2008)

In Sweden during 2007, exits took place with a total value of SEK102 Bn. The most common exit route was a disposal to another buyout group followed by an IPO. An LR was the fourth most common exit alternative (SVCA 2007).

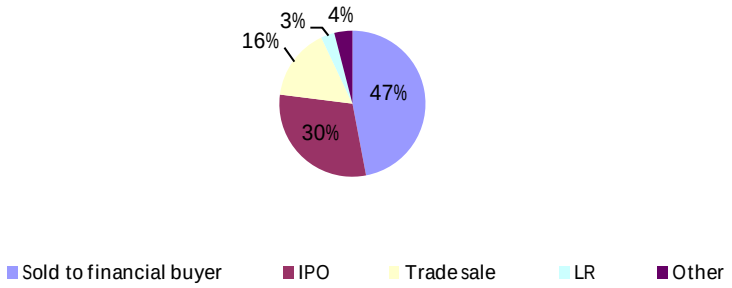

FIGURE 3.1.2: Exits of Buyout Transactions (Q1-Q4 2007) (SVCA 2007)

3.1.1 LR

An LR is an intermediate strategy whereby shareholders refinance the company to further increase its debt thereby releasing a portion of funds to equity holders, which is typically distributed via a dividend. The acquirer can recoup the investment in an LR, but the target remains unsold and in the hands of the same investor. Therefore the investor can be exposed to the asset for a longer period of time.

3.1.2 Secondary Buyout

The sale of the asset to another financial sponsor is probably quicker than both the IPO and the trade sale alternatives. In addition management often keeps independence after this exit alternative. A secondary buyout provides a potential for a full exit for shareholders but often there is a possibility to retain exposure to the asset via an ownership stake. The ultimate disposal price is however not affected positively by potential synergies. This exit alternative is also dependent on the state of debt markets and the competitiveness of the PE environment.

3.1.3 IPO

The fortunes of PE investors in the developed world have been largely linked to those of the market for initial public offerings (IPOs). Studies of the U.S. market suggest that the most profitable PE investments have, on average, been disproportionately exited by way of IPOs (Lerner 2003).

There are several potential benefits of exiting an LBO investment via an IPO. After the company has gone public, access to future financing ought to increase, since the IPO creates a liquid market for the firm's securities. Furthermore a public offering generally results in the highest valuation, and thus it is often the most preferred exit route. The IPO is also often favoured by management since it preserves the firm's independence (Fenn 1995). In addition there is a marketing benefit of the IPO since it increases the visibility of the financial sponsor as well as the company (Lerner 2001). An IPO also leads to information generation by public investors and analysts covering the stock. The IPO, unlike a private sale, usually doesn't end the partnership's involvement since it is often restricted from selling a portion of its shares in the offering (Fenn 1995). At the same time the IPO is expensive due to fees to underwriters and the fact that management needs to dedicate time to provide investors with sufficient information. The

information that is provided to the market might also be used by competitors in an unfavourable way. Even though the IPO often yields a high valuation price, it is dependent on the state of IPO markets which may change along the process of going public (Lerner 2001). Going from a concentrated private ownership to a dispersed public one might also create corporate governance costs. Long time underperformance of the stock could also hurt the reputation of the company and eventually the chance to get access to new capital.

3.1.4 Trade Sale

There are several potential benefits of exiting via a sale to a strategic acquirer. The potential for synergies might imply that the ultimate disposal price is higher. The trade sale process is often quicker compared to the IPO process. A trade sale is also attractive since it provides payment in cash or marketable securities and ends the partnerships involvement with the firm. For the company's management, in contrast, a trade sale is potentially unwelcome, to the extent that the company is merged with or acquired by a larger company and cannot remain independent (Fenn 1995).

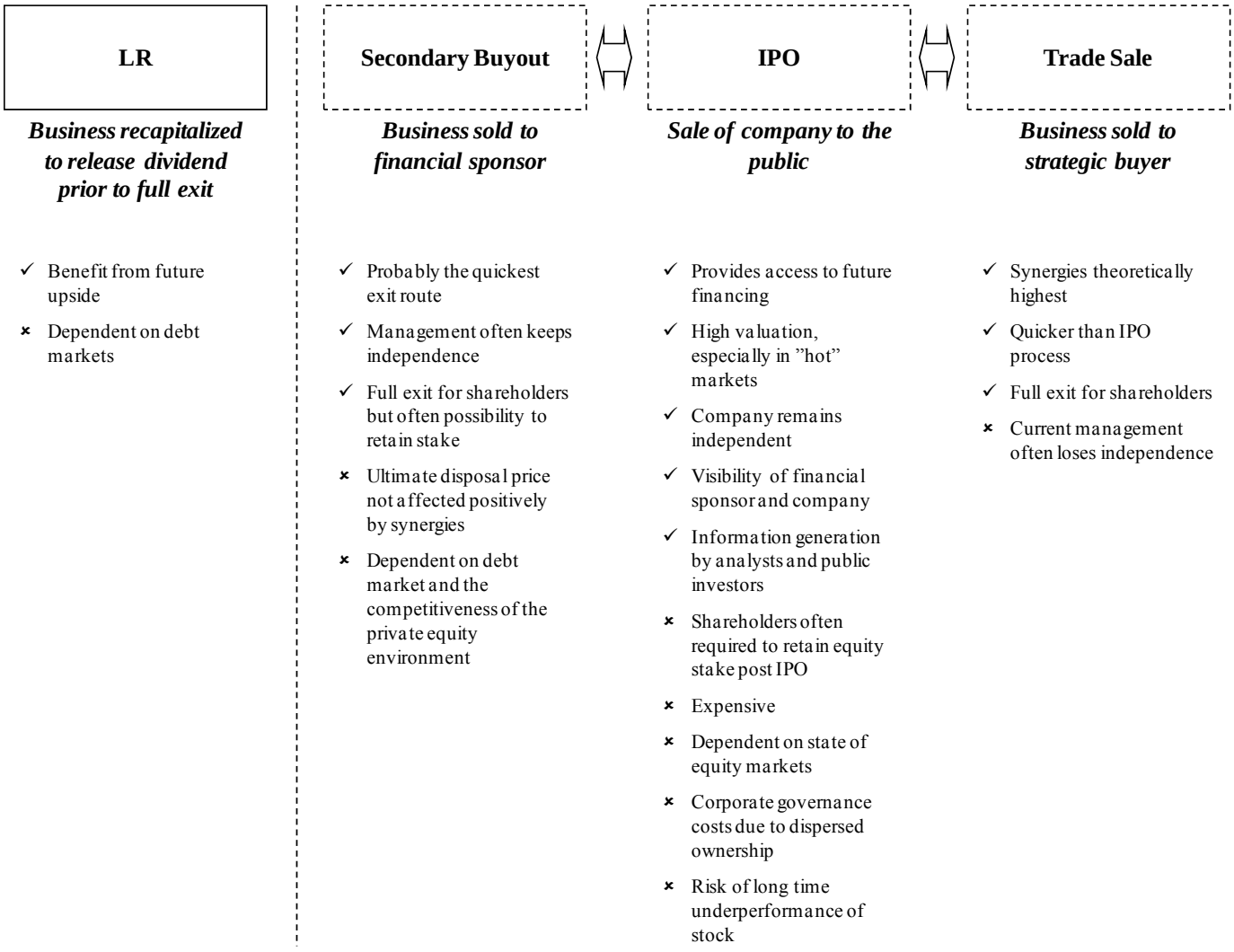

FIGURE 3.1.3: Exiting the LBO

3.2 Leverage and Favourable Market Conditions

Barry, Muscarella, Peavy, and Vetsuypens (1990), Lerner (1994), Gompers (1996), Brav and Gompers (2003), Black and Gilson (1998) and others have studied how PE funds exit their portfolio companies. A key finding from this literature is that PE funds act strategically in their exit decisions, especially with respect to current exit market conditions and their need to build reputations. Buyout activity is largely dependent on the liquidity of the market for corporate debt and it has been found that buyout funds accelerate their investment flows when credit market conditions loosen (Ljungqvist 2007). It has also been found that the possibilities of leveraging increase when market conditions are favourable, defined as low interest rates and high liquidity. In contrast, none of the firm-specific characteristics such as profitability, cash flow variability and growth opportunities are consistently related to LBO leverage levels. However, conditions in debt markets have a strong influence. In particular, the higher the real interest cost of leveraged loans, measured as the local real interest rate plus the market leveraged loan spread, the lower the leverage (Axelson 2008).

3.3 Access to Credit

The tradeoff theory of capital structure states that firms determine their leverage ratio by calculating tax advantages, costs of financial distress, mispricing and incentive effects of debt versus equity. Previous research has investigated whether firms for whom tax shields of debt are greater, costs of financial distress lower and the mispricing of debt relative to equity more favourable are more levered. When these firms discover that the net benefit of debt is positive, they ought to move toward their preferred capital structure by affecting their debt or equity. The implicit assumption behind this has been that a firm's leverage is a function of a firm's demand for debt i.e. the supply of capital is infinitely elastic at the correct price, and the cost of capital depends only on the risk of the firm's projects. The empirical literature has been successful, in the sense that many of the proposed proxies are correlated with firms' actual capital structure choices but some authors have argued that certain firms appear to be significantly under-levered e.g. Graham (2000). One interpretation of this is that firms have the opportunity to increase their leverage but choose to leave money on the table. An alternative and more probable explanation is that firms may not be able to issue additional debt. The same type of market frictions that make capital structure choices relevant (information asymmetry and investment distortions) also imply that firms sometimes are rationed by their lenders (Stiglitz and Weiss 1981). Thus, when estimating a firm's leverage, it is important to include not only the determinants of its preferred leverage but also the variables that measure the constraints on a firm's ability to increase its leverage (Faulkender 2006).

Firms that are riskier, smaller, and about whom less is known are those that are most likely to borrow from financial intermediaries (Cantillo and Wright 2000, Faulkender 2005, and Petersen and Rajan 1994). Larger firms, about which much is known, will be more likely to borrow from arm's length

capital markets. However, the monitoring that is done by financial intermediaries and the resources devoted to restructuring firms are costly. This cost must be passed back to the borrower. This implies that the cost of capital for firms in such an imperfect market depends not only on the risk of their projects but also on the resources needed to verify the viability of their projects. Although the institutional response (the development of financial intermediaries and lending relationships) can partially mitigate the market distortions, it is unlikely that these distortions are completely eliminated. If monitoring is costly and imperfect, then for two firms with identical projects, the one that needs to be monitored will find that the cost of debt capital is higher. The cost of monitoring will be passed on to the borrower in the form of higher interest rates, causing the firm to reduce its use of debt capital. If the monitoring and additional information collection performed by the financial intermediary can't completely eliminate the information asymmetry, then credit may be rationed. When small private firms have been investigated it has been found that they are credit constrained. Little public information is available about such firms, and given their size, the relative cost of collecting this information can be high (Faulkender 2006).

Characteristics of highly leveraged firms have been examined in the past. Firms that have more tangible, easily valued assets are expected to have lower costs of financial distress and therefore might be more levered (Pulvino 1998). Rajan and Zingales (1995) and Titman and Wessels (1988) used the ratio of the firm's property, plant, and equipment to assets as a measure of the firm's asset tangibility in order to examine this relationship. Investments in brand name and intellectual capital are more difficult to measure but advertising (scaled by sales) as a measure of the firm's intangible assets has been used by e.g. Graham (2000) and Mackie-Mason (1990), market-to-book ratio has been used by Hovakimian, Opler, and Titman (2001) and Rajan and Zingales (1995). Historically, leverage has also been found to be positively correlated with size (Graham, Lemmon, and Schallheim 1998 and Hovakimian, Opler, and Titman 2001). Larger firms are less risky and more diversified, and therefore the probability of distress and the expected costs of financial distress are lower. In addition it has been shown by e.g. Bradley, Jarrell, and Kim (1984), Fisher, Heinkel, and Zechner (1989), Graham (1996, 2000), Graham, Lemmon, and Schallheim (1998), and Scholes, Wilson, and Wolfson (1990) that firms with higher marginal tax rates before the deduction of interest expenditures have higher interest tax shields and thus have more leverage. Furthermore firms with more volatile assets will have higher probabilities and expected costs of distress (Cantillo and Wright 2000). These firms are expected to choose lower leverage ratios and are also more likely to go to banks to obtain financing (Faulkender 2006).

3.4 The Institutional Structure of PE Funds

PE funds are typically organized as limited partnerships, which have a limited life, on average twelve years, after which the capital of the fund is distributed to the partners. The managers of the PE funds are the general partners (GPs are typically skilled professionals), while the investors in the fund are the

limited partners (LPs are typically pension funds, insurance funds and high net worth individuals) in the partnership. Once a fund is raised, the LPs have committed to a certain amount of investment. The GPs draw down the funds and invest them in the different portfolio companies over the first 3 to 5 years of the fund's life. During the remaining life of the fund, investments in the portfolio companies are managed and eventually exited. The GP is compensated by an annual management fee (usually 1.5 to 2.5% of committed capital) and a fraction of the profits in the fund called "carry" (usually 20%) (Stromberg 2004).

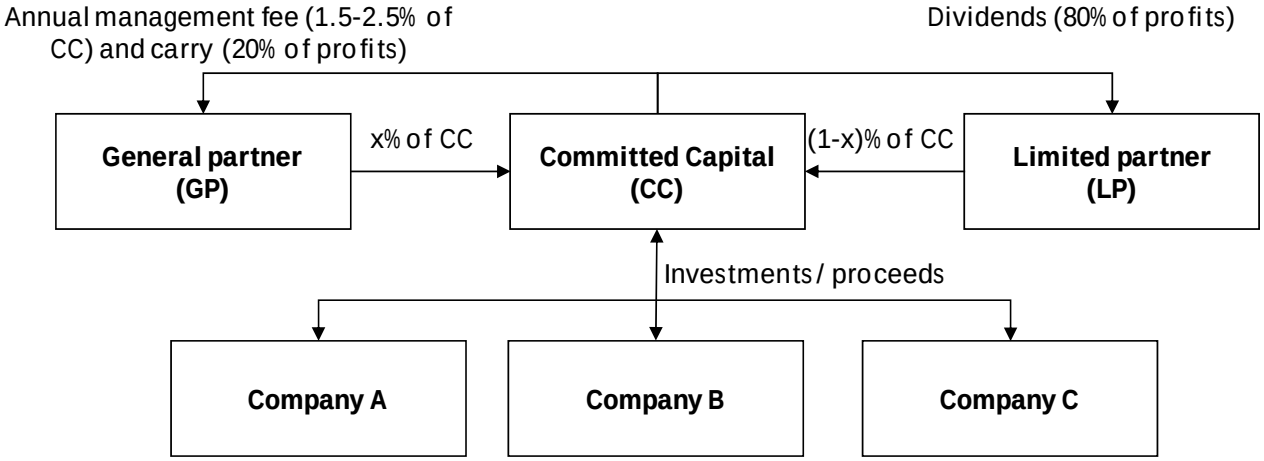

FIGURE 3.4.1: Illustrative Structure of PE Funds

4. Hypotheses

Based on existing theories outlined in section three I have formulated five hypotheses about potential rationales for LRs in the PE setting and when they are more likely to occur, which I aim to investigate further. Certainly, my hypotheses do not capture all reasons for LRs in the PE setting and other rationales might have an impact in the decision process. However, I have chosen those hypotheses I believe are of greatest importance. A short description of my hypotheses is outlined in this section.

4.1 The LR as an Intermediate Exit Strategy that Enables Exposure to a Future Potential Upside

Value creation possibilities and exit opportunities naturally emerge and disappear after an LBO has taken place. If there are few full exit opportunities and value creation possibilities still exist after several years of ownership, an exit of the investment might neither be feasible nor the number one alternative for a PE fund. An LR might then be a way for the PE fund to continue to be exposed to the asset while at the same time satisfying investors with a dividend. A possible explanation for an LR might therefore be that it is a tool for prolonging the holding period of an investment in order to benefit from a potential future upside. Consequently I therefore expect that the holding period of investments including an LR is longer than those of similar investments without an LR.

Hypothesis 1: *Holding periods for PE investments including an LR is longer than those of similar investments without an LR*

4.2 LRs and more Favourable Market Conditions than at the Time of the LBO

As described in section 3 previous research has found that PE funds act strategically, that the possibilities of leveraging increase when market conditions are favourable and that conditions in debt markets, measured as the local real interest rate plus the market leveraged loan spread, have a strong influence on leverage levels. However firm-specific characteristics are not consistently related to LBO leverage levels. If debt market conditions have improved since the time of the LBO, the possibilities of leveraging have increased, and the PE firm might gain from increasing leverage and benefit from the better terms offered on debt markets. One possible explanation for why an LR takes place could therefore be that conditions in debt markets have improved since the time of the LBO. Consequently I expect that a high proportion of the LRs occur when debt market conditions are more favourable than at the time of the LBO.

Hypothesis 2: *LRs take place because debt market conditions have improved since the time of the LBO*

4.3 The LR and Size of the Initial LBO

Discussions of optimal capital structure often implicitly assume that debt is readily available. However research has shown that deviations from optimal leverage exist and two reasons have been identified as explanations. Firstly companies might leave money on the table, but more likely debt might be rationed and not always available. It has been shown that e.g. size, a higher proportion of tangible assets, a higher marginal tax rate and less volatile assets are associated with higher leverage. Therefore firms with certain characteristics e.g. larger companies might have a higher probability of succeeding in raising debt for an LR. With the aim of investigating this I decided to evaluate the sizes of the debt packages associated with LBOs of target companies that subsequently performed an LR and comparing it to the debt packages associated with LBOs without a subsequent LR, expecting to observe that the former debt packages are larger, the reason being that size ought to increase the probability of an increased leverage.

Hypothesis 3: *The size of the debt packages associated with LBOs with subsequent LRs is larger than that of similar transactions without subsequent LRs*

4.4 The LR and Size of the Relevant Financial Sponsor Fund

Mega PE funds face pressures of scale, because it can get pretty embarrassing sitting on large commitments, getting paid management fees and not putting money to work. It takes incomprehensible amounts of discipline to let ok deals (from a risk/return perspective) go by in order to wait for the truly great deals with solid margins of safety to present themselves. Due to this reason larger funds might be more likely to engage in LBOs that are not originally optimally leveraged. These originally sub optimal leveraged deals are in turn more likely to need an LR going forward. Therefore larger funds might have a more pronounced usage of LRs. With the aim of investigating this I decided to evaluate the sizes of the funds performing an LR and comparing it to the size of the funds performing an LBO without a subsequent LR, expecting to observe that the former funds are larger.

Hypothesis 4: *The size of the funds performing an LR after an LBO is larger than the size of the funds performing an LBO without a subsequent LR*

In addition the funds' associated reputation and power might be valuable in the negotiations with the lenders which might affect the probability of an LR in a positive way. With the aim of investigating this I decided to evaluate the reputation of the funds performing an LR and comparing it to the reputation of the funds performing an LBO without a subsequent LR, expecting to observe that the former funds have a more well regarded reputation.

Hypothesis 5: *The reputation of the funds performing an LR after an LBO is more well regarded than the reputation of the funds performing an LBO without a subsequent LR*

4.5 Summary of Hypotheses

The table below summarizes my stated hypotheses which I will investigate further. I derived my hypotheses through my stated theoretical framework and base them on economic theory.

Hypotheses	**Main variables used for testing**	**Expected results**
H1: Holding periods for PE investments including an LR is longer than those of similar investments without an LR	Holding periods for PE investments with a subsequent LR (A), holding periods for PE investments without a subsequent LR (B)	(A-B)>0
H2: LRs take place because debt market conditions have improved since the time of the LBO	Real interest rate at the time of the LR (C) , real interest rate at the time of the LBO (D)	(C-D)<0
H3: The size of the debt packages associated with LBOs with subsequent LRs is larger than that of similar transactions without subsequent LRs	Size of the debt packages associated with LBOs with subsequent LRs (E), size of the debt packages associated with LBOs without subsequent LRs (F)	(E-F)>0
Hypothesis 4: The size of the funds performing an LR after an LBO is larger than the size of the funds performing an LBO without a subsequent LR	Size of the funds performing LBOs with subsequent LRs (G), size of the funds performing LBOs without subsequent LRs (H)	(G-H)>0
Hypothesis 5: The reputation of the funds performing an LR after an LBO is more well regarded than the reputation of the funds performing an LBO without a subsequent LR	Time (for funds performing LBOs with subsequent LRs) since the first fund of the financial sponsor was raised (I), time (for funds performing LBOs without subsequent LRs) since the first fund of the financial sponsor was raised (J)	(I-J)>0

Table 4.5.1: Hypotheses summary

5. Methodology and Data Description

In this section I go through my method of analysis, data collection process and present descriptive statistics of my dataset.

5.1 Methodology

In order to evaluate my hypotheses I have performed a quantitative study. A more detailed description of the unique method used for each hypothesis will be presented in section six.

5.2 Collection of Data

The starting point of my thesis was an already existing dataset on transaction-level data on syndicated financial structures from LPC/ Dealscan. This dataset was updated with monthly interest rates and inflations by country for the period 1988-2008 from OECD. Furthermore quarterly market leveraged loan spreads for the U.S. and Europe for the period 1997-2006 from S&P LCD was added to the dataset. I proceeded with using Capital IQ in order to add 83 PE fund families to the dataset.

5.3 Descriptive statistics of the data set

5.3.1 Existing dataset

The existing dataset on deal-level data on financial structures consists of 3,836 transactions from 91 funds. The dataset only includes deals with syndicated loans which probably are larger than loans that are not syndicated. Therefore my original dataset might be somewhat biased towards larger deals. Out of the transactions, 1,760 are LBOs and 504 are LRs.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
SizeofLBO ($ MM)	1740	9,4	35750,0	633,331	1661,4837
SizeofRecap ($ MM)	502	6,0	10305,4	562,406	869,6222
Valid N (listwise)	494				

Table 5.3.1.1: Transaction descriptives

The number of target company countries of the LBOs amounts to 36 whereas the similar figure for LRs is 19. As can be seen from the graph below most LRs in the dataset occur in the U.S., Germany, the U.K., France, Netherlands, Spain, Italy and Sweden. Most LBOs occur in the same countries but with a somewhat different order.

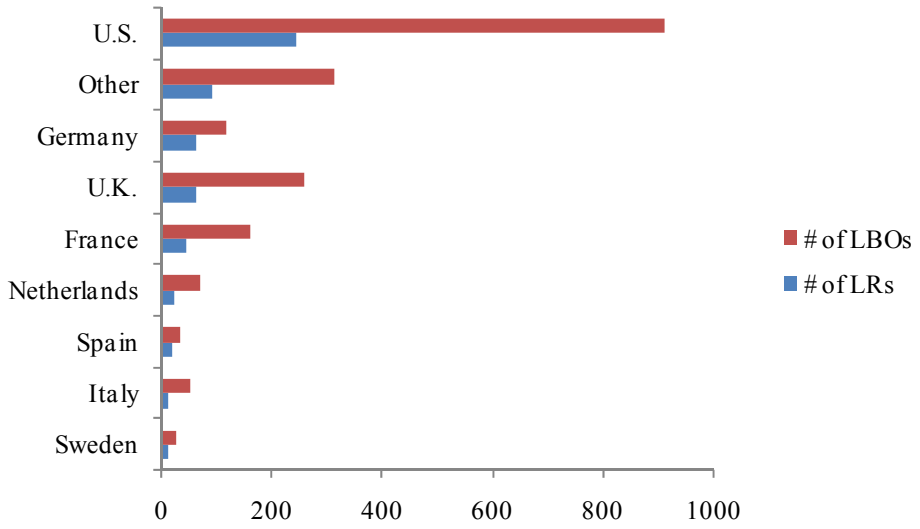

Figure 5.3.1.1: LBOs and LRs by country

Looking at primary SIC codes the LBOs occur in 469 different industries whereas the LRs occur in 238. Furthermore both the number of and amount of LRs and LBOs have varied substantially during past years and become more frequent in later years, which can be seen from the two graphs below.

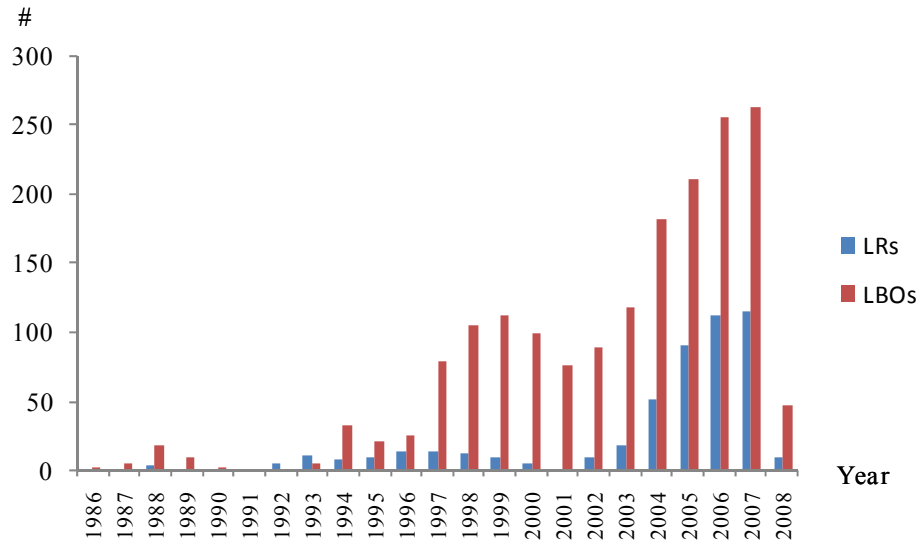

Figure 5.3.1.2: LBOs and LRs by time and number of transactions

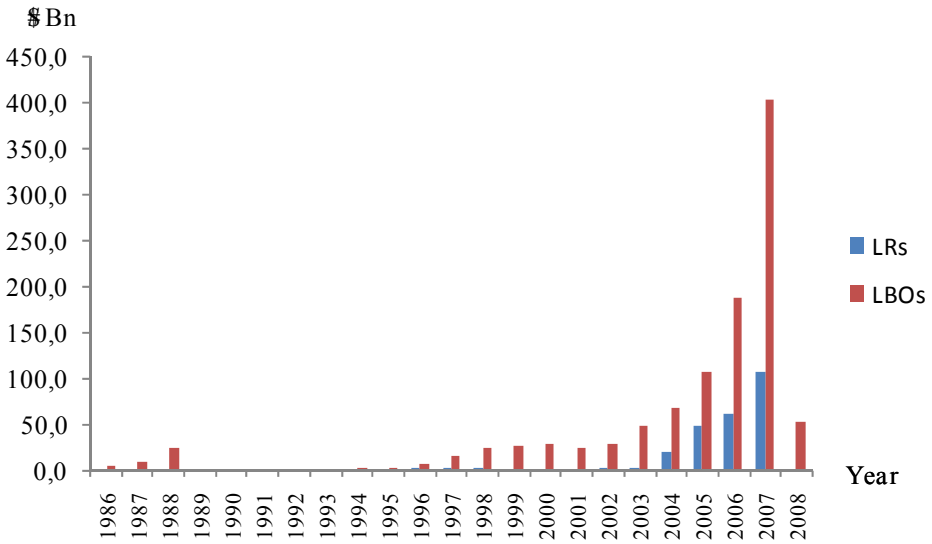

Figure 5.3.1.3: LBOs and LRs by time and $ amount of transactions

The existing dataset contains 268 LRs with an LBO associated to it. The average time from LBO to the undertaking of an LR is approximately 2.4 years which can be seen from the table below.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Holding Period	266	,137	9,082	2,43857	1,794073
Valid N (listwise)	266				

Table 5.3.1.2: Holding periods from the time of the LBO to the LR

5.3.2 Interest rates and inflations

Interest rates have decreased substantially since the beginning of the 90s for all countries collected from OECD, which can be seen from the graph below.

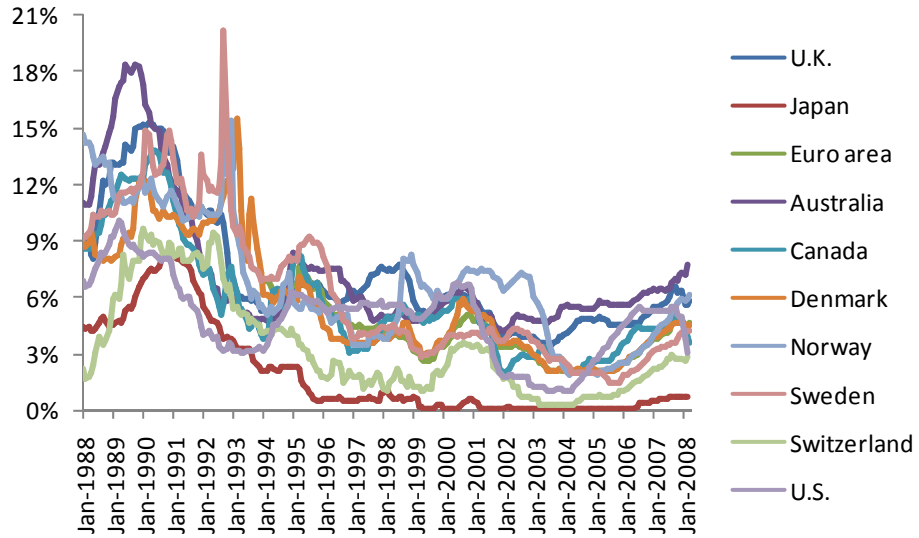

Figure 5.3.2.1: Interest rates by country (Jan 1988-Mar 2008)[1]

From the graph below it is clear that CPIs have increased for almost all countries collected from OECD.

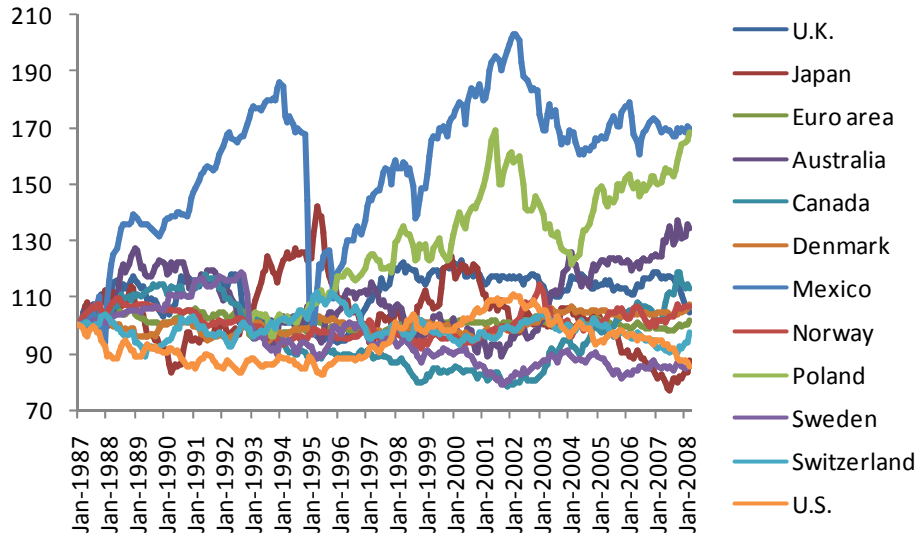

Figure 5.3.2.2: CPI by country (Jan 1988-Mar 2008) rebased to 100 in Jan-1987

5.3.3 Market leveraged loan spreads

The graph below depicts the spread for leveraged loans on the U.S. and European market. Spreads on the U.S. market has been somewhat higher and more volatile.

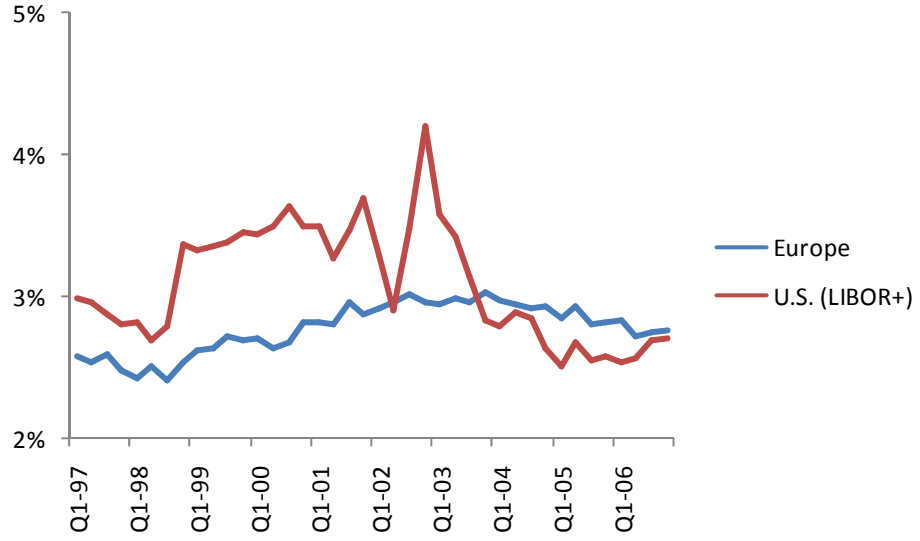

Figure 5.3.3.1: Market leveraged loan spreads for Europe and the U.S.

[1] The graph excludes Poland and Mexico due to extreme values that distorts the chart

5.3.3 PE fund families

The existing dataset is extended to include fund families for 83 PE houses amounting to a total of 628 funds. Consequently the average number of funds for each PE house amounts to approximately 7.57. The PE house with the oldest fund is TA Associates that raised a fund in 1969 and the PE house with the most recent fund is American Capital Strategies that raised their first fund in 2006. The largest fund was raised by Blackstone in May 2005 and the smallest by Gresham Private Equity Partners in November 1984. The average fund size in the total sample amounts to approximately $1,475 MM.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Fund Size	628	2	21700	1474,65	2698,437
Valid N (listwise)	628				

Table 5.3.3.1: PE funds descriptives

6. Results and Analysis

In this section I present the results from my quantitative study. For each hypothesis I firstly present the method used as well as the test results. Each hypotheses use data from my extended dataset but since I use different approaches for every hypotheses they all have unique samples with different number of transactions which is depicted in table 6.1.

	H1	H2	H3	H4	H5
# of LRs	0	172-263	232-305	223-295	232-305
# of LBOs	152	149-221	675-987	636-940	657-968

Table 6.1: Hypotheses descriptives

A more detailed description of the different methods and sub samples is presented under each relevant section below.

6.1 Hypotheses 1: Holding periods for PE investments including an LR is longer than those of similar investments without an LR

6.1.1 Quantitative tests: methodology

In order to evaluate whether an LR prolongs the holding period of a PE investment I first limited my dataset to include only those LBO transactions that are followed by another LBO transaction, a so called secondary buyout. Thereby this particular sub-sample contained 76 "acquisitions" and 76 "disposals" of assets i.e. 152 LBOs. Furthermore this sub-sample can be said to consist of 76 pairs of transactions, whereof 27 included at least one LR between acquisition and disposal. Thereafter a Mann-Whitney U-test is used to investigate whether the holding periods are longer when an LR has occurred. This test assumes that apart from any possible differences in central location, the two population distributions are equal, which seemed reasonable after depicting the variable distributions using histograms (Newbold 2007). Mean holding periods for LBO-transactions with a financial sponsor have previously been estimated to approximately 50 months or 4,17 years (Stromberg 2008).

H_0 : mean(Holdingperiod with an LR) = mean(Holdingperiod without an LR)
H_1 : mean(Holdingperiod with an LR) ≠ mean(Holdingperiod without an LR)
$\alpha = 10\%$

6.1.2 Quantitative tests: results

As can be seen from the table below the mean holding period between the pairs with an LR between acquisition and disposal is approximately 3,69 years and the equivalent number for transactions without an LR in between them is approximately 3,67 years. The average holding period when LRs have occurred

therefore appears to be slightly higher than for holding periods without LRs. This implies that LRs tend to increase the holding period which is in line with my original hypotheses. However, even though the results indicate what I originally expected the test is insignificant and I can't reject the null hypotheses of equal holding periods. A problem with my test is that the sample is relatively small and only includes secondary buyouts as exits. LBOs that have been exited via an IPO or trade sale have been excluded from my dataset since it is not observable how and when they have been exited. A larger sample with all possible exits might have reinforced the tendency of holding periods when LRs have occurred being longer than equivalent holding periods excluding LRs. When comparing the mean holding period with an LR between acquisition and disposal with previous studies of holding periods the holding periods with LRs don't strike you as substantially longer.

Mean holding period (years) with LR between acquisition and disposal (1)	Mean holding period (years) without LR between acquisition and disposal (2)	Mean 1-2	Z	Sig
3,691121	3,674084	0,170368	-0,385	0,700

Table 6.1.2.1: Hypotheses 1, quantitative test results

6.2 Hypotheses 2: LRs take place because debt market conditions have improved since the time of the LBO

6.2.1 Quantitative tests: method

In order to evaluate whether LRs take place because debt market conditions have improved since the time of the LBO, I first matched all LBOs in my dataset with their associated LRs. LBOs with no subsequent LR are excluded from this particular sub sample. LBOs and LRs of the same target company that occur at the same date are excluded. If several LRs occur at the same date for the same target all except one LR are excluded from the sample. Thereafter real interest rates are calculated for the time period of my complete dataset. The real interest is defined according to the following equation:

$$\text{Real Interest Rate}_{\text{Country,t}} = \text{Interest Rate}_{\text{Country,t}} - \text{Expected Inflation}_{\text{Country,t}} + \text{Market Leveraged Loan Spread}_{\text{Country,t}}$$

The expected inflation is estimated as the 12 months lagged inflation.

Ideally my data would include data on each variable for each point in time in order to calculate the correct real interest rates. However all my interest and inflation data is on a monthly basis and my market leveraged loan spread data is on a quarterly basis. I proceeded by matching the nearest values to each other. In addition my data lacks interest rates and inflations for several countries in my data sample. I therefore assumed that the prevailing interest rate in Europe (U.S.) is a good approximation for countries belonging to this continent (all other countries) but where interest and inflation data is not available. Furthermore the market leveraged loan spread is only available for the U.S. and Europe. I therefore

assume that the prevailing market leveraged loan spread in Europe (U.S.) is a good approximation for countries belonging to this continent (all other countries).

Each LBO and LR is then matched with the relevant real-interest rate. The relevant real-interest rate is dependent on the date of the transaction and the currency of the loan. As an example an LBO on the first of January 2006 denoted in £ is matched with the nearest prevailing real interest rate at the time in the U.K. The Wilcoxon signed rank test is used in order to test that the central locations of the two distributions are the same. This test assumes that the population distribution of the paired differences is symmetric, which appears appropriate when checking the distribution via a histogram (Newbold 2007). LBOs with several subsequent LRs exist in my dataset. These are treated as several LBOs and several LRs. As an example the real interest rate at the time of the second LR is compared to the real interest rate at the time of the first LR.

H_0 : mean(real interest rate at transaction1) = mean(real interest rate at LR)
H_1 : mean(real interest rate at transaction1) ≠ mean(real interest rate at LR)
$\alpha = 10\%$

6.2.2 Quantitative tests: results

As can be seen from the table below the mean real interest rate at the time of the first transaction (LBO or LR) was approximately 6.5% and the similar interest rate was approximately 6.9% at the time of the LR. The mean difference was approximately -0.5% i.e. the real interest rate at the time of the LR was approximately 0.5% higher than at the first transaction (original LBO or subsequent LR). These results indicate the opposite of my hypotheses. Therefore I can't reject the null hypotheses and the test gives no support to my hypotheses that LRs take place because debt market conditions have improved since the time of the LBO.

Mean real interest rate transaction 1 (1)	Mean real interest rate LR (2)	Mean 1-2	Z	Sig
0.06478821	0.06929583	-0.00451	-1,15	0,75

Table 6.2.2.1: Hypotheses 2, quantitative test results

Since there was only limited data available on the market leveraged loan spreads I conducted a second test excluding the spreads in order to extend my dataset. However as can be seen from the table below the test gave no support for my original hypotheses.

Mean real interest rate transaction 1 excl. spread (1)	Mean real interest rate LR excl. spread (2)	Mean 1-2	T-stat	Sig
0,03574313	0,04320362	-0,007460	-2,499	0,725

Table 6.2.2.2: Hypotheses 1, quantitative test results (extended sample)

The insignificance of my test is an indication that there are more rationales for LRs than lower interest rates. Another potential reason for performing an LR might for example be to increase leverage in order to decrease agency costs. Unfortunately other potential reasons for why PE houses perform LRs are not readily available in my dataset and since my quantitative tests don't allow for controlling these other potential variables I am not able to find support for my hypotheses.

6.3 Hypotheses 3: The size of the debt packages associated with LBOs with subsequent LRs is larger than that of similar transactions without subsequent LRs

6.3.1 Quantitative tests: methodology

When I examined this hypothesis I first identified all LBOs that were not followed by an LR and all LBOs that were followed by an LR. Thereafter I identified the debt package associated with each LBO. I proceeded with comparing the debt packages used at the time of the LBOs followed by an LR with the debt packages used at the LBOs not followed by an LR, via Mann-Whitney's U-test. The Mann-Whitney U-test is used in order to test that the central locations of the two distributions are the same. This test assumes that apart from any possible differences in central location the two population distributions are identical, which appears appropriate when checking the distributions via a histogram (Newbold 2007). However LBOs occurring at the end of my original dataset's period have less time to perform an LR. In order to take this into account I created 3 different sub samples where I eliminated all LBOs with less than 1/2/3 years of time to perform an LR.

6.3.2 Quantitative tests: results

As can be seen from the table below the mean debt package size at the time of the LBOs followed by an LR is approximately $461-669 MM. This amount is substantially larger than the mean debt package size at the time of the LBOs without a subsequent LR which varies between $322-443 MM. The means vary since I excluded all LBOs if they occur 1/2/3 years before the end of my dataset. A larger debt package size for LBOs with subsequent LRs than for LBOs without subsequent LRs is significant on a 10% significance level for all of my 3 tests and all mean differences have the expected sign. Therefore I find support for my hypothesis and reject the null hypotheses in favour of the alternative hypotheses which support my original hypothesis that the size of the debt packages associated with LBOs with subsequent LRs is larger than those of similar transactions without subsequent LRs. However my results need to be interpreted with caution due to complicating factors. Some of the targets of LBOs in my dataset without subsequent LRs might have been disposed of shortly after the first LBO. Therefore some LBOs without subsequent LRs in my dataset might have had too little time to perform an LR and should have been

excluded from my dataset. However this information isn't readily available in my dataset which is the reason for why I haven't controlled for these factors.

Sub sample	# of LBOs	# of LRs	Mean debt package size ($ MM) at the time of the LBO (with a subsequent LR) (1)	Mean debt package size ($ MM) at the time of the LBO (without a subsequent LR) (2)	Mean 1-2	Z	Sig
1	987	305	669	443	226	-7,493	0,000
2	810	287	648	336	312	-8,075	0,000
3	675	232	461	322	139	-6,041	0,000

Table 6.3.2.1: Hypotheses 3, quantitative test results

When I construct two new datasets with only European and U.S. deals respectively the results are still valid. In an attempt to check if my results are still valid if one controls for both time and origin I identify two new sub samples. I first divide the dataset into two, by separating European and U.S. deals from one another. A more careful division is not done in order to get sufficiently large data samples. I then proceed by allocating the deals to the specific year of the LBO and then I compute averages for each year. Thereby I obtain yearly debt package matched pairs for LBOs without subsequent LRs and for LBOs with subsequent LRs. I proceed with using Wilcoxon signed rank to test if the central locations of the two distributions are the same. As can be seen from the tables below my previous results largely disappear when controlling for time and origin and a difference is no longer significant. However controlling for these factors are difficult due to the limited samples one ends up with which in turn provides somewhat unreliable tests.

Sub sample	Mean debt package size ($ MM) at the time of the LBO (followed by an LR) > mean debt package size ($ MM) at the time of the LBO (not followed by an LR)	Mean debt package size ($ MM) at the time of the LBO (followed by an LR) < mean debt package size ($ MM) at the time of the LBO (not followed by an LR)	Z	Sig
1	4	5	-0,889	0,374
2	4	5	-0,889	0,374
3	5	3	-0,420	0,674

Table 6.3.2.1: Hypotheses 3, quantitative test results matched pairs Europe

Sub sample	Mean debt package size ($ MM) at the time of the LBO (followed by an LR) > mean debt package size ($ MM) at the time of the LBO (not followed by an LR)	Mean debt package size ($ MM) at the time of the LBO (followed by an LR) < mean debt package size ($ MM) at the time of the LBO (not followed by an LR)	Z	Sig
1	5	4	-0,059	0,963
2	4	5	-0,770	0,441
3	3	5	-1,680	0,093

Table 6.3.2.2: Hypotheses 3, quantitative test results matched pairs U.S

6.4 Hypotheses 4: The size of the funds performing an LR after an LBO is larger than the size of the funds performing an LBO without a subsequent LR

6.4.1 Quantitative tests: methodology

When I examined this hypothesis I first identified all LBOs that were not followed by an LR and all LBOs that were followed by an LR. Thereafter I matched each transaction with the associated PE house and the associated fund. In order to identify the fund that was used for the particular transaction I assumed that the latest fund raised was the one actually used. In a few cases the fund used is disclosed whereby I used that fund even though it was not the latest fund to have been raised. In cases were the latest fund raised was intended for e.g. Germany but the transaction occurred in Sweden, i.e. it was obvious that the latest fund raised couldn't have been used for the transaction, I assigned a more appropriate fund for the particular transaction. It should be noted however that identifying the fund that was used for the particular transaction is not straight forward and surely my assumptions aren't appropriate in all cases.
Thereafter I compared the fund sizes used for LBOs with subsequent LRs with the fund sizes for LBOs without subsequent LRs, via Mann-Whitney's U-test. The Mann-Whitney U-test is used in order to test that the central locations of the two distributions are the same. This test assumes that apart from any possible differences in central location the two population distributions are identical, which appears appropriate when checking the distributions via a histogram (Newbold 2007). However LBOs occurring at the end of my original dataset's period have less time to perform an LR. In order to take this into account I once again created 3 different sub samples where I eliminated all LBOs with less than 1/2/3 years of time to perform an LR.

H_0 : mean fund size at the time of the LBO(not followed by an LR) =
mean fund size at the time of the LBO(followed by an LR)
H_1 : mean fund size at the time of the LBO(not followed by an LR) ≠
mean fund size at the time of the LBO(followed by an LR)
$\alpha = 10\%$

6.4.2 Quantitative tests: results

As can be seen from the table below the mean fund size for LBOs with a subsequent LR is approximately $2,600-3,472 MM. This amount is substantially larger than the mean fund size for LBOs without a subsequent LR which varies between $2,183-3,028 MM. The means vary since I exclude all LBOs that occur 1/2/3 years before the end of my dataset. A larger fund size for LBOs with subsequent LRs than for LBOs without subsequent LRs is significant on a 10% significance level for all of my 3 tests and all mean differences have the expected sign. I therefore find support for my hypotheses and reject the null hypotheses in favour of the alternative hypotheses which support my original hypothesis that the size of the funds performing an LR after an LBO is larger than the size of the funds performing an LBO without a

subsequent LR. However my results need to be interpreted with caution due to several complicating factors. First of all assigning the correct fund from a PE house to a certain investment is as mentioned above not straight forward. In addition some of the targets of LBOs in my dataset with no subsequent LR might have been disposed of shortly after the first LBO. Therefore some LBOs with no subsequent LR in my dataset might have had too little time to perform an LR and should have been excluded from my dataset. However this information isn't readily available in my dataset which is the reason for why I haven't controlled for these factors.

Sub sample	# of LBOs	# of LRs	Mean fund size ($ MM) at the time of the LBO (followed by an LR) (1)	Mean fund size ($ MM) at the time of the LBO (not followed by an LR) (2)	Mean 1-2	Z	Sig
1	940	295	3472	3028	444	-3,966	0,000
2	765	278	3221	2437	784	-4,735	0,000
3	636	223	2600	2183	417	-3,691	0,000

Table 6.4.2.1: Hypotheses 4, quantitative test results

When I construct two new datasets with only European and U.S. deals the results are still valid. Once again I proceed with trying to check if my results are still valid if one controls for both time and origin. Two new sub-samples are created in the same fashion as in the previous hypotheses in order to obtain yearly fund size matched pairs for LBOs that were not followed by LRs and for LBOs that were followed by LRs. As can be seen from the tables below my previous results largely still exist when looking at Europe but are reversed for the U.S. Once again it should be noted however that controlling for these factors is difficult due to the limited samples one ends up with witch in turn provides somewhat unreliable tests.

Sub sample	Mean fund size ($ MM) at the time of the LBO (followed by an LR) > mean fund size ($ MM) at the time of the LBO (not followed by an LR)	Mean fund size ($ MM) at the time of the LBO (followed by an LR) > mean fund size ($ MM) at the time of the LBO (not followed by an LR)	Z	Sig
1	7	2	-2,073	0,038
2	7	2	-2,073	0,038
3	6	2	-1,82	0,069

Table 6.4.2.2: Hypotheses 4, quantitative test results matched pairs Europe

Sub sample	Mean fund size ($ MM) at the time of the LBO (followed by an LR) > mean fund size ($ MM) at the time of the LBO (not followed by an LR)	Mean fund size ($ MM) at the time of the LBO (followed by an LR) > mean fund size ($ MM) at the time of the LBO (not followed by an LR)	Z	Sig
1	1	8	-1,599	0,11
2	1	8	-1,599	0,11
3	0	8	-2,521	0,012

Table 6.4.2.3: Hypotheses 4, quantitative test results matched pairs U.S.

6.5 Hypotheses 5: The reputation of the funds performing an LR after an LBO is more well regarded than the reputation of the funds performing an LBO without a subsequent LR

6.5.1 Quantitative tests: methodology

When I examined this hypothesis I used the same sub-sample as in the two previous hypotheses i.e. all LBOs that were not followed by an LR and all LBOs that were followed by an LR. Thereafter I matched each transaction with the associated PE house. I proceeded with identifying the first fund that was raised for each financial sponsor. Thereafter I calculated the time since the first fund was raised for each LBO. I proceeded with comparing the time since the first fund was raised for LBOs with a subsequent LR with the time since the first fund was raised for the LBOs without a subsequent LR, via Mann-Whitney's U-test. The test was chosen due to the same reasons outlined above and in the same fashion as above I created 3 different sub samples where I eliminated all LBOs with less than 1/2/3 years of time to perform an LR.

H_0 : mean time since the first fund was raised for LBOs(not followed by an LR)) = mean time since the first fund was raised for LBOs(followed by an LR))

H_1 : mean time since the first fund was raised for LBOs(not followed by an LR)) ≠ mean time since the first fund was raised for LBOs(followed by an LR))

$\alpha = 10\%$

6.5.2 Quantitative tests: results

As can be seen from the table below all the mean differences of my tests are larger than zero which is in line with my hypotheses. However none of the tests are significant and therefore I can't reject the null hypotheses. The reason for this might be that most likely there are other factors affecting the reputation of a fund than the time since the first fund was raised. This could e.g. be the total size of the fund family or the personnel's reputation. In addition the reputation of a fund that is associated with e.g. a large investment bank might be affected by the latter's reputation.

Sub sample	# of LBOs	# of LRs	Mean time since the first fund was raised at the time of the LBO (followed by an LR) (1)	Mean time since the first fund was raised at the time of the LBO (not followed by an LR) (2)	Mean 1-2	Z	Sig
1	968	301	13,9	13,8	0,1	-0,172	0,863
2	791	284	13,8	13,2	0,6	-1,106	0,269
3	657	229	12,8	12,6	0,2	-0,407	0,684

Table 6.5.2.1: Hypotheses 4, quantitative test results

6.6 Summary of results

As can be seen from the table below and the tests above I find some support for my third and fourth hypotheses even when checking for origin of the deals. However I am not able to find support for my hypotheses when I control for both time and origin of the LBO.

Hypotheses:	Support
H1: Holding periods for PE investments including an LR is longer than those of similar investments without an LR	×
H2: LRs take place because debt market conditions have improved since the time of the LBO	×
H3: The size of the debt packages associated with LBOs with subsequent LRs is larger than that of similar transactions without subsequent LRs	(✓)
H4: The size of the funds performing an LR after an LBO is larger than the size of the funds performing an LBO without a subsequent LR	(✓)
H5: The reputation of the funds performing an LR after an LBO is more well regarded than the reputation of the funds performing an LBO without a subsequent LR	×

Table 6.6.1: Summary of results

7. Regression analysis

7.1 Quantitative tests: methodology

In order to assess the explanatory power of my hypotheses I perform a regression analysis. Since my evaluated hypotheses are not the only rationales for when LRs are more likely to occur I expect the explanatory power of my hypotheses to be relatively low. This expectation is further strengthened by the fact that three of my five hypotheses have been proved insignificant in my previous tests. However, I hope that the regression can provide an indication of the hypotheses' relative importance and in that way support my results. In addition my third, fourth and fifth hypotheses are naturally related since larger funds perform larger transactions. In addition larger funds might also have a more well regarded reputation. It is therefore necessary to control for each variable via a regression in order to see if the same relationship still exists.

I perform a Probit regression, since it is the most accurate test to use for my rather limited sample. The Probit model is a generalized linear model with binary dependent variables (Altman et al 1981). For that reason it is useful in cases where the dependent variable can take two values, in my case LR or no LR. The model used is presented in equation 1.

Equation 1: $P(Y=1X) = \Phi(\beta 0 + \beta 1(\text{debt\_package\_size}) + \beta 2(\text{fund\_size}) + \beta 3(\text{diff\_real\_interest\_rate}) + \beta 4(\text{time\_since\_latest\_transaction}) + + \beta 5(\text{time\_since\_first\_fund\_ raised}))$, where Φ is the standard normal cumulative distribution function.

I limit my dataset to include only those transactions that have known holding periods i.e. all LBOs with matched secondary buyouts in my dataset. Thereafter I divide the holding periods in 3 months sub periods. For each sub period independent variables are gathered and if an LR occurred during the sub period the dependent variable is assigned with the value 1 otherwise a 0. The independent variables are debt package size which is the debt assumed in the original LBO, fund size which is the size of the fund

for the PE house used at the time of the LBO, the real interest rate difference which is the difference in real interest rates at the specific point in time and the latest transaction be it LR or LBO, the time since the latest transaction which is the elapsed time since the latest transaction be it LR or LBO and the time since the first fund was raised at the LBO point in time.

Unfortunately I excluded several data points in my test since all types of exits aren't known and therefore my sample becomes rather limited. In addition I excluded my fourth hypotheses, since the dependent variables don't aim to clarify the probability of a longer holding period. I have instead included the time passed since the latest transaction, be it LR or LBO. I expect this variable to have a positive sign since a longer holding period ought to imply more debt payments which in turn ought to increase the room for additional debt. Table 6.1 summarizes the variables used in the regression as well as the coefficients' expected signs. As can be seen from the table below 3 of my 5 variables are constant for each holding period. Naturally the time since the latest transaction and the real interest rate difference vary.

Hypotheses	Variable	Expected sign	Constant
H1	Real Interest rate difference excl/ incl. spread	-	×
H3	Debt package size	+	✓
H4	Fund size	+	✓
H5	Time since the first fund was raised at the LBO point in time	+	✓
New variable	Time since latest transaction	+	×

Table 7.1: Regression independent variables and expected signs

7.1 Quantitative tests: results

In order to evaluate if any of the variables have a larger explanatory power for an LR I tested all variables together. The results from the Probit regression are presented in table 7.1.1 and 7.2.2. In line with my expectations I find that the fund size, time since the first fund was raised at the LBO point in time and time since the latest transaction are positively correlated to the occurrence of an LR. In addition two of these three dependent variables are significant at the 10% level. The real interest rate difference and the debt package size variables have the opposite sign to what I expected and they are insignificant. The reason for the insignificance and opposite signs of some of my coefficients might be due to multicollinearity but more likely due to my limited sample. In addition some variables that affect the probability of an LR from happening are most likely excluded. Not surprisingly the explanatory power of my estimated function is low when applying it to my observations. Furthermore, the fund size variable is the only variable which I found support for in both my quantitative tests as well as my regression, which can be seen from table 7.1.3 below.

Parameter	Estimate	Wald	Sig
Real Interest rate difference	1,858	0,656	0,418

incl. spread			
Debt package size	-0,000025	0,009	0,923
Fund size	0,000	10,917	0,001
Time since the first fund was raised at the LBO point in time	0,024	2,582	0,108
Time since latest transaction	0,11	4,284	0,038

Table 7.1.1: Probit regression 1

Parameter	**Estimate**	**Wald**	**Sig**
Real Interest rate difference excl. spread	0,760	0,144	0,704
Debt package size	-0,000042	0,031	0,860
Fund size	0,000	9,894	0,002
Time since the first fund was raised at the LBO point in time	0,028	4,120	0,042
Time since latest transaction	0,086	3,066	0,080

Table 7.1.2: Probit regression 2

Hypotheses:	**Support from quantitative test**	**Support from regression**
H1: Holding periods for PE investments including an LR is longer than those of similar investments without an LR	×	×
H2: LRs take place because debt market conditions have improved since the time of the LBO	×	×
H3: The size of the debt packages associated with LBOs with subsequent LRs is larger than that of similar transactions without subsequent LRs	(✓)	×
H4: The size of the funds performing an LR after an LBO is larger than the size of the funds performing an LBO without a subsequent LR	(✓)	✓
H5: The reputation of the funds performing an LR after an LBO is more well regarded than the reputation of the funds performing an LBO without a subsequent LR	×	×

Table 7.1.3: Quantitative test results vs. regression results

8. Conclusions and Suggestions for Further Research

LRs are an interesting phenomenon that has become more common in later years. It is a way for PE firms to release a dividend without selling the company. It is therefore a method for a firm to satisfy owners with a dividend while at the same time being able to continue to be exposed to an asset that might have good opportunities going forward. Previous studies have exclusively focused on LRs in the public setting, where the motives are somewhat different. My study uses relevant financial theory in order to explain the potential rationales for an LR and the circumstances when they are more likely to occur in the PE setting.

In my study five different hypotheses have been formulated in order to evaluate both the rationales for and circumstances when LRs are more likely to occur. Via an identification of a somewhat unique sub-sample for each hypothesis they have been tested using a quantitative approach.

In line with my expectations support is found for hypothesis 3 and 4 i.e. that LRs are more likely to occur for larger transactions and when the fund performing the transaction is larger. An explanation for the positive correlation between larger transactions and LRs might be that larger transactions are more easily levered since size is associated with a higher probability of supply of debt actually being readily available. A potential reason for why larger funds are positively correlated to the occurrence of an LR might be that they are more prone to engage themselves in deals that are not originally optimally leveraged since the institutional structure of PE funds might cause them to invest in deals that are not great from a risk/ return perspective. However the support for hypothesis 3 and 4 largely disappear when controlling for time and origin of the LBO. In addition the fact that larger funds naturally perform larger transactions complicates my results somewhat. To mitigate this problem a regression analysis was performed and the only relationship that turned out to still exist was the positive relationship between the fund size and the occurrence of an LR. This makes me conclude that the most important factor for an LR to occur appears to be the size of the fund actually performing the original LBO.

My study has therefore found some evidence regarding when LRs are more likely to occur. However no support is found for the rationales behind the LR. Interest rates don't appear to be significantly lower at the time of the LR compared to the original LBO or previous LR. In addition LRs don't appear to increase the holding period of PE investments and the funds that perform LBOs with subsequent LRs don't appear to have a more well regarded reputation than funds that perform LBOs without a subsequent LR.

My results are a contribution to the relatively unexplored research field of LRs in the PE setting. It is, to my knowledge, a first start towards clarifying the concept and identifying potential motives for and circumstances when LRs are more likely to occur.

I believe that there are several interesting and relevant areas for future research regarding LRs in the PE setting. Firstly a replication of my study where the dataset is extended to include all types of

exits would increase the number of observations which might render support for my hypotheses regarding the rationales for LRs in the PE setting. The extension of the dataset to include all exits would have made my thesis stronger but unfortunately due to the amount of work was needed to be done it was outside of the scope of this thesis. Furthermore other rationales for the occurrence of an LR needs to be investigated and could be found in e.g. agency theory where the increase of leverage might decrease agency costs. In addition it would be interesting to examine the amount of tangible assets, volatility of the assets and the marginal tax rates effect on the occurrence of an LR. It would also be interesting to investigate the effect on the final disposal price if LRs have occurred.

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13. Appendix

13.1 The LR in the Public Setting

13.1.1 The LR Compared to the LBO

The typical LR transaction entails making a substantial debt financed payout to existing shareholders. The LR is similar to an LBO in several ways; a comparison of the two can therefore serve as a way of describing the concept and its benefits further (Denis and Denis 1993).

Similarities:

(i) In both transactions, there is a substantial increase in debt/ equity or debt to total capital

(ii) In both cases, there is substantial pressure on management to run the firm more efficiently, and to be less wasteful of free cash flow

(iii) Both transactions result in a substantial increase or the potential for a substantial increase in management/ employee ownership of equity. This leads to greater alignment of stockholder and managerial interests

(iv) All the potential negatives of increased leverage are applicable to both types of transactions (e.g., forcing the foregoing of investment in risky projects or those with excess cash flows far in the future)

(v) In general, the tax implications for the firm are similar

(vi) If a dividend is paid by firms undergoing an LR, a tax-paying investor incurs an ordinary tax liability in the year of the dividend. If stock is tendered for cash, a capital gains liability is incurred. In an LBO, a capital gains liability is incurred for cash received. With both LBOs and LRs, if payment-in-kind preferred or debt or zero coupon debt is exchanged for equity, a tax liability is incurred without any concomitant cash inflow

Differences:

(i) LBOs go private while LRs remain public

(ii) Due to strip financing, major creditors may be major stockholders in LBOs, thereby reducing monitoring and agency costs. In LRs, unless debt is paid to the stockholders, stockholders do not become bondholders as well

(iii) In LBOs, managers are responsible to a small but powerful group of shareholders (e.g., LBO specialists or institutional investors to whom they must report). In LRs, there may still be a large number of (smaller) equityholders. Shareholder servicing costs should be lower with LBOs

(iv) With LRs, there is no possibility that managers/ buyout investors benefit at the expense of public shareholders, as has been suggested for LBOs

Theoretically stockholders should derive all the benefits of still having their stock publicly traded (e.g. liquidity and market discipline), without having to bear the cost of going public again as is the case for many LBOs (Gupta and Rosenthal 1991).

13.1.2 The LR and Managerial Discretion over Investment Policy

The impact of LRs on managerial discretion over investment policy has been examined and significant decreases in undistributed cash flow, capital expenditures, and total assets following completed LRs were found. The reductions in investment were significantly correlated with the cumulative abnormal returns earned by the shareholders of the recapitalizing firms. Moreover, evidence of poor investment decisions on the part of the sample firms in the years leading up to the LR was found. The overall results are consistent with the hypothesis that increased debt plays a valuable role in limiting managerial discretion (Denis and Denis 1993).

13.1.3 The LR as a Takeover Defence

An LR can serve as a form of takeover defence, since firms make themselves less desirable for a potential hostile takeover when they take on additional debt to pay out to the stockholders in the form of dividends or in a share buyback program. An LR defence requires that the target firm issues debt and pays out the proceeds as a dividend to target shareholders. It is necessary to distribute the proceeds from the debt issue, otherwise, in the event of a successful takeover; target shareholders lose access to the newly raised capital. Such a strategy has two effects. First, the equity value of the target falls by the amount of the dividend payment. Second, the LR creates wealth redistributions between shareholders and bondholders in a takeover. LRs provide target management with a means for proposing direct counteroffers, because these valuation effects increase the effective price implicit in an outstanding tender offer. An LR is particularly useful in this regard because the dividend payment, which is financed with newly issued debt, leaves the target's original asset structure intact and the potential synergy gains unaffected (Lewis 1991).

Harris and Raviv (1988) however proposed that the role of capital-structure changes in corporate takeovers is somewhat different. They argue that firms make capital-structure decisions that are based on a tradeoff between synergistic merger gains and the loss of personal benefits of control.

Stulz (1988) argued that an LR changes the distribution of voting rights when issue proceeds are used to repurchase shares from outside stockholders. Share repurchases increase management's control of the voting rights and therefore it can potentially make a corporate acquisition more difficult. Stulz showed that an optimal capital structure emerges as managers trade off the increased benefits of control against the greater probability of losing control through bankruptcy.

There is empirical evidence supporting the notion that recapitalizations are consistent with shareholder wealth maximization. Handa and Radhakrishnan (1989) document that shareholders realized abnormal returns of 1.19% (t-statistic of 3.45) and 2.16% (t-statistic of 6.27) on days -1 and 0 relative to

the recapitalization announcement date for a sample of 31 active target firms. They also provide direct evidence that target managers use LRs to negotiate a higher bid price. In their study, nine of the 31 firms that proposed a recapitalization subsequently abandoned their plans upon receipt of a higher bid.

13.1.4 Different Types of LRs

The payout from the LR can be cash or a mix of cash and debt securities; in some cases the existing equity is exchanged for a new equity security plus cash and debt securities. The transactions can be classified into six categories (Denis and Denis 1993):

(vii) A substantial cash dividend financed with bank debt, high yield bonds or both. Subsequently, the stock sells at a fraction of its previous value and a so called "stub" is created

(viii) Cash (financed as above) and a new share of stock (sometimes a fraction of the original share) are exchanged for old shares. Again, a stub is created

(ix) A significant cash dividend is paid along with high-yield debt securities (and/or high-yield preferred stock), and a stub is created

(x) A cash tender offer for a substantial fraction of the shares outstanding. This is financed with bank debt and/or high-yield debt

(xi) Cash and high-yield debt are exchanged for a significant fraction of the stock outstanding. A significant fraction of the stock is tendered and paid for with high-yield securities

In reality, many recapitalizations are initiated before a formal tender offer is made, the so-called pre-emptive LR (Lewis 1991). In addition bankrupt companies often undertake a recapitalization as a part of their reorganization process.