



LUND UNIVERSITY

School of Economics and Management
Department of Business Administration

FEKN90

Business Administration-

Degree Project Master of Science in Business and Economics

Spring term of 2012

From Greed to Good?

*- A Study on the Long-Run Stock Performance of
Reverse Leveraged Buyouts on the American
Stock Exchanges*

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Acknowledgements:

We would like to thank our supervisor Maria Gårdängen for good advice and support. Pär Strömberg for contributing with valuable data. Finally, we would like to extend our appreciation to Gustaf Kugelberg at SVCA and other industry professionals for contributing with time, knowledge and helpful comments.

Title: From Greed to Good? – A study on the long-run stock performance of reverse leveraged buyouts on the American stock exchanges

Seminar date: 05/29/2012

Course: Master thesis in business administration, 30 University Credit Points (30 ECTS)

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Five key words: Reverse Leveraged Buyout (RLBO), Private Equity (PE), Initial Public Offering (IPO), Leveraged Buyout (LBO), Long-Run Stock Performance

Purpose: The study seeks to investigate long-term stock performance of RLBOs. The purpose also to investigate long-term performance differences across RLBOs by examining whether certain characteristics can be attributed to deviations in performance. In general, the study seeks to shed some light on the recent wave of leveraged buyout transactions.

Methodology: Quantitative approach using event-time analysis, calendar-time portfolio regression analysis, and multiple regression analysis.

Theoretical perspectives: Information Asymmetry Theory, Agency Theory, Behavioral Finance, Efficient Market Hypothesis

Empirical foundation: This study is to our knowledge based on the largest and hitherto most up-to-date sample of US RLBOs with return data. In total we have a dataset of 448 US RLBOs and 7804 non-buyout-backed benchmark IPOs during 1981-2007 with stock return data ending March 2012.

Conclusions: In the whole sample analysis, RLBOs show superior performance relative to other IPOs. However, performance seems to deteriorate over time:

- RLBOs that floated the years of 1981-1995 outperformed non-buyout-backed IPOs and the market significantly.
- RLBOs between 1996 and 2003 still outperformed non-buyout-backed IPOs but they did not outperform the market.
- RLBOs that floated between 2004 and 2007 show no significant outperformance to other IPOs. Nor do they however, show any significant underperformance.

Cross-sectionally, two conclusions emerge in particular: (1) Public-to-private RLBOs that floated between the years 2004-2007, perform significantly better than other RLBOs, and (2) quick-flip RLBOs significantly underperform throughout the whole sample.

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Glossary

IPO – Initial Public Offering: The process when the stock of a firm is introduced to the public market.

IRR – Internal Rate of Return: The common profitability measurement in private equity investments.

LBO – Leveraged Buyout: Financial transaction when an investor acquires a controlling stake in a firm's equity through a significant part of debt financing.

Non-Buyout-Backed IPO: A regular IPO taken public without the support of a buyout firm.

PE – Private Equity: Umbrella name for venture capital and leveraged buyout investors.

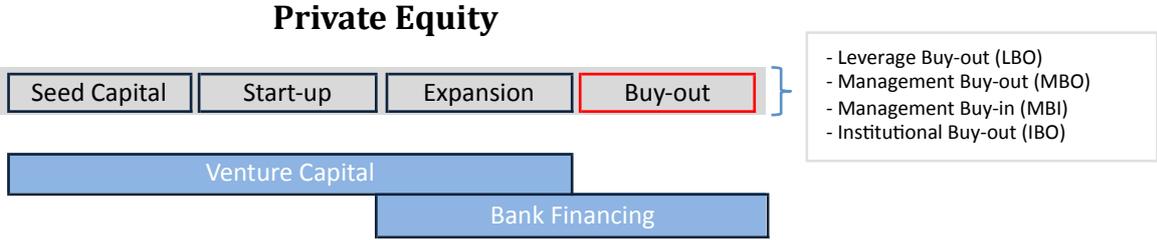
RLBO – Reverse Leveraged Buyout – Buyout-Backed IPO: Transaction process when a firm acquired through a leveraged buyout subsequently is taken public through an initial public offering.

Secondary Leveraged Buyout: Transaction process when a buyout firm acquires a target firm from another buyout firm.

VC – Venture Capital: Financing provided to early-stage, high growth companies.

Definitions

Private equity (PE) is the umbrella name for venture capital (VC) and buyout firms. Kaplan and Strömberg (2009) define a leveraged buyout (LBO) as when a specialized investment firm acquires a company using a large part debt relative to equity for the financing of the acquisition. The investment firms typically acquire the majority control of an existing or mature firm in a leveraged buyout transaction. This transaction form differs from venture capital transactions that typically involve investments in emerging growth companies without obtaining the majority control. In this study, we use a definition of LBOs consistent with Kaplan and Strömberg and define LBO transactions as a private equity acquisition technique whether it is a publicly traded or a privately firm. Furthermore, we will focus on the transactions where the LBO target firm does a subsequent IPO following the LBO process i.e. reverse leveraged buyouts.



Source: Authors' illustration inspired by SEB Venture Capital and definitions in previous research

1. INTRODUCTION

1.1 Background and Public Debate

Buyout firms increased influence in the financial markets coupled with the economic turmoil following the financial crisis, has ignited an intense public debate around reverse leveraged buyouts (RLBOs) i.e. leveraged buyout backed initial public offerings (IPOs). Late stage private equity investors have been criticized for acting shortsighted and the value these firms create for stakeholders and the society at large have been fiercely debated.

In public media, much of the debate has relied on anecdotal evidence. The discussion was sparked when a few RLBOs underperformed significantly causing heavy losses for public stock investors. The RLBO that the US private equity firm Blackstone pulled off on Southern Cross Healthcare is an illustrative example of after flotation underperformance that has attracted significant public scrutiny. Led by Stephen Schwarzman, Blackstone acquired Southern Cross for £162million in 2004 and took the firm public two years later, they are believed to have quadrupled the investment (Shipman, 2011). To achieve this, Blackstone restructured the business by selling off the firm's nursing homes, forcing the firm to lease the properties. (Ruddick, 2011-06-04). Wachman (2011-04-12) argues that public shareholders took the hit, following a growth mania financed by the sale-and-leaseback program, Southern Cross stock lost 98% of its value from early 2008 to early 2011. Blackstone denied responsibility. Justin Bowden, union representative comments:

“Blackstone can attempt to play Pontius Pilate all they like but they separated the properties from the rest of the business, and they set up the back-to-back escalating rent deal. It is the consequences of these actions by Blackstone, above all else that left Southern Cross and 31,000 dependent residents with a ticking time bomb that was always going to go off.” (Neville, 2011-06-04).

On a more general basis, late stage private equity investors have been criticised for imposing too much debt on their targets and for pushing them to the stock market too soon. The New York Times DealBook (2006-10-06) notes:

“The practice, where buyout firms acquire companies, only to sell or float them a few months later, has been on the rise. In 1998, buyout firms held newly acquired companies for an average of six years. By 2002, the average was three years, and though there is no data available, that number has likely dropped further since then.

The New York Times DealBook (2006-10-06) further notes quoting Breakingviews:

“Like kids who’ve got bored with their party toys, private equity firms often hand on their recent acquisitions to competitors. (...) It’s doubtful whether companies benefit from being handed around from one set of foster parents to another. Of course, the senior executives who run them make out handsomely when their firms are sold on after a few months. But this is hardly the time-horizon conducive to making strategic decisions. Instead, it’s probably more conducive to slashing costs even at the expense of damaging the firm’s long-term competitive position. Favourable conditions in the credit and equity markets have enabled buyouts funds to offload their investments at blistering pace.”

Following the controversy around leveraged buyouts, one could question whether late stage private equity investors would consider these strategies preferable? Cao and Lerner (2009) observe that the mean buyout group ownership post IPO between 1980 and December 2003 was 40,48%, suggesting that stock performance of RLBOs has significant impact on the performance of buyout funds. Notably, late stage private equity investors risk severe reputational losses if buyout backed IPOs systematically underperform their peers, i.e. the market would not pay as much for their public issues going forward.

1.2 Problem Discussion and Purpose

There are several reasons to address the discussion in a more systematical study. While it is debatable how long or even whether late stage private equity investors’ responsibility reaches beyond the point when they no longer wield any power over their former target firms – the long term performance following leveraged buyouts transactions is unquestionably important from a social and economical perspective. Private Equity Growth Capital Council (2012) estimated that in the USA, 2012, private equity controlled firms’ employ more than 8,1 million people. These workers and other external stakeholders are affected by the performance beyond the typical buyout firm holding period of 3-7 years.

Since the first significant buyout wave of the 1980s, private equity has evolved through boom and bust periods to become one of the most important investment classes in the financial system. Leading up to the financial crisis, deal activity increased in particular. Practitioners commonly refer to this unrivalled period of private equity growth as the second wave of leveraged buyouts. By 2006, Jensen (2007) notes that the investment bank Morgan Stanley estimated that private equity represented:

- 25% of the global mergers and acquisitions activity

- 50% of the leverage loan volume
- 33% of the high yield market
- 33% of the IPO market

During the worldwide recession following the credit burst, private equity went into a short period of hibernation, but private equity and the buyout market is now on the rise again and continues to be a major force in the financial markets. In the aftermath of the financial crisis and the secondary buyout wave, discussions have sparked around whether private equity and other alternative investment funds have evolved to increase the system-wide risk in the financial markets. Regulations have followed, such as an extension of the American Dodd-Frank act (SEC, 2010) and the implementation of the European AIFM directive (European Union, 2011). With this in mind, it seems desirable to investigate whether the received criticism on buyout transactions is justified or not.

While the first significant wave of leveraged buyout transactions has been scrutinized in several distinguished studies, the second major leveraged buyout wave of the 2000's, remains uninvestigated. In this study, many theories have been drawn from the early studies covering the 1980's buyout era, such as the "Eclipse of the Public Corporation" by Jensen (1989) and "The Staying Power of Leveraged Buyouts" by Kaplan (1991). Twenty-years later, it is, however, questionable whether these observations characterize what private equity has evolved into.

After the crash of the high-yield market in the early 1990s and the following deterioration in leveraged buyout transactions, the backwash of these transactions have attracted reduced attention in academic research. There are, however, four distinguished studies on the performance of reverse leveraged buyouts that are of particular importance for our study. Mian and Rosenfeld (1993) define a reverse leveraged buyout as when a publicly traded firm (or a division within one) is acquired through a leveraged buyout and then goes public once again through an IPO. They examine a sample of 85 RLBOs between 1983 and 1988 and found signs of abnormal market returns over a three-year period, following reversed public offerings. Holthausen and Larcker (1996) examine a sample of 90 LBOs going public between 1983 and 1988; finding evidence that the accounting performance of these firms significantly outperform their industry peers during a four-year post IPO period. Chou, Gombola, and Liu (2006) use a sample of 329 reverse LBOs from 1981 through 1999 and emphasize the effect of earnings management around RLBOs. In their study, they conclude

that there is a quicker resolution to the impacts of earnings management for RLBOs than for regular IPOs, explaining less post-offering underperformance for RLBOs. Finally, we have the Cao and Lerner (2009) study, which examines the performance of 437 US RLBOs between 1981 and 2003. From their findings they conclude that RLBOs consistently outperform regular IPOs and the market over a three-year period post IPO. When the full sample is divided into two subsamples, one 1981-1995 and one 1996-2003, they find that the results diminish in the later period.

Our study has two main goals. First, we seek to continue on where Cao and Lerner stops, by examining the performance of reverse leveraged buyouts during the boom and bust of the subprime craze bubble, i.e. the second buyout wave. This includes examining why certain RLBOs outperform and others underperform. Secondly, we seek to contribute by shedding some new light on the second wave of leveraged buyouts and the changing nature of the industry.

The key research question is: *Does long-term value creation still follow late stage private equity backed IPOs as previous research has indicated and what characteristics makes certain reverse LBOs perform better than others?*

1.3 Delimitations

As the USA is the by far largest market for buyout transactions, it is set as the geographical base for this study. The observation period, January 1981- March 2007, is set to include boom and bust periods, such as the rise and fall of the junk bond market, the ups and downs of the dotcom crisis and the swelling and bursting of the subprime credit bubble. No observations prior to 1981 are included, as earlier studies suggest that RLBO transactions virtually did not appear before the 1980s. The latter cut-off date is set to ensure a minimum of five years of return data for each RLBO. Our time series of return data ends in March 2012.

1.4 Summary of Findings

This study is to our knowledge based on the largest and hitherto most up-to-date sample of US RLBOs with return data. In total, we have a dataset of 448 US RLBOs and 7804 non-buyout-backed benchmark IPOs during 1981-2007 with stock return data ending March 2012.

Our analysis suggest the following conclusions:

- In the whole sample analysis of RLBOs that floated between the years 1981 to 2007, RLBOs show superior performance relative to other IPOs. However, the performance seem to deteriorate over time:
 - Reverse leveraged buyouts that were taken public between the years of 1981-1995 outperformed non-buyout-backed IPOs and the market significantly
 - RLBOs between 1996 and 2003 still outperformed non-buyout-backed IPOs three- and five years post IPO but they did not outperform the market, confirming the trend earlier observed by Cao and Lerner (2009).
 - Leveraged buyouts that were taken public between 2004 and 2007, after the observation period used by Cao and Lerner, show no significant outperformance to other IPOs. Nor do they however, show any significant underperformance as public debate somewhat has indicated.
- Quick-flip reverse LBOs, that were held by the buyout firm for no longer than 12 months, underperforms significantly.
- Public-to-private RLBOs that floated between the years 2004-2007, perform significantly better than other RLBOs that reversed in the same time period.

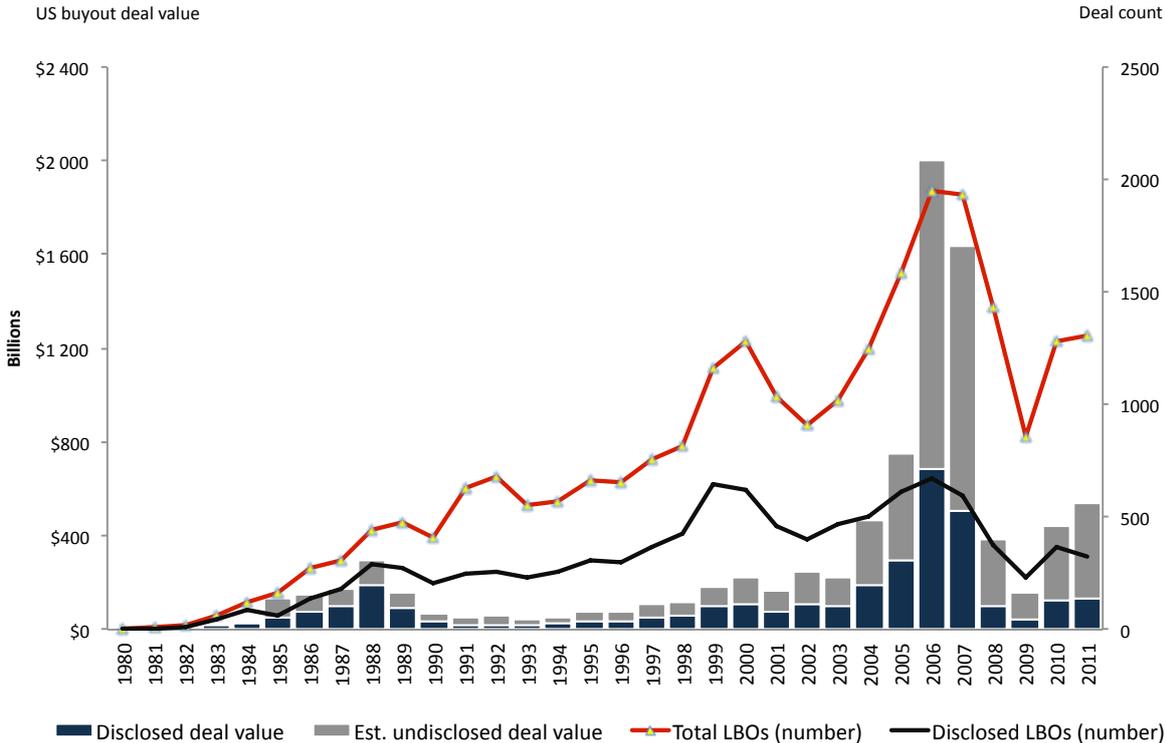
1.5 Disposition

This paper proceeds as follows. In section 2 we briefly discuss and examine the inception and development of the US leveraged buyout market. Section 3 presents key findings from previous research and outline the theoretical framework. Section 4 states the hypotheses for both the long-run performance study and the study examining the cross-sectional differences in long-term RLBO performance. In section 5, the methodology and construction of the data sample is discussed. Section 6, provides descriptive statistics on the dataset used in the analysis. Section 7 provides the analysis of long-term RBLO performance. Section 8, analysis the cross-sectional differences in long-term RLBO performance. Finally, section 9 closes the paper and provides suggestions for further research.

2. THE DEVELOPMENT OF THE LEVERAGED BUYOUT MARKET

Late stage private equity has evolved through a series of boom and bust cycles during the last decades (see figure 2.1 & 2.2).

Figure 2.1 Leveraged buyout activity is cyclical



Notes: Represents 24548 deals when closed. Deal values are expressed in constant dollars, with 2011 as reference point. Estimated undisclosed deal value is calculated based on the assumption that the average undisclosed deal value equals the average disclosed deal value, which might result in over- or under-estimations of actual yearly undisclosed deal values. Source: Thomson Reuters ThomsonOne Investment Banking, authors' calculations.

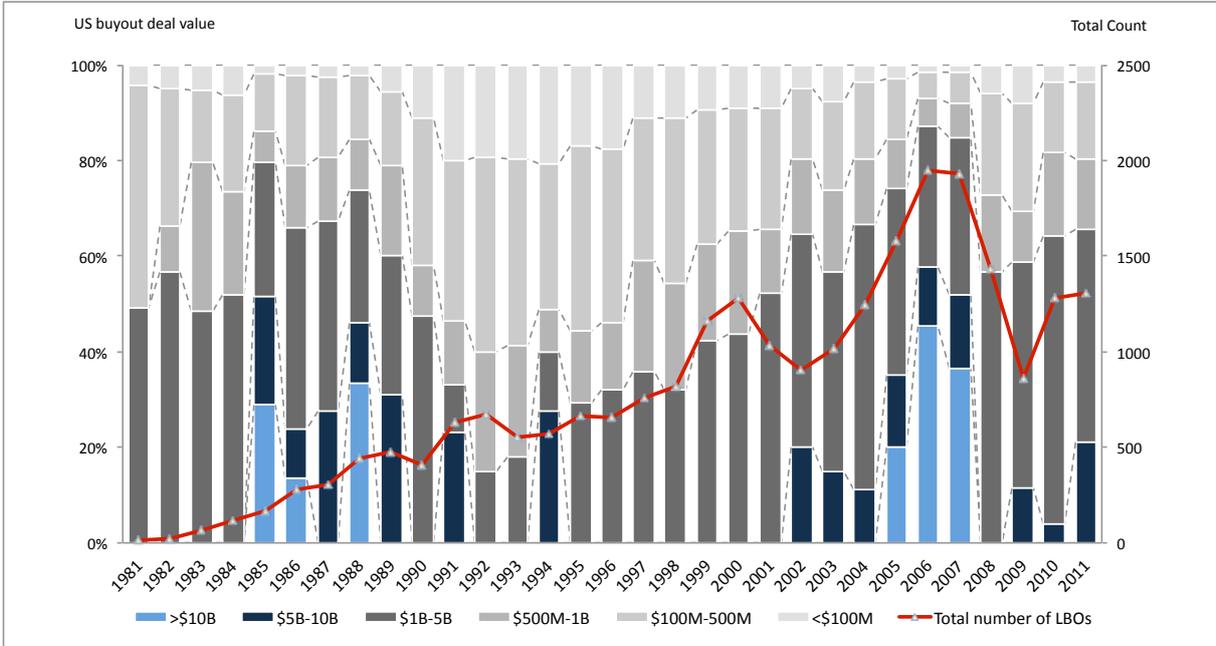
As the public debt markets opened in the 1980s, the first significant wave of leveraged buyouts hit the financial markets. Following this development, Jensen (1989) predicted that private equity would develop to become the prevailing ownership structure of the future. He argued that private equity characteristics such as concentrated ownership in portfolio firms, incentive driven professionals and lean and efficient holding organization was favourable compared to the ownership structure in public firms i.e. dispersed ownership.

But in early 1990s, the leveraged buyout market collapsed following the crash of Drexel Byrnham Lambert and the junk bond market (Kaplan and Strömberg, 2009). Numerous high profile leveraged buyouts defaulted and the high profile public-private transactions that

marked this period virtually ceased to appear. While Jensen’s prediction seemed far from the outcome, the leveraged buyout market was not dead, it merely changed guise.

In subsequent years, smaller private companies and divisions became the bread and butter and leveraged buyouts of public companies remained few throughout the 1990s. During the 1980s, mature firms such as manufacturing and retail firms had dominated as buyout targets. Now activity spread to industries such as media, technology, communications, financial services, and healthcare (Kaplan and Strömberg, 2009). While total transaction value decreased, almost 50% more deals were completed during 1990-1995 than during 1984-1989 (See figure 2.2).

Figur 2.2 Leveraged buyout deal size tend to increase significantly during boom-periods



Notes: Represents 24548 deals when closed. Deal values are expressed in constant dollars, with 2011 as reference point. Deal-size intervals excludes deals where the deal value was not disclosed and includes 9982 transactions.
 Source: Thomson Reuters ThomsonOne Investment Banking, authors’ calculations.

From the mid-1990s to the early 2000s, the buyout market experienced steady growth, except for a dip following the dotcom crises. The industry continued to evolve with secondary leveraged buyouts, becoming increasingly more popular. By the early to mid-2000s, a combination of falling interest rates, an increasingly promiscuous lending environment and favourable macroeconomic winds set the stage for a new boom of large multi-billion US leveraged buyouts. Marked by Carlyle Group, Welch, Carson, Anderson & Stowe buyout of Dex Media in 2002, the large public-to-private transactions resurfaced (Harrison, 2010).

Between 2001 and 2006, the average disclosed deal size increased nearly seven times in deflated numbers (see figure 2.2). Numerous mega-leveraged buyout transactions were completed, including the buyout of Hertz Corporation, Toys “R” Us, Metro-Goldwyn-Mayer, Alliance Boots and SunGard. From 2004 to 2007, Thomson Reuters ThomsonOne Investment Banking recorded 6709 US leveraged buyout transactions, equalling roughly 34% of the total number of US leveraged buyout transactions recorded between 1981-2007. In deal value, the deals with disclosed transaction value during the four years together equalled roughly \$1,7 trillion (2011 dollars) or 49% of the aggregated disclosed deal value from 1981-2007 (see figure 2.1). Since 2007, leveraged buyout activity has decreased following the economic turmoil. Fostered by a better economic outlook and recovering debt markets, the US leveraged buyout market seems to have started to revive.

While the leveraged buyout market has had to navigate through boom and bust periods during the last decades, both buyout fundraising and the number of buyout practitioners have increased significantly since the mid-1980s. For instance, US buyout funds raised 36 times more capital in 1998 than in 1985 and in 2006 fundraising reached more than 100 times the level of 1985 (Cao and Lerner, 2009). Although US buyout fundraising has increased considerably, several academic studies, such as Kaplan and Schoar (2005) and Schmidt, Nowak, and Knigge (2004), show that the IRR of US late stage private equity investments have deteriorated over time. Among explanatory factors, deterioration in returns has been attributed to increased competition. As the buyout industry has grown and evolved, the window of opportunity to buy companies under limited competition seems to have curtailed. On the sell side, firms have gradually become more aware of the variety of possible buyers and started to conduct auctions between potential buyers with the help from investment banks (Cao and Lerner, 2009).

Given these discussions, it is reasonable to assume that the continuous evolution of the buyout market and the changes in global financial markets will be reflected in the long-term performance of buyout backed IPOs. To capture the changing patterns of the buyout market, we include return data from 1981-2012.

3. PREVIOUS RESEARCH AND THEORETICAL FRAMEWORK

3.1 Previous Research

To date, not much systematic work has been cited on the recent performance of reverse leveraged buyouts. In particular, there is a demand for more systematic studies on the most recent boom and bust leveraged buyout cycle, described in the previous section.

In earlier literature, there are several studies relevant to our study. We divided them in to the following areas: (i) IPO performance in general (both short-term and long-term), (ii) the impact of Venture Capital funds, and (iii) LBO-transactions and previous studies on the performance of RLBOs.

3.1.1 General IPO Performance

The short-run performance of IPOs has been widely examined and the initial underpricing effect of IPOs is a well-documented phenomenon that has been proven to be statistically significant by numerous studies. Stoll and Curley (1970) and Ibbotson (1975) studied the first day trading prices and observed an increase from the offer price to the closing price.

Muscarella and Vetsuypens (1989) studied the short-run performance of 74 secondary IPOs and found that the initial underpricing effect is smaller for these transactions compared to other IPOs. The smaller initial underpricing effect is explained by the information hypothesis, which assumes that the market already has publicly available information to price these issues more correctly.

The long-run IPO performance has also been studied and an overpricing effect has been documented. Ritter (1991) found that a sample of 1526 US IPOs between 1975-1984 significantly underperformed comparables three years after going public. The underperformance varies over time and across industries, suggesting that investors act overoptimistically and periodically overprice new issues, whilst the issuers exploit these “windows of opportunity” and time the IPO to the most advantageous time.

3.1.2 The Impact of Venture Capital Firms

There has been extensive research addressing the market impact of venture capital funds. These studies are also relevant to our study.

Gompers (1995) finds that venture capital firms primarily invest in early stage and high technology companies where agency and monitoring costs are considered to be the highest. Gompers (1996) examines the effect of the age of the venture capital firms and suggests that IPOs backed by younger VCs are earlier stage investments and have a greater underpricing effect when taken public compared to IPOs backed by more mature venture capital firms. Further, his study indicates that younger VCs hold smaller equity stakes in their targets.

Barry, Muscarella, Peavy Iii, and Vetsuypens (1990) and Jain and Kini (1995) show that VC-backed IPOs are priced higher at the time of the IPO relative to comparable non-VC-backed IPOs, suggesting that the market values the monitoring done by venture capital firms, hence giving them higher valuations. Barry, Muscarella *et al.* show that the venture capitalists are represented on their target firms' boards and serve as important players in the governing mechanism of emerging companies. Furthermore, Jain and Kini find that IPOs backed by venture capitalist firms show significantly better operating performance post-IPO relative to non-VC-backed IPOs. Alon and Gompers (1997) study indicates that the long-term returns of VC-backed IPOs are significantly greater than those of non-VC-backed IPOs.

3.1.3 LBO-Transactions and Previous Studies on the Performance of RLBOs

The value created in the LBO restructuring process has been studied in terms of debt financing, management ownership, corporate governance changes, changes in R&D expenditure, etcetera. The theoretical context is based around the agency theory where several governance mechanisms have been indicated to mitigate the conflict of interest between stockholder investors and managers.

Kaplan (1989 a) shows that buyout investors pay a substantial premium above market price to pre-buyout shareholders suggesting that buyout investors see value in reduced agency costs, reduced information asymmetry and tax advantages. Kaplan (1989 b) supports the hypothesis that increased tax benefits from the use of an increased debt tax shield does create value in buyout transactions. Kaplan (1991) identifies 183 public-to-private leveraged buyouts

between 1979 through 1986 and concludes that the medium time of which an LBO target remains under the LBO control is 6,82 years.

Advocates of the LBO transaction form argue that the private equity firms create economic value in their targets. Jensen (1989) argues that the private equity firms are active investors focusing on maximizing firm value instead of just earnings in line with modern finance theory. He claims that agency cost of managerial incentives is mitigated more effectively under LBO ownership than under public ownership through structural leverage and performance based compensation systems. Jensen argues that highly leveraged private ownership is more suitable than public ownership for companies in low long-term growth and cash-rich industries with managerial incentives to waste cash flow through overinvestment in unsound projects. Debt financing as a solution to overinvestment problems and other principal-agent costs between managers and shareholders is in line with existing theory on optimal capital structures. Phan and Hill (1995) indicate that LBO targets do show increased performance efficiency in the short-run, which they derive to changes in company goals and a decrease in organizational complexity and centralization. They do however suggest that the efficiency improvements decline somewhat in the long-run.

Schmidt, Steffen, and Szabó (2010) identify three distinct exit strategies for private equity firms to sell their buyout investments. The PE-firms can exit through an initial public offering, a sale, or a write-off and they conclude that the IPO method is the least used exit strategy. The choice of exit strategy is driven by market cycles with trade sales and IPOs declining during recession while write-offs increase. In market booms the returns for IPO exits are much higher than for sales.

Degeorge and Zeckhauser (1993) identify two explaining phenomena that influence the choice of a buyout firm to take its target public, behavioural decision and debt overhang. The behavioural decision phenomenon is described as irrational behaviour on both the buyer and the seller side of an IPO while the debt overhang phenomenon states that if the LBO holds risky debt, old equity holders shun an IPO as it inclines a transfer of wealth to old debt holders. Degeorge and Zeckhauser call the combination of these two phenomena a “pure selection” effect and argue that it might explain why poorly performing LBOs rarely go public and why those who choose to go public tend to show unusually strong performance. This could be contrasted by theories on adverse selection costs of which the most famous

theory is the Akerlof (1970) problem of market lemons, where the market has difficulties identifying good quality from bad.

Most relevant for our study are the previous studies of IPOs backed by late stage private equity firms. Generally these suggest that such IPOs outperform other issuers. Mian and Rosenfeld (1993) define a reverse leveraged buyout as when a publicly traded firm (or a division within one) is acquired through a leveraged buyout and then goes public once again through an IPO. They examine a sample of 85 RLBOs between 1983 and 1988 and found signs of abnormal market returns over a three-year period following reversed public offerings. Holthausen and Larcker (1996) examine a sample of 90 LBOs going public between 1983 and 1988 and find evidence that the accounting performance of these firms significantly outperform their industry peers during a four year post IPO period. Chou *et al.* (2006) use a sample of 329 reverse LBOs from 1981 through 1999 and emphasize on the effect of earnings management around RLBOs. In their study they conclude that there is a quicker resolution of the impacts of earnings management for RLBOs than for regular IPOs explaining less post-offering underperformance for RLBOs. von Drathen (2007) and von Drathen and Faleiro (2007) study PE-backed backed (both VC- and buyout-backed) IPOs in Germany and UK respectively and the results indicate that they outperform other IPOs. Cao and Lerner (2009) examine the performance of 437 US RLBOs between 1981 and 2003. From their findings they conclude that RLBOs consistently outperform regular IPOs and the market over a three-year period post IPO. When the full sample is divided into two subsamples, one 1981-1995 and one 1996-2003, they do however find that the results diminish in the later period. Cao and Lerner's study is the most comprehensive and up-to-date paper on the performance of US RLBOs and their work has inspired this study.

3.2 General Theories Explaining Pricing Anomalies

Previous studies covering research on pricing anomalies mainly consist of two dominating theoretical frameworks; behavioural finance theory and the efficient market hypothesis.

3.2.1 Behavioral Finance Theory

Different behavioural aspects that affect the financial markets and patterns of market anomalies have been documented in several studies. The impact of psychological phenomena

on asset pricing contradicts the neoclassical microeconomics framework traditionally applied to finance theory. According to Shefrin (2008a) the neoclassical theory has its foundation in the assumption that investors make rational decisions based on statistical data. In contrast, the behavioural framework uses the phenomena of heuristics and biases to explain investor behaviour. According to this theory, investors use heuristics, rules of thumb, and especially representativeness, a particular heuristic in which people tend to overestimate the likelihood of an event when it is more represented and underestimate the likelihood of an event when it is less represented even though the events have the same probability. Shefrin (2008b) explains that representativeness has many implications on asset pricing and explains how asset prices can deviate from fundamental values.

The existence of market anomalies that can be explained by behavioural finance theory have been widely examined. Signs of representativeness amongst investors can be found to explain asset mispricing where investors rely too heavily on recent performance and trends. Porta (1996) shows that an active trading strategy of selling stocks with high expected growth rate in earnings and buying stocks with low expected earnings growth generated excess returns. He suggests that the market was overly optimistic concerning high expected earnings growth stocks and overly pessimistic concerning low expected earnings growth stocks. Bondt and Thaler (1985) find what they call a winner-loser effect, or overreaction hypothesis, in which the stock market investors overreact to prior performance and where prior losers outperform prior winners. Lakonishok, Shleifer, and Vishny (1994) show signs of market anomalies in their study where “value” stocks with low multiples outperform “glamour” stocks with high multiples i.e indicating that the market underestimates value stocks and overestimates glamour stocks.

3.2.2 Efficient Markets Hypothesis and Rational Asset Pricing Models

Contrary to behavioural finance theory, advocates of the efficient market hypothesis argue that pricing anomalies are explained by flaws in the information reaching the investors and that the market does not completely control for risk factors. Proponents such as Fama and French (1996) claim that a multifactor asset pricing model can explain the pricing patterns suggested by Bondt and Thaler (1985) and Lakonishok *et al* (1994).

Alon and Gompers (1997) do however present the view that it is possible to criticize the Fama and French multifactor model with the argument that investor behaviour may well be

correlated with the factors. The multifactor model results may reflect the possibility that investor sentiment and bias correlates with factors like book-to-market.

Ritter and Welch (2002) first and foremost advise caution when interpreting long-run stock performance results as they are sensitive to both methodology and the time period chosen, but admit that they tend to lean on the side of the behavioural point of view. von Drathen and Faleiro (2007) supports the behavioural finance theory in their findings as the explanatory theory to why LBO-backed IPOs outperform other IPOs.

4. HYPOTHESES

4.1 Long-Run Performance Hypotheses

From an efficient market hypothesis perspective, it would be reasonable to assume that if buyout-backed IPOs outperformed other IPOs, the market would recognize this mispricing. Theoretically, the market would price in the increased expectations at the time of IPO, and converging long-run performance should be expected.

Previous research also argues that the market in particular may not discount the price of non-buyout-backed IPOs enough. Megginson and Weiss (1991) show that a larger part of the investors in non-buyout backed IPOs are individual investors. Given these findings, it has from a behavioural point of view been suggested that the investor clientele of non-buyout backed IPOs might be more sensitive to representativeness, explaining the poor performance compared to buyout-backed IPOs.

The hypotheses for the long-run performance study are set to support findings from previous research i.e we believe that RLBOs still outperform.

H1₁ Reverse leveraged buyouts outperform non-buyout-backed IPOs.

H1₂ Reverse leveraged buyouts outperform the market.

Opponents of late stage private equity often argue that these firms profit from information asymmetry by hyping the flotation of their target firms. If this is true we are likely to reject our hypothesis as poor long-run performance should be expected when the market finds out the true nature of such firms.

4.2 Cross-Sectional Performance Hypotheses

To examine whether certain RLBO characteristics can be attributed to deviations in long-run stock performance we introduce a number of cross-sectional performance hypotheses that we

divide into the categories: Deal specific characteristics, Target firm characteristics and Buyout firm characteristics.

The hypotheses are set to address the intense debate around late stage private equity that has followed the second wave of buyout transactions and indications from previous research. To increase our understanding of the subject, we have also had discussions with the Swedish Private Equity & Venture Capital Association (SVCA), Nordea Leveraged Finance, Enskilda Corporate Finance and Danske Bank Corporate Finance among others.

4.2.1 Deal Specific Characteristics

Holding Period between LBO and IPO

It is questionable whether it is possible for the buyout firm to create any extra value in the target firm during a short amount of time. Previous research has indicated that so-called quick-flip LBOs, i.e leveraged buyouts with a holding period no longer than 12 months, underperform. Thus, it is of interest to use holding period measures as explanatory variables for long-run stock performance for which we form the following hypotheses;

H1₃ Reverse leveraged buyouts with holding periods below the median are more likely to underperform.

H1₄ Reverse leveraged buyouts with holding periods below or equal to 12 months are more likely to underperform.

4.2.2 Target Firm Specific Characteristics

Divisional Buyouts/Carve-Outs

A target firm that prior to buyout was a division of a larger company is considered a divisional buyout. Hite and Vetsuypens (1989) suggest that divisional buyouts are likely to involve the management of the target division and that the buyout reallocates the divisional resources to a more efficient use in a new separate firm, thus creating value.

Given these observations, we believe that divisional buyouts are more likely to create excess returns after reversing.

H1₅ Target firms from divisional origin are more likely to outperform.

Public-to-Private Buyouts

Target firms that were publicly traded prior to buyout have characteristics that are already known to the public market and the public market should be able to distinguish what possible extra value that was created during the buyout. Muscarella and Vetsuypens (1989) suggest that public-to-private-to-public transactions (or secondary IPOs) have a smaller underpricing effect as the market has more publicly available information regarding firm and asset value. Given this, we form the following hypothesis;

H1₆ Target firms that were acquired through a public-to-private transaction are more likely to underperform compared to other RLBOs.

Secondary Leveraged Buyouts

In a secondary leveraged buyout or a sponsor-sponsor transaction, the buyout firm acquires the target firm from another buyout investor. These transactions have received intense public scrutiny and in particular it has been questioned whether target firms benefit from being handled around between buyout groups. Industry professionals at various investment bank leveraged finance departments that we have had discussions with also tend to raise concerns around the performance of secondary leveraged buyouts. A common concern is that the previous buyout group owners are likely to have completed a great share of the possible operating and capital structure enhancements, and thus that the up side of improvement generally is lower.

Previous research have showed that secondary leveraged buyouts on average are more leveraged, which might imply that financial engineering is an in particular important tool for buyout firms conducting these transactions. Given these discussions, we believe that reverse secondary leveraged buyouts are likely to underperform compared to other reverse leveraged buyouts.

H1₇ Target firms that were acquired from another private equity firm before reversing are more likely to underperform.

4.2.3 Buyout Firm Specific Characteristics

Club Deal Buyouts

Buyouts where the target is acquired by multiple buyout investors are also known as club deal buyouts and is a way for the buyout firms to share risk and financing. Previous research has indicated both pros and cons of club deals. Wright and Lockett (2003) indicate a possible upside in venture capital club deals where multiple sponsors contribute with different skills. However, a club deal also indicates that each buyout firm has less incentive to conduct effective monitoring and a potential freerider problem might occur. Given this discussion it is possible to assume that club deals can have either positive or negative effect on the performance of the target firm, but we form the following hypothesis;

H1₈ Target firms that were acquired by more than one buyout firm are more likely to overperform.

Repetitiveness of the Acquiring Buyout Group

A buyout firm that does a lot of public exits should be more familiar with the private-to-public mechanisms and should be keen on keeping a good reputation of quality for future IPO exits. Given this, we form the following hypothesis;

H1₉ Target firms that were acquired by a buyout firm that does more public exits are more likely to outperform.

5. DATA AND SAMPLE

5.1 The Data

This study is to our knowledge based on the largest and hitherto most up-to-date sample of US RLBOs with return data. The observation period, January 1981- March 2007, is set to depict the changing nature of the buyout industry and includes boom and bust periods, such as the rise and fall of the junk bond market, the ups and downs of the dotcom crisis and the swelling and bursting of the subprime credit bubble. No observations prior to 1981 are

included as earlier studies suggest that RLBO transactions virtually did not appear before the 1980s. The latter cut-off date is set to ensure a minimum of five years of return data for each RLBO. Our time series of return data ends in March 2012.

5.1.1 Identifying the Sample

A demanding part of research around RLBOs is the process of identifying the sample. As Cao and Lerner (2009) and von Drathen and Faleiro (2007) also have noted, it is particularly demanding because:

- Buyout groups are far more secretive than venture capital firms. They do not tend to disclose deal-information in press releases or on websites as venture capital firms usually do to attract investments. For these reasons the coverage in economic databases is far less complete for leveraged buyout backed transactions than for venture capital backed transactions.
- It has become harder to distinguish between leveraged buyout investments and venture capital investments. It is no longer uncommon that venture capital firms engage in leveraged buyout deals and the other way around and thus is not possible to classify deals by merely looking at investor names.

The RLBO dataset was collected from several sources. Per Strömberg from The Institute for Financial Research (SIFR) provided us with a sample of 1102 worldwide reverse leveraged buyouts of which 569 were US based. This sample was then compared to a less comprehensive sample collected from the database Thomson Reuters ThomsonOne Investment Banking by matching IPOs with firms that previously had been acquired through a leveraged buyout transaction.

This process worked as a first “sanity check” and if any inconsistencies could not be worked out, RLBOs were eliminated from the sample. Secondly a detailed transaction-by-transaction analysis was carried out and transactions were eliminated if we found them inscrutable. In particular, to ensure comparability with previous work such as Haulthausen and Larcker (1996) and Cao and Lerner (2009) we set up the following two criteria:

- That the transaction could be identified as backed by at least one buyout group.
- That the original transaction involved leverage. In order to eliminate transactions with

characteristics more similar to venture capital conducted by buyout groups, we screened transaction comments, searched news databases and buyout group webpages.

We also eliminated transactions where the late stage private equity firms did not wield any noteworthy control of the target firms prior to IPO. Furthermore, when conducting our performance analysis, we require that stock-returns are available in the Center for Research in Security Pricing database (CRSP). The final sample consists of 448 US RLBOs.

5.1.2 Data Collection Criticism

Although we sought to collect a comprehensive sample resembling the total population of US RLBOs during 1981-2007, our dataset might be subject to selection biases. Large transactions that attracted more media attention are possibly overrepresented, especially during the earlier years as the coverage in financial databases, such as Thomson Reuters ThomsonOne Investment Banking and Capital IQ (from which the sample mainly originates), tend to be less comprehensive in the earlier years. While we have screened for transactions resembling venture capital, there is a possibility that our final sample includes a few transactions in the grey zone between venture capital and buyout backed IPOs.

5.1.3 Supplemental Data

The benchmark sample of non-buyout backed IPOs was constructed from the Field-Ritter dataset of company founding dates, as used in Field and Karpoff (2002) and Loughran and Ritter (2004)¹, which includes 8861 IPOs with primary listing in US during the observation period 1981-2007. From this initial sample we eliminate Real Estate Investment Trusts, Close-end funds and late stage private equity backed IPOs in line with previous research. Furthermore, when conducting our performance analysis, we require that stock-returns are available in the CRSP database. The final benchmark sample includes 7804 IPOs. In addition to the benchmark sample, we use several public equity indices in this study, which we collect from the CRSP database.

For the cross-sectional analysis we require some RLBO transaction and buyout group specific

¹ Further details about the data can be found in Appendix A of the Loughran-Ritter article.

information. Descriptive statistics of the data used can be found in section 7.

6. METHODOLOGY

6.1 Procedure for the Long-Run Performance Analysis

To ensure comparability with previous research, we use similar methods as Holthausen and Larcker (1996) and Cao and Lerner (2009). Stock performance following the IPOs are calculated both in event-time and calendar-time and we use return measurements such as raw (unadjusted) buy-and-hold returns, marked adjusted buy-and-hold abnormal returns, and alphas from the three factor Fama and French model to investigate stock performance following the IPOs.

To gain a deeper understanding of the performance of reverse LBOs and change in performance patterns over time we divide the whole sample of RLBOs and benchmark IPOs into subsamples based on time periods. Cao and Lerner (2009) divide their whole sample into two time period subsamples, 1981-1995 and 1996-2003, and to ensure comparability we divide our subsample into the same time periods plus the last time period subsample of 2004-2007. As Cao and Lerner find that reverse LBO performance seems to deteriorate in the second subsample compared to the first, we find it essential to cover the same time periods and to see if this trend holds for our last time period subsample.

6.1.1 Procedure for the Event-Time Analysis

The event time analysis is based on buy-and-hold returns including dividends ending 12, 24, 36, 48, and 60 months after the initial public offering date. The buy-and-hold raw return (BHR) is computed using the following formula:

$$BHR = \left(\frac{S_{i,T=t}}{S_{i,T=0}} \right) - 1$$

where S is the stock price (including distributions) at time t over the first closing stock price after initial public offering ($t=0$).

If a stock is delisted, the buy-and-hold return is calculated from the available trading days only. The buy-and-hold abnormal returns (BHAR) relative to the value weighted (VW) market and equally weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index and the S&P 500 composite index. The buy-and-hold abnormal return is computed as follows:

$$BHAR = BHR - \left[\left(\frac{I_{i,T=t}}{I_{i,T=0}} \right) - 1 \right]$$

Where I is the benchmark index (including distributions) at time t over the benchmark index at the time of the matching initial public offering ($t=0$).

The use of buy-and-hold returns as a measure for long-run stock performance is a commonly used method in studies on IPO performance, advocated by Ritter (1991) and Loughran and Ritter (1995) and also used in previous studies on RLBO performance, such as Cao and Lerner (2009) and Holthausen and Larcker (1996). The buy-and-hold returns are controlled by a two-tailed parametric t-test (difference from zero). The parametric t-test is also complemented with a nonparametric generalized sign test as it does not hold the same assumptions about the probability distribution of the returns (Cowan, 1992). The difference in buy-and-hold abnormal returns relative to the value-weighted market between the RLBO sample and the non-buyout-backed IPO sample is tested with a two-sample, two-tailed t-test, assuming unequal variances, for the 36-month and 60-month holding periods.

6.1.2 Procedure for the Calendar-Time Analysis

While the measuring of long-run stock performance through buy-and-hold returns is widely used by practitioners conducting long-term event studies, a few problems have been identified. Barber and Lyon (1997) suggest measurement problems when finding the true population mean with buy-and-hold return tests as they are unable to address the impact of positive skewness on the test statistics. To address the problem of event-time buy-and-hold returns, Cao and Lerner (2009) suggest a complementary calendar-time approach, which we also use in our study.

In this approach, each stock is credited to a calendar-date portfolio if the calendar date matches the chosen period. The portfolio returns are measured as the mean of stock returns each calendar month through the Fama and French (1993) three-factor model relative to the value weighted market index. The returns are computed as average monthly returns of a three year and five year period. The regression uses the Fama-French three-factor model;

$$R_p - R_f = \alpha + \beta (R_m - R_f) + sSMB + hHML + \epsilon_p,$$

where R_p is the portfolio return, R_f is the one-month Treasury bill rate, α is the abnormal return, β is the beta, R_m is the value weighted NYSE/AMEX/Nasdaq market index return, SMB is the small minus big market capitalization factor, HML is the high minus low book-to-market factor and ϵ_p is a random variable that must have an expected value of zero.

Regression is controlled by OLS and heteroskedasticity t-test statistics.

6.2 Procedure for the Cross-Sectional Analysis

6.2.1 Procedure for the Cross-Sectional Event-Time Analysis

The cross-sectional event-time analysis is also based on the buy-and-hold abnormal return measure (described in section 6.1.1). We divide the whole sample of 448 reverse leveraged buyouts into the subsamples; 35 secondary LBOs versus 413 non-secondary LBOs, 124 divisional LBOs versus 324 non-divisional LBOs, 35 public-to-private LBOs versus 413 private-to-private LBOs, 52 quick-flip LBOs (holding period less or equal to 12 months) versus 396 LBOs with a holding period longer than 12 months, 219 LBOs with a holding period below median versus 229 LBOs equal to or above the median holding period and 314 LBOs with single LBO investors and 134 LBOs with multiple LBO investors.

The mean returns are computed ending 36 and 60 months after the initial public offering date. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index and the S&P 500 composite index. The returns are controlled by a two-tailed t-test and the differences between the subsamples are tested with two-sample, two-tailed t-tests, assuming unequal variances.

6.2.2 Procedure for the Multiple Regression Analysis

Dependent and independent variables

The multiple regressions use three-year buy-and-hold abnormal returns relative to the value-weighted market, adjusted by excess returns on the NYSE/AMEX/Nasdaq market index, set as the dependent variable. The independent variables are set as:

<i>Holding Period</i>	The natural logarithm of the holding period in months (LBO-IPO).
<i>Quick-flip (Dummy)</i>	If the target was held by the buyout firm for no longer than 12 months it is consider a quick-flip RLBO.
<i>Divisional (Dummy)</i>	If the target was acquired as a carve-out from a larger company.
<i>Public-to-private (Dummy)</i>	If the target was publicly traded when acquired by the buyout firm.
<i>Secondary LBO (Dummy)</i>	If the target firms that was acquired from another buyout firm before reversing.
<i>Club-deal (Dummy)</i>	If the target was acquired by a multiple set of buyout investors if the target was acquired by a multiple set of buyout investors
<i>Buyout firm reputation</i>	One plus the number of RLBO transactions at RLBO date. Demiroglu and James (2010) recommends that one way to estimate the reputation of the buyout group is to calculate one plus the natural logarithm of the total number of transactions conducted by the group. We have used one plus the natural logarithm of the number of transactions conducted by the buyout firm within the sample as this reflects whether the buyout firm is a repetitive player in the IPO market or not. In transactions where there are more

than one buyout group involved, the buyout firm with most transactions within the sample was used.

The estimates are controlled by a two-tailed t-test. The regression is done on the whole 1981-2007 sample and on the time period subsamples of 1981-1995, 1996-2003, and 2004-2007. Prior to running the multiple regression, we conduct various statistical tests on the data. In particular we test for multicollinearity by calculating the correlation between the explanatory variables (presented in Appendix 1). No explanatory variables were excluded due to multicollinearity but it can be noted that the correlation between the natural logarithm of the holding period and the quick-flip dummy for obvious reasons is high (0,623). Independent and depended outliers are identified but not excluded.

Yearly Effects

Previous studies have indicated that the relative long-term performance of IPOs differs over time. In line with Cao and Lerner (2009), we control for this using year fixed effects (time-dummies) and present the multiple regression with and without year fixed effects.

7. DESCRIPTIVE STATISTICS AND DISTRIBUTION ANALYSIS

In this section we present general characteristics of the data used in the long-run performance analysis and the cross-sectional performance analysis. While this section primarily seeks to depict the dataset used in the analysis, it also displays valuable new descriptive statistics on reverse leveraged buyout deals.

7.1 General Data Description

In table 7.1, we present the yearly distribution of the dataset. Two in particular important patterns emerge from the table: (1) RBLO activity increased significantly during the 1990s and 2000s; and (2) while the RLBO activity relative to other IPO activity remained low during the 1990s, it increased considerably during the 2000s reaching yearly ratios in the high 20s for some years. The table also highlights that most RLBO activity in our sample took place during the mega boom period of the 2000s (described in section 2).

Table 7.1

Distribution of the three-year buy-and-hold raw returns for 448 reverse leveraged buyouts (RLBOs) between January 1981 and March 2007. Sample distribution by cohort year. Columns two and three show the number of reverse leveraged buyouts and leveraged buyouts in each year. Column four presents the number of initial public offerings for each year, after elimination of Real Estate Investment Trusts, Close-end funds and reverse leveraged buyouts. Columns five and six presents the ratio of reverse leveraged buyouts to the number of leveraged buyouts and initial public offerings. Column seven presents each year's annual number of reverse leveraged buyouts to the total in sample amount of reverse leveraged buyouts. Finally, column eight show each year's annual number of IPOs to the total in sample number of IPOs. The data of the number of leveraged buyouts is subtracted from the Thomson Reuters ThomsonOne Investment Banking database.

Year	RLBOs	LBOs	IPOs	RLBOs/LBOs (number)	RLBOs/IPOs (number)	Annual RLBOs/Total RLBOs (number)	Annual LBOs/Total LBOs (number)	Annual IPOs/Total IPOs (number)
1981	4	14	181	28,57%	2,21%	0,89%	0,07%	2,32%
1982	0	21	74	0	0	0	0,11	0,01
1983	2	62	551	3,23	0,36	0,45	0,31	7,06
1984	5	120	232	4,17	2,16	1,12	0,61	2,97
1985	3	168	244	1,79	1,23	0,67	0,85	3,13
1986	8	276	535	2,90	1,50	1,79	1,40	6,86
1987	7	304	401	2,30	1,75	1,56	1,54	5,14
1988	2	445	163	0,45	1,23	0,45	2,26	2,09
1989	3	477	160	0,63	1,88	0,67	2,42	2,05
1990	4	406	140	0,99	2,86	0,89	2,06	1,79
1991	20	627	312	3,19	6,41	4,46	3,18	4,00
1992	24	677	441	3,55	5,44	5,36	3,43	5,65
1993	28	550	541	5,09	5,18	6,25	2,79	6,93
1994	16	569	456	2,81	3,51	3,57	2,89	5,84
1995	30	665	480	4,51	6,25	6,70	3,37	6,15
1996	33	652	654	5,06	5,05	7,37	3,31	8,38
1997	25	758	448	3,30	5,58	5,58	3,84	5,74
1998	15	818	296	1,83	5,07	3,35	4,15	3,79
1999	34	1160	454	2,93	7,49	7,59	5,88	5,82
2000	27	1284	360	2,10	7,50	6,03	6,51	4,61
2001	17	1034	66	1,64	25,76	3,79	5,24	0,85
2002	16	908	56	1,76	28,57	3,57	4,60	0,72
2003	8	1015	64	0,79	12,50	1,79	5,15	0,82
2004	32	1244	155	2,57	20,65	7,14	6,31	1,99
2005	39	1582	149	2,47	26,17	8,71	8,02	1,91
2006	41	1952	151	2,10	27,15	9,15	9,90	1,93
2007	5	1931	40	0,26	12,50	1,12	9,79	0,51
Total/mean	448	19719	7804	2,32%	8,29%	3,67%	3,70%	3,58%

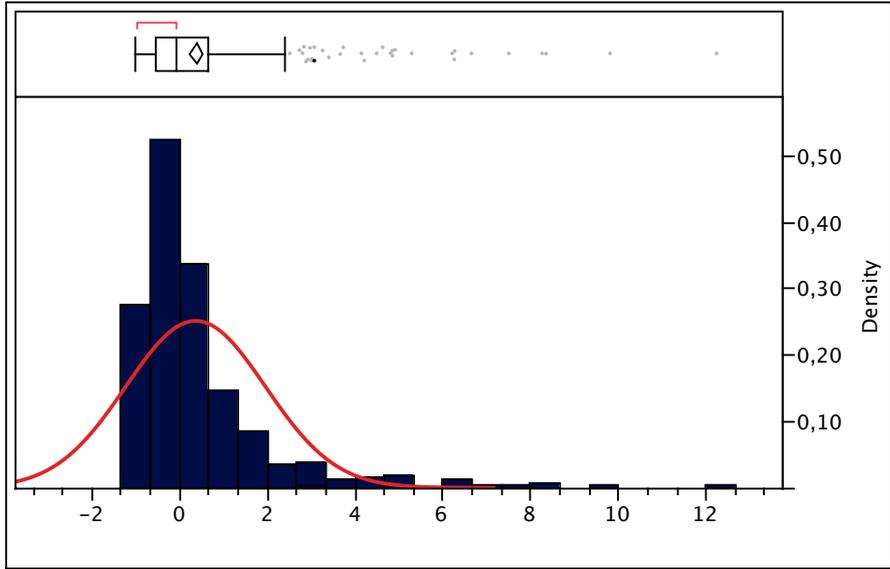
While a great number of different buyout groups are represented in the RLBO sample, the majority of the RLBOs were completed by major buyout groups such as Blackstone, Kohlberg Kravis Roberts (KKR), TPG Capital, Goldman Sachs Capital Partners, The Carlyle Group, Apollo Management, Bain Capital, First Reserve Corporation and Warburg Pincus.

7.2 RLBO Performance Distribution Characteristics

Holthausen and Larcker (1996) and Cao and Lerner (2009) show large cross-sectional variances in RLBO performance. In line with Cao and Lerner, we perform several tests to increase the understanding of the cross-sectional RLBO performance distribution. Using a Shapiro-Wilk W test we analyse whether RLBOs follow normal distribution by studying the three-year return after IPO for each transaction. From the test, we reject the null hypothesis, suggesting that RLBOs do not fit the normal distribution and from further tests we conclude significant skewness and kurtosis. The findings are in line with Cao and Lerner (2009). The distribution is illustrated in figure 7.1. The line displays the fitted normal distribution and the histogram bars illustrate the actual three-year buy-and hold return distribution. In line with Cao and Lerner (2009) we find a major cluster of RLBOs with negative returns near -1 and at the right the distribution display a fat tail with some extremely well performing transactions. The skewed distribution suggests that a relatively small cluster of transactions with extraordinary performance have a noteworthy influence on the distribution.

These findings indicates that our sample is characterized by the kind of positive skewness in measuring buy-and-hold returns described by Barber and Lyon (1997).

Figure 7.1
Distribution of three-year RLBO raw buy-and-hold returns.

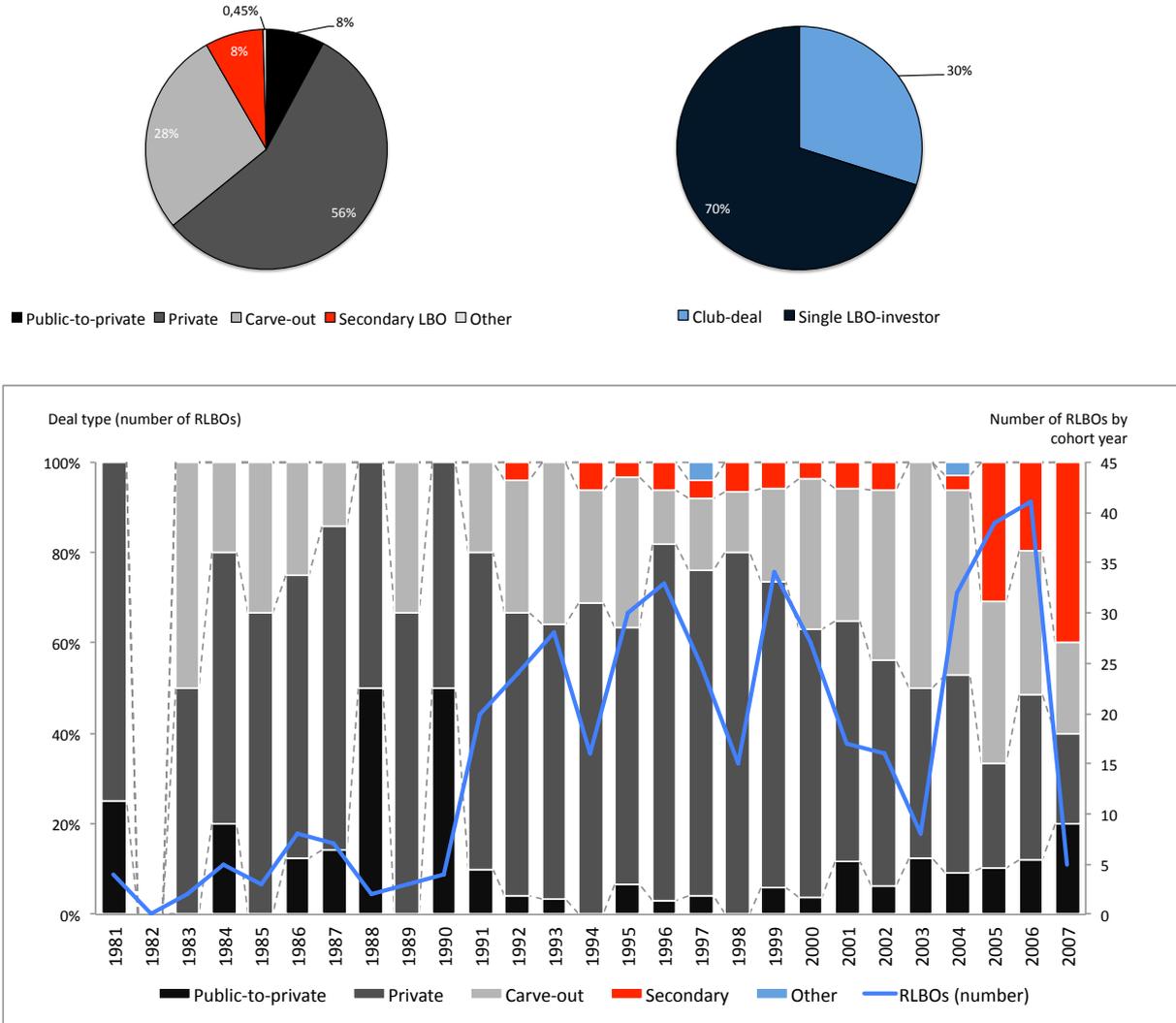


Mean	Median	Standard deviation	Skewness	Kurtosis	Normal distribution fit-test
42,52	-9,31	159,15	3,16***	13,98***	<,0001

7.3 Data Description for the Cross-Sectional Analysis

The pie chart to the right in figure 7.2 displays the mixture between private company buyouts, public-to-private buyouts, carve-outs/divisional buyouts and secondary leveraged buyouts within our RLBO sample. During the whole observation period, 56% of the LBOs that reversed were private firm transactions, 28% carve-outs/divisional transactions, 8% public-to-private transactions and 8% secondary leveraged buyouts transactions. In the pie chart to the left in figure 7.2 we show that 30% of all RLBOs within our sample were club-deals i.e they were backed by more than one buyout group.

Figure 7.2
 The pie chart to the left displays the in sample mixture between public-to-private, private, carve-out, secondary leverage buyout transactions. In the right pie chart we display the mixture between club-deals and single LBO-investor investments. The graph below displays how deal consumption have changed over time.



In the bar chart we display the cohort year deal-type distribution within our RLBO sample. Overall, the change in LBO-firm consumption within our sample overtime seems to reflect the general development of the US leveraged buyout market described in section 2. In line with the observations of Kaplan and Strömberg (2009), our RLBO sample indicates that secondary leveraged buyout deals increased in popularity significantly during the late 1990s and the 2000s. In figure 7.2 we show that almost 70 % of all secondary reverse leveraged buyout activity in our sample took place between 2004-2007.

Figure 7.3 and 7.4 provides information on RLBO holding periods. The median holding period for RLBOs in our sample is 33 months and the mean is 42.60 months. Figure 7.3 displays the distribution of holding periods within the RLBO sample. Two patterns in particular emerge from the graph: (1) there is a major clustering of RLBOs with holding periods between 12-24 months; (2) the distribution of holding period is wide with a few RLBOs with very long holding periods.

Figure 7.3
Distribution of holding period within RLBO sample.

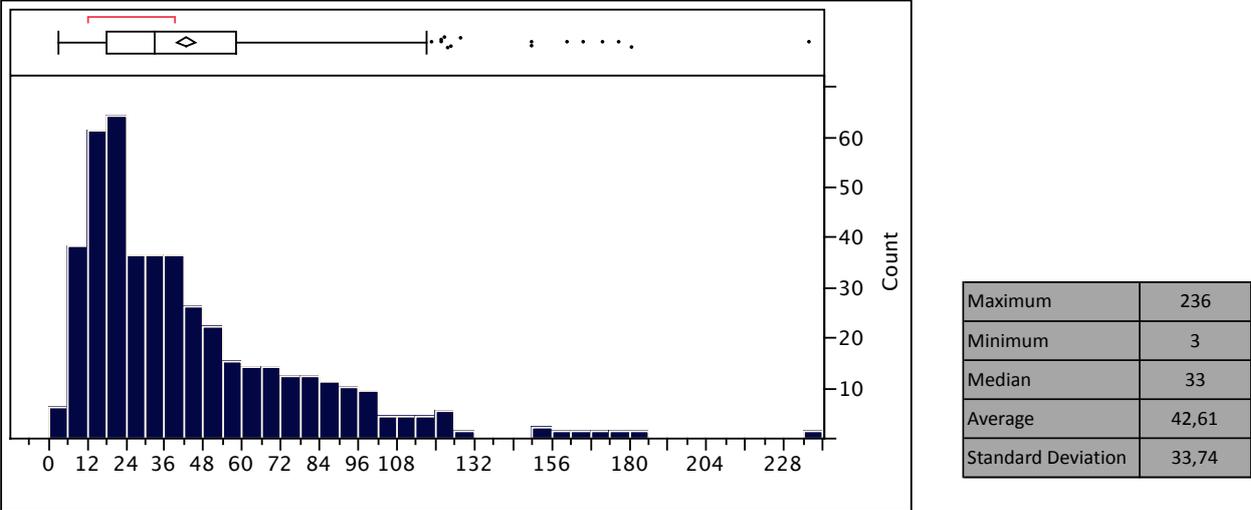
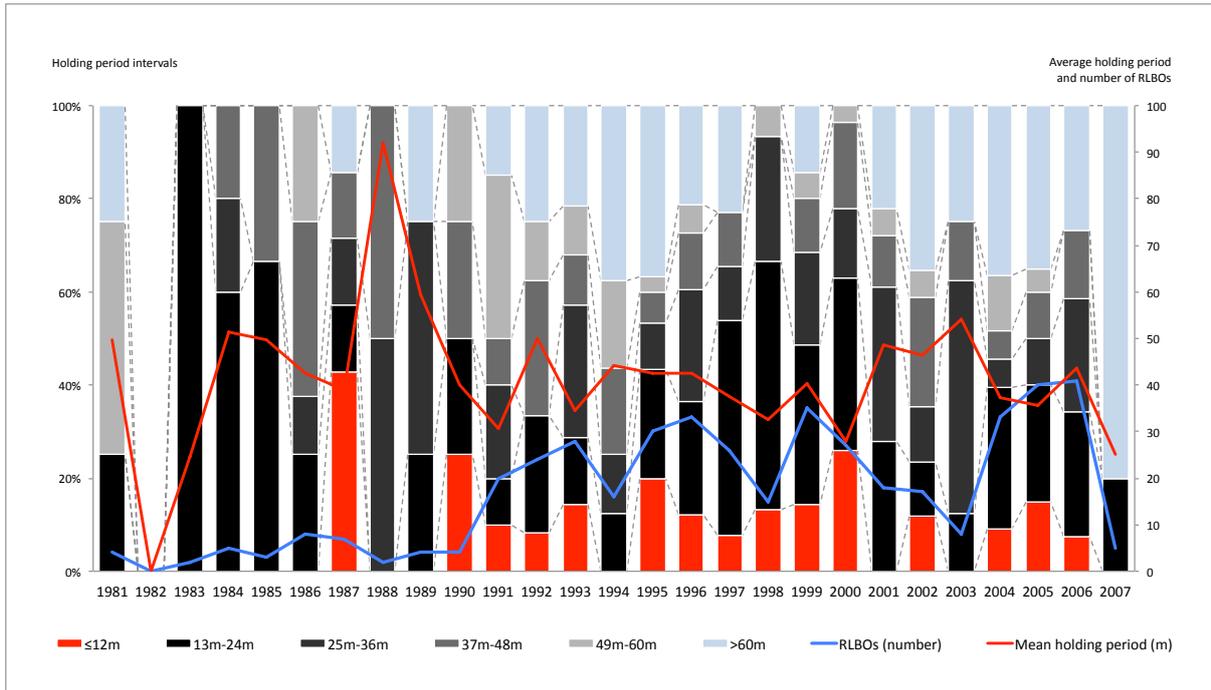


Figure 7.4 show how RLBO holding periods have changed over time. In our RLBO sample we find no evidence of considerably deteriorating holding periods over time. The yearly cohort share of quick-flip transactions i.e LBOs with less or equal to 12 months holding period does not change considerably over time.

Figure 7.4
 Distribution of holding period intervals and change in average holding period over time.



8. RESULTS AND ANALYSIS LONG-RUN PERFORMANCE

In this section, we seek to investigate the research question; *Does long-run value creation still follow late stage private equity backed IPOs as previous research has indicated?*

For further details of the methods used in this section, see section 6.1.

8.1 Event-Time Analysis

8.1.1 Whole Sample Event-Time Analysis

Table 8.1 shows the event-time stock performance of the whole sample of 448 reverse LBOs and 7804 non-buyout-backed IPOs between January 1981 and March 2007. The buy-and-hold return is calculated for the holding periods 12, 24, 36, 48, and 60 months following the first closing price of the initial public offerings. The RLBO sample produces an unadjusted mean raw buy-and-hold return of 17,96% for the first year post IPO, 42,52% after 3 years and 56,92% after 5 years. The unadjusted RLBO raw buy-and-hold return show significant t-test p-values at the 0,01% level for all holding periods and a significant generalized sign test at the 5% level for the 12 month holding period. The RLBO buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market show positive means almost exclusively but the results lacks statistical significance. Relative to the S&P 500 composite index the RLBO buy-and-hold abnormal returns produce a positive mean of 17,6% 3 years after IPO with significant t-test statistics. The market adjusted buy-and-hold returns have negative medians with high generalized sign test significance levels indicating that the majority of returns perform poorly relative to benchmark indices. In line with our findings in section 7.2 the results indicate that a limited number of RLBOs outperform considerably and raise the mean return.

Table 8.1

Event-time stock performance. The sample consists of 448 reverse leveraged buyouts (RLBOs) and 7804 non-buyout-backed IPOs between January 1981 and March 2007. The returns are computed ending 12, 24, 36, 48, and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index and the S&P 500 composite index. The two-tailed significance levels reported in parentheses below the means are based on t-tests, and the symbols (<, <<, <<< or >, >>, >>>) show the direction and two-tailed significance of the generalized sign test at the 10%, 5%, 1%, and 0,1% levels, respectively. The last row denote the difference between the RLBO and the non-buyout-backed samples' BHAR relative to the value-weighted market in a two-tailed, two-sample t-test assuming unequal variances, and the symbols \$, *, **, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Whole sample	12 months		24 months		36 months		48 months		60 months	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
RLBOs										
Buy-and-hold raw return	17,96 (<,001)	8,52 >	25,44 (<,001)	4,43	42,52 (<,001)	-9,31	45,81 (<,001)	-12,83	56,92 (<,001)	-0,35
BHAR relative to the VW market	5,15 (0,256)	-2,98	2,15 (0,732)	-20,64 <<<	11,03 (0,15)	-27,56 <<<	4,17 (0,636)	-29,89 <<<	4,1 (0,677)	-36,22 <<<
BHAR relative to the EW market	3,92 (0,357)	-4,97	0,04 (0,995)	-25,41 <<	8,07 (0,261)	-30,22 <<<	-2,68 (0,746)	-45,28 <<<	-8,51 (0,356)	-52,24 <<<
BHAR relative to S&P 500	7,54 (0,124)	-0,46	6,64 (0,329)	-14,65 <<	17,6 (0,033)	-20,75 <<<	13,15 (0,167)	-21,11 <<<	16,22 (0,127)	-24,19 <<<
Non-buyout-backed IPOs										
Buy-and-hold raw return	6,3 (0,301)	-9,09 <<	14,42 (0,088)	-18,39 <<<	19,33 (0,06)	-26,5 <<<	26,8 (0,024)	-31,63 <<<	33,53 (0,011)	-34,83 <<<
BHAR relative to the VW market	-7,34 (0,249)	-21,61 <<<	-14,39 (0,104)	-45,67 <<<	-24,71 (0,022)	-62,86 <<<	-31,72 (0,01)	-75,29 <<<	-36,29 (0,009)	-83,23 <<<
BHAR relative to the EW market	-4,73 (0,373)	-18,66 <<<	-9,55 (0,194)	-40,06 <<<	-15,52 (0,083)	-58,46 <<<	-21,1 (0,041)	-72,48 <<<	-25,92 (0,024)	-83,98 <<<
BHAR relative to S&P 500	-5,58 (0,386)	-19,49 <<<	-10,37 (0,245)	-41,2 <<<	-18,85 (0,083)	-57,04 <<<	-23,57 (0,059)	-66,72 <<<	-25,57 (0,067)	-73,94 <<<
Significant difference VW	n/a		n/a		***		n/a		***	

The benchmark sample of 7804 non-buyout backed IPOs consistently produce lower returns than the RLBO sample. Three year after IPO, the non-buyout backed IPO sample yields a mean raw buy-and-hold return of 19,33% increasing to 33,53% after five years at the significant t-test levels of 10% and 5% levels respectively. The mean and median returns relative to indices are negative throughout all holding periods.

During the whole observation period, reverse leveraged buyouts seems to outperform non-buyout-backed IPOs. For the 36-month and 60-month holding periods relative to the value-weighted market, the difference is controlled using a two-sample t-test, confirming that RLBOs outperform non-buyout-backed IPOs with 0,01% statistical significance.

8.1.2 Time Period Subsample Event-Time Analysis

We have divided our whole sample of reverse LBOs and non-buyout-backed IPOs into three different time period subsamples; January 1981 – December 1995 with 156 RLBOs and 4913 non-buyout-backed IPOs, January 1996 – December 2003 with 175 RLBOs and 2397 non-buyout-backed IPOs, January 2004 – March 2007 117 RLBOs and 494 non-buyout-backed IPOs.

Table 8.2 reports the subsample of 156 reverse LBOs and 4913 non-buyout-backed IPOs between January 1981 and December 1995. In line with Cao and Lerner (2009) we find that RLBOs outperform non-buyout-backed IPOs and the market significantly during this time period.

Table 8.2

Event-time stock performance. The subsample consists of 156 reverse leveraged buyouts (RLBOs) and 4913 non-buyout-backed IPOs between January 1981 and December 1995. The returns are computed ending 12, 24, 36, 48, and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index and the S&P 500 composite index. The two-tailed significance levels reported in parentheses below the means are based on t-tests, and the symbols (<,<<,<<< or),>,>>,>>> show the direction and two-tailed significance of the generalized sign test at the 10%, 5%, 1%, and 0.1% levels, respectively. The last row denote the difference between the RLBO and the non-buyout-backed samples' BHAR relative to the value-weighted market in a two-tailed, two-sample t-test assuming unequal variances, and the symbols \$,*,**, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Subsample 1981-1995	12 months		24 months		36 months		48 months		60 months	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
RLBOs (N=156)										
Buy-and-hold raw return	28,22 (<,001)	13,82 >	62,44 (<,001)	25,14 >>>	87,18 (<,001)	27,32 >	97,64 (<,001)	30,04 >	127,79 (<,001)	39,74 >
BHAR relative to the VW market	12,77 (0,055)	3,88	26,4 (0,004)	-10,94	31,01 (0,006)	-22,15	12,77 (0,323)	-45,75 <	14,5 (0,315)	-53,35 <<
BHAR relative to the EW market	10,87 (0,065)	-1,07	25,09 (0,002)	-8,54	36,28 (<,001)	-11,92	28,47 (0,013)	-34,06	34,78 (0,006)	-42,68 (
BHAR relative to S&P 500	15,67 (0,025)	4,57	32,02 (<,001)	-7,02	37,96 (0,001)	-16,82	21,48 (0,113)	-34,2 <	27,15 (0,073)	-52,39 <<
Non-buyout-backed IPOs (N=4913)										
Buy-and-hold raw return	8,45 (0,384)	-5,01	20,57 (0,127)	-8,82	27,34 (0,095)	-12,77	37,45 (0,047)	-17,81 <<	53,44 (0,011)	-21,25 <<
BHAR relative to the VW market	-4,7 (0,632)	-16,61 <<<	-11,77 (0,387)	-38,43 <<<	-26,05 (0,116)	-63,03 <<<	-38,3 (0,044)	-87,99 <<<	-42,57 (0,045)	-107 <<<
BHAR relative to the EW market	-2,18 (0,827)	-13,47 <<<	-6,53 (0,637)	-32,68 <<<	-12,27 (0,466)	-49,52 <<<	-15,77 (0,416)	-63,34 <<<	-13,72 (0,526)	-78,4 <<<
BHAR relative to S&P 500	-2,22 (0,816)	-14,18 <<<	-6,08 (0,646)	-32,4 <<<	-18,3 (0,255)	-54,6 <<<	-28,43 (0,125)	-76,7 <<<	-29,44 (0,154)	-93,82 <<<
Significant difference VW	n/a		n/a		***		n/a		***	

The buy-and-hold raw returns for reverse LBOs have positive means and medians for all holding periods and the results show statistical significance using both the t-test and the generalized sign test. RLBO return relative to indices has positive means for all holding periods but negative medians for longer holding periods. The buy-and-hold raw return for non-buyout-backed IPOs show positive means but negative medians throughout all holding periods. The non-buyout-backed IPO BHAR relative to indices has negative means and medians for all holding periods.

Table 8.3 reports the subsample of 175 reverse LBOs and 2397 non-buyout-backed IPOs between January 1996 and December 2003. This subsample of RLBOs does not show as good performance as the 1981-1995 subsample indicating a deterioration of the performance, confirming the trend of declining long-term RLBO returns that Cao and Lerner (2009) observed. Three and five years after IPO, RLBOs still significantly outperform other IPOs.

Table 8.3

Event-time stock performance. The subsample consists of 175 reverse leveraged buyouts (RLBOs) and 2397 non-buyout-backed IPOs between January 1996 and December 2003. The returns are computed ending 12, 24, 36, 48, and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index and the S&P 500 composite index. The two-tailed significance levels reported in parentheses below the means are based on t-tests, and the symbols (<, <<, <<< or >, >>, >>>) show the direction and two-tailed significance of the generalized sign test at the 10%, 5%, 1%, and 0.1% levels, respectively. The last row denote the difference between the RLBO and the non-buyout-backed samples' BHAR relative to the value-weighted market in a two-tailed, two-sample t-test assuming unequal variances, and the symbols \$, *, **, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Subsample 1996-2003	12 months		24 months		36 months		48 months		60 months	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
RLBOs (N=175)										
Buy-and-hold raw return	6,44 (0,318)	-8,68	-0,73 (0,935)	-24,76 <	27,94 (0,01)	-27,27 <<	31,15 (0,013)	-25,82 (	26,53 (0,058)	-17,79
BHAR relative to the VW market	-3,48 (0,606)	-16,37	-18,11 (0,052)	-34,98 <<<	4 (0,725)	-46,1 <<<	2,13 (0,871)	-36,7 <<<	-1,6 (0,913)	-41,03 <<<
BHAR relative to the EW market	-4,88 (0,475)	-15,01 (	-24,21 (0,011)	-50,59 <<<	-10,07 (0,382)	-65,8 <<<	-27,84 (0,036)	-80,44 <<<	-46,35 (0,002)	-75,52 <<<
BHAR relative to S&P 500	-2,78 (0,668)	-14,46 (	-16,55 (0,065)	-33,51 <<<	7,93 (0,467)	-39,52 <<	9,57 (0,446)	-26,97 <<	8,43 (0,548)	-29,98 <<
Non-buyout-backed IPOs (N=2397)										
Buy-and-hold raw return	0,02 (0,998)	-24 <<<	2,49 (0,79)	-45,24 <<<	5,33 (0,638)	-54,3 <<<	10,35 (0,428)	-59,72 <<<	-1,03 (0,944)	-63,39 <<<
BHAR relative to the VW market	-14,85 (0,045)	-41,15 <<<	-22,57 (0,028)	-63,17 <<<	-26,47 (0,034)	-67,11 <<<	-23,74 (0,099)	-71,49 <<<	-30,02 (0,062)	-73,71 <<<
BHAR relative to the EW market	-11,67 (0,040)	-34,54 <<<	-18,11 (0,022)	-64,73 <<<	-25,16 (0,009)	-81,57 <<<	-34,96 (0,002)	-95,95 <<<	-53,9 (<,001)	-100,2 <<<
BHAR relative to S&P 500	-15,07 (0,05)	-42,23 <<<	-22,66 (0,033)	-62,56 <<<	-25,38 (0,05)	-64 <<<	-19,98 (0,18)	-65,83 <<<	-25 (0,133)	-67,87 <<<
Significant difference VW	n/a		n/a		*		n/a		*	

The RLBO buy-and-hold raw returns have a positive mean of 27,94% three years after IPO and 26,53% five years after IPO with 1% and 10% significant t-test levels respectively. The medians are negative throughout all holding periods. The non-buyout-backed IPOs have lower returns compared with RLBOs for most holding periods throughout the sample. The difference between the RLBO sample and the non-buyout-backed IPO sample for the BHAR relative to the value-weighted market is statistical significant at the 5% level for 36-month and 60-month holding periods. This suggests that even though RLBO performance declined in this period compared to the 1981-1995 subsample, RLBOs between 1996-2003 still outperformed non-buyout-backed IPOs.

Table 8.4 reports the subsample of 117 RLBOs and 494 non-buyout-backed IPOs between January 2004 and March 2007. The trend of deterioration in RLBO performance observed in the 1996-2003 subsample continued into the 2004-2007 RLBO subsample. In this final time period, RLBOs does not significantly outperform (nor underperform) other IPOs. Relative to the market indices, we observe no statistical significant over- or underperformance.

Table 8.4

Event-time stock performance. The subsample consists of 117 reverse leveraged buyouts (RLBOs) and 494 non-buyout-backed IPOs between January 2004 and March 2007. The returns are computed ending 12, 24, 36, 48, and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index and the S&P 500 composite index. The two-tailed significance levels reported in parentheses below the means are based on t-tests, and the symbols (<, <<, <<< or >, >>, >>>) show the direction and two-tailed significance of the generalized sign test at the 10%, 5%, 1%, and 0.1% levels, respectively. The last row denote the difference between the RLBO and the non-buyout-backed samples' BHAR relative to the value-weighted market in a two-tailed, two-sample t-test assuming unequal variances, and the symbols \$, *, **, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Subsample 2004-2007	12 months		24 months		36 months		48 months		60 months	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
RLBOs (N=117)										
Buy-and-hold raw return	21,52 (0,18)	18,22 >	15,26 (0,493)	13,16	4,79 (0,859)	-9,44	-1,36 (0,965)	-26,35 <<	7,88 (0,821)	-8,96
BHAR relative to the VW market	7,9 (0,621)	3,16	0,14 (0,995)	-1,67	-5,08 (0,85)	-16,62 <	-4,24 (0,891)	-23,06 <	-1,23 (0,972)	-19,1
BHAR relative to the EW market	7,83 (0,621)	3,81	2,91 (0,894)	-4,31	-2,38 (0,929)	-14,37 (	-6,58 (0,83)	-25,15 <	-9,62 (0,779)	-24,09
BHAR relative to S&P 500	12,14 (0,453)	8,65	7,5 (0,738)	0,78	4,93 (0,857)	-2,53	7,41 (0,814)	-9,92 (	13,3 (0,704)	-2,6
Non-buyout-backed IPOs (N=494)										
Buy-and-hold raw return	15,4 (<,001)	4,14)	11,18 (0,081)	-11,48	7,69 (0,324)	-22,26 <<<	0,62 (0,945)	-33,33 <<<	3,23 (0,746)	-33,88 <<<
BHAR relative to the VW market	2,89 (0,427)	-6,35	-0,68 (0,893)	-18,83 <<<	-2,86 (0,642)	-27,6 <<<	-4,88 (0,49)	-36,59 <<<	-4,22 (0,592)	-42,09 <<<
BHAR relative to the EW market	3,55 (0,352)	-7,24	1,94 (0,714)	-14,12 <<	-1,05 (0,871)	-26,03 <<<	-6,88 (0,353)	-42,14 <<<	-11,47 (0,165)	-49,75 <<<
BHAR relative to S&P 500	7,07 (0,053)	-2,97	6,57 (0,193)	-14,78 <	7,36 (0,231)	-19,46 <	7,36 (0,298)	-23,81 <<<	10,06 (0,203)	-26,94 <<
Significant difference VW	n/a		n/a		n/a					

While there is no significant difference between RLBO and non-buyout-backed performance, the non-buyout-backed IPOs have considerably much lower medians across all holding periods. This suggests that RLBO performance has drifted towards other IPOs but that there is a larger spread in the non-buyout-backed returns.

8.1.3 Event-Time Yearly Cohorts

In order to investigate the changing performance patterns over time in more detail, we divide our whole sample of reverse LBOs and non-buyout-backed IPOs into yearly cohorts. Table 8.5 reports the three-year event-time stock performance of reverse leveraged buyouts and non-buyout-backed IPOs divided into yearly cohorts². This table demonstrates the performance patterns of reverse LBOs and other IPOs. The pattern shows that, on average, reverse LBOs perform better than other IPOs although some yearly cohorts deviate from this picture.

Table 8.5

Event-time stock performance. The sample consists of 448 reverse leveraged buyouts (RLBOs) and 7804 non-buyout-backed (N-B-B) IPOs between January 1981 and March 2007. The returns are computed ending 36 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Year	Number of RLBOs	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR	Number of N-B-B IPOs	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR
1981	4	185,02	140,13	149,44	181	6,17	-43,79	-33,16
1982	0				74	42,04	-32,88	-31,34
1983	2	6,78	-11,70	-53,54	551	22,60	-1,23	-33,94
1984	5	51,92	2,43	-30,51	232	72,52	27,77	-9,97
1985	3	127,64	111,93	89,46	243	4,66	-22,13	-45,86
1986	8	27,94	13,08	-12,03	538	8,19	-7,90	-31,75
1987	7	160,85	169,04	144,12	401	-11,68	-6,82	-31,14
1988	2	327,32	310,34	280,57	164	27,89	8,19	-20,92
1989	3	91,65	48,76	46,79	160	45,51	11,53	7,37
1990	4	119,18	29,76	63,55	140	33,10	-42,91	-14,34
1991	20	48,85	-28,27	12,40	312	29,78	-39,10	-3,54
1992	24	72,29	22,95	38,77	441	32,16	-21,83	-6,53
1993	28	119,13	63,38	66,21	540	36,62	-14,43	-16,24
1994	16	103,53	48,37	26,32	456	67,41	7,56	-16,36
1995	30	58,10	2,21	-36,36	480	19,74	-32,32	-69,70
1996	33	0,32	-31,38	-80,63	654	29,89	-4,45	-53,76
1997	25	196,29	151,56	129,82	448	49,40	10,61	-12,42
1998	15	-1,41	-21,38	-19,14	296	17,55	-7,53	-0,10
1999	34	-37,41	-57,57	-18,43	454	-44,98	-65,36	-31,38
2000	27	-32,91	-47,57	-5,19	359	-60,19	-68,39	-31,89
2001	17	28,88	-43,79	22,16	66	18,70	-51,48	14,73
2002	16	106,12	20,82	75,45	56	77,24	-8,84	44,98
2003	8	-4,49	-67,84	-51,86	64	37,29	-28,25	-7,63
2004	32	56,27	12,21	14,11	155	44,52	-1,82	0,48
2005	39	6,09	-1,77	-10,50	148	14,27	13,19	3,52
2006	41	-28,53	-7,54	-9,36	151	-27,63	-10,08	-10,42
2007	5	-61,56	-58,22	-50,59	40	-26,10	-16,63	-10,79
Average	17	66,46	29,61	30,04	289	20,99	-16,64	-16,74

² The full sample of RLBO and non-buyout-backed IPO returns ending 1-5 year holding periods are presented in appendix 2-5.

The high peaks of RLBO returns can be seen in firms that went public in the mid 1980's and early 1990's with mean raw buy-and-hold returns of over 100% three years after the initial public offering. Honing in on the offerings that took place during the dot-com bubble's spike years during the late 1990's, both RLBOs and non-buyout-backed offerings show poor three-year performance relative to indices. Offerings from 1997 however, perform excellent mean three-year returns as the cut-off ends just before the bubble burst.

The many buyout-backed firms and other non-buyout-backed firms that went public in the boom period of 2005-2006 demonstrate poor three year performance, indicating that the global financial crisis struck these firms worse than the benchmark market indices. These patterns suggest that the market overprices new issues, both within the RLBO sample and the non-buyout-backed sample, during hot market periods. This would be in line with previous research on general long-run IPO performance, such as Ritter (1991).

8.2 Calendar-Time Portfolio Regression Analysis

8.2.1 Whole Sample Calendar-Time Portfolio Regression Analysis

Table 8.6 reports the calendar-time portfolio regression of the whole sample of RLBOs and non-buyout-backed IPOs. The RLBO portfolios show a positive monthly abnormal return of 0.39% at the three year period and 0.37% at the five year period. The results are statistically significant at the 10% and 5% level respectively. Interestingly, this suggests that the efficient market hypothesis is not a valid explanation for the mispricing as the Fama-French factors have been taken into consideration. The table also shows that RLBOs have a significant positive exposure to the small minus big market capitalization factor with coefficients of 0,9813 and 1,0303, three and five years after IPO, respectively. The high minus low book-to-market factor also has a positive coefficients of 0,1188 and 0,1459, three and five years after IPO with 10% and 5% statistical significance, respectively.

The non-buyout-backed IPOs show an average negative abnormal return but the results lack statistical significance. As we base our non-buyout-backed IPO sample on data from Ritter,

the carefully reader might note that the market beta for regular IPOs coincides with the estimates presented in Ritter and Welch (2002)³.

Table 8.6

Fama-French Calendar-time portfolio regression. The sample consists of 448 reverse leveraged buyouts (RLBOs) and 7804 non-buyout-backed IPOs between January 1981 and March 2007. The stocks are formed into portfolios and the portfolio returns are calculated as the mean of the stock returns each calendar month. The returns are computed as average monthly returns of a three year and five year period. The regression uses the Fama-French three-factor model; $R_p - R_f = \alpha + \beta (R_m - R_f) + sSMB + hHML + C_p$, where R_p is the portfolio return, R_f is the one-month Treasury bill rate, α is the abnormal return, β is the beta, R_m is the value weighted NYSE/AMEX/Nasdaq market index return, SMB is the small minus big market capitalization factor, HML is the high minus low book-to-market factor and C_p is a random variable that must have an expected value of zero. Regression is controlled by OLS and heteroskedasticity t-test statistics. The symbols \$, *, **, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively.

Whole sample	Average Month in (-0,+36)	OLS t	Skedasticity Consistent t (HC)	Average Month in (-0,+60)	OLS t	Skedasticity Consistent t (HC)
RLBOs						
Alpha (Abnormal Return)	0,0039	1,47\$	1,52\$	0,0037	1,67*	1,77*
Beta	1,3846	22,88***	18,87***	1,3243	26,38***	20,58***
SMB	0,9813	11,31***	7,18***	1,0303	13,94***	8,20***
HML	0,1188	1,30\$	1,11	0,1459	1,89*	1,55\$
R-squared	71,01%			76,02%		
Adjusted R-squared	70,76%			75,82%		
Non-buyout-backed IPOs						
Alpha (Abnormal Return)	-0,0018	-0,94	-0,95	-0,0013	-0,79	-0,8
Beta	1,2287	28,37***	24,79***	1,1783	30,73***	25,83***
SMB	1,0463	16,88***	9,13***	1,0626	18,84***	11,03***
HML	-0,328	-5,00***	-3,77***	-0,2327	-3,95***	-2,92**
R-squared	83,23%			84,26%		
Adjusted R-squared	83,09%			84,13%		

8.2.2 Time Period Subsample Calendar-Time Portfolio Regression Analysis

Table 8.7 reports the calendar-time portfolio regression of the 1981-1995 subsample of RLBOs and non-buyout-backed IPOs. The results from this subsample converge with results from the event-time analysis and suggest that reverse leveraged buyouts significantly outperformed non-buyout-backed IPOs and the market between the years of 1981-1995.

The RLBOs have an average monthly excess return of 1,03% in the three-year period and 0,52% in the five-year period with 1% and 10% statistical significance respectively. The non-buyout-backed IPOs show a monthly average negative abnormal return of 0,32% in the three-year period and 0,24% in the five-year period at the statistical significance level of 5% and 10% respectively.

³ The observation period used by Ritter and Welch (2002) is between 1973-2001

Table 8.7

Fama-French Calendar-time portfolio regression. The subsample consists of 156 reverse leveraged buyouts (RLBOs) and 4913 non-buyout-backed IPOs between January 1981 and December 1995. The stocks are formed into portfolios and the portfolio return is calculated as the mean of the stock returns each calendar month. The returns are computed as average monthly returns of a three year and five year period. The regression uses the Fama-French three-factor model; $R_p - R_f = \alpha + \beta (R_m - R_f) + sSMB + hHML + C_p$, where R_p is the portfolio return, R_f is the one-month Treasury bill rate, α is the abnormal return, β is the beta, R_m is the value weighted NYSE/AMEX/Nasdaq market index return, SMB is the small minus big market capitalization factor, HML is the high minus low book-to-market factor and C_p is a random variable that must have an expected value of zero. Regression is controlled by OLS and heteroskedasticity t-test statistics. The symbols \$, *, **, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively.

1981-1995 Subsample	Average Month in (-0,+36)	OLS t	Skedasticity Consistent t (HC)	Average Month in (-0,+60)	OLS t	Skedasticity Consistent t (HC)
RLBOs						
Alpha (Abnormal Return)	0.0103	2.79**	2.86**	0.0052	1.53\$	1.63\$
Beta	1.1938	12.60***	11.66***	1.2515	14.25***	12.40***
SMB	1.2417	8.43***	7.59***	0.8661	7.69***	4.27***
HML	-0.3538	-2.13*	-2.30*	0.0081	0.06	0.06
R-squared	66.12%			63.91%		
Adjusted R-squared	65.63%			63.45%		
Non-buyout-backed IPOs						
Alpha (Abnormal Return)	-0.0032	-1.93*	-2.02*	-0.0024	-1.29\$	-1.43\$
Beta	1.0500	24.53***	21.13***	1.0720	22.40***	19.90***
SMB	1.2794	19.33***	15.63***	1.0192	16.65***	9.32***
HML	-0.2372	-3.17***	-2.48**	-0.1114	-1.49\$	-1.10
R-squared	88.60%			85.10%		
Adjusted R-squared	88.44%			84.91%		

Table 8.8 reports the calendar-time portfolio regression of the 1996-2003 subsample of RLBOs and non-buyout-backed IPOs. The results for both group abnormal returns have very low statistical significance and are insufficient to draw any reliable conclusions about the stock returns.

Table 8.8

Fama-French Calendar-time portfolio regression. The subsample consists of 175 reverse leveraged buyouts (RLBOs) and 2397 non-buyout-backed IPOs between January 1996 and December 2003. The stocks are formed into portfolios and the portfolio return is calculated as the mean of the stock returns each calendar month. The returns are computed as average monthly returns of a three year and five year period. The regression uses the Fama-French three-factor model; $R_p - R_f = \alpha + \beta (R_m - R_f) + sSMB + hHML + \epsilon_p$, where R_p is the portfolio return, R_f is the one-month Treasury bill rate, α is the abnormal return, β is the beta, R_m is the value weighted NYSE/AMEX/Nasdaq market index return, SMB is the small minus big market capitalization factor, HML is the high minus low book-to-market factor and ϵ_p is a random variable that must have an expected value of zero. Regression is controlled by OLS and heteroskedasticity t-test statistics. The symbols \$, *, **, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively.

1996-2003 Subsample	Average Month in (-0,+36)	OLS t	Skedasticity Consistent t (HC)	Average Month in (-0,+60)	OLS t	Skedasticity Consistent t (HC)
RLBOs						
Alpha (Abnormal Return)	-0.0021	-0.44	-0.43	0.0002	0.05	0.04
Beta	1.2787	10.39***	13.70***	1.2193	12.90***	11.97***
SMB	0.8902	7.03***	5.82***	0.9734	8.63***	6.30***
HML	0.1674	1.02	1.11	0.1884	1.40\$	1.17
R-squared	65.55%			68.74%		
Adjusted R-squared	64.73%			68.11%		
Non-buyout-backed IPOs						
Alpha (Abnormal Return)	-0.0013	-0.31	-0.32	-0.0013	-0.38	-0.39
Beta	1.3825	12.90***	13.60***	1.3255	16.84***	18.03***
SMB	0.9250	8.39***	6.33***	1.0009	10.65***	8.23***
HML	-0.4268	-3.00**	-2.93**	-0.2464	-2.20*	-2.23*
R-squared	80.66%			81.81%		
Adjusted R-squared	80.20%			81.45%		

Table 8.9 reports the calendar-time portfolio regression of the January 2004 to March 2007 subsample of RLBOs and non-buyout-backed IPOs. The results of this subsample also have low statistical significance but coupled with our findings from the previous 1996-2003 period subsample, a trend seems to emerge indicating that reverse LBOs do not perform as good in the later subsamples as in the 1981-1995 period subsample. This pattern coincides with the indicative results in Cao and Lerner's study, and stocks of reverse LBOs seem to have lost the overall superior performance relative to other IPOs that they showed in offerings between the years of 1981-1995.

Table 8.9

Fama-French Calendar-time portfolio regression. The subsample consists of 175 reverse leveraged buyouts (RLBOs) and 2397 non-buyout-backed IPOs between January 2004 and December 2007. The stocks are formed into portfolios and the portfolio return is calculated as the mean of the stock returns each calendar month. The returns are computed as average monthly returns of a three year and five year period. The regression uses the Fama-French three-factor model; $R_p - R_f = \alpha + \beta (R_m - R_f) + sSMB + hHML + \epsilon_p$, where R_p is the portfolio return, R_f is the one-month Treasury bill rate, α is the abnormal return, β is the beta, R_m is the value weighted NYSE/AMEX/Nasdaq market index return, SMB is the small minus big market capitalization factor, HML is the high minus low book-to-market factor and ϵ_p is a random variable that must have an expected value of zero. Regression is controlled by OLS and heteroskedasticity t-test statistics. The symbols \$, *, **, and *** denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively.

2004-2007 Subsample	Average Month in (-0,+36)	OLS t	Skedasticity Consistent t (HC)	Average Month in (-0,+60)	OLS t	Skedasticity Consistent t (HC)
RLBOs						
Alpha (Abnormal Return)	0,0024	0,52	0,57	0,0029	0,88	0,94
Beta	1,4744	12,65***	12,71***	1,3698	16,82***	15,57***
SMB	1,0157	4,67***	4,68***	1,0426	6,61***	6,66***
HML	0,187	0,98	0,83	0,1863	1,34\$	1,02
R-squared	0,8245			0,8746		
Adjusted R-squared	0,8169			0,8704		
Non-buyout-backed IPOs						
Alpha (Abnormal Return)	0,0044	1,2	1,2	0,0019	0,6	0,62
Beta	1,3529	14,70***	16,08***	1,234	15,72***	14,76***
SMB	0,6661	3,88***	3,78***	0,7071	4,66***	4,43***
HML	-0,2879	-1,91*	-1,62\$	-0,1539	-1,15	-0,78
R-squared	0,8317			0,8328		
Adjusted R-squared	0,8245			0,8273		

9. RESULTS AND ANALYSIS CROSS-SECTIONAL PERFORMANCE

9.1 Cross-Sectional Event-Time Performance of Subsamples

In table 9.1, panel 1, we divide our sample based on whether the LBO firms was handed around between two or several buyout firms pre IPO i.e if the transactions could be classified as secondary leveraged buyout or not. The subsample includes only 35 transactions mirroring the relative rarity of such transactions until the beginning of the 2000s that Kaplan and Strömberg (2009) observed. We do not find any evidence of secondary reverse leveraged buyout underperforming after three years. Five years after IPO the secondary leveraged buyout sample produce returns of -17,20 % relative to the value weighted market index, -31,62 % relative to the equally weighted market index and -4,38 % relative to S&P 500. While the returns in economical terms differ largely from the after five year better performing non-secondary reverse leveraged buyout sample, the results are not statistically significant. Although the first secondary buyout in our sample reversed in 1987, it should also be noted that more than two out of three secondary leveraged buyouts recorded in our RLBO sample floated between 2004-2007. This could possibly produce a bias given our findings in the previous sections of seemingly deteriorating abnormal RLBO returns over time.

Panel 2 shows the buy-and-hold abnormal return relative to indices for 124 divisional LBOs that were bought out as spin-offs or divisions of larger firm versus 324 non-divisional LBOs. Divisional LBOs show a mean buy-and-hold abnormal return of 19,7% relative to the value-weighted market and 27,15% relative to the S&P 500 three years after IPO with 5% and 1% statistical significance respectively. The findings are in line with the results presented by Cao and Lerner (2009) and divisional reverse leveraged buyouts outperformed indices largely in economical terms but contradictory to our findings, their results lack statistical significance within their sample and time period.

Panel 3 reports the buy-and-hold abnormal return relative to indices for 35 public-to-private LBOs that were public firms when bought out versus 413 private-to-private LBOs that were in private ownership when bought out. The public-to-private RLBOs seem to be performing better overall. Public-to-private LBOs yield a mean buy-and-hold abnormal return of 23,29%

relative to the S&P 500 after three years versus the comparable 17,2 % for the private-to-private LBOs sample (significance level of 10 % and 5% respectively).

Panel 4 reports that RLBOs where the holding period between the buyout and IPO was less or equal to 12 months, so called quick-flips, underperforms the market. Our subsample includes 52 quickflips and yield a mean buy-and-hold abnormal return of -25,33% over three years and -53,84 % over five years post IPO relative to the equally-weighted market index, with the returns statistically different from zero at a 10% and 1 % level respectively. Relative to the value-weighted market index the underperformance is also economically large but only significant 5 years post IPO (5% level). The performance of RLBOs with holding periods above 12 months produce a three-year mean buy-and-hold abnormal return of 15,65 % relative to the value-weighted market index, 12,46 % relative to the equally-weighted market index and 22,43 % relative to S&P 500, with the returns statistically different from zero at a 5%, 10%, 1% level respectively.

The p-value for difference between the long-term stock performance of quick-flip reverse leveraged buyouts and other RLBOs are statistically significant at the 5% level after both three and five years after IPO and relative to both the equally weighted and the value weighted market indices as well as the S&P 500 Composite index. The evidence suggests that quick-flips destroy value for reverse leveraged buyout firms, as the discussions in the business press have indicated. The results presented in the Cao and Lerner (2009) event-time cross-sectional analysis, showed that quick-flip RLBOs underperformed other RLBOs largely in economical terms but lacked statistical significance. However, our event-time cross-sectional analysis show that the differences are statistically significant across all benchmark indices both three years and five years after the initial public offering.

Panel 5 shows that firms with longer than median holding periods between LBO and IPO tend to perform better than below median firms after five years but the results are not statistically significant.

Panel 6 reports the performance of reverse leveraged buyouts where the LBO deal was sponsored by single LBO firms versus multiple LBO investors (club deals). The spread in the results indicate no characterizing performance patterns between these two subsamples.

Table 9.1

Cross-sectional performance of subsamples. The whole sample consists of 448 reverse leveraged buyouts (RLBOs) between January 1981 and March 2007. In this table it has been divided into the subsamples; 35 secondary LBOs versus 413 non-secondary LBOs, 124 divisional LBOs versus 324 non-divisional LBOs, 35 public-to-private LBOs versus 413 private-to-private LBOs, 52 Quick-flip LBOs (holding period less or equal to 12 months) versus 396 LBOs with a holding period longer than 12 months, 219 LBOs with a holding period below median versus 229 LBOs equal to or above the median holding period and 314 LBOs with single LBO investors and 134 LBOs with multiple LBO investors. The mean returns are computed ending 36 and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index and the S&P 500 composite index. The two-tailed significance levels reported in parentheses after the means are based a t-test. The \$, *, **, *** in the Significant Difference column denote the two-tailed significance of a two-tailed, two-sample t-test, assuming unequal variances, between the subsamples on a 10%, 5%, 1% and 0,01% confidence level respectively.

RLBO Cross-Sectional Subsamples	Mean 36 months		Significant Difference	Mean 60 months		Significant Difference
Panel 1. Secondary LBOs versus other LBOs						
	Secondary LBOs (35)	Non-secondary LBOs (413)		Secondary LBOs (35)	Non-secondary LBOs (413)	
BHAR relative to the VW market	10,99 (0,709)	11,04 (0,039)		-17,20 (0,649)	5,91 (0,389)	
BHAR relative to the EW market	12,53 (0,6709)	7,70 (0,146)		-31,62 (0,403)	-6,55 (0,335)	
BHAR relative to S&P 500	18,30 (0,537)	17,54 (0,002)		-4,38 (0,908)	17,96 (0,013)	
Panel 2. Divisional LBOs versus other LBOs						
	Divisional LBOs (124)	Non-divisional LBOs (324)		Divisional LBOs (124)	Non-divisional LBOs (324)	
BHAR relative to the VW market	19,70 (0,042)	7,72 (0,670)		19,00 (0,126)	-1,6 (0,945)	
BHAR relative to the EW market	14,53 (0,129)	5,60 (0,754)		6,35 (0,605)	-14,19 (0,536)	
BHAR relative to S&P 500	27,15 (0,005)	13,95 (0,444)		31,25 (0,012)	10,46 (0,655)	
Panel 3. Public to private LBOs versus other LBOs						
	Public LBOs (35)	Private LBOs (413)		Public LBOs (35)	Private LBOs (413)	
BHAR relative to the VW market	15,2 (0,272)	10,68 (0,171)		18,82 (0,289)	2,85 (0,776)	
BHAR relative to the EW market	11,21 (0,438)	7,81 (0,284)		5,38 (0,772)	9,68 (0,301)	
BHAR relative to S&P 500	23,29 (0,094)	17,2 (0,042)		33,87 (0,058)	14,72 (0,173)	
Panel 4. Quick-flips versus LBOs with longer holding periods						
	Less or equal to 12 months (52)	More than 12 months (396)		Less or equal to 12 months (52)	More than 12 months (396)	
BHAR relative to the VW market	-24,15 (0,120)	15,65 (0,025)	*	-37,77 (0,0589)	9,60 (0,286)	*
BHAR relative to the EW market	-25,33 (0,091)	12,46 (0,074)	*	-53,84 (0,005)	-2,55 (0,775)	*
BHAR relative to S&P 500	-19,18 (0,230)	22,43 (0,003)	*	-27,24 (0,184)	21,93 (0,025)	*
Panel 5. Holding period below median versus above median						
	Below median (219)	Equal or above median (229)		Below median (219)	Equal or above median (229)	
BHAR relative to the VW market	14,35 (0,3348)	7,86 (0,7220)		-3,62 (0,8499)	11,48 (0,6856)	
BHAR relative to the EW market	12,58 (0,3761)	3,76 (0,8645)		18,25 (0,3173)	0,81 (0,9770)	
BHAR relative to S&P 500	20,06 (0,1861)	15,26 (0,4400)		7,43 (0,7029)	24,62 (0,3317)	
Panel 6. Single LBO Investors versus club-deal LBOs						
	Single LBO Investors (314)	Club-deal LBOs (134)		Single LBO Investors (314)	Club-deal LBOs (134)	
BHAR relative to the VW market	14,96 (0,2073)	1,83 (0,8647)		4,98 (0,7439)	2,05 (0,8817)	
BHAR relative to the EW market	12,91 (0,2523)	-3,27 (0,7620)		-6,48 (0,6548)	-13,27 (0,3380)	
BHAR relative to S&P 500	21,38 (0,0794)	8,74 (0,4157)		17,21 (0,2717)	13,90 (0,3135)	

9.2 Cross-Sectional Multiple Regression Analysis

Table 9.2 reports the multiple regression of the whole sample of RLBOs with year fixed effects. Several interesting patterns emerge from the output. The flip dummy is statistically significant at the 5% level as an explanatory variable negatively correlated with performance throughout the whole sample and for the 1981-1995 and 1996-2003 subsamples. In accordance with our findings in previous sections, this further stress that quick-flips destroy value in the long-run stock performance of reverse leveraged buyouts. Longer holding periods however, seems to have a negative impact on long-term RLBO performance (p-value 0,139). Public-to-private RLBOs floated between the years 2004-2007, perform significantly better than other RLBOs at a 10% significant level. The secondary leveraged buyout dummy is positively correlated with returns in the 1996-2003 subsample and even though the result is statistically significant at the 10% level, it should be interpreted with caution as the low number of secondary LBOs combined with a major positive outlier in this subsample cause positive skewness.

Divisional RLBOs seems to perform better than other RLBOs during the whole observation period and especially in the subsample between the years 1981-1995 (p-value 0,109). For the interested reader we also present the multiple regression without the year fixed effects in appendix 6.

Table 9.2

Multiple regression. The sample consists of 448 reverse leveraged buyouts (RLBOs) and 7804 non-buyout-backed IPOs between January 1981 and March 2007. The buy-and-hold abnormal return (BHAR) relative to the value-weighted (VW) market adjusted by excess returns on the NYSE/AMEX/Nasdaq market computed ending 36 months after the initial public offering date is set as the dependent variable. The natural logarithm of the LBO holding period, a flip dummy, a divisional dummy, a public-to-market dummy, a secondary leveraged buyout dummy, a club deal dummy, and one plus the natural logarithm of the buyout reputation are set as the independent variables. The symbols \$, *, **, and *** next to the p-value denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

With Year Fixed Effects	Whole Sample		1981-1995 Subsample		1996-2003 Subsample		2004-2007 Subsample	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
Observations	448		156		175		117	
Natural logarithm of LBO holding period	-0,181	0,138	-0,296	0,262	-0,270	0,247	-0,056	0,591
Flip dummy	-0,719	0,015*	-1,477	0,028*	-1,204	0,024*	0,290	0,288
Divisional dummy	0,250	0,154	0,543	0,109	0,136	0,667	0,063	0,724
Public-to-private dummy	0,094	0,742	-0,502	0,382	0,184	0,755	0,455	0,058\$
Secondary leveraged buyout dummy	0,403	0,185	1,172	0,275	1,195	0,069\$	0,031	0,891
Club deal dummy	-0,095	0,573	-0,366	0,345	-0,248	0,488	-0,083	0,626
One plus natural logarithm of buyout reputation	0,078	0,315	0,015	0,927	0,258	0,114	0,024	0,820
R ²	0,124		0,163		0,133		0,104	

10. CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

10.1 Conclusions

This study had two broad goals. First, we sought to continue where Cao and Lerner (2009) stopped, by examining the performance of reverse leveraged buyouts during the boom and bust of the subprime craze bubble. Secondly, we also wanted to contribute by shedding some new light on the second wave of leveraged buyouts in general and the changing nature of the industry.

The hypotheses in our analysis was set to reflect the intense debate around late stage private equity that has followed the second wave of buyout transactions in the mid 2000's and indications from previous research. To depict the changing nature of the buyout industry, we choose to include an observation period ranging back to 1981. In order ensure reliability and statistical significance we based our study on the, to our knowledge, largest and hitherto most up-to-date sample of US RLBOs with return data. The analysis of 448 RLBOs between 1981-2007, with return data to march 2012, offers the following conclusions.

The long-run performance of reverse LBOs differs within the sample and the time period with transactions yielding a large spread of returns. In the whole sample analysis of RLBOs that floated between the years 1981 to 2007, RLBOs show superior performance relative to other IPOs. However, the performance varies over time and reverse leveraged buyouts that were taken public between the years of 1981-1995 outperformed non-buyout-backed IPOs and the market significantly. This suggests that during this period, RLBOs were consistently mispriced compared to other IPOs indicating that the market did not acknowledge and sufficiently price in the fact that the RLBOs were backed by buyout firms and what that contributed to the float at the time of IPO.

This effect seems to deteriorate in later time period subsamples and the long-run performance of RLBOs tend to drift towards similar return levels as non-buyout-backed firms. RLBOs between 1996 and 2003 still outperformed non-buyout-backed IPOs three- and five years post

IPO but they did not outperform the market, confirming the trend earlier observed by Cao and Lerner (2009).

Leveraged buyouts that were taken public between 2004 and 2007, after the observation period used by Cao and Lerner (2009), show no significant outperformance to other IPOs. Nor do they however, show any significant underperformance as the public debate somewhat has indicated.

From our cross-sectional analysis, several interesting patterns emerge. Leveraged buyouts with holding periods no longer than 12 months, so called, quick-flips underperform other RLBOs significantly throughout the whole sample indicating that these transactions destroy value as previous research and public media in general have suggested. The in public media scrutinized public-to-private RLBOs that floated between the years 2004-2007, perform significantly better than other RLBOs. Within the time period from 1996-2003, we find that secondary leveraged buyout that reversed, performed significantly better than other RLBOs. However, when interpreting this result, caution is advisable as our analysis are based on quite few observed secondary reverse leverage buyouts, mirroring the relative rarity of these transactions until the beginning of the 2000's. Whether secondary reverse leveraged buyouts underperform after IPO, calls for further research, as these transactions seem to be on an increasing trend.

Private equity and leveraged buyouts are and will remain controversial. While Warren Buffet once said:

"The idea that we're going to find a business to buy from a guy who's been thinking from the moment he bought only about how he's going to spruce it up and get out, is very low."

(Dumortier, 2006-09-25)

Our findings suggest that buying in on a reverse leveraged buyout has not been such a bad idea during the last decades, from greed; good sometimes seems to have emerged. However, if the trend of deteriorating long-run returns following reverse leveraged buyouts described by the findings in this study turns out to be non-temporary, a better understanding of these transactions will be essential.

10.2 Suggestions for Further Research

This study leaves a number of questions open for future research. First, it would be of interest to conduct a more comprehensive cross-sectional RLBO long-run performance study on the linkage between buyout group involvement and performance. Secondly, it would be interesting to conduct an extensive study on significantly underperforming leveraged buyouts and in more detail investigate characteristics explaining the underperformance. Such a study could seek to also investigate whether private equity contributes to any systematic market risk. Third, from an investor perspective, a study that seeks to in detail determine characteristics of superior performing RLBOs would also be of interest. Finally, it would be interesting to replicate our study in a few years to shed some light on the long-term performance following leveraged buyouts that did not reverse during our observation period. In particular, the rise of secondary leveraged buyout transactions calls for further research.

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9. APPENDIX

Appendix 1

Multicollinearity test of the independent variables used in the multiple regression.

	LN holding period	Quick-flip	Divisional	Public-to-private	Secondary LBO	1+LN Reputation	Club Deal
LN holding period	1,000	-0,623	-0,010	0,154	-0,192	0,044	-0,062
Quick-flip (Dummy)	-0,623	1,000	-0,006	-0,080	0,206	-0,018	0,054
Divisional(Dummy)	-0,010	-0,006	1,000	-0,180	-0,180	0,099	0,199
Public-to-private (Dummy)	0,154	-0,080	-0,180	1,000	-0,085	0,078	-0,080
Secondary LBO (Dummy)	-0,192	0,206	-0,180	-0,085	1,000	-0,094	0,011
1+LN Reputation	0,044	-0,018	0,099	0,078	-0,094	1,000	0,248
Club Deal (Dummy)	-0,062	0,054	0,199	-0,080	0,011	0,248	1,000

Appendix 2

Event-time stock performance. The sample consists of 448 reverse leveraged buyouts (RLBOs) between January 1981 and March 2007. The returns are computed ending 12, 24, 36, 48, and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Yearly Cohorts		12 months			24 months			36 months		
Year	Number of RLBOs	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR
1981	4	19,08	34,42	30,42	264,03	202,24	225,2	185,02	140,13	149,44
1982	0									
1983	2	-40,06	-26,48	-42,5	-15,38	-19,13	-43,64	6,78	-11,7	-53,54
1984	5	61,94	46,8	37,1	65,98	25,29	2,79	51,92	2,43	-30,51
1985	3	75,61	50,95	41,99	79,84	58,04	39,88	127,64	111,93	89,46
1986	8	28,74	14,42	3,63	27,9	24,6	12,03	27,94	13,08	-12,03
1987	7	10,72	21,63	17,21	94,67	93,87	79,86	160,85	169,04	144,12
1988	2	55,23	38,72	21,71	113,34	110,38	83,39	327,32	310,34	280,57
1989	3	-4,41	2,4	-9,23	8,18	4,66	-15,71	91,65	48,76	46,79
1990	4	68,49	49,16	48,13	68,15	20,4	32,98	119,18	29,76	63,55
1991	20	22,29	-10,9	5,19	38,46	-24,98	6,54	48,85	-28,27	12,4
1992	24	31,59	5,38	17,97	36,58	-6,08	15,9	72,29	22,95	38,77
1993	28	39,2	29,45	34,89	94,56	67,47	68,38	119,13	63,38	66,21
1994	16	27,23	18,75	11,49	79,2	40,77	31,04	103,53	48,37	26,32
1995	30	15,21	-12,01	-13,64	39,16	-7,43	-21,98	58,1	2,21	-36,36
1996	33	18,33	0,13	-11,94	2,9	-19,43	-53,07	0,32	-31,38	-80,63
1997	25	35,17	27,26	8,54	19,07	0,02	-32,84	196,29	151,56	129,82
1998	15	4,46	4,55	-13,86	12,86	-11,39	-20,45	-1,41	-21,38	-19,14
1999	34	9,1	-13,92	-2,18	-25,49	-46,2	-18,45	-37,41	-57,57	-18,43
2000	27	-31,64	-27,76	-14,89	-36,83	-33,91	-9,69	-32,91	-47,57	-5,19
2001	17	-2,18	-4,49	11,14	6,91	-24,44	16,17	28,88	-43,79	22,16
2002	16	10,59	-5,79	12,98	61,59	-3,39	43,46	106,12	20,82	75,45
2003	8	-1,39	-27,09	-17,61	-16,88	-58,73	-46,44	-4,49	-67,84	-51,86
2004	32	18,87	2,79	5,98	28,51	-3,78	2,25	56,27	12,21	14,11
2005	39	36,97	20,12	23,29	45,27	14,21	13,96	6,09	-1,77	-10,5
2006	41	15,13	3,15	-0,96	-11,87	1,67	-9,79	-28,53	-7,54	-9,36
2007	5	-29,65	-17,38	-27,22	-81,21	-32,14	-39,84	-61,56	-58,22	-50,59
Average	17	19,02	8,63	6,83	38,44	14,33	13,92	66,46	29,61	30,04

Appendix 3

Event-time stock performance. The sample consists of 448 reverse leveraged buyouts (RLBOs) between January 1981 and March 2007. The returns are computed ending 12, 24, 36, 48, and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Yearly Cohorts		48 months			60 months		
Year	Number of RLBOs	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR
1981	4	117,91	53,62	49,42	191,95	84,26	64,49
1982	0						
1983	2	-4,01	-28,83	-84,67	2,2	-0,72	-52,07
1984	5	55,74	10,55	-22,1	56,25	-0,76	-53,45
1985	3	153,45	131,35	100,76	81,85	70,4	33,78
1986	8	13,14	9,17	-26,27	42,47	20,58	-19,93
1987	7	167,75	162,28	131,61	234,95	205,13	183,21
1988	2	329,42	302,22	276,51	377,67	324,64	309,29
1989	3	44,12	-25,99	-17,97	96,37	-3,24	21,57
1990	4	216,98	111	156,16	299,35	161	204,55
1991	20	80,33	-20,8	15,53	102,42	-56,57	-5,94
1992	24	56,8	-27,84	-8,25	73,62	-32,19	-20,29
1993	28	145,45	68,33	50,72	188,74	94,85	53,4
1994	16	128,66	53,54	10,81	138,85	57,09	-9,67
1995	30	66,33	-0,92	-58,95	102,93	11,09	-36,19
1996	33	17,45	-34,8	-78,76	6,66	-41,01	-69,6
1997	25	125,1	83,7	80,14	33,79	-8,12	2,52
1998	15	-1,64	-21,88	-8,88	-9,36	-39,81	-15,62
1999	34	-36,05	-84,32	-20,24	-9,54	-101,88	-6,81
2000	27	-17,72	-76,69	-4,46	-12,62	-88,02	-6,28
2001	17	72,95	-22,49	54,44	114,17	-11,74	81,44
2002	16	139,67	24,24	93,63	157,75	18,17	89,88
2003	8	0,23	-69,37	-64,3	-10,11	-25,98	-29,11
2004	32	31,2	16,07	10,29	8,88	-4,7	-0,25
2005	39	-19,83	-15,47	-14,13	2,28	-20,46	-8,07
2006	41	-4,56	-9,91	-1,6	18,25	1,25	9,11
2007	5	-39,47	-54,98	-41,73	-39,91	-45,65	-39,01
Average	17	70,75	20,45	22,22	86,53	21,83	26,19

Appendix 4

Event-time stock performance. The sample consists of 7804 non-buyout-backed (N-B-B) IPOs between January 1981 and March 2007. The returns are computed ending 12, 24, 36, 48, and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Yearly Cohorts		12 months			24 months			36 months		
Year	Number of N-B-B IPOs	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR
1981	181	-12,33	-8,22	-9,63	46,91	-14,76	7,43	6,17	-43,79	-33,16
1982	74	96,6	30,85	55,14	17,89	-36,85	-25,64	42,04	-32,88	-31,34
1983	551	-15,34	-6,33	-16,2	0,01	-4,86	-24,5	22,6	-1,23	-33,94
1984	232	25,17	14,17	3,03	65,72	33,33	10,54	72,52	27,77	-9,97
1985	243	23,31	0,86	-8,92	13,84	-14,87	-36,71	4,66	-22,13	-45,86
1986	538	4,12	-3,18	-13,74	-6,47	-9,61	-22,26	8,19	-7,9	-31,75
1987	401	-16,5	-6,85	-10,59	-2,48	-3,39	-16,58	-11,68	-6,82	-31,14
1988	164	21,97	8,04	-3,59	6,84	2,92	-22,13	27,89	8,19	-20,92
1989	160	0,38	11,2	-3,41	31,77	23,72	8,89	45,51	11,53	7,37
1990	140	12,06	-0,15	-3,23	23,49	-19,97	-7,38	33,1	-42,91	-14,34
1991	312	9,13	-16,89	-5,24	30,08	-32,03	-0,23	29,78	-39,1	-3,54
1992	441	18,71	-8,69	4,63	21,64	-17,08	2,85	32,16	-21,83	-6,53
1993	540	-3,33	-11,7	-7,46	7,8	-16,91	-18,13	36,62	-14,43	-16,24
1994	456	23,93	11,41	5,04	71,9	30,9	23,52	67,41	7,56	-16,36
1995	480	25,81	0,16	-1,04	24,32	-21,9	-36,6	19,74	-32,32	-69,7
1996	654	6,66	-11,08	-23,07	9,7	-16,61	-48,15	29,89	-4,45	-53,76
1997	448	6,67	0,19	-17,35	32,38	16,06	-15,51	49,4	10,61	-12,42
1998	296	17,77	13,63	-2,34	73,82	44,35	38,98	17,55	-7,53	-0,1
1999	454	13,95	-10,69	1,27	-38,02	-58,68	-33,46	-44,98	-65,36	-31,38
2000	359	-55,86	-48,73	-37,29	-66	-60,78	-38,58	-60,19	-68,39	-31,89
2001	66	-18,92	-21,5	-4,48	-11,15	-37,48	0,77	18,7	-51,48	14,73
2002	56	17,11	-9,99	13,89	64,93	-4,95	43,08	77,24	-8,84	44,98
2003	64	22,62	-8,28	4,34	20,56	-25,92	-9,74	37,29	-28,25	-7,63
2004	155	14,98	0,04	2,77	33,25	-0,31	6,49	44,52	-1,82	0,48
2005	148	17,58	0,87	3,81	39,1	10,56	8,83	14,27	13,19	3,52
2006	151	24,89	14,71	9,33	-20,8	-1,87	-13,63	-27,63	-10,08	-10,42
2007	40	-26,83	-15,06	-24,33	-56,93	-6,87	-14,78	-26,1	-16,63	-10,79
Average	289	9,42	-3,01	-3,28	16,08	-9,03	-8,62	20,99	-16,64	-16,74

Appendix 5

Event-time stock performance. The sample consists of 7804 non-buyout-backed (N-B-B) between January 1981 and March 2007. The returns are computed ending 12, 24, 36, 48, and 60 months after the initial public offering date and are expressed in percentages. The buy-and-hold abnormal returns (BHAR) relative to the value-weighted (VW) market and equal-weighted (EW) market are adjusted by excess returns on the NYSE/AMEX/Nasdaq market index. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Yearly Cohorts		48 months			60 months		
Year	Number of N-B-B IPOs	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR	Mean Raw Buy-and-Hold	Mean EW BHAR	Mean VW BHAR
1981	181	13,15	-54,1	-54,11	26,33	-70,94	-81,88
1982	74	68,14	-33,06	-43,19	109,44	-5,75	-31,46
1983	551	16,69	-14,75	-61,35	4,67	-22,6	-70,91
1984	232	47,76	11,86	-27,77	69,21	21,55	-33,14
1985	243	20,55	-18,38	-59,17	10,11	-15,63	-68,41
1986	538	-1,96	-5,33	-42,3	17,62	-3,07	-43,52
1987	401	-4,52	-9,35	-38,88	11,15	-14,48	-36,57
1988	164	58,65	14,49	-5,12	109,14	39,03	30,06
1989	160	54,48	-8,71	1,74	47,28	-23,23	-9,29
1990	140	33,59	-58,41	-19,53	31,95	-79,1	-43,09
1991	312	60,3	-36,8	-1,44	88,08	-45,79	-3,45
1992	441	80,15	-7,68	10,86	88,56	-21,73	-15,13
1993	540	53,11	-19,48	-36,04	55,03	-26,22	-66,45
1994	456	73,52	0,17	-47,98	116,08	35,69	-36,82
1995	480	30,78	-33,91	-87,35	74,03	-11	-57,36
1996	654	72,86	16,56	-25,9	27,19	-25,47	-52,26
1997	448	12,67	-22,01	-30,91	3,91	-30,93	-30,28
1998	296	0,79	-25,86	-6,61	3,53	-32,03	-0,91
1999	454	-45,94	-84,72	-34,37	-36,09	-103,08	-32,59
2000	359	-50,96	-89,79	-32,76	-47,69	-100,82	-35,41
2001	66	40,08	-47,01	27,86	56,4	-52,75	33,8
2002	56	93,05	-19,35	46,45	118,65	-6,89	57,41
2003	64	39,96	-34,78	-19,35	1,41	-36,64	-29,52
2004	155	20,65	3,57	-2,79	7,58	-7,08	-1,91
2005	148	-9,34	-7,37	-5,92	11,18	-9,8	1,06
2006	151	-8,22	-13,87	-5,24	-3,47	-15,96	-9,19
2007	40	-6,77	-19,21	-7,77	-17,69	-17,73	-13,98
Average	289	28,27	-22,86	-22,55	36,43	-25,28	-25,23

Appendix 6

Multiple regression. The sample consists of 448 reverse leveraged buyouts (RLBOs) and 7804 non-buyout-backed IPOs between January 1981 and March 2007. The buy-and-hold abnormal return (BHAR) relative to the value-weighted (VW) market adjusted by excess returns on the NYSE/AMEX/Nasdaq market computed ending 36 months after the initial public offering date is set as the dependent variable. The natural logarithm of the LBO holding period, a flip dummy, a divisional dummy, a public-to-market dummy, a secondary leveraged buyout dummy, a club deal dummy, and one plus the natural logarithm of the buyout reputation are set as the independent variables. The symbols \$, *, **, and *** next to the p-value denote statistical significance at the 10%, 5%, 1% and 0.1% levels, respectively. If a stock is delisted, the buy-and-hold return is calculated from the available trading days only.

Without Year Fixed Effects	Whole Sample		1981-1995 Subsample		1996-2003 Subsample		2004-2007 Subsample	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
Observations	448		156		175		117	
Natural logarithm of LBO holding period	-0,158	0,183	-0,291	0,250	-0,197	0,391	-0,099	0,334
Flip dummy	-0,607	0,040*	-1,244	0,050*	-1,122	0,036*	0,243	0,369
Divisional dummy	0,232	0,182	0,439	0,198	0,240	0,445	0,005	0,977
Public-to-private dummy	0,164	0,562	-0,163	0,765	0,238	0,691	0,380	0,110
Secondary leveraged buyout dummy	0,197	0,492	0,887	0,410	1,219	0,068\$	-0,124	0,550
Club deal dummy	-0,156	0,356	-0,484	0,203	-0,142	0,694	-0,069	0,684
One plus natural logarithm of buyout reputation	0,104	0,166	0,026	0,870	0,210	0,202	0,053	0,621
R ²	0,019		0,045		0,044		0,068	

This is the article assignment. Suggested media: Wall Street Journal, Financial Times and similar.

Modern Private Equity: From Greed to Good?

During the worldwide recession following the credit burst, private equity went into a short period of hibernation, but private equity and the buyout market is now on the rise again and continues to be a major force in the financial system.

Private Equity Growth Capital Council have estimated that private equity controlled firms' today employ more than 8.1 million people in the USA. While it has been debated whether late stage private equity investors' responsibility considering moral and ethics reaches beyond the holding period of their investments, workers, external shareholders, and other stakeholders are unquestionably affected by the long-run performance following leveraged buyouts. With a large amount of buyout-backed firms taken public, from an investor's point of view, the long-run stock performance of buyout-backed IPOs should be a burning topic for a more balanced debate. Yet, public media seems to discuss private equity from a very existential point of view. With the former private equity titan Mitt Romney on the run for the republican frontrunner position in the US presidential election, discussions are likely to get more intense but to date not much systematic work have been cited.

Jesper Antonsson and Marcus Palmer, at Lund University School of Business and Economics, have conducted a comprehensive study examining the long-run performance following US leveraged buyouts that were taken public between 1981 and 2007. With a sample of 448 buyout-backed IPOs and return data ending in March 2012, this is the most comprehensive and up-to-date study of its kind. In their study they suggest that buyout-backed IPOs actually perform better in the long-run than other IPOs. The scholars do however raise a note of caution for quick-flip transactions, which they define as buyout backed IPOs with holding periods no longer than 12 months between buyout and IPO. According to their study, these transactions are significantly more likely to destroy value than create excess long-run returns. Public-to-private buyout backed IPOs on the other hand, performed significantly better during the boom-and-bust of the subprime craze bubble.

Private equity and leveraged buyouts are and will remain controversial. Private equity critic Warren Buffet once said:

"The idea that we're going to find a business to buy from a guy who's been thinking from the

moment he bought only about how he's going to spruce it up and get out, is very low."

But buying in on a leveraged buyout taken public does not necessarily have to be such a bad idea. From greed, good sometimes seems to emerge.