Managerial Behavior, Asymmetric Information and the Flow of Information around Equity Offerings

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Abstract

The aim of this thesis project is to investigate the managerial behavior, the conflict of interest as well as the flow of information in the financial markets, in particular in the setting around equity offerings. An Initial Public Offering (IPO)s represents a fertile testing ground for these topics as this event constitutes a major structural change in the life of a company. At the time of the offering, data on past firm performance is very limited and the estimation of future cash flows very difficult. This is especially true in a dynamic environment of a young and fast growing company. Consequently, the asymmetric information, in this context the difference in knowledge of the firm and its expected future performance between managers and insiders on the one hand and potential investors / the market on the other hand, are very pronounced.

This thesis project is divided into three chapters. Each chapter focuses on a specific problem setting and time period in relation to the equity offering.

Chapter 1 tests and finds support for the hypothesis that shareholders pressure analysts to support the share price until the end of the lockup period[1]. The end of the lockup period of initial public offerings is of particular importance to insiders as this time period generally constitutes the first time corporate insiders sell significant numbers of shares on the market. Chapter 2 investigates if and to which extent managerial behavior, its private information and its potential behavioral biases can account for the underperformance phenomenon of companies in IPOs as well as Seasoned Equity Offerings (SEOs). I test a behavioral explanation, the Optimistic Manager Hypothesis, and rational theories, the Window of Opportunity Hypothesis as well as Empire Building Hypothesis. I find support that both optimistic managers as well privately informed managers help to explain the phenomenon of the long-run underperformance of equity issues. Chapter 3 investigates why and to which extent companies pay out dividends prior to going public. We find support for the hypothesis that pre-IPO shareholders use dividends as a means to avoid sending a bad signal by selling a large number of secondary shares in the IPO. Furthermore, managers are actively managing their cash holdings prior the IPO. They fear the market undervalues the marginal dollar of excess cash in the IPO and reduce their cash holdings accordingly. We reject the hypothesis that managers pay out dividends to take advantage of a window of opportunity and strip the company of its hard assets before going public.

[1] The lockup period is a voluntary agreement between the underwriter and corporate insiders not to sell shares without the consent of the underwriter during a set time period, in general 180 days, after the IPO.

Summary

Chapter 1: Prop Ups during Lockups

In chapter 1 I investigate the impact of the end of the lockup period on analyst behavior. The lockup period is a voluntary agreement between the underwriter and corporate insiders not to sell shares without the consent of the underwriter during a set time period, in general 180 days, after the IPO. Insiders refrain from selling shares during the IPO itself as they fear it will convey a negative signal to the market (Brau and Fawcett (2006)). Thus, the end of the IPO lockup period is the prime opportunity for corporate insiders to cash out their shares when taking a company public. Indeed, Brav and Gompers (2003) observe a high selling pressure by insiders after the end of the lockup period.

Analysts are pressured both by the pre-IPO shareholders, who want to exit, and the investment banks, which seek to maintain a reputation to support the share price until insiders are able to exit. Michaely and Womack (1999) demonstrate that analysts deviate from the role as a neutral provider of information for investment decisions and issue overoptimistic recommendations for IPOs. Degeorge, Derrien and Womack (2007), as well as Ljungqvist, Marston and Wilhelm (2009), show that even analysts unaffiliated with the underwriting syndicate will issue biased share recommendations, because such a behavior increases their chances to be part of an underwriting syndicate in the future. Aggarwal, Krigman and Womack (2002) develop a model in which insiders strategically underprice their IPOs in order to create price momentum which enables these insiders to exit at a superior share price after the end of the lockup period. Surprisingly, however, there is no literature on analyst behavior around the lockup period. This chapter of my thesis tries to fill this gap.

I develop the *Prop Up during Lockups* hypothesis, which argues that analysts behave strategically and prop up the share price until the end of the lockup period allowing insiders to exit on good terms. My hypothesis yields four conjectures. First, analysts artificially support the share price of an IPO during the lockup period. Hence, they will revise their recommendations significantly downward after the end of the lockup period. Second, insiders of companies whose stock underperformed after the IPO will increase the pressure on analysts to issue favorable recommendations. Consequently, the downward revision of analyst recommendations after the end of the lockup period will be especially pronounced for these underperforming companies. Third, analysts issue similar recommendations for underperforming and overperforming companies during the lockup period. Only after the end of the lockup period will underperforming companies receive significantly worse recommendations compared to overperforming companies. Fourth, the pressure on analysts to send a good signal to the market in the form of coverage of the IPO is only temporary. As a result, the coverage will decease after the end of the lockup period.

This paper finds evidence that is consistent with each of these conjectures. Using U.S. data from 1995 through 2006 obtained from FirstCall, SDC Platinum, CRSP and Thomson Financial, I find that the probability for a company to receive a strong buy recommendation drops by 31% after the end of the lockup period. This finding supports my first conjecture. Consistent with the incentives of the underwriter to act strategically, affiliated analysts issue even more optimistic recommendations during the lockup period. This results in an additionally 15% increased probability for an IPO to receive a strong buy recommendation by an affiliated analyst during the lockup period compared to after the end of the lockup

period. Confirming the second conjecture, I find that underperforming companies have an additional 12.8% increased probability to receive a strong buy recommendation during the lockup period. Consistent with the third conjecture, I observe no difference between underperforming and overperforming companies in terms of analyst recommendations during the lockup period. However, this behavior changes after the end of the lockup period, when analysts issue significantly worse recommendations for underperforming companies. Finally, I detect a significant drop in coverage in the 50 days following the lockup period, which provides support for my fourth conjecture.

Chapter 2: The Impact of Optimistic and Privately Informed Managers on Firm Performance and Corporate Decisions

In this chapter, I aim to shed light on if and to which extent managerial behavior, its private information and potential behavioral biases can explain the underperformance phenomenon of equity offerings. I derive the theoretical predictions for the behavior of the managers both from the behavioral literature as well as from the rational expectations literature. Indeed, several models of these two schools of thought can be found to offer very similar predictions, which seem plausible examined on their own. However, I find these rivaling models standing in stark contrast in their reasoning to each other, while trying to explain the same economic context. I test as a behavioral explanation the optimistic manager hypothesis and as rational theories the window of opportunity hypothesis as well as empire building.

Recent papers in the behavioral finance literature seek to investigate the effect and impact of optimistic managers, referred to as managerial hubris by Roll (1986), on corporate decisions, for example Heaton (2002). An optimistic manager is defined as a manager who systematically overestimates good firm behavior and underestimates bad firm behavior. Thus, while believing to act in the best interest of shareholders and the firm, the manager will invest the proceeds of the offering into suboptimal projects. However, the manager will believe in the profitability of the investments by the company.

According to the Window of Opportunity Hypothesis, the manager is trying to time the market and to take advantage of his private information. He believes that the market overvalues the company compared to its real value. The company will return from its inflated share price to its true value on the long run, resulting in a long term underperformance of the stock price. Thus, the offering in itself constitutes a positive net present value project which should motivate the manager to maximize the amount of proceeds. A different motive for conducting an equity offering and a possible cause for the underperformance arises from the agency conflict between managers and shareholders. Managers may, according to Jensen (1986), rationally maximize their private benefits at the expense of their shareholders. This implies that the more free cash the manager is able to raise during the offering, the more he can channel away to invest in his pet projects and the worse the performance of the firm will be on the long run. I identify the type of managers according to his trading behavior: optimistic managers believe in the long run overperformance of their companies and will consequently buy shares. Informed managers believe, on the other hand, in the long run underperformance of the company and will therefore sell shares. I observe the trading behavior in three different time periods: trading in the period six months before the equity issuance up to one day before the issuance. Trading during the equity offering, hence the selling of secondary shares or the signing of new shares at the time of the offering as stated in the prospectus. As well as trading beginning from the end of the lockup period for a period of three months. In case I lack the exact duration of the lockup period, I assume a six month lockup period.

This chapter seeks to contribute to the existing literature on several dimensions. First, I give for the first time empirical evidence of the impact of optimistic managers on underperformance of IPOs respectively SEOs. Second, I show that the amount of free cash which both privately informed managers as well as optimistic managers are able to invest helps to explain underperformance. Third, I investigate the change in firm variables such as debt level, cash holding and capital expenditure, and if this change is consistent with the predicted behavior for each type of manager. I employ U.S. data of companies undertaking either an IPO or a SEO from 1990 up to 2001.

Chapter 3: The Pre-IPO Dividend Payment Puzzle

Chapter 3 investigates the behavior of companies prior to their Initial Public Offering. It is joint work with Richard Zeckhauser. In May 2006, Burger King conducted an IPO. The company sold primary shares to raise 400 million USD in new funds. However, three month before going public in February 2006 Burger King paid out a dividend of 367 million USD to old shareholders. In addition, they paid 33 million USD to its senior management as compensation payment at the same time. This anecdote illustrates the puzzle we investigate in this chapter: Why does a company choose to pay dividends only to pay fees shortly afterwards to raise monies in an IPO?

In particular, we examine if and why managers pay out cash dividends prior to going public. Cash payouts prior to an IPO are particular puzzling as taxes on dividends were higher than capital gains prior to 2003. In addition, raising monies in an equity is very costly for the company, both in terms of fees as well as money left on the table due to underpricing of the IPO.

We find that these cash dividends prior to the IPO, either measured in a three year or a one year window before the IPO, are significant in number and in economic value. 30% of all companies do pay out dividends in the three years prior to going public. On average, these companies pay out dividends worth 20% of the money subsequently raised in the IPO. We see the impact of the 2003 tax act in our data as both the number of dividend payments prior to the offering as well as the payout amount of those dividends increases after 2003.

We develop three potential hypotheses explaining this puzzle and test these subsequently on the data. We use U.S. data of companies going public between 1990 and 2006. The first two hypotheses involve the avoidance of negative signals. The third is the avoidance of insufficient valuation: cash on hand is undervalued in an IPO.

We find evidence that pre-IPO shareholders use dividends in addition to secondary shares as a means to exit the company before the IPO itself. In such a way they are able to avoid sending a negative signal to the market by selling a large amount of secondary shares during the IPO itself. Managers split the amount they wish to sell in the IPO into secondary shares sold and dividends. They sidestep in such a way the appearance of having lost the confidence in the company. Accordingly, we find that pre-IPO dividend payments help to explain the amount of secondary shares sold in the offering.

The second hypothesis conjectures that managers believe their company to be in a window of opportunity. In this scenario, the manager will take advantage of the temporarily overvaluation by the market and conduct an equity offering. Managers do not need the funds from the IPO due to a lack of liquidity or for future investments. The IPO in itself constitutes the positive NPV project. However, potential investors might raise doubts about the true motivation for the IPO if the company has already a high amount of excess cash prior to its IPO. Hence, the manager pays out dividends to lower the cash levels to avoid sending this signal. After the IPO, the company will eventually revert to its lower true value and underperform on the long run. However, we do not find that dividend paying companies predict subsequent underperformance. Thus, we are able to reject that dividend payments are initiated as part of the Window of Opportunity Hypothesis.

Our third hypothesis predicts that the market is too focused on the envisioned future growth opportunities of the company going public In such a setting, the market tends to neglect the amount of excess liquidity in the company, resulting in an undervaluation. Consequently, it is optimal for managers to

reduce the undervalued excess cash before the IPO to the level at which it is valued correctly by the market. We find evidence for the undervaluation hypothesis. Even though companies that pay dividends prior to their IPO are bigger and have positive earnings, their cash holdings *after* dividends and *before* the IPO are remarkably similar to those of non-dividend paying companies in absolute terms, both on average and in the median. However, taking into consideration the dividends already paid out, they would exhibit significantly larger cash holdings than non-dividend paying companies. Normalizing cash holdings by assets in place yields a similar pattern as described above. In the next step we regress the impact of cash before the IPO on the valuation of the IPO at the offer day. We find that the coefficient of pre-IPO cash holdings on Tobin's Q at the time of the offering is positive. However, its square term is negative. This supports the hypothesis that the value of each additional dollar of cash on the balance sheets is positive, whilst its incremental value on the firm valuation is decreasing. Thus, by managing the cash and paying out dividends prior to the IPO, companies minimize wealth losses due to the undervaluation of excess cash.

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Chapter I

Prop Ups during Lockups

Prop Ups During Lockups*

Jens Martin†

The end of the lockup period of initial public offerings generally constitutes the first time corporate insiders sell significant numbers of shares on the market. I test the hypothesis that shareholders pressure analysts to support the share price until the end of the lockup period. In a sample of U.S. initial public offerings from 1996 up to 2006, I find that analysts issue overly optimistic recommendations until the end of the lockup period. Furthermore, I find a significant downward revision of recommendations for the whole sample of firms as soon as the lockup period ends.

JEL classification code: G14; G24
Keywords: booster shots, lockup period, analyst behavior

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I. Introduction

The lockup period is a voluntary agreement between the underwriter and corporate insiders not to sell shares without the consent of the underwriter during a set time period, in general 180 days, after the IPO. Insiders refrain from selling shares during the IPO itself as they fear it will convey a negative signal to the market (Brau and Fawcett (2006)). Thus, the end of the IPO lockup period is the prime opportunity for corporate insiders to cash out when taking a company public. Indeed, Brav and Gompers (2003) observe a high selling pressure by insiders after the end of the lockup period.

Analysts are pressured both by the pre-IPO shareholders, who want to exit, and the investment banks, which seek to maintain a reputation to support the share price until insiders are able to exit. Michaely and Womack (1999) demonstrate that analysts deviate from the role as a neutral provider of information for investment decisions and issue overoptimistic recommendations for IPOs. Degeorge, Derrien and Womack (2007), as well as Ljungqvist, Marston and Wilhelm (2008), show that even analysts unaffiliated with the underwriting syndicate will issue biased shares recommendations, because such a behavior increases their chances to be part of an underwriting syndicate in the future. Aggarwal, Krigman and Womack (2002) develop a model in which insiders strategically underprice their IPOs in order to create price momentum which enables these insiders to exit at a superior share price after the end of the lockup period. Surprisingly, however, there is no literature on analyst behavior around the lockup period. This paper tries to fill this gap.

I develop the *Prop up During Lockups* hypothesis, which argues that analysts behave strategically and prop up the share price until the end of the lockup period to allow insiders to exit on good terms. My hypothesis yields four conjectures. First, analysts artificially support the share price of an IPO during the lockup period. Hence, they will revise their recommendations significantly downward after the end of the lockup period. Second, insiders of companies whose stock underperformed after the IPO will increase the pressure on analysts to issue favorable recommendations. Consequently, the downward revision of analyst recommendations after the end of the lockup period will be especially pronounced for these underperforming companies. Third, analysts issue similar recommendations for underperforming and overperforming companies during the lockup period. Only after the end of the lockup period will underperforming companies receive significantly worse recommendations compared to overperforming companies. Fourth, the pressure on analysts to send a good signal to the market in the form of coverage of the IPO is only temporary. As a result, the coverage will decease after the end of the lockup period.

This paper finds evidence that is consistent with each of these conjectures. Using U.S. data from 1995 through 2006 obtained from FirstCall, SDC Platinum, CRSP and Thomson Financial, I find that the probability for a company to receive a strong buy recommendation drops by 31% after the end of the lockup period. This finding supports my first conjecture. Consistent with the incentives of the underwriter to act strategically, affiliated analysts issue even more optimistic recommendations during the lockup period. This results in an additionally 15% increased probability for an IPO to receive a strong buy recommendation by an affiliated analyst during the lockup period compared to after the end of the lockup period. Confirming the second conjecture, I find that underperforming companies have an additional 12.8% increased probability to receive a strong buy recommendation during the lockup period. Consistent with the third conjecture, I observe no difference between underperforming and overperforming companies in terms of analyst recommendations during the lockup period. However, this behavior changes after the end of the lockup period, when analysts issue significantly worse recommendations for underperforming companies. Finally, I detect a significant drop in coverage in the 50 days following the lockup period, which provides support for my fourth conjecture.

These results are robust to a number of sensitivity checks. In particular, I test if this downward revision is due to a correction of the analysts' optimistic bias (Rajan (1997)). Even after accounting for analysts' learning, my results still hold. Furthermore, I find neither significant clustering of earnings announcements around the lockup period, nor particularly good earnings announcements at the end of the lockup period, which would be an indication that insiders themselves try to deceive analysts and push the share price of their company. Finally, the results hold in a subsample of firms with a lockup period different from 180 days, indicating that the event of the end the lockup period, and not the time period of 180 days after the IPO, is responsible for these downward revisions.

Additional evidence supports a number of collateral predictions of my *Prop up During Lockups* hypothesis. I find that analysts affiliated with the lead-underwriter react to the ownership structure of the IPO. Affiliated analysts issue even more favorable recommendations for IPOs that are backed by a venture capitalist or with a very high concentration of managerial ownership during the lockup period. This is consistent with the view that these two groups of insiders have higher bargaining power. Venture capitalists are repeated players in the IPO business and managers decide on the partner for future investment banking business for the company.

Other supporting evidence comes from the impact of changes in regulation. NYSE Rule 472, NASD Rule 2711, and the Global Settlement in 2002 were designed to enhance transparency of

analyst recommendations and aimed to reduce the potential conflict of interest. In the sample years after the new regulation, I find a significant decrease in the strength of analyst support.

Concerning the market reaction to analysts' recommendations, my *Prop up During Lockups* hypothesis is consistent with two alternative views. On the one hand, the market might be deceived by these propped up recommendations and weigh similarly recommendations issued before and after the end of the lockup period. On the other hand, a rational market might be able to recognize this scheme and discount overoptimistic recommendations, even more so for underperforming companies, during the lockup period. The evidence is mixed. I find that the market more highly values the information content of a downward revision for an underperforming company during the lockup period. However, I do not detect a difference in market reaction to analyst recommendations that have been issued during or after the lockup period.

The remainder of the paper proceeds as follows: Section II describes the data sources. Section III elaborates the *Prop up During Lockups* hypothesis and shows the empirical results. Section IV observes patterns in analyst coverage around the lockup period. Section V investigates which groups of insiders (VC or managers) push for these biased analyst recommendations. Section VI explores the impact of new regulation and Section VII discusses several alternative hypotheses. Section VIII studies the market reaction. Section IX concludes

II. Data sources and descriptive statistics

My sample consists of companies conducting an initial public offering (IPO) and issuing common class A shares from the years 1996 until 2006, as recorded in the Securities Data Company (SDC) database. All firms must be listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) or NASDAQ subsequent to their offering.

Consistent with previous research I omit unit offerings, real estate investment trusts (REITS), American depository receipts (ADRs), closed-end mutual funds, financial companies and utilities. Consistent with IPO literature (Ritter and Zhang (2007)), I also drop all offerings with an offer price of less than $5 as well as firms for which information on the lockup period is missing. From SDC I obtain the offer price, length of the lockup period, insider ownership at the time of the offering, and primary and secondary shares offered. Stock returns, share volume traded and shares outstanding are from the Center for Research in Security Prices (CRSP).

In a second step I match the analysts' recommendation history from the FirstCall database to the sample firms[1]. The FirstCall database includes the analyst recommendations on a 1 (strong buy) to 5 (strong sell) scale, the analyst's prior recommendation, the exact time of the recommendation,

[1] Of these files of analysts recommendations I omit those records marked as deleted as recommended by FirstCall

his affiliation, and the ticker symbol and name of the company he is evaluating. I have to restrict my sample to the years 1996 through 2006, because information of the FirstCall database on analyst recommendations for earlier years is sporadic. Throughout the paper, I partition the analyst recommendations into two distinct time periods. The first time period, which I will subsequently call *during the lockup period*, includes analyst recommendations beginning from the issue day until one day before the end of the lockup period. The second time period, in the following called *after the lockup period*, includes analyst recommendations issued from the end of the lockup period until 50 calendar days thereafter. I chose a period of 50 calendar days in order to measure the differences in analyst behavior directly after the lockup period while allowing a buffer period during which analysts formulate and issue their new recommendations. I recalculate all my results with an alternative time period of 30 calendar days after the lockup period, which yields similar results.

I group all recommendations published according to the type of analyst affiliation: lead-manager, co-manager or non-affiliated analysts. I retrieve information about the lead-manager and co-manager from the SDC files and match these with the FirstCall database. I consider an analyst to be affiliated if the analyst is working for a bank affiliated with the underwriting syndicate or for a corporate group in which at least one bank is affiliated with the underwriting syndicate[2]. I screen the data for possible errors such as inconsistencies in primary and secondary shares offered, the resulting proceeds, number of shares outstanding, missing or wrong sales, firms classified incorrectly as high tech firms, and analyst recommendation which are higher than 5. I use third-party sources, for example as provided by Jay Ritter (2006), to correct my sample. To calculate the underwriting reputation I employ the Carter and Monaster (1990) rank updated by Jay Ritter.

For each of the sample firms I collect insider trading data from Thomson Financial, which in turn obtains insider trading records published by the Security and Exchange Commission (SEC). I examine all open market transactions following the end of the lockup period for 50 calendar days. I define managers as employees in the following position: CEO, COO, CFO, CIO, CTO and (Executive-)Vice President. As insiders I define managers plus officers and directors of a company.

Table 1 provides the descriptive statistics for this sample. After losing companies due to missing CRSP variables, missing information on the lockup period, and other restrictions as described in this section, my sample consists of 1,128 firms. Of these companies, roughly half (689) were backed by venture capitalists. Two thirds of the IPOs issue only primary shares[3], which indicates that in most cases these insiders refrain from selling shares in the IPO itself. The vast

[2] In this analysis I take all mergers in the investment banking world into account as reported in Morrison and Wilhelm (2007)

[3] Primary shares are shares newly issued during a public offering. Secondary shares refer to already existing shares. In an IPO, proceeds from primary shares go to the company, whereas proceeds raised from selling secondary shares go to existing shareholders.

majority of funds raised derive from primary shares. Only 8% of the proceeds went to existing shareholders from the sale of secondary shares. The length of the lockup period is highly concentrated with 91% of the companies in my sample having a lockup period of 180 days.

INSERT Table 1 HERE

The lockup period and insider selling

The lockup period is a voluntary agreement between the underwriter and pre-IPO shareholders not to sell shares without the consent of the underwriter during a set time period, usually 180 days after the IPO. Not only are insiders barred from selling shares on the open market, this agreement prohibits insider from offering, contracting to sell, short selling or in any way reducing their ownership stake (Bartlett (1995)) in the company without the consent of the underwriter. Field and Hanka (2001) conclude that selling locked up shares is a rare event. They observe that 1% of firms in their sample announce an early release and 6% of the companies disclose that at least one insider was allowed to sell locked up shares. Consistent with their findings, I see an economically insignificant amount of insider trades during the lockup period. As the vast majority of insiders tends to refrain from selling secondary shares during the offering, and is unable to do so during the lockup period, the end of the lockup period thus constitutes the first opportunity for insiders to sell on the open market.

Consistent with Brau, Lambson and McQuenn (2005) and Brav and Gompers (2003), I find that insiders tend to sell shares as soon as the lockup period is over. I look into every open market transaction by insiders and determine whether they have sold or bought shares. The sell-to-buy ratio in dollar terms is 35 to 1, which is much larger than the average sell-to-buy ratio over the life of the company. When calculating this ratio for my sample firms three years after the IPO, this figure drops to 7 to 1. Indeed, research on insider trading shows that insider sales on average outnumber insider purchases over the long horizon with a sell–to-buy ratio of 3 to 1 (Seyhun (1998)). Figure 1 illustrates these findings. As shown in Table 2, in the 50 days following the end of the lockup period managers, directors and officers sold shares worth $2,800,000, 6% in terms of the median proceeds raised during the IPO. In the same period this group bought only shares worth $83,000. To investigate all trades by insiders recorded by the SEC, I add large owners of company stock as well as other individuals with possibly access to non-public, price relevant information[4]. For this group, I see an increase in shares sold totaling $7,400,000, 16% in terms of the median proceeds raised during the IPO. In contrast, shares worth only $203,400 are bought in the same time period.

[4] All trades which are registered by the SEC forms 3, 4, 5 and 144

INSERT Table 2 HERE

III. The *Prop up During Lockups* hypothesis and its predictions

The share price after the end of the lockup period is of particular importance to insiders, as they tend to divest at this time. Indeed, Aggarwal, Krigman and Womack (2002) develop a model and show empirically that insiders strategically underprice IPOs in order to exit at favorable terms after the lockup period. They argue that underpericing creates price momentum which supports and pushes the share price of the IPO upwards until insiders are allowed to exit at the end of the lockup period. Starting with Michaely and Womack (1999), the literature has shown that analysts may cater to companies by issuing more favorable recommendations than is justified by purely economical arguments. Michaely and Womack (1999) show that this bias is observable in the recommendations issued by analysts affiliated with the underwriting syndicate. Degeorge, Derrien and Womack (2007) develop the *currying favor* hypothesis and find evidence, supported as well by Bradley, Jordan and Ritter (2008), that the issuance of overoptimistic recommendations extends to non-affiliated analysts as well. Similarly Hong and Kubik (2003) find that brokerage houses encourage their analysts to issue optimistic recommendations in order to increase trading. However, overly overoptimistic recommendations for their clients come at a cost to both analysts and their investment banks in terms of loss of credibility. An analyst fears that loss of credibility will hurt his career as clients and the market will discount his recommendations. If the analyst's recommendations are discounted by market participants, he has less impact on the market and the investor community, and is therefore less valuable for his employer and his clients. Furthermore, an aspiring or current all-star analyst will fear that poorly judged recommendations will hurt his chances to be elected as an all-star analyst[5] the next year[6].

I hypothesize that analysts will try to support the share price of a company for two possible reasons: because of pressure by insiders and large shareholders who want t o exit at favorable terms as well as because the investment bank wants to maintain a reputation for propping up stocks until insiders are allowed to sell to attract future business. As this support is costly for the reputation of the analyst, the analyst will revert to his true beliefs as soon as insiders have had the opportunity to sell and hence reduce the insider's pressure on the bank to prop up the share price. This argument yields the first testable prediction of the *Prop up During Lockups* hypothesis.

[5] The *Investment Dealer Digest* organizes once a year a poll in which buy side analysts and customers vote on the quality of analysts. The best in each field is elected into a team of all-star analysts.

[6] Members from the Institutional Investor All American Research Team are found to supply more accurate recommendations (Stickel (1992))

Prediction I: *Analyst recommendations before the end of the lockup period are significantly better than recommendations after the lockup period*

Taking Prediction 1 to the data, I find strong support for the *Prop up During Lockups* hypothesis. The mean recommendation during the lockup period is 1.86 (on a scale of 1=strong buy to 5=strong sell), which is significantly lower than the mean recommendation after the end of the lockup of 2.23, as reported in Table 3. This trend of downward revisions is observable for affiliated as well as non-affiliated analysts

INSERT Table 3 HERE

Following I investigate the change in the distribution of analysts' recommendations before and after the lockup period. Figure 2 illustrates this change. I detect a shift from strong buy and buy recommendations during the lockup period towards hold recommendations after the end of the lockup period. I observe a sharp decline of the issuance of strong buy (buy) recommendations from 39% (41%) of all recommendations issued before the end of the lockup period to 32% (35%) after the end of the lockup period. Additionally, I observe a 69% increase (from 16% to 27%) in hold recommendations after the end of the lockup period.

INSERT Figure 2 HERE

This difference in recommendations between the two time periods is significantly (at the 1% level) more pronounced for lead-manager affiliated analysts than for co-manager affiliated analysts, and least pronounced for non-affiliated analysts (see Table 3). To further investigate the change of recommendations by type of analyst affiliation, I compare each distribution by affiliation in Figures 3a, 3b and 3c. Analysts affiliated with the lead manager exhibit the strongest tendency to revise their strong buy recommendation (issued during the lockup period) downwards to a hold recommendation after the end of the lockup period. Accordingly, this group displays the most pronounced increase of 89% in hold recommendations after the end of the lockup period.

INSERT Figures 3 HERE

Next, I move away from the average recommendation issued during the observed time period and focus on the recommendations issued closest around the end of the lockup period. I compare the last recommendation before the end of the lockup period to the first recommendation after its end. Table 3 shows that these changes are large and significant at the 1% level, which underlines the impact of the end of the lockup period on analyst behavior. As shown in Figure 4, I detect a sharp decrease in strong buy recommendations and an increase in hold recommendations after the end of the lockup period.

INSERT Figure 4 HERE

To test this prediction in a multivariate regression analysis, which I present in Table 4, I employ four different specifications. In Model 1, I run an ordered probit regression with a lockup dummy variable (*lockup_ended*), standard firm control variables as independent variables and the analyst recommendation (*rec*) as the dependent variable.

$$\Pr(rec_j = i) = \Pr(\kappa_{i-1} < \beta_1 lockup_ended_j + \sum_{l=2}^{n} \beta_l firm_control_variables_{jl} + u_j < \kappa_i) \qquad (1)$$

Here, rec_i (1,2,3,4,5) represents the possible type of recommendation issued by the analyst, u_i is the normally distributed error term and *lockup_ended is* a dummy variable taking the value one if the analyst issued the recommendation after the end of the lockup period and zero otherwise.

As predicted by the *Prop up During Lockups* hypothesis, the *lockup_ended* dummy variable is positive and significant at the 1% level. As FirstCall records the analyst recommendation on a 1 (strong buy) to 5 (strong sell) scale, the positive coefficient is revealing the downward revision of analyst recommendations after the lockup period. This downward revision is especially pronounced for analysts affiliated with the lead manager, documented by the significant and negative coefficient of the dummy variable *lockup ended x lead manager*[7]. The regression furthermore reveals that lead affiliated analysts issue significant better recommendations than non-affiliated analysts during the entire sample period. Holding the other control variables constant at their mean, the probability of receiving a strong buy (=1 in the FirstCall database) recommendation after the lockup period decreases by 31%. The probability to receive a strong buy recommendation after the end of the lockup period by an analyst affiliated with the lead manager is furthermore decreased by an

[7] The dummy variable *lockup ended x lead manager* equals 1 if the analyst is affiliated with the lead manager and the recommendation has been issued after the end of the lockup period, 0 otherwise.

additional 15%. The probability of getting a good recommendation, defined as a buy or a strong buy recommendation, drops by 13% points after the end of the lockup period. The ordered probit regression model computes the error terms and hence the significance of my regression coefficients on the assumption of the normality of the sample distribution. As a robustness check for the observed significance of the coefficients, I relax this assumption and recalculate my regression using the bootstrapping methodology. Instead of assuming a specific theoretical distribution of the underlying population, the bootstrapping methodology uses the observed sample to calculate the underlying distribution and thus the standard errors (Efron (1979), Davison and Hinkley (1997)). I proceed as follows: My dataset contains *N* observations. From these I draw randomly *N* observations with replacements. With this new dataset I now calculate my estimator and the statistics. I repeat the resampling and the subsequent calculation of the estimator 1000 times. I then use the following formula to calculate the standard error of my coefficients (as shown in Hall and Wilson (1991)):

$$\widehat{se} = \left[\frac{1}{k-1}\sum_{i=1}^{k}\left(\hat{\theta}_i - \bar{\theta}\right)^2\right]^{\frac{1}{2}}$$

Here k represents the number of repetitions and $\hat{\theta}_i$ the statistics of the i^{th} bootstrap sample.

The results using the bootstrapping methodology remain highly significant as shown in Model 2 in Table 4 which supports my earlier results and validates the use of the oprobit model. To account for both seasonal and industry effects, I add additional control variables such as a bubble-period dummy and industry dummies based on the 2-digit SIC code. The results are robust as shown in Model 3. I find that during the bubble period analysts issued significantly better recommendations. Nevertheless, the impact of the lockup period remains highly significant for the whole sample. As a robustness check, I want to see whether these results are possibly driven by small firms. These suffer from large information asymmetries and have very few analysts following (hence with very few analyst observations). I restrict my sample in Model 4 to companies with at least 5 analyst recommendations during the sample period. The results remain highly significant and are consistent with the findings for the entire sample. To furthermore test the sensitivity of these results, I rerun these regressions with alternative dependent variables. First, I keep only the last recommendation of an analyst before the end and the first recommendation after the end of the lockup period as the dependent variable. In this way, I only capture the change in recommendation directly around the end of the lockup period. Alternatively, I use the difference in analyst recommendation to the analyst consensus as the dependent variable. The results remain significant in both alternative specifications (not shown).

INSERT Table 4 HERE

The lockup period, company performance and analyst incentives

In this section I discuss the different incentives analysts face during and after the lockup period of a company. On the one hand, analysts want to build and maintain a reputation in the market. This implies issuing precise recommendations according to their true beliefs about a firm and its economic outlook. On the other hand, analysts are exposed to pressure of varying magnitude to support the stock to please their clients. Although managers and large owners would always prefer to receive strong buy recommendations, they will attach special importance to favorable analyst coverage if they plan to sell shares of the company in the near future

In the following I describe two different scenarios to illustrate the changing pressure on analysts. In Scenario I, Company A performed poorly since its IPO. Insiders pressure the analyst to support the company stock by issuing overly optimistic recommendations, which are contrary to his true beliefs. The analyst's career concern incentive and currying favor incentive are thus conflicting. He has now two possibilities: the *Prop up During Lockups* hypothesis predicts that he will yield to the pressure and issue overly-optimistic recommendations. If he adheres, on the other hand, to his career concern incentives, he will issue recommendations according to his true beliefs, which are worse than those demanded by insiders. The pressure by insiders eases as soon as they had the possibility to sell their equity. Hence, from this point in time, the career concern incentive prevails and analysts issue their true recommendation. Analysts behaving according to the *Prop up During Lockups* hypothesis will subsequently revise their recommendations downward to the level consistent with their true beliefs.

In contrast, in Scenario II the stock price performance of company B is positive after its IPO. Insiders are happy with the performance and will put less pressure on the analysts to support the share price with too optimistic recommendations. In this setting, the career concern incentive prevails and the analyst's recommendation will represent to a large extent his true beliefs. After the lockup period ends and insiders have the opportunity to divest from the company and existing pressure by insiders eases. The analyst will follow his career concern incentive and issue recommendations according to his true beliefs.

Figure 5 illustrates the above described two scenarios, from which I derive two separate testable predictions.

INSERT Figure 5 HERE

Prediction II: *Comparing recommendations during and after the lockup period, analysts will revise their recommendations downwards to a higher degree for underperforming firms than for overperforming firms.*

Prediction III: *Analysts will issue qualitatively similar recommendations for under- and overperforming companies during the lockup period, and afterwards issue significantly worse recommendations for underperforming companies.*

To test Prediction II of the *Prop up During Lockups* hypothesis, I divide my sample into performance tertiles. The buy and hold return is measured from the closing price of the offering day through the day prior to each recommendation. I subsequently benchmark the buy-and hold return against the equally weighted market index. As a robustness check, I use a variety of different performance measures. The results remain stable. Next, I measure the mean analyst recommendation for each tertile before and after the end of the lockup period. The results, as shown in Table 5, support Prediction II of the *Prop up During Lockups* hypothesis. The difference of the analyst recommendation for the overperforming tertile of 1.78 before the lockup period compared to 2.01 after the lockup period is significantly smaller than the downward revision for the underperforming tertile: for this tertile, the mean recommendation drops from 1.77 to 2.13, approximately 30% larger than the downward revision of the overperforming companies. This finding is consistent whether I use mean recommendation during the sample period or focus on the closest recommendations around the end of the lockup period.

INSERT Table 5 HERE

Next, I test Prediction II with the following ordered probit regression.

$$\Pr(rec_j = i) = \Pr(\kappa_{i-1} < \beta_1 lockup_ended_j + \beta_2 lockup_ended_x_overperformance_tertile_j + \sum_{l=3}^{n} \beta_l firm_control_variables_{jl} + u_j < \kappa_i) \quad (2)$$

Here i (1,2,3,4,5) represents the possible type of recommendation issued by the analyst and u_i is normally distributed, *lockup_ended is* a dummy variable taking the value one if the analyst issued the recommendation after the end of the lockup period and zero otherwise. The crossproduct variable *lockup_dummy x underperformance tertile* equals one if the lockup has ended and the company belongs to the tertile with the worst share price performance, and equals zero otherwise.

To account for a possible econometric miscomputation when using an interaction term including a dummy variable in a probit model, I adjust the marginal effects for this interaction term using the methodology proposed by Ai and Norton (2003) and Powers (2005). I find the coefficient on the variable *lockup_dummy x underperformance tertile* to be highly significant (at the 1 % level) and positive, which supports my reasoning. The marginal effects reveal that firms have a 12.8% point lower probability to receive a strong buy recommendation after the lockup period. Companies belonging to the worst performance tertile have an additional 10.6 % point lower chance to receive a strong buy recommendation after the lockup period. The significance of these results holds whether I calculate the buy-and-hold return performance benchmarked against the equal weighted CRSP market return, starting at the closing price at the offer day until the midpoint of the lockup period (Model 1), or if I calculate the performance until the day prior to each recommendation (Model 2). The results of both performance measurement alternatives are shown in Table 6.

INSERT Table 6 HERE

I now test Prediction III, which conjectures that analysts following underperforming stocks tend to imitate the behavior of analysts following overperforming stocks up until the end of the lockup period. During the lockup period, the analyst will state his true positive belief or only issue only slightly biased recommendations for the overperformer. In contrast, the analyst is supporting strongly the share price of the underperformer. Hence, one cannot statistically discern a difference between these two groups. After the end of the lockup period, analysts will issue recommendations according to their true beliefs for both types of companies. In the case of the underperforming company, the analyst will switch from highly inflated recommendations to recommendations according to his true belief after the lockup period has ended. Alternatively the analyst will reveal bad news for the company only after insiders were able to exit. This results in a strong downward revision of his recommendations and to a significant difference in recommendations between the over- and underperforming firms after the end of the lockup period. Table 5 supports the above reasoning. In line with Prediction III of the *Prop up During Lockups* hypothesis, this gap between analyst recommendations between over- and underperformer widens from -0.01 (Underperformer 1.77 - Overperformer 1.78) during the lockup period to 0.11 (Underperformer 2.13 - Overperformer 2.02) in the period after the end of the lockup period.

To test if these descriptive statistics hold in a multivariate regression setting, I run the following probit models: I first split my sample into two groups whether recommendations have been issued before or after the end of the lockup period. Subsequently, I create tertiles according to

the share performance. I measure the buy and hold return from the end of the first trading day through the mid-point of the lockup period. I choose this measurement period on the one hand to give the market, the issuer and the involved banks sufficient data on the share performance to determine a trend of the past performance (and enough time for the issuer to worry about the performance and pressure the investment bank for support). On the other hand, it leaves the analysts enough time to react to this pressure (I rerun this regression with a multitude of different periods, all yielding the same results). I run the ordered probit model once on the sample containing the analysts' recommendations before the end of the lockup period (3) and a second time on the recommendations after the end of the lockup period (4), as shown below.

$$\Pr(rec_during_lockup_j = i) = \Pr(\kappa_{i-1} < \beta_1 underpeformance_tertile_j + \beta_2 average_performance_tertile_j + \sum_{l=3}^{n} \beta_l firm_control_variables_{jl} + u_j < \kappa_i) \quad (3)$$

$$\Pr(rec_after_lockup_j = i) = \Pr(\kappa_{i-1} < \beta_1 underpeformance_tertile_j + \beta_2 average_performance_tertile_j + \sum_{l=3}^{n} \beta_l firm_control_variables_{jl} + u_j < \kappa_i) \quad (4)$$

Here i (1,2,3,4,5) represents the possible types of recommendation issued by the analyst and u_i is normally distributed.

Consistent with the *Prop up During Lockups* hypothesis, the coefficient of the underperformer tertile in Table 7 is insignificant (compared to the overperformer tertile which was left out of the regression). Hence, the recommendations issued during the lockup period for underperforming companies are qualitative similar and are statistically indifferent from those issued for the overperforming tertile. However, for recommendations issued after the end of the lockup period, I observe a highly significant negative coefficient of the underperformer tertile. Thus, in contrast to the period during the lockup period, underperforming companies are getting significantly worse recommendations than overperforming companies after the end of the lockup period.

INSERT Table 7 HERE

IV. Analyst coverage around the end of the lockup period

I now turn my attention to the number of analysts starting (and stopping) coverage of the newly issued firms. The market perceives an increase in analyst coverage as a good signal. For example, Das, Guo and Zhang (2006) show that IPOs with high analyst coverage yield better

returns than IPOs with less coverage. Given the positive reaction by the market, companies might try to increase the number of analysts following their IPO. Indeed, Cliff and Denis (2004) demonstrate that companies conducting an IPO try to boost coverage by underpricing the equity offering.

However, taking into consideration analysts' time constraint and the fact that the average analyst consequently covers only about 10 companies (Boni and Womack (2006)), increasing the number of covered companies is costly and has an upper limit. An analyst who is pressured into covering the stock after the IPO to convey a positive signal to the market, but does not believe in the positive outlook of the company, will consequently see this commitment as only temporary. He will seek to avoid the time consuming process of collecting and processing of information as soon as he is permitted. Thus, the *Prop up During Lockups* hypothesis predicts that coverage will be sustained only until insiders are able to cash out after the end of the lockup period. In addition, McNichols and O'Brien (1997) show that analysts adding coverage of a company are bullish about this economic outlook and bearish if they drop coverage. Thus, analysts feeling bearish about the company and would like to drop coverage are aware that stopping coverage conveys a bad signal to the market. The *Prop up During Lockups* hypothesis predicts that analysts will convey this bad signal only after the end of the lockup period.

Prediction IV: The coverage by analysts for an IPO will drop after the end of the lockup period

Thus, if the analyst was pressured by his employer into taking up coverage or he himself became bearish after voluntarily taking up coverage, I expect to find a significant clustering of analysts dropping coverage after the end of the lockup period.

INSERT Figure 7 HERE

Figure 7 illustrates the predicted discontinuity around the end of the lockup period. I observe a sharp (and significant at the 1% level using the Kruskal-Wallis test) spike in the number of analysts dropping coverage[8] following the end of the lockup period. Following this spike in the reduction of coverage, I detect a decrease in the number of analysts dropping coverage. Thus, equivalent to the pattern thed downward revisions after the end of the lock period, I detect a large drop in coverage after the end of the lockup period.

[8] A drop of coverage is hereby defined if a given broker does not issue a new recommendation for more than 180 days as reported by the FirstCall database

V. Specific groups of insiders

The previous sections show that analysts cater to insiders in IPOs by offering biased recommendations. In this section I investigate if a specific group of insiders is prone to receive this service. I investigate two groups of stakeholders, both having a strong interest in a positive share price performance around the end of the lockup period. In addition, both groups have a considerable lever on the investment banks. One group consists of management, directors and possibly founders working in the company. This group of insiders chooses the future path of the company, including follow-on investment business such as SEOs and mergers and acquisitions, and decides which investment bank will accompany them on this track. Thus, knowing that this group will bring follow-on business, investment banks might be tempted to cater to the needs of these insiders and attempt to ensure that they are content with the business relationship. Venture capitalists (VCs) are a second group of stakeholders with a special interest in a good share price performance after the lockup period. VCs which use an IPO as an exit strategy do so by redistributing their shares back to their limited partner at the end of the lockup period. The performance of the investment of the VCn and hence his fees, is calculated from the time of the investment until the shares are transferred to the limited partner. Hence the VC has a very keen interest to have a favorable share price at the end of the lockup period. VCs have a different type of leverage on investment banks compared to entrenched managers: instead of directing the future business course of the company they are currently bringing public, VCs are repetitive players in the IPO market. IPO underwriting is a very lucrative business, generating substantial fees of around 7% of the proceeds raised (Chen and Ritter (2000), which does not even include any kickbacks after the IPO. Consequently, investment banks have a large incentive to retain these VCs as customers for future deals.

To test if either one of these two groups is particularly prone to receive these biased recommendations, I run the below ordered probit model with analyst recommendations as the dependent variable. As right hand side variables I add a interaction variable if an IPO is backed by a VC, the lockup period has ended and if the analyst is affiliated with the lead manager. As a proxy for the strength of management leverage over the investment bank I split my sample into quartiles according to the degree of management ownership concentration before the IPO (obtained via SDC) and interact this variable with both the end of lockup variable and the type of affiliation by the analyst.

$$\Pr(rec_j = i) = \Pr(\kappa_{i-1} < \beta_1 lockup_ended_x_VC_j + \beta_2 lockup_ended_x_high_management_ownership_j + \sum_{l=3}^{n} \beta_l firm_control_variables_{jl} + u_j < \kappa_i) \quad (5)$$

Here i (1,2,3,4,5) represents the possible type of recommendation issued by the analyst and u_i is normally distributed.

As shown in Table 8, I find that neither VCs nor large ownership levels by management significantly increase the bias in analyst recommendations per se. However, both VCs and companies with high insider concentration profit from their leverage on the lead-manager. Analyst affiliated with the lead-manager revise their recommendations significantly stronger downward for both interest groups.

INSERT Table 8 HERE

VI. The impact of stricter regulation

In wake of the corporate scandals of 2001-2002 such as Worldcom, GlobalCrossing or Enron, the U.S. government decided to impose new regulations to increase accounting standards, transparency of analyst recommendations and reduce the possibility of fraud. In 2002, the Sarbanes-Oxley Act (SOX) was introduced. As a consequence of the congressional "Analyzing the Analyst" hearings in 2001, both the NASD and the NYSE issued new regulations affecting basically every sell-side analysts and brokerage houses doing business in the U.S. These two sets of regulation were enacted in July 2002 in form of NASD Rule 2711 and the amendment of NYSE Rule 472. An article in the Wall Street Journal describing an alleged misconduct by analysts within the investment banking industry initiated an investigation by the New York Attorney General. This inquiry uncovered several cases in which analysts yielded to internal pressure in investment banks by issuing favorable investment recommendations, even though internal e-mails showed the analyst's true private beliefs to be less than positive about potential of the company. This investigation led to the *Global settlement* between initially ten investment banks[9] and the Attorney General, which was subsequently announced in December 2002. The involved investment banks were fined a total of $1.435 billion and accepted new regulation to curb inappropriate influence of investment banking departments on analysts within banks.

The new regulation affected different aspects of the position of the analyst within the investment bank and the transparency of analysts' output. In order to prevent analysts from being

[9] The ten investments banks involved in the Global settlement 2002 were Bear Stearns & Co. LLC, Citigroup Global Markets, Credit Suisse First Boston Corp., Goldman Sachs, J. P. Morgan Chase & Co., Lehman Brothers Inc., Merrill Lynch & Co., Morgan Stanley, Pierce, Fenner & Smith, Salomon Smith Barney, UBS Warburg LLC. and U.S. Bancorp Piper Jeffray with Deutsche Bank and Thomas Weisel agreeing on the settlement two years later in 2004.

pressured by investment bankers to issue too favorable appraisals in order to gain new business, investment banks were forced to establish “Chinese walls”. These sought to separate the analyst and investment banking departments. Furthermore, the budget allocation decision to analyst departments had to be independent from specific fees generated by the investment banking department. Analysts were furthermore prohibited to accompany the investment banker to clients to deliver pitches as well as to participate on roadshows with clients and investment bankers. Additionally, the quiet period has been increased from 25 to 40 days. Historical ratings by the banks’ analysts had to be made available to investors.

Overall, these new regulations increased the scrutiny with which the media and markets were able to observe analyst behavior, reduced the pressure on the analyst by investment bankers and made it more difficult to issue biased recommendations in order to positively influence the market. Recent papers, such as Bartov and Cohen (2008) as well as Koh, Matsumoto and Rajgopal (2008), find a distinctive difference in earnings management and analyst behavior between the pre- and post-regulation era.

The *Prop up During Lockups* hypothesis argues that analysts are pressured to issue knowingly upward biased recommendations. Consequently, the passing of tougher regulation and increased scrutiny lead to two testable hypotheses. Fewer biased recommendations will result in, on average, worse recommendations for newly issued companies. Additionally, if analysts are less willing to booster the stock price of a company up until the end of the lockup period, I expect to detect a less severe downward revision of recommendation by analysts after the end of the lockup period.

INSERT Table 9 HERE

I add in the oprobit regression as additional right hand side variables a dummy variable regulation, equaling one after the new regulation was ebacted, as well as an interaction term of regulation and the end of the lockup period. The *regulation* variable in Table 9 is positive at the 1% level significant, indicating that analysts issue on average worse and thus less over-optimistic recommendations after the new regulation has been passed. This finding is consistent with earlier literature such as Kadan, Madureira, Wang and Zach (2008). Interestingly, the interaction coefficient of the post-regulation period with the lockup ended variable is significantly negative. Thus, after the new regulation has taken effect, I see a less severe downward revision of analyst recommendations after the lockup period. This is consistent with the prediction by the *Prop up During Lockups* hypothesis. Due to the new, stricter regulation, analysts are less willing to support

insiders with overoptimistic recommendations during the lockup period. Consequently, analysts revise their recommendation downward to a lesser degree after the end of the lockup period. It has to be noted, however, that I still detect a significant, albeit weaker, negative revision after the end of the lockup period. Hence, even after the new regulation has been in place, I still observe that analyst prop up shares during the lockup period.

VII. Robustness Checks

In this section I present and test competing hypotheses which have similar predictions as the *Prop up During Lockups* hypothesis and hence offer an alternative explanation for the results presented in this paper

A. Updating beliefs

Rajan (1997) argues that analysts are on average too optimistic about a company at the moment they initiate coverage. Only with time do analysts learn about the lower true value of the company and thus continuously downgrade their recommendations towards the real value of the firm. This implies that the end of the lockup period per se is no significant event during this downgrading process and should thus have no additional impact on the analysts' recommendations. As a testable prediction of this hypothesis, I expect a continuous downward revision for each recommendation issued by the analyst over time, independent of the firm performance and the lockup period.

The difference of the recommendations before and after the end of the lockup period, as shown in Table 3, as well as the significance of the end of the lockup dummy variable in Table 4, are predicted by this alternative hypothesis. The difference in recommendation derives from the division of my sample into two consecutive time periods: the time period during the lockup period and the time period after the end of the lockup period. According to the learning hypothesis, the average recommendation during the lockup period has been issued earlier and is thus more optimistic than the recommendations issued after the lockup period.

However, I find that this alternative hypothesis does not substitute the *Prop up During Lockups* hypothesis. The first evidence contradicting this alternative hypothesis, in particular the prediction that the event "end of the lockup period" has no significant impact, can be found by comparing Figure 2 to Figure 4. The magnitude of the shift in distribution from strong buy recommendation during the lockup period to hold recommendation after the end of the lockup period is very similar for the sample containing all the recommendations to the sample focusing on

the last recommendation before to the first recommendation after the lockup. Thus, the difference between the recommendations is largely captured around the end of the lockup period and is hence not due to a continuous updating by analysts. Additional evidence for the discontinuity of analyst behavior around this time period is the number of analyst following the company. I do not detect a continuous pattern in analyst coverage from the IPO onwards as predicted by this competing hypothesis. Rather do I detect a large spike in the number of analysts dropping the coverage of companies shortly after the lockup period (as shown in Figure 7). This pattern underlines the unique impact of the end of the lockup period in analyst behavior and strongly supports the *Prop up During Lockups* hypothesis.

As a second test I modify the probit model run in Table 4 by adding a right hand side variable accounting for analyst' learning in form of counting the previous number of recommendations issued for the firm.

INSERT Table 10 HERE

If analysts continuously downgrade their opinion with each recommendation from a too optimistic starting point, this counting variable will capture all significance of this downgrading and hence the learning. The end of the lookup period, on the other side, should not constitute a special event. Consequently, the *lockup ended* dummy variable should lose its significance. However, I find that the *lockup ended* dummy remains highly significant as shown in Table 10, even after including the count variable. This result shows that, while analysts may be too optimistic at the time of the IPO, they still revise their recommendation downward after the end of the lockup period. Calculating the marginal effects, I find that the end of the lockup period reduces probability of receiving a strong buy recommendation by 25.6% after the end of the lockup period, even after controlling for analyst learning. This finding supports the *Prop up During Lockups* hypothesis.

B. Earnings announcements around the lockup period

The Prop up During Lockups hypothesis states that analysts issue too optimistic recommendations to enable insiders to cash out at favorable stock prices. However, instead of putting pressure on analysts, the company itself could try to influence the market by issuing too optimistic earnings or release an over-optimistic earnings outlook at the end of the lockup period. Thus, the attempt to influence the market to provide a good exit for insiders might originate from the company and not from the analyst. In such a setting, analysts would be merely manipulated into issuing too optimistic recommendations up to the end of the lockup period. The company will

release only more realistic future outlook and earnings after the end of the lockup period. This drop in earning will cause the analysts to revise their recommendations downward.

This alternative theory predicts a significant decrease in earnings per share (or alternatively a decrease in growth of earnings) after the end of the lockup period, which would in turn account for the downward bias in analyst recommendations illustrated in this paper. To test this theory, I obtain the date of the quarterly earnings announcement releases together with the quarterly earnings per share (EPS) as reported from Compustat (variable epsfiq). Table 11 displays the mean and the median of the diluted EPS of three earnings announcements before up to three earnings announcements after the end of the lockup period. Both, median and mean EPS, increase slightly over this time period (from 0.05 up to 0.07 for the average). The mean EPS of the first earnings announcement *after* the end of the lockup of -0.01 (median 0.05) dollars do not significantly differ from the last reported EPS *before* the end of the lockup period of -0.03 (median 0.06) dollar, as a non-parametrical Kruskal-Wallis test confirms.

INSERT Table 11 HERE

Firms furthermore do not exhibit to cluster their earnings announcements around the end of the lockup period. Out of 1,008 companies, only 173 (17%) release their earnings in the 30 days around the end of the lockup period. Focusing on these companies, I investigate the change in EPS around the lockup period in the same fashion as before. As illustrated in Table 12, I discover indeed a local maximum in the EPS at the end of the lockup period. However, while I find this maximum to be significant in the mean, the magnitude of this difference in EPS disappears largely, together with its significance, when I focus on the median. I consequently conclude that this difference is largely drive by outliers and is not inherent in the majority of my sample firms.

INSERT Table 12 HERE

In total, the investigation of the earnings releases around the end of the lockup period shows that companies do not exhibit pronounced higher earnings around the lockup period in order to manipulate analysts to issue biased recommendations.

C. Investigating the variation in the length of the lockup period

The vast majority, more than 90%, of my sample firms has a lockup period duration of exactly 180 days. Thus, one might argue that the 180 days after the IPO constitutes a special event which drives the downward revision by analysts instead of the end of the lockup period. To investigate this possible explanation, I focus on the companies which have a lockup period different from 180 days. For these companies I am able to disentangle the potential 180 days effect and the end of lockup effect on analyst recommendation. For this subsample, I run a panel data probit regression on the probability of receiving a good recommendation. I add to my set of right hand side variables a dummy variable to take into account if a recommendation has been issued after 180 days.

INSERT Table 13 HERE

While the end of the lockup ended dummy remains highly significant at the 1% level, the 180 days dummy variables shows no statistical significance as shown by Table 13. Thus, I conclude that the end of the lockup period is indeed causing the observed downward revision in analyst recommendation.

VIII. The market reaction

In this section I investigate the market reaction to analyst recommendations around the lockup period. If the analysts have been issuing booster shots during the lockup period and return to issuing recommendations according to their own true belief afterwards, downgrades after the lookup period have less informational content. This is especially pronounced for underperforming firms, which, according to the *Prop up During Lockups* hypothesis, exhibit a particularly strong predictable downward revision after the end of the lockup period.

If the market learns from past analyst behavior and thus anticipates the analyst behavior, it will react less strongly to sell recommendations after the end of the lockup period than during the lockup period. However, even if the market is fully rational, investors may not learn that analyst issue continuously strategically distorted recommendations, as shown by Benabou and Laroque (1992). To test empirically the market reaction, I calculate the cumulative market adjusted abnormal returns (CMAR) starting one day before the recommendation until the day after the recommendation has been issued. I benchmark these returns against the CRSP equal-weighted-market return. Table 14 displays the market return in relation to past share price performance and in relation to whether the analyst' recommendation has been issued before or after the end of the

lockup period. Panel A shows the market reaction to downgrades, Panel B for upgrades by analysts. I define an upgrade as a positive change in recommendation, for example from buy to strong buy, by a given analyst in comparison to his previous recommendation, and vice versa for downgrades. Panel A highlights a remarkable difference in market reaction whether the downgrade has been issued before or after the lockup period. I find that the market reacts on average less negatively to downgrades for underperforming companies after the end of the lockup period (median minus 6.6%) compared to during the lockup period (median minus 14.9%). In contrast, the market reacts to downgrades of overperforming companies more strongly with an increase in the median market reaction from -4.4% to -6.0%. The *Prop up During Lockups* hypothesis predicts upgrades to be more informative after the lockup period, because they represent the true beliefs by the analysts. Consistently, as revealed by a Kruskal-Wallis test, I find that the market reacts significantly more positively to an upgrade after the lockup period than to an upgrade during the lockup period.

INSERT Table 14 HERE

However, the market discounts only downward and upwards revisions by the same analyst. Comparing the market reaction to the level of recommendation (buy, hold, etc.) during the lockup period compared to after the end of the lockup period, I find no difference in magnitude.

IX. Conclusion

This paper examines the behavior of analysts around the lockup period. For a sample of IPOs going public either on the NASDAQ, AMEX or NYSE from 1996 through 2005, I find that analysts issue significantly better recommendations during the lockup period. I argue that insiders, who fall under the lockup agreement, pressure analysts to issue upward biased recommendations until insiders are allowed to sell shares on the open market. In addition, the investment bank may pressure the analyst in order to keep up a reputation of propping up shares in the lockup period. Consistent with the *Prop up During Lockups* hypothesis, I find a significant downward revision by analyst recommendation after the end of the lockup period. This downward revision is even more pronounced for analysts affiliated with the lead manager. I predict that insiders will be more concerned and thus exercise more pressure if their firm has underperformed since its IPO. Dividing my sample into performance tertiles I find indeed that analysts' downgrades after the end of the lockup period are significantly more pronounced for recent underperforming firms than for those overperforming. This difference in pressure exercised by insiders leads to an additional testable

prediction. During the lockup period, analysts following underperforming stocks tend to imitate the behavior of analysts following overperforming stocks. Statistically, one cannot discern a difference between these two groups. Only after the end of the lockup period, when insider pressure eases, I detect significantly worse recommendations for underperforming companies in comparison to overperforming ones.

Which insiders are responsible for this systematic bias in recommendations? Ordered probit regressions show that IPOs backed by venture capital, or in which ownership is very concentrated, are more likely to receive optimistic recommendations during the lockup period.

The fact that an analyst is starting coverage (dropping) coverage sends a good (bad) signal to the market. Thus, the *Prop up During Lockups* hypothesis also predicts a strong increase in coverage during the IPO and a cluster of analysts dropping coverage after the end of the lockup period. The data confirms this pattern.

The market is only partly aware of this bias in analyst revisions for underperforming companies. The price reaction to downgrades by the same analyst after the end of the lockup period is less severe than to downgrades before the end of the lockup period. However, the market reaction to analyst recommendations issued during or after the lockup period is indifferent.

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Appendix A: Why do insiders not sell secondary shares during the IPO?

Even though insiders and shareholders are theoretically able to significantly reduce their equity stake in the company during an IPO by issuing a large amount of secondary shares, they generally refrain from doing so. Insiders fear that selling a large number of secondary shares during the IPO will send a bad signal to the market as Leland and Pyle (1977) as well as Brau and Fawcett (2006) point out. Consequently, managers believe that they could realize only a lower and thus worse offer price. Additionally, the literature offers alternative explanations why insiders would optimally sell shares only after the lockup period: insiders can use underpricing to create momentum for the share price as described by Aggarwal, Krigman and Womack (2002). Alternatively, they might use the IPO as a marketing tool as shown by Habib and Ljungqvist (2001) as well as Demers and Lewellen (2003). In these cases insiders would leave money at the table if they would sell own shares at the offer price, as the offer price has been knowingly set too low.

Appendix B: Robustness Checks

In this section I want to account for the potential sensitivity of my results to performance measurement methodologies as well as to the time frames in which the performance has been measured. I test several different time horizons to calculate the firm performance. First, I select two different starting points: the day of the offering as well as ten days after the offer date. I chose the latter point in time to avoid the impact of the IPO underpricing. I recalculate the performance window with these starting points in combination with different time lengths, which I selected in relation to the timing of the analyst recommendation as well as in relation to the ending of the lockup period. I include time periods ending at the midpoint of the lockup period, the end of the lockup period, up to ten days before the end of the lockup period, 50 days after the lockup period, one day before the analyst recommendation as well as 10 days before the analyst recommendation has been issued. I moreover benchmark these different buy and hold returns against the equally weighted market portfolio, the value weighted market portfolio and, alternatively, take the raw returns. These robustness checks reveal that the results are stable across these different methodologies (not shown).

As a second robustness check I specify which analysts issue recommendations at which point in time. Instead of regressing my sample on each analyst recommendation for the whole time period, I rerun my tests focusing on the revision around the lockup period. I take only the first recommendation after the end of the lockup period minus the last recommendation before the end of the lockup period into consideration. Furthermore, I look into the potential differences whether

these recommendations around the end of the lockup period have been issued by a lead manager affiliated, a co-manager affiliated, non-affiliated analyst or any analyst. Again, my results are similar to those presented earlier.

Additionally, I interpret an analyst' recommendation in different ways. Next to the five point scale offered by the FirstCall Database and used in this paper, I calculate the difference of the current recommendation with a) the prior recommendation b) the analyst consensus (average recommendation for this company) up to the issuance of the current recommendation. I split these recommendation measures into quintiles according to their magnitude and according to the type of analyst. As a further alternative I reduce the 5 point scale into a binary scale*: Good Recommendations* (1 or 2 in the FirstCall database) versus *Bad Recommendations* (3, 4 of 5 in the FirstCall Database) as well as *Very Good Recommendations* (1 in the FirstCall database) versus *Bad Recommendations* (2, 3, 4 of 5 in the FirstCall Database). I find qualitative similar results with each of these measurements (not shown).

To avoid seasonal influences and effects of specific time periods such as the bubble period 1998-2000, I create and add time fixed effetcs. The results remain the same (not shown).

Appendix C: Econometric Comments

In the paper I use the ordered probit model for my analysis. Analysts are issuing their recommendations on a scale of 1 to 5. As the differences between these categories, for example 2 = buy to 3 = hold, differs between brokers, I have to treat these answers as numbers on an ordinal scale. Thus my choice of the ordered probit model as the econometric model. An ordered probit regression is equivalent to running J-1 (with J the number of possible outcomes on an ordinal scale) binary regressions with *constant* slope coefficients for each regression. This results in the parallel regression assumption (Long and Freese (2006) p.197) on which the ordered probit model is based. However, the log-likelihood ratio test refutes this assumption for several variables of the data. Additionally, a Wald test as proposed by Brant (1990) examining the parallel regression assumption on each variable, shows that some variables violate the parallel regression assumption.

To address this issue, I rerun my regressions using a different methodology. The generalized ordered logit model avoids the parallel regression assumption (Greene (2003)). Instead of assuming identical regression coefficients for all J-1 regressions as the ordered probit or ordered logit model, the generalized ordered logit model[10] allows the coefficients to vary for each single regression.

[10] I employ the gologit2 command by Williams (2005)

However, in contrast to a multinomial logit model, it is possible to relax only those coefficients from the parallel regression assumption which violate it. The other coefficients are held constant. In addition, Peterson (2008) investigates the accuracy of standard errors in panel data sets for widely used econometrical approaches popular in the finance literature. He demonstrates significant biases for several methodologies and strongly urges to account for a possible dependency in residuals. Otherwise, he warns, standard models are having a tendency to overestimate the significance of the regression coefficients. Taking up his suggestions, I allow for a correlation of analyst coverage and recommendations for a given firm by clustering the error terms on the firm level. As robustness check, I additional cluster, as a second level, the error term of the recommendations by the same analyst for a given firm. Rerunning my regressions using this technique shows results very similar to those calculated by the ordered probit model.

Adding fixed effects to an ordered probit model in a panel data setting raises serious econometric issues, which have not yet been solved by the profession. Trying to obtain fixed effects by inserting dummy variables when using probit models will trigger the incidental parameter problem. In a first attempt to avoid these problems and to investigate the impact of fixed effects on my data, I rerun my regressions with panel data conditional logit regression model using fixed effects. This type of model has been developed by Andersen (1970) and Chamberlain (1980) to circumvent the incidental parameter problem. However, to be able to apply this model, I have to reduce the analyst' recommendation from a five point scale ranging from 1 (strong buy) to 5 (strong sell) to a binary recommendation scale consisting of good recommendations (which include recommendation 1 and 2) and hold/sell recommendations (including recommendation 3, 4 and 5). Having in such a way created a binary outcome of the analyst recommendation, I am now able to employ a panel data fixed effect conditional logit regression. Rerunning all regressions with this technique yields very similar results, which emphasizes the robustness of my earlier presented results and conclusions.

Figure 1: Selling pressure after the end of the lockup period, three years after the IPO and in the average firm

This table compares the sell-to-buy ratio of insider after the end of the lockup period, three years after the IPO as well as for U.S. companies in general. The sell-to-buy is calculated by the number of insider sells divided by insiders buys from the end of the lockup period up to 50 days thereafter. I include IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX as reported by the SDC database. I exclude REITS, utilities and financial institutions. I furthermore exclude offerings with an offer price below $5. Companies have to have information on shares outstanding and stock returns in the CRSP database. Insider trading is obtained from Thompson Financial. Insider trading three years after the IPO consists of insiders of my sample firms trading three years after the IPO. The insider trading in general sell to buy ratio is taken from Seyhun (1998) and describes the average insider trading ratio for U.S. firms.

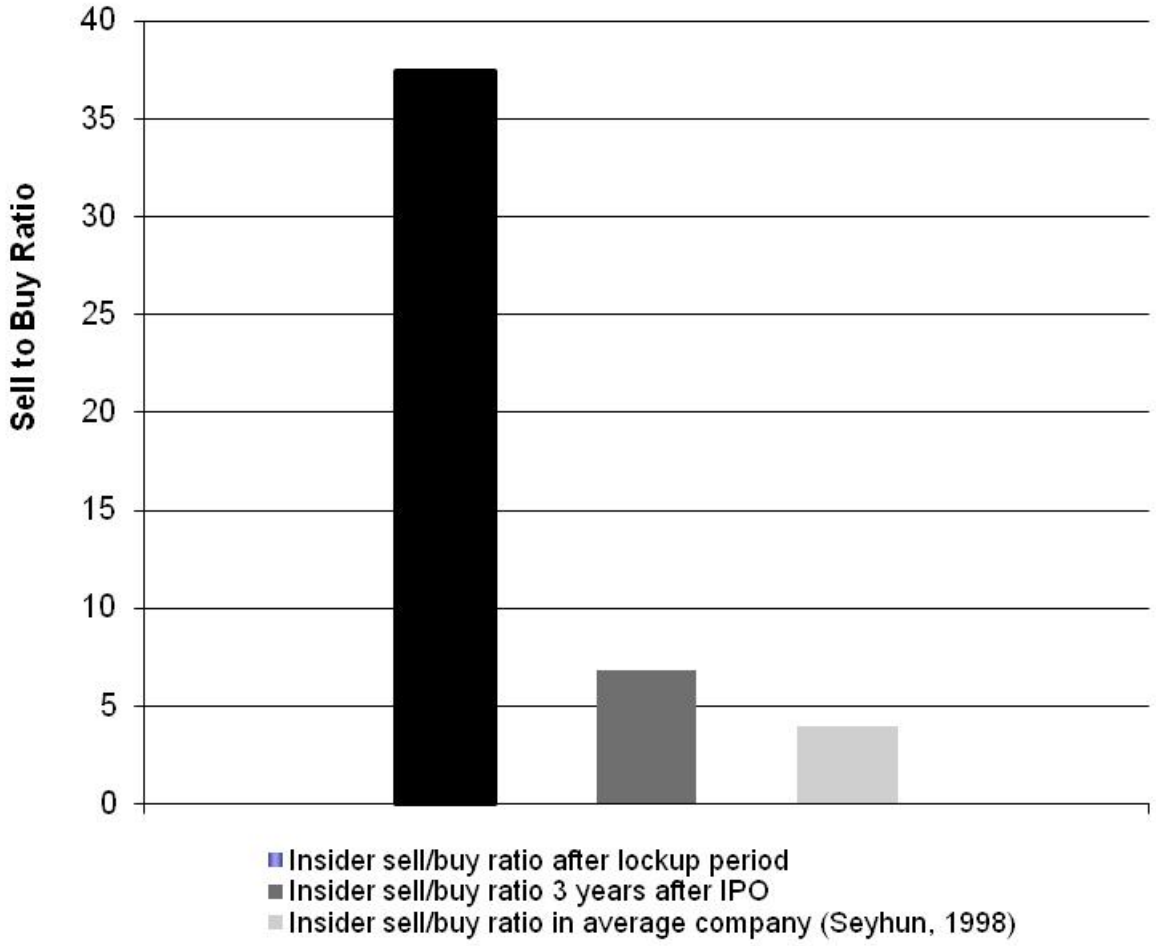
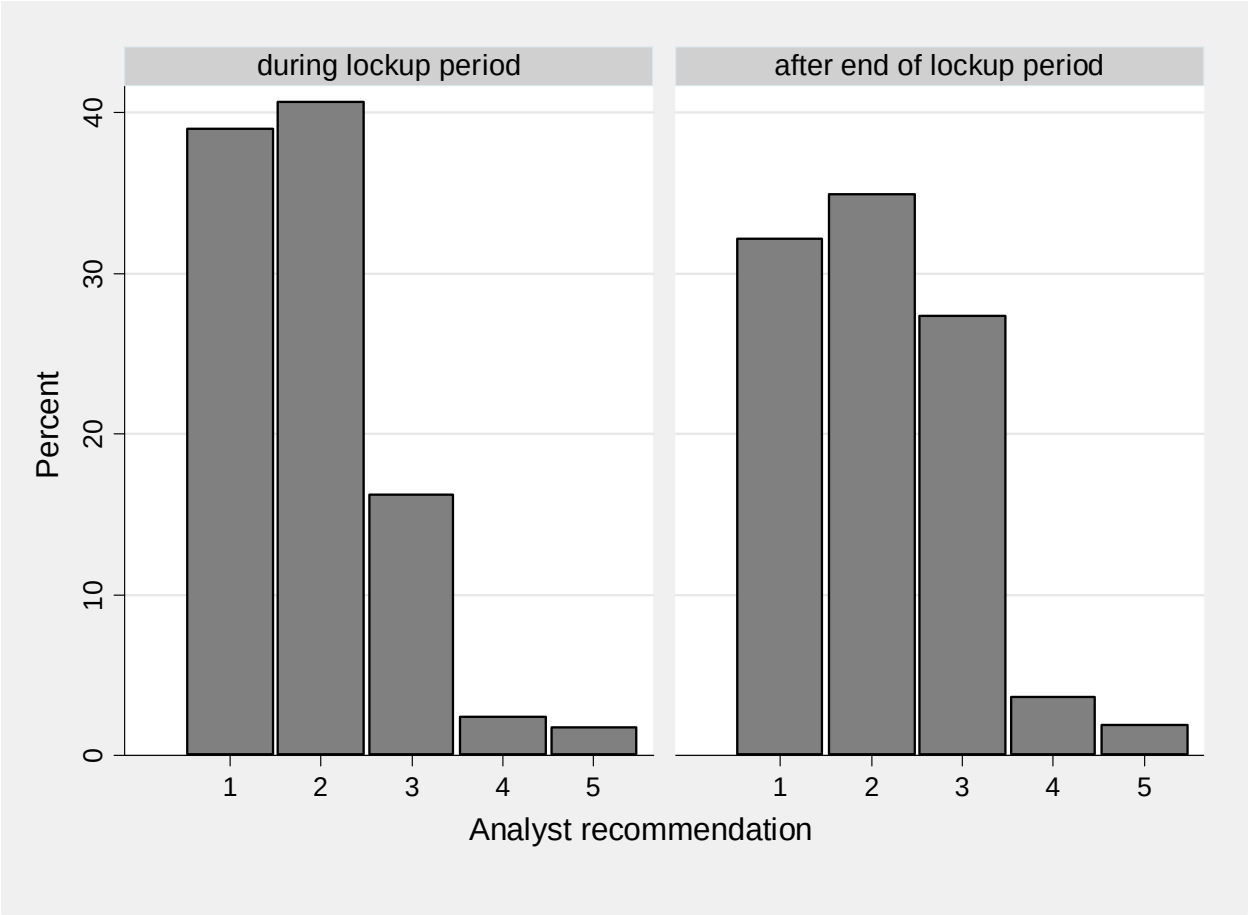


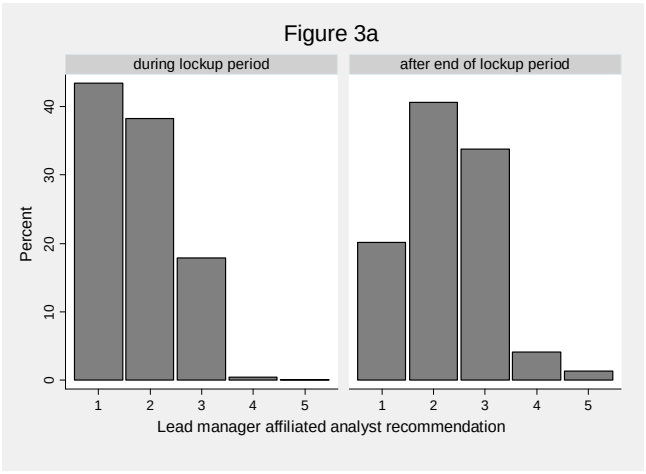
Figure 2: Distribution of analyst recommendation during and after the lockup period

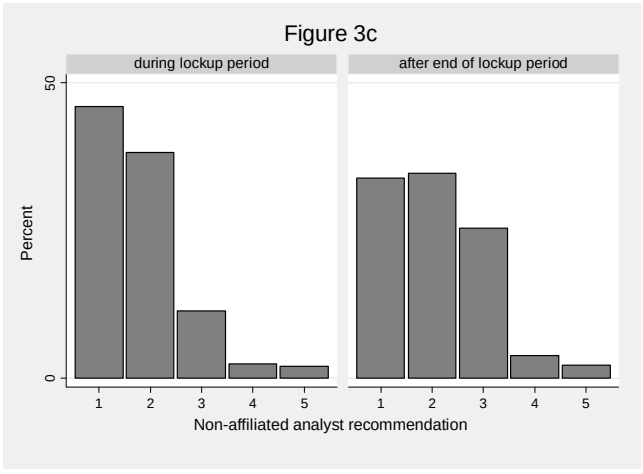
This histogram shows the frequency of analyst recommendations (on a 1 (=Strong Buy) to 5 (=Strong Sell) scale). Each bar denotes the percentage points the respective recommendation has been issued in comparison to all recommendations issued during this time period. The recommendations are divided into two time periods: recommendations issued after the quiet period until the end of the lockup period and recommendations issued from the day of the end of the lockup period up until 50 days later. The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below $5. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC.



Figures 3a, b, c: Distribution of analyst recommendation during and after the lockup period per type of affiliation

Histograms of the analyst recommendations (on a 1 (=Strong Buy) to 5 (=Strong Sell) scale) with each bar denoting the frequency in percent this recommendation has been issued in comparison to all recommendations issued in this time period. Figure 3a shows the recommendations by Lead Manager affiliated analysts, Figure 3b the recommendations by Co-Manager affiliated analysts and Figure 3c the recommendations by non-affiliated analysts. The recommendations are divided into two time periods: recommendations issued after the quiet period until the end of the lockup period and recommendations issued from the day of the end of the lockup period up until 50 days later. The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below $5. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC.





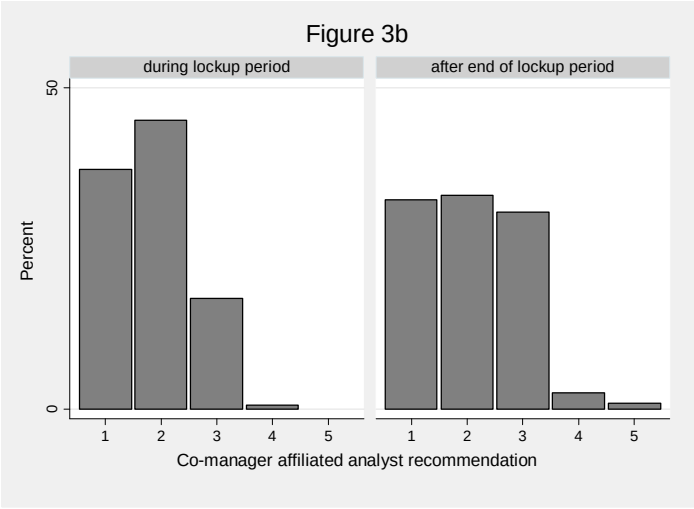
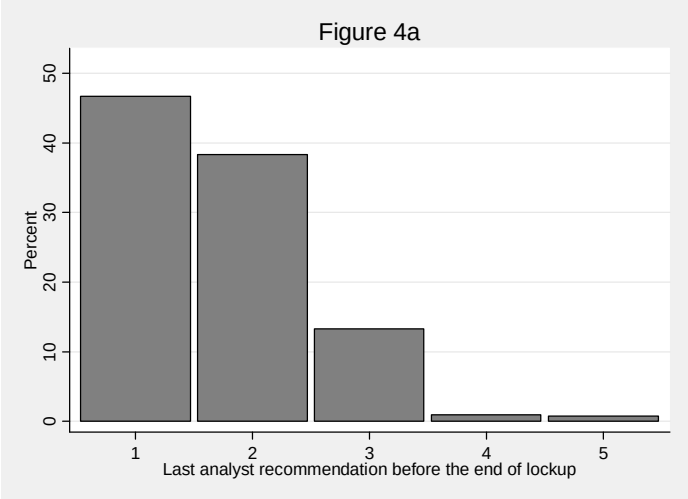


Figure 4: Distribution of the last analyst recommendation before the lockup period compared to the first recommendation after the end of the lockup period

Figure 4a shows the distribution of the last recommendation issued before the end of the lockup period and Figure 4b the distribution of the first recommendation issued after the end of the lockup period. Recommendations are issued on a 1 (=Strong Buy) to 5 (=Strong Sell) scale. The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below $5. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC.



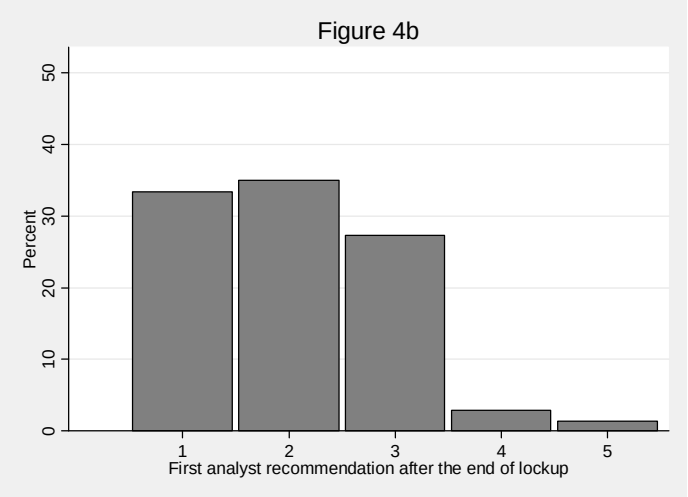


Figure 5: Prediction II and Prediction III of the *Prop Up During Lockups* hypothesis in relation to firm performance and analyst recommendations

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	Bad Performer*	**Good Performer***	***Predicted difference in recommendations bad-good performer****
During lockup period	overoptimistic recommendations	overoptimistic / truthful recommendations	**no significant difference**
After end of lockup period	truthful recommendations	truthful recommendations	**good performers will receive stronger recommendations than bad performers**
Predicted difference in recommendations before-after	**downward revision**	**slight downward revision**	

Prediction II

Prediction III

*performance is measured as the buy-and-hold return starting from the end of the first offer day up until the analyst recommendation and benchmarked against the equally weighted market return

Figure 6: Timing of the start of coverage by analysts in respect to the end of the quiet period

The start of broker coverage is defined as the first recommendation of a broker for a given company. Data on analyst recommendation is obtained from FirstCall. Distance in days from the end of the quiet period is the difference in days of the date of analyst recommendation minus the date of the end of the quiet date as reported by SDC. The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below $5. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC.

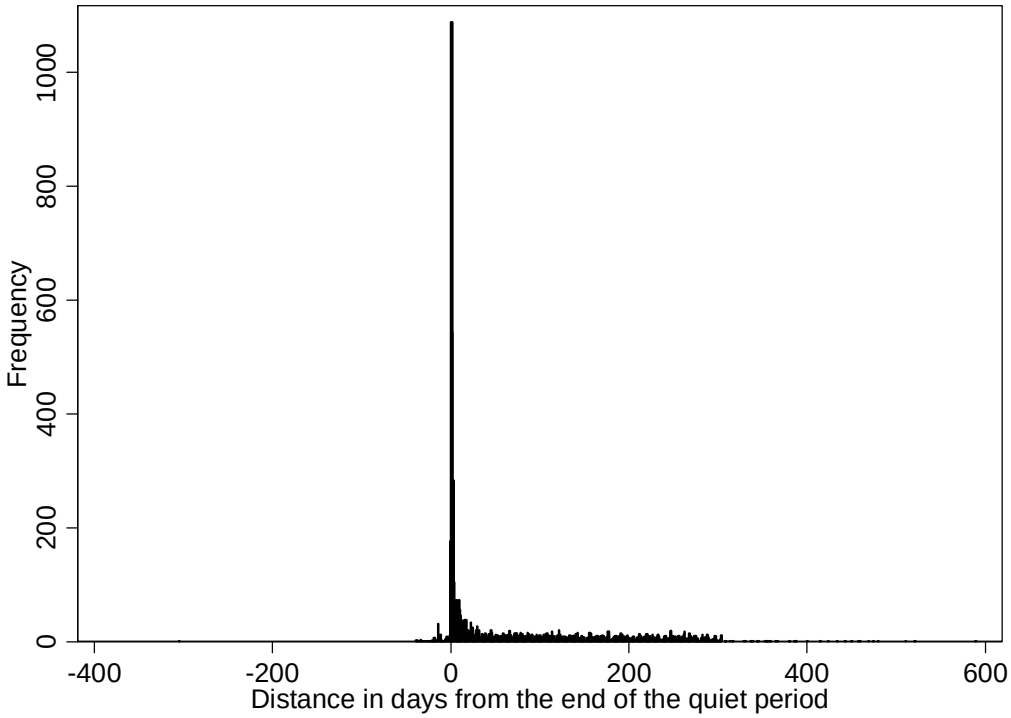

Figure 7: Analyst stopping coverage around the end of the lockup period

The end of broker coverage is defined if a broker did not issue a new recommendation for at least one year for a given company. Data on analyst coverage is obtained from FirstCall. Distance in days from the end of the lockup period is the difference in days of the date of analyst recommendation minus the date of the end of the lockup date as reported by SDC. I focus on the end of broker coverage events in the +/- 150 period around the end of the lockup period. The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below $5. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC. A Kruskal-Wallis test reveals that the difference in number of analysts stopping coverage around the end of the lockup test is highly significant at the 1% level.

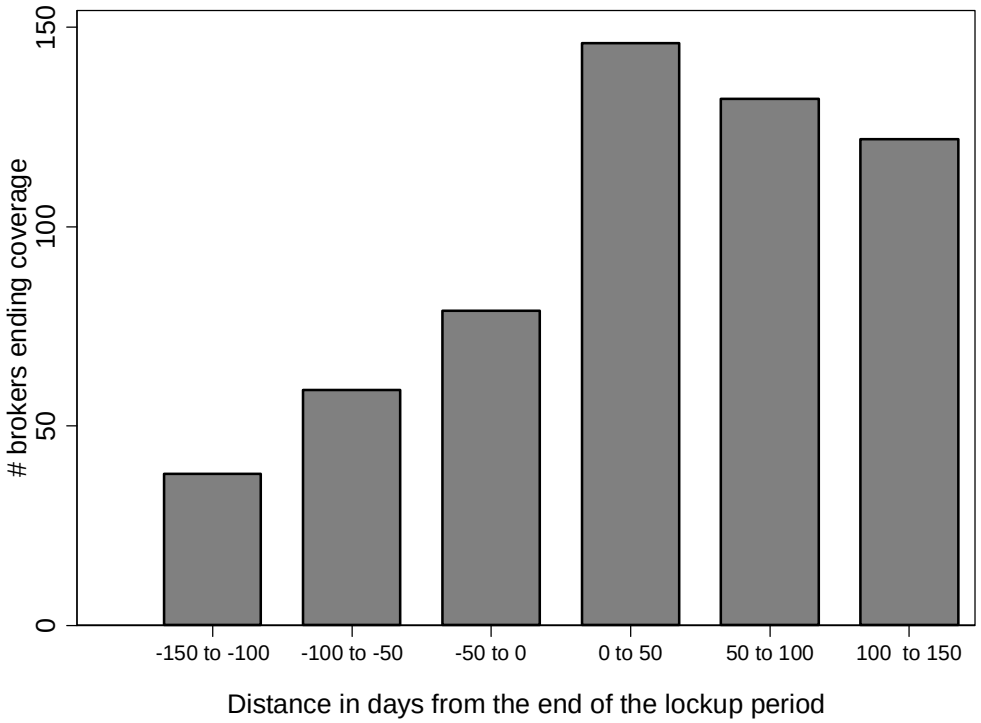

Table 1: Descriptive statistics of the sample

The sample consists of IPOs which went public from 1996 - 2006 and subsequently registered either at the NYSE, NASDAQ or AMEX as reported by the SDC database. I exclude REITS, ADRs and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC.

Panel A reports the firm characteristics of the offering companies. *Proceeds* are shown in million $. *Firm size* is calculated with the Compustat variables "Shares outstanding" * "Share Price" as reported on the day of the offering by CRSP and shown in million $. *Length of lockup period* is measured in days. *% of insider ownership* represents the percentage of the company owned by managers (as reported by SDC) before the IPO.

Panel B shows the amount and type of shares offered during the IPO. *Shares offered in IPO as % of total shares outstanding after IPO* measures the relation of shares offered during the IPO to the total amount of shares outstanding after the offering. *Primary shares as % shares offered* measures the ratio of primary shares offered in the IPO to the total amount of shares offered (primary plus secondary shares) in the IPO. Data is obtained from SDC

		Obs	Mean	Median	Minimum	Maximum	Interquartile Range
Panel A	Proceeds	1'232	82 m$	45 m$	4 m$	4'600 m$	48 m$
	Firm size	1'017	340 m$	180 m$	13 m$	10'000 m$	260 m$
	Length of lockup period	1'232	185	180	90	730	0
	VC backing	542					
	% of insider ownership	1'082	45%	46%	0%	100%	32%
Panel B	Shares outstanding after the offering	1'154	23'000'000	15'000'000	648'848	490'000'000	17'000'000
	Shares offered in IPO as % of total shares outstanding after IPO	1'150	32%	26%	0%	501%	16%
	Primary shares offered	1'206	4'494'845	3'350'000	400'000	46'000'000	2'610'000
	Primary shares as % shares offered	1'206	92%	100%	8%	100%	11%
	Secondary shares offered	423	3'402'234	0	12'000	200'000'000	1'369'310

Table 2: Insider trading after the IPO

The sample consists of IPOs which went public from 1996 - 2005 and subsequently registered either at the NYSE, NASDAQ or AMEX as reported by the SDC database. I exclude REITS, utilities, reverse LBOs, spinoffs, ADRs and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC.

This table reports the dollar value of ihe shares traded by insiders beginning with the lockup period for 50 days, depending on whether secondary shares were issued during the IPO. Insiders are defined as CEO, COO, CFO, CIO, CTO, Executive-Vice President, plus officers and directors. All traded shares, all shares sold and all shares bought incorporate every trade recorded in the Thompson Insider Trading database.

	No Secondary Shares Sold in IPO						Secondary Shares Sold in IPO						Total
	Obs	Mean	Median	Minimum	Maximum	Interquartile Range	Obs	Mean	Median	Minimum	Maximum	Interquartile Range	Mean
Value of total shares traded by *insiders* after lockup period	809	-$3'348'249	$0	-$730'000'000	$8'283'228	$0	423	-$1'975'502	$0	-$150'000'000	$45'000'000	$154'535	-$2'876'924
Value of shares sold by *insiders* after lockup period	809	$3'418'803	$0	$0	$8'283'228	$0	423	$2'091'080	$0	$0	$150'000'000	$156'450	$2'962'937
Value of shares bought by *insiders* after lockup period	809	$66'459	$0	$0	$730'000'000	$0	423	$115'578	$0	$0	$45'000'000	$0	$83'324
Value of *all* shares traded after lockup period	809	-$7'403'011	$0	-$2'500'000'000	$50'000'000	$0	423	-$7'352'248	$0	-$1'000'000'000	$45'000'000	$198'000	-$7'385'582
Value of *all* shares sold after lockup period	809	$7'641'631	$0	$0	$2'500'000'000	$11'750	423	$7'494'194	$0	$0	$1'000'000'000	$209'904	$7'591'009
Value of *all* shares bought after lockup period	809	$234'526	$0	$0	$50'000'000	$0	423	$141'946	$0	$0	$45'000'000	$0	$202'739

Table 3: Analyst recommendations during and after the lockup period

Analyst recommendation (on a 1 (=Strong Buy) to 5 (=Strong Sell) scale) by analyst affiliation (Lead manager – Co-manager – Non-affiliated - All Analysts) to the investment bank organizing the IPO. We show the *mean* of the recommendations issued during the lockup period (after the quiet period until the end of the lockup period) and after the lockup period ended (recommendations issued from the day of the end of the lockup period and 50 days following) with # describing the number of recommendations issued. The *last recommendation before lockup* lists the last recommendation by an analyst before the end of the lockup period. *First recommendation after lockup* shows the first recommendation issued by an analyst after the lockup period has expired. The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX. I exclude REITS, utilities, reverse LBOs, spinoffs, ADRs and financial institutions. I furthermore exclude offerings with an offer price below 5 $.

		Recommendations issued		
Analyst affiliation		during lockup period	after lockup period	Difference after - before
Lead manager	#	342	167	
	mean	1.85	2.23	0.38 ***
last recommendation before lockup		1.81		0.36 ***
first recommendation after lockup			2.17	
Co-manager	#	670	350	
	mean	1.85	2.09	0.24 ***
last recommendation before lockup		1.81		0.20 **
first recommendation after lockup			2.01	
Non-affiliated	#	1,348	1,193	
	mean	1.86	2.04	0.18 ***
last recommendation before lockup		1.75		0.24 ***
first recommendation after lockup			1.99	
All analysts	#	2,360	1,710	
	mean	1.86	2.06	0.20 ***
last recommendation before lockup		1.78		0.24 ***
first recommendation after lockup			2.02	

A Kruskal-Wallis test shows significant differences between the groups at the *** (1%), ** (5%) and * (10%) confidence level.

Table 4: Ordered probit regression highlighting the change in analyst' recommendations around the end of the lockup period

Ordered probit model regression with analyst recommendations as the dependent variable. Model 1 uses standard firm control variables. Model 2 uses the bootstrap methodology to calculate the standard errors of the coefficients. Model 3 additionally controls for the bubble period during 1999 and 2000 as well as for the industry in terms of the 2 digit SIC codes. Model 4 omits firms with less than 5 analyst recommendations.

Lockup ended is a dummy variable equaling 1 if the recommendation was issued after the end of the lockup period. *Underwriter rank* is the Carter and Manaster (1990) underwriting reputation rank as updated by Loughran and Ritter (2004). *Lead manager* equals 1 if the recommendation has been issued by a lead-underwriter. *Lockup ended x lead manager* is a dummy variably equaling 1 if the analyst affiliated with the lead manager and the recommendation has been issued after the end of the lockup period. *Co-manager* equals 1 if the recommendation has been issued by a analyst affiliated with a co-managing bank in the IPO process. *Log_size* represents the log of the market capitalization as calculated by the shares outstanding after the offering (obtained from CRSP) multiplied with the share price at the end of the offering day (obtained from SDC). *Primary shares in % of shares offered* is the ratio of primary shares offered divided by the total amount of shares (=primary plus secondary) offered during the IPO. *Proceeds* is the amount in dollars of the total shares offered during the offering (SDC). *VC* is a dummy variable if the offering was backed by a venture capitalist (SDC). # *Lead managers* (# *Co-managers*) represents the number of lead manager (co-managers) during the IPO process. *Bubble* is a dummy variables equaling 1 during the years 1999 and 2000. We include recommendations by analysts in the time period starting from the date of the offering up to 50 days after the lockup period has ended.

The sample consists of IPOs which went public from 1996 - 2006 and subsequently registered either at the NYSE, NASDAQ or AMEX as reported by the SDC database. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below $5. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC. The number of lead managers and co-managers are taken from the SDC database. Analyst recommendations are taken from FirstCall, insider trading from Thompson Financial. The t-values are shown in brackets below the coefficients.

	dependent variable: analyst recommendation			
	Model 1	Model 2	Model 3	Model 4
Lockup ended	***0.369****	***0.369****	***0.373****	***0.260****
	(10.41)	***(10.31)***	***(10.43)***	***(6.24)***
Lockup ended x lead manager	***0.225****	***0.225****	***0.232****	***0.168***
	(2.34)	***(2.4)***	***(2.37)***	***(1.45)***
Underwriter rank	0.027**	0.027**	0.020*	0.065***
	(2.28)	2.32	(1.68)	(4.6)
Lead manager	-0.093**	-0.093**	-0.103**	-0.127**
	-(2.04)	-1.98	-(2.26)	-(2.27)
Co-manager	0.049	0.049	0.042	-0.036
	(1.52)	1.45	(1.27)	-(0.91)
log_size	0.121***	0.121***	0.145***	0.022
	(6.85)	7.13	(7.06)	(1.02)
NASDAQ	0.08	0.08	0.034	0.133
	(0.56)	0.56	(0.23)	(0.76)
NYSE	0.196	0.196	0.169	0.263
	(1.33)	1.35	(1.11)	(1.46)
Primary shares in % of shares offered	0.001	0.001	0.001	0.001
	(0.76)	0.75	(1.37)	(1.54)
Proceeds	0.001***	0.001***	0.000**	0.001***
	(4.11)	4.12	(2.27)	(3.96)
# Lead managers	0.225***	0.225***	0.211***	0.202***
	(6.25)	6.19	(5.38)	(5.37)
Bubble			-0.154***	
			-(4.27)	
SIC 2 Digit dummy	No	No	Yes	No
R-squared	0.044	0,044	0.055	0.034
N	6596	6596	6593	4215

* p<0.10, ** p<0.05, *** p<0.01

Table 5: Impact of underperforming companies and the end of the lockup period on analyst recommendation

Average recommendation (on a 1 (=Strong Buy) to 5 (=Strong Sell) scale) by analyst affiliation (Lead manager – Co-manager – Non-affiliated) to the investment bank organizing the IPO. Panel A shows the average recommendation from the IPO up to the end of the lockup period as well as from the end of the lockup period for 50 days. In Panel B I show the last recommendation before the end of the lockup period and the first recommendation after the lockup period expired. The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX. I split the sample into terciles according to their stock buy-and-hold return from time of the day after the offering up to one day before each recommendation (benchmarked against the equally weighted market portfolio). The significance of the differences between the groups is calculated using a Kruskal-Wallis equality-of-populations rank test.

			Under-performance	Over-performance	Total	***Difference Under - Overperformance***
Panel A	**mean recommendation before end of lockup**	N	1'709	1'696	5'159	
		mean	1.77	1.78	1.76	***-0.01***
	mean recommendation after end of lockup	N	321	333	930	
		mean	2.13	2.02	2.04	***0.11****
	Difference before - after lockup		***0.36****	***0.24****		
Panel B	**last recommendation before end of lockup**	N	685	771	674	
		mean	1.69	1.65	1.73	***0.04***
	first recommendation after end of lockup	N	213	183	203	
		mean	2.15	2.01	1.91	***0.14****
	Difference before - after lockup		***0.46****	***0.36****		

* p<0.10, ** p<0.05, *** p<0.01

Table 6: Average recommendation around the lockup period by past firm performance

Dependent variable is the current analyst recommendation, issued on a 1 (=Strong Buy) to 5 (=Strong Sell) scale and obtained from the FirstCall database. I add the crossproduct *lockup_ended* (=1 if lockup period has ended, 0 otherwise) *x underperforming* tercile, the crossproduct *lockup_ended x overperforming tercile* as well as the *performance* variable itself. In Model 1 I measure the performance as the buy-and-hold return from the end of the offer day up to the midpoint of the lockup period, benchmarked against the equally weighted CRSP market return. In Model 2 I calculate the buy-and-hold return from the offer day up to one day prior to the recommendation date.

Additional control variables are: Underwriter rank is the Carter and Manaster (1990) underwriting reputation rank as updated by Loughran and Ritter (2004). *Underpricing*, measured as the difference between the closing price of the first trading day minus the offer price. *Lead manager* equals 1 if the recommendation has been issued by a lead-underwriter, *Co-manager* equals 1 if the recommendation has been issued by an analyst affiliated with a co-managing bank in the IPO process. *Log_size* represents the log of the market capitalization as calculated by the shares outstanding after the offering (obtained from CRSP) multiplied with the share price at the end of the offering day (obtained from CRSP). *Primary shares in % of shares offered* is the ratio of primary shares offered divided by the total amount of shares (=primary plus secondary) offered during the IPO. *Proceeds* is the amount in dollars of the total shares offered during the offering (SDC). *VC* is a dummy variable if the offering was backed by a venture capitalist (obtained from SDC). We include recommendations by analysts in the time period starting from the date of the offering up to 50 days after the end of the lockup period. The t-values are shown in brackets below the coefficients.

	dependent variable: analyst recommendation	
	Model 1	Model 2
underperformance up to recommendation x lockup_ended	***0.169****	
	(2.26)	
overperformance up to recommendation x lockup_ended	***-0.154****	
	-(2.07)	
overperformance up to recommendation	***-0.019***	
	-(0.97)	
underperformance up to mid of lockup period x lockup_ended		***0.284*****
		(3.89)
overperformance up to mid of lockup period x lockup_ended		***-0.09***
		-(1.27)
overperformance up to mid of lockup period		***-0.013***
		-(0.79)
Lockup ended	0.387***	0.338***
	(6.91)	(6.39)
Underwriter rank	0.022*	0.022*
	(1.95)	(1.94)
Underpricing	-0.058*	-0.019
	-(1.73)	-(0.5)
Lead-manager	-0.059	-0.059
	-(1.43)	-(1.42)
Co-manager	0.049	0.043
	(1.51)	(1.31)
log_size	0.129***	0.133***
	(6.08)	(6.27)
NASDAQ	0.08	0.076
	(0.57)	(0.53)
NYSE	0.224	0.218
	(1.53)	(1.47)
Primary shares in % of shares offered	0	0
	(0.3)	(0.48)
Proceeds	0.001***	0.001***
	(3.73)	(3.57)
VC	0.078**	0.078**
	(2.56)	(2.55)
# Lead managers	0.233***	0.237***
	(6.4)	(6.53)
# Co-managers	-0.010***	-0.010***
	-6.2	-6.22
R-squared	0.0465	0.0431
N	6590	6596

* p<0.10, ** p<0.05, *** p<0.01

Table 7: Ordered probit regression of past firm performance on analysts' recommendations

Ordered probit model regression with 5 different dependent variables: Model 1 uses recommendations by analysts issued in the second half of the lockup period, model 2 the analysts' recommendations issued after the end of the lockup period. Model 3 uses the last recommendation issued by analysts before and model 4 the first recommendations after the end of the lockup period as the left hand side variable. Model 5 uses the difference between the first recommendation minus the last recommendation before the end of the lockup period of a given analyst for a given firm as the dependent variable.

Analyst recommendations are on a 1 (=Strong Buy) to 5 (=Strong Sell) scale and obtained from the FirstCall database. L*ockup ended* is a dummy variable equaling 1 if the recommendation was issued after the end of the lockup period. The indicator variable *Underperformer* (*Average performer*) equals 1 if the company belongs to the lower tercile (middle tercile) of our sample in terms of the performance starting from the end of the offering day up to the midpoint of the lockup period, benchmarked against the equal weighted market portfolio return. *Underpricing* denotes the ratio of closing price minus offer price divided by offer price.

Lead manager equals 1 if the recommendation has been issued by a lead-manager, c*o-manager* equals 1 if the recommendation has been issued by an analyst affiliated with a co-managing bank in the IPO process. *Log_size* represents the log of the market capitalization as calculated by the shares outstanding after the offering (obtained from CRSP) multiplied with the share price at the end of the offering day (obtained from CRSP). *Primary shares in % of shares offered* is the ratio of primary shares offered divided by the total amount of shares (=primary plus secondary) offered during the IPO. *Proceeds* is the amount in dollars of the total shares offered during the offering (SDC). *VC* is a dummy variable if the offering was backed by a venture capitalist (SDC). # *Lead managers (# Co-managers)* represents the number of lead manager (co-managers) during the IPO process. I include recommendations by analysts in the time period starting from the date of the offering / end of the quiet period up to 50 days after the lockup period has ended.

The sample consists of IPOs which went public from 1996 - 2006 and subsequently registered either at the NYSE, NASDAQ or AMEX as reported by the SDC database. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC. The number of lead managers and co-managers are taken from the SDC database. Analyst recommendations are taken from FirstCall, insider trading from Thompson Financial. The t-values are shown in brackets below the coefficients.

	Model 1	Model 2	Model 3	Model 4	Model 5
Dependent variable	Recommendations issued during lockup	Recommendations issued after end of lockup	Last recommendation issued before end of lockup	First recommendation issued after end of lockup	Difference of first recommendation after lockup and last recommendation. before end of lockup
Underperformer	***0***	***0.396****	***0.014***	***0.430****	***0.356****
	(0.01)	***(5.73)***	***(0.23)***	***(4.95)***	***(3.05)***
Average performer	**0.023**	**0.067**	**0.052**	**0.056**	**0.1**
	(0.61)	***(1.)***	***(0.89)***	***(0.63)***	***(0.79)***
Underpricing	0.038***	-0.01	0.036*	-0.031	-0.103**
	(2.93)	-(0.41)	(1.74)	-(0.94)	-(2.19)
Lead manager	-0.100**	0.09	-0.007	0.107	0.236
	-(2.11)	(1.05)	-(0.12)	(1.06)	(1.62)
Co-manager	0.037	0.058	0.153***	-0.002	0.059
	(1.01)	(0.82)	(2.68)	-(0.02)	(0.49)
log_size	0.161***	-0.021	0.119***	0.007	-0.207***
	(7.53)	-(0.61)	(3.59)	(0.15)	-(3.47)
NASDAQ	0.104	-0.075	-0.14	0.032	-0.335
	(0.63)	-(0.25)	-(0.7)	(0.1)	-(0.78)
NYSE	0.225	0.193	-0.025	0.218	-0.383
	(1.31)	(0.63)	-(0.12)	(0.62)	-(0.86)
Primary shares in % of	0	0.003*	-0.002	0.001	0.003
shares offered	-(0.42)	(1.65)	-(1.36)	(0.35)	(0.87)
Proceeds	0.001***	0.001***	0.001*	0.001***	0
	(3.14)	(3.14)	(1.85)	(2.92)	(0.51)
VC	0.100***	0.002	0.158***	0.048	0.02
	(2.82)	(0.03)	(2.94)	(0.61)	(0.19)
# Lead managers	0.246***	0.204***	0.263***	0.198*	0.051
	(5.83)	(2.87)	(3.56)	(1.95)	(0.39)
# Co-managers	-0.011***	-0.008**	-0.015***	-0.007*	0.012**
					-1.55
R-squared	0.044	0.046	0.023	0.024	0.048
N	5000	1596	2203	951	507

+ p<0.15, * p<0.10, ** p<0.05, *** p<0.01

Table 8: Influence of different shareholders on analyst recommendation

Dependent variable is the current analyst recommendation, issued on a 1 (=Strong Buy) to 5 (=Strong Sell) scale and obtained from the FC database. *Lockup ended* is a dummy variable equaling 1 if the recommendation was issued after the end of the lockup period. *VC x lockup* is a dummy variable equaling one if the company is VC backed and the lockup period is over. *VC x lead(co)-manager-lockup* is a dummy variable if an analyst affiliated with the lead(co)-manager issued the recommendation, the lockup period has ended and the company is backed by VCs. *High Insider Ownership x lockup* is a dummy variable equaling 1 if the company belongs to the highest quartile in terms of ownership by management before the IPO and the lockup period is over. *High Insider Ownership* measures the ownership of managers before the IPO in percent (obtained from SDC). *High Insider Ownership x lockup* is a dummy variable equaling 1 if the company belongs to the highest quartile in terms of the degree of insider ownership before the IPO. *High insider ownership x lead(co)-manager x lockup* equals one if an analyst affiliated with the lead(co)-manager issued the recommendation, the lockup period has ended and the company belongs to the highest quartile in terms of the degree of insider ownership before the IPO.

Lead manager equals 1 if the recommendation has been issued by a lead-underwriter, *Co-manager* equals one if the recommendation has been issued by a analyst affiliated with a co-managing bank in the IPO process. *Log_size* represents the log of the market capitalization as calculated by the shares outstanding after the offering (obtained from CRSP) multiplied with the share price at the end of the offering day (obtained from SDC). *Primary shares in % of shares offered* is the ratio of primary shares offered divided by the total amount of shares (=primary plus secondary) offered during the IPO. *Proceeds* is the amount in dollars of the total shares offered during the offering (SDC). *VC* is a dummy variable if the offering was backed by a venture capitalist (SDC). We include recommendations by analysts in the time period starting from the date of the offering / end of the quiet period up to 50 days after the lockup period has ended. The t-values are shown in brackets below the coefficients.

	dependent variable analyst recommendation
VC x lead-manager x lockup	***0.672******
	(2.93)
High insider ownership x lead-manager x lockup	***0.322****
	(2.01)
VC x co-manager x lockup	0.023
	(0.11)
High insider ownership x co-manager x lockup	-0.009
	-(0.07)
VC x lockup	-0.119
	-(1.54)
High insider ownership x lockup	0.01
	(0.12)
VC	0.068*
	(1.86)
Insider Ownership before IPO	-0.002***
	-(3.47)
Lockup ended	***0.407******
	(7.3)
Underwriter rank	0.008
	(0.62)
Lead-manager	-0.069
	-(1.45)
Co-manager	0.04
	(1.05)
log_size	0.142***
	(7.11)
R-squared	0.48
N	5624

+ p<0.15, * p<0.10, ** p<0.05, *** p<0.01

Table 9: The impact of new regulation on the downward revision of analysts after the lockup period

Ordered probit model regression with analyst recommendations as the dependent variable. *Regulation* is a dummy variable equaling 1 if recommendations were issued after more restrictive regulation (NASD Rule 2711, NYSE Rule 472, the Global Settlement) of analyst and company disclosure has been in enacted. *Regulation x lockup ended* is the interaction term equaling 1 if the lockup period has ended and the new regulation has been passed. *Lockup ended* is a dummy variable equaling 1 if the recommendation was issued after the end of the lockup period. *Underwriter rank* is the Carter and Manaster (1990) underwriting reputation rank as updated by Loughran and Ritter (2004). *Lead manager* equals 1 if the recommendation has been issued by a lead-underwriter, *Co-manager* equals 1 if the recommendation has been issued by a analyst affiliated with a co-managing bank in the IPO process. *Log_size* represents the log of the market capitalization as calculated by the shares outstanding after the offering (obtained from CRSP) multiplied with the share price at the end of the offering day (obtained from SDC). *Primary shares in % of shares offered* is the ratio of primary shares offered divided by the total amount of shares (=primary plus secondary) offered during the IPO. *Proceeds* is the amount in dollars of the total shares offered during the offering (SDC). *VC* is a dummy variable if the offering was backed by a venture capitalist (SDC). # *Lead managers* (# *Co-managers*) represents the number of lead manager (co-managers) during the IPO process. *Bubble* is a dummy variables equaling 1 during the years 1999 and 2000. We include recommendations by analysts in the time period starting from the date of the offering up to 50 days after the lockup period has ended.

The sample consists of IPOs which went public from 1996 - 2006 and subsequently registered either at the NYSE, NASDAQ or AMEX as reported by the SDC database. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC. The number of lead managers and co-managers are taken from the SDC database. Analyst recommendations are taken from FirstCall, insider trading from Thompson Financial. The t-values are shown in brackets below the coefficients.

	dependent variable: analyst recommendation
Regulation	***0.762******
	(17.12)
Regulation x lockup ended	***-0.140****
	-(1.94)
Lockup ended	***0.411******
	(10.33)
Underwriter rank	0.012
	(1.01)
Lead manager	-0.120***
	-(2.88)
Co-manager	-0.029
	-(0.86)
log_size	0.108***
	(5.55)
NASDAQ	-0.031
	-(0.21)
NYSE	0.059
	(0.38)
Primary shares in % of shares offered	0.002**
	(2.19)
Proceeds	0
	(0.7)
SIC 2 Digit dummy	yes
R-squared	0.0767
N	6593

* p<0.10, ** p<0.05, *** p<0.01

Table 10: Test if analyst learning explains downward revision at the end of the lockup period

Ordered probit model regression with analyst recommendations as the dependent variable. *Recommendation number* counts the recommendations issued since the IPO in ascending order. *Lockup ended* is a dummy variable equaling one if the recommendation was issued after the end of the lockup period. *Underwriter rank* is the Carter and Manaster (1990) underwriting reputation rank as updated by Loughran and Ritter (2004). *Lead manager* equals one if the recommendation has been issued by a lead-underwriter, Co-manager equals one if the recommendation has been issued by a analyst affiliated with a co-managing bank in the IPO process. *Log_size* represents the log of the market capitalization as calculated by the shares outstanding after the offering (obtained from CRSP) multiplied with the share price at the end of the offering day (obtained from SDC).

Primary shares in % of shares offered is the ratio of primary shares offered divided by the total amount of shares (=primary plus secondary) offered during the IPO. *Proceeds* is the amount in dollars of the total shares offered during the offering (SDC). # *Lead managers* (# *Co-managers*) represents the number of lead managers (co-managers) during the IPO process. *Bubble* is a dummy variables equaling one during the years 1999 and 2000. We include recommendations by analysts in the time period starting from the date of the offering up to 50 days after the lockup period has ended.

The sample consists of IPOs which went public from 1996 - 2006 and subsequently registered either at the NYSE, NASDAQ or AMEX as reported by the SDC database. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC. The number of lead managers and co-managers are taken from the SDC database. Analyst recommendations are taken from FirstCall, insider trading from Thompson Financial.. The t-values are shown in brackets below the coefficients.

	dependent variable: analyst recommendation
Recommendation number	***0.033****
	(8.93)
Lockup ended	***0.178****
	(4.38)
Underwriter rank	0.014
	(1.15)
Lead-manager	-0.077*
	-(1.75)
Co-manager	0.037
	(1.06)
log_size	0.091***
	(4.63)
NASDAQ	-0.02
	-(0.13)
NYSE	0.078
	(0.48)
Primary shares in % of shares offe	0.001
	(0.95)
Proceeds	0.001***
	(3.31)
VC	0.032
	(0.98)
# Lead managers	0.169***
	(4.36)
# Co-managers	-0.010***
	-(5.71)
R-squared	0.048
N	5792

* p<0.10, ** p<0.05, *** p<0.01

Table 11: Earnings per share development around the end of the lockup period of newly issued companies

Quarterly earnings per share data is taken from Compustat. *Quarter prior to lockup* is the distance in terms of earnings announcements to the lockup period. I winsorize the earnings per share at the 5 percent level. *Difference Eps to Eps of prior quarter* is the difference between the current Eps and the Eps of the prior quarter (both winsorized). The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX as obtained from the SDC database. I exclude REITS, utilities and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database.

	Quarter prior to lockup expiration	Earnings per share (diluted, winsorized)	Difference Eps to Eps of prior quarter (winsorized)
mean	-3	-0.38	0.00
median		-0.02	0.00
mean	-2	-0.20	0.07
median		0.03	0.01
mean	-1	-0.03	0.18
median		0.05	0.02
mean	1	-0.01	0.03
median		0.06	0.01
mean	2	-0.02	-0.02
median		0.07	0.00
mean	3	-0.01	0.00
median		0.06	0.00

A Kruskal-Wallis test shows no significant differences between the three groups at the 15% confidence level.

Table 12: Earnings per share development around the end of the lockup period of newly issued companies with earnings announcement 30 days around the expiration of the lockup period

Quarterly earnings per share data is taken from Compustat. *Quarter prior to lockup* is the distance in terms of earnings announcements to the lockup period, with 0 being the earnings announcement at the end of the lockup period. I show Eps as well as at the 5 percent level winsorized EPS. *Difference Eps to Eps of prior quarter* is the difference between the current Eps and the Eps of the prior quarter (both winsorized). The sample consists of IPOs with earnings announcements in the 30 days around the lockup period. The IPOs went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX as obtained from the SDC database. I exclude REITS, utilities and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database.

	Quarter prior to lockup expiration	Earnings per share (diluted, winsorized)	Difference Eps to Eps of prior quarter (winsorized)
mean	-1	-0.13	0.19
median		0.03	0.02
mean	0	-0.01	0.11
median		0.05	0.03
mean	1	-0.02	-0.01
median		0.04	0.00

A Kruskal-Wallis test shows no significant differences between the three groups at the 15% confidence level.

Table 13: Impact of the end of the lockup period versus 180 days after IPO

Ordered probit model regression with analyst recommendations as the dependent variable. *Lockup ended* is a dummy variable equaling 1 if the recommendation was issued after the end of the lockup period. *180 days dummy* is a dummy variable equaling 1 if 180 days after the IPO have passed, 0 else. *Underwriter rank* is the Carter and Manaster (1990) underwriting reputation rank as updated by Loughran and Ritter (2004). *Lead manager* equals 1 if the recommendation has been issued by a lead-underwriter, *Co-manager equals* 1 if the recommendation has been issued by a analyst affiliated with a co-managing bank in the IPO process. *Log_size* represents the log of the market capitalization as calculated by the shares outstanding after the offering (obtained from CRSP) multiplied with the share price at the end of the offering day (obtained from SDC). *Primary shares in % of shares offered* is the ratio of primary shares offered divided by the total amount of shares (=primary plus secondary) offered during the IPO. *Proceeds* is the amount in dollars of the total shares offered during the offering (SDC). *VC* is a dummy variable if the offering was backed by a venture capitalist (SDC). *# Lead managers* (*# Co-managers*) represents the number of lead manager (co-managers) during the IPO process. I include recommendations by analysts in the time period starting from the date of the offering up to 50 days after the lockup period has ended.

The sample consists of IPOs with a lockup period different from 180 days. The companies went public from 1996 - 2006 and subsequently registered either at the NYSE, NASDAQ or AMEX as reported by the SDC database. I exclude REITS, utilities, ADRs and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database as well as lockup period information on SDC. The number of lead managers and co-managers are taken from the SDC database. Analyst recommendations are taken from FirstCall. The t-values are shown in brackets below the coefficients.

	dependent variable: analyst recommendation
Lockup ended	***0.417******
	(2.71)
180 days dummy	***0.214***
	(1.33)
Underwriter rank	-0.003
	-(0.05)
Lead manager	-0.526**
	-(2.27)
Co-manager	0.083
	(0.47)
log_size	0.073
	(0.69)
NASDAQ	0.058
	(0.13)
NYSE	0.437
	(0.91)
Primary shares in % of shares offered	0.004
	(0.84)
Proceeds	-0.001
	-(0.31)
# Lead managers	0.205
	(1.01)
# Co-managers	-0.021**
	-(2.53)
R-squared	6.06
N	253

* p<0.10, ** p<0.05, *** p<0.01

Table 14: Market reaction to analyst recommendations before and after the offering

Panel A presents the number of downgrades, the mean and the median market reaction following a negative change in recommendation by an analyst compared to his earlier recommendation. Panel B presents the number of upgrades, the mean and the median market reaction following a positive change in recommendation by an analyst compared to his earlier recommendation, The market reaction is calculated using the buy and hold return of the share one day prior to the recommendation up to one day after the recommendation and is benchmarked against the equally weighted market return in the same period. The share price performance is calculated as the buy and hold return from the end of the first offer day up to the midpoint of the lockup period and is benchmarked against the equal weighted market return. The sample is split into three terciles of overperformer, average performer and underperformer according to their buy and hold return.

Revisions issued before the end of lockup include all changes in recommendations issued by a given analysts from the offering day up to the day prior to the end of the lockup period. Revisions after the end of the lockup period include all changes in recommendations from the day of the end of the lockup period up to 50 days thereafter.

The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX as obtained from the SDC database. I exclude REITS, utilities and financial institutions. I furthermore exclude offerings with an offer price below 5 $. Companies have to have information on shares outstanding and stock returns in the CRSP database. The number of lead managers and co-managers are taken from the SDC database. Analyst recommendations are taken from FirstCall, insider trading from Thompson Financial. The significance of the differences between the groups is calculated using a Kruskal-Wallis equality-of-populations rank test.

		Share price performance			
		Underperformer	Average Performer	Overperformer	Total
Panel A: Market reaction following a downgrading by an analyst					
Timing of revision					
Downgrading issued before end of lockup	# of recs.	157	101	100	358
	Mean	-18.50%	-6.90%	-9.20%	-12.60%
	Median	-14.90%	-4.50%	-4.40%	-6.50%
Downgrading issued after end of lockup	# of recs.	72	52	52	176
	Mean	-12.60%	-11.50%	-11.40%	-11.90%
	Median	-6.60%	-4.00%	-6.00%	-5.80%
Difference before - after lockup		**-5.90%**	**4.60%**	**2.20%**	**-0.70%**
		-8.30%	-0.50%	1.60%	-0.70%
Panel B: Market reaction following an upgrading by an analyst					
Timing of revision					
Upgrading issued before end of lockup	# of recs.	103	80	97	280
	Mean	3.90%	1.80%	-1.20%	1.50%
	Median	2.00%	1.70%	-2.60%	0.60%
Upgrading issued after end of lockup	# of recs.	33	36	53	122
	Mean	5.10%	4.30%	4.60%	4.70%
	Median	3.00%	1.50%	2.50%	2.40%
Difference before - after lockup		**-1.20%**	**-2.50%**	**-5.8%*** **	**-3.20%**
		1.00%	-0.20%	5.10%	1.80%

* p<0.10, ** p<0.05, *** p<0.01

Chapter II

The Impact of Optimistic and Privately Informed Managers on Firm Performance and Corporate Decisions

The Impact of Optimistic and Privately Informed Managers on Firm Performance and Corporate Decisions[1]

Jens Martin[2]

This paper investigates if and to which extent managerial behavior, its private information and potential behavioral biases of managers can explain the underperformance of IPOs and SEOs. I test a behavioral explanation, the optimistic manager hypothesis, as well as rational theories, the window of opportunity hypothesis and empire building. Using data on U.S. IPOs and SEOs going public from 1990 through 2003, I find evidence that optimistic managers as well as privately informed managers seem to drive the long run underperformance of equity offerings. I furthermore investigate the investment decisions taken by each type of manager after the share issuance. I see a distinct different behavior by each type of manager in terms of capital expenditures, debt rebalancing and cash holdings.

JEL Classification Code: G14; G32; G35
Keywords: Initial Public Offerings, Seasoned Equity Offering, Window of Opportunity, optimistic managers, overinvestment, long-term performance

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I. Introduction

In this paper, I aim to shed light on if and to which extent managerial behavior, its private information and potential behavioral biases of managers' help to explain the underperformance of companies. I derive the theoretical predictions for the behavior of the managers both from the behavioral literature as well as from the rational expectations literature. Indeed, several models of these two schools of thought can be found to offer very similar predictions, which seem plausible examined on their own. However, I find these rivaling models standing in stark contrast in their reasoning to each other, while trying to explain the same economic context.

An equity issuance constitutes a special event in the lifecycle of a company. During an IPO or SEO a company receives a large influx of money in a short time period. Thus the way and extent to which these proceeds will be invested will impact significantly the future course and performance of the company. Such a setting allows me to relate observe how managerial behavior as well as the managerial private information impacts on firm performance.

This paper seeks to contribute to the existing literature on several dimensions. First, I give for the first time empirical evidence of the impact of optimistic managers on underperformance of IPOs respectively SEOs. Second, I show that the amount of free cash that both privately informed managers as well as optimistic managers are able to invest helps to explain the underperformance phenomenon of equity issuances. Third, I investigate the development of firm variables such as debt level, cash holding and capital expenditure around the offering, and if this change is consistent with the predicted behavior for each type of manager.

Recent literature, for example Clarke, Dunbar and Kahle (2004), investigate whether managers conducting SEOs take advantage of temporary "windows of opportunity". The manager is hereby trying to time the market and to take advantage of his private information. The manager believes that the market overvalues the company. The company will revert from its inflated share price to its true value on the long run, resulting in a long term underperformance of the stock price.

Thus, the offering in itself constitutes a positive net present value project which should motivate the manager to maximize the amount of proceeds raised. Lee (1997) is looking to determine whether insiders of SEOs can time the market. Both papers focus solely on insider selling and if this insider selling has predictive power on long term performance. However, insiders trade and in particular sell shares for a variety of reasons, for example diversification, personal liquidity needs etc. Only if their reason for trading company shares is to take advantage of their inside information to time the market, they are correctly identified as behaving according to the window of opportunity hypothesis. In contrast to earlier research, I aim to use a more refined proxy. I use as a proxy the amount of free cash generated in the offering, conditional on insider trading. The higher the perceived undervaluation by the manager, the higher the proceeds he is trying to raise. Even at increasing marginal costs as the market has to absorb a larger number of offered shares.

A different cause for the underperformance arises from the agency conflict between managers and shareholders. Managers may, according to Jensen (1986), rationally maximize their private benefits at the expense of their shareholders. This implies that the more free cash the manager is able to raise during the offering, the more he can channel away to invest in pet projects and perquisites. This will lead to a worse performance of the firm on the long run. I aggregate these two hypotheses and label managers exhibiting behavior consistent with either hypothesis as *privately informed*. Managers according to both the Free Cash Flow Hypothesis as well as to the Window of Opportunity Hypothesis know, albeit for different reasons, that the future share price will decrease. Thus informed managers will sell shares.

The behavioral finance literature underscores the impact of optimistic managers. Roll (1986) called it the "managerial hubris" and Heaton (2002) investigates theoretically the impact of optimistic managers on corporate decisions. An optimistic manager is defined as a manager who systematically overestimates good firm behavior and underestimates bad firm behavior. Thus, while believing to act in the best interest of shareholders and the firm, the manager will invest the

proceeds of the offering into suboptimal projects. However, the manager will believe in the profitability of the investments by the company.

Even though the concept of overconfident / optimistic managers has been picked up in other strands of the literature several years ago, only recently I see a growing number of empirical studies in corporate finance. Examples are Malmendier and Tate (2005), Brown and Sarma (2007) or Puri and Robinson (2007). To my best knowledge, no empirical study exists which investigates the impact of overconfident managers on long time performance of SEOs and IPOs. The aim of this study is to fill this gap. One has to note, however, that privately informed and optimistic managers, while being mutually exclusive on the firm level, may both help to explain part of the underperformance puzzle.

Using US data of companies undertaking either an IPO or a SEO from 1990 through 2003, I find that insiders trade according to their private information after the lockup period has ended. I predict and find that additional "free cash" will aggravate long term performance for companies being led by privately informed managers. I here for regress the three year abnormal buy-and-hold return (calculated either as a matched firm approach or in comparison to market-to-book portfolios) on proceeds from primary shares conditional on insider selling.

To test the Optimistic Manager Hypothesis on my data, I measure the impact of the amount of new cash raised from primary shares on firm performance, conditional on insider buying. My regressions show that optimistic managers have a negative impact on firm performance.

Following, I investigate the differences in corporate investment decisions by these types of managers. I analyze the debt level, cash holdings as well as capital expenditures from the year prior to the year after the offering. I find that optimistic managers show a much higher propensity to increase debt than both the control group of non-trading managers as well as the privately informed managers, both in the IPO and SEO sample. Privately informed managers decrease debt, which supports the Window of Opportunity Hypothesis and contradicts the Free Cash Flow Hypothesis. I

find no significant different behavior for optimistic, privately informed as well as non-trading managers in their capital expenditures. However, I detect a decrease in cash levels of optimistic managers after IPOs and SEOs, supporting the Optimistic Manager Hypothesis. In addition, I find that privately informed managers tend to increase their cash holdings, supporting once more the Window of Opportunity Hypothesis.

The paper is organized in the following structure: in Section II, I describe the data and give the sample description. In Section III I illustrate the announcement day effect and the insider trading data. In Section IV I explain the methodology and the results of the long term performance study. Section V discusses the theoretical implications for debt, cash and capital expenditures development and Section VI shows the empirical findings. Section VII concludes.

II. Sample

A. Equity Offering Data

My sample consists of initial public offerings (IPOs) and seasoned equity offerings (SEOs) recorded by the Security Data Company (SDC) during the years 1990 to 2001. All firms have to have monthly returns listed at the Center for Research in Security Prices (CRSP) database and on Compustat. I consider firms issuing common class A shares up to 2001 in order to execute a three year performance study. Firms included in my sample have to be traded on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) or NASDAQ. I exclude unit offers as well as real estate investment trusts (REITS), American depository receipts (ADRs) and closed end mutual funds. In addition, I exclude offerings of financial institutions as well as of utility companies (SIC codes 4910-4949). Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. I screen the data for possible errors and use third party sources, for example as provided by JayRitter (2006), to correct my sample.

B. Data on Insider Trading

For each of my sample firms I collect the insider trading data from Thomson Financial. I examine all open market transactions. To check for the robustness of my data, I use four different definitions of insiders according to their position in the company hierarchy:

CEO: CEO

Directors: Directors

Managers: CEO, COO, CFO, CIO, CTO and (Executive-)Vice President

Insiders: Definition as in *Managers* plus officers and directors

Throughout the paper, I consider two distinct time periods in which I analyze the trading by insiders:

Trading Before: six months before the equity issuance up to one day before the issuance

Trading After: Beginning from the end of the lockup period for three months. In case I lack the exact duration of the lockup period, I assume a six month lockup period.

I add the second time period *Trading After* as insiders might refrain from trading before the offering for fear of sending a bad signal resulting in a negative market reaction. Brau and Fawcett (2006) show that insiders are well aware of this possibility. Consequently insiders, instead of revealing their true beliefs about the future of the company and selling before the offering, might time their selling until after the offering has taken place.

I aggregate the number of shares traded by insiders during each period. A positive *Buy* (*Sell*) dummy variable for a specific firm signifies that the sum of all shares bought minus shares sold by

insiders in the respective time period is positive (negative). *Pure Buys (Pure Sells)* is a dummy variable taking the value of 1 if at least one insider buys (sells) and no insider sells (buys) in the respective time period for the firm event. I run all tests and regressions by summarizing the number of trades committed. Using the number of shares traded instead of the number of trades undertaken yields similar results.

C. Summary Statistics

Table 1 shows the basic sample description of the full sample as well as the sample description divided into the type of insider trading. The vast majority of shares issued, both for SEOs (85%) and IPOs (91%), are primary shares. Primary shares are new shares and proceeds flow to the firm. The median for new shares issued, both for SEOs and IPOs, is with 100%. This indicates that either the company uses these offerings mainly to raise money for future projects or those insiders are well aware of the possible negative signal of cashing out.

INSERT TABLE 1 HERE

I find that insiders sell more shares than they buy. Over my sample period from 1990 up to 2001, I see a steady increasing amount of insider trading. These observations are consistent with the literature on insider trading (Seyhun (1998)).

INSERT TABLE 2 HERE

Trading patterns across all four groups of insiders are remarkably similar. As the sample size of the trading by CEOs is small, I use for the later statistical analysis the trading behavior of the

broader insider definitions of *Manager* and *Insider*. To see trading activities by managers before an IPO might strike the reader as curious. However, this has two possible reasons:

All public firms registered at the SEC have to report under Section 16a/2a tradings by insiders and owners with a stake of 10% or more in the company. This rule applies from the first registration of the shares with the SEC (Forms 3, 4 and 5) as stated in the Securities Act of 1933. However, such an insider has to declare even a trade before the registration of the company, if this insider traded again in a 6 month period while the company is registered.

Example: A company registers on January 1st. An insider trades in November, thus two months before registration. If he doesn't trade until May, he does not have to publish his November trade. But if he would trade again in February, he would have to declare the February trading as well as the November trading. In this case I would observe a pre-IPO insider trading in November, two month before the offering took place.

Furthermore, it is possible that a company is public and listed on another exchange with the SEC, for example at Over the Counter Bulleting Board (OTCBB), and then decides to list at NYSE. In this case, I have the history of insider trading dating back to the point in time when the company registered with the SEC for the first time, which would be the registration with the OTCBB.

III. Optimistic and privately informed managers and the announcement day reaction

If privately informed and optimistic managers underperform the market on the long run and the two types of managers can be identified on the basis of their personal trading, the market could react accordingly and exhibit a negative announcement reaction. Additionally, the insiders themselves should be aware of the signal they are sending to the market by trading shares of their own company beforehand. CFOs interviewed by Brau and Fawcett (2006) believe that selling

insider shares before and / or during the IPO sends a bad signal to the market. Does the market react accordingly? To answer this question, I conduct a short term event study. I split my sample into three portfolios depending on the type of trading before the offering (sells / no trades / buys). I measure the cumulative average abnormal return (CAAR) with respect to the market portfolio two days prior through two days after the announcement date of the offering.

INSERT FIGURE 1 HERE

I limit this investigation to SEOs, because stock prices prior to the offering of IPOs are not available.

INSERT TABLE 3 HERE

The market does not react significantly different to SEO announcements whether insiders sell or buy beforehand as shown in Table 3. Confining my sample to managers or CEOs, the market reacts to offering announcements 50 basis points more negative if insiders buy in contrast to when they sell. However, a t-test of comparison of the means yields no statistical significance between these announcement effects.

Instead of considering trades *before* the offering, I now turn towards the market reaction of the SEO announcement if insiders change their ownership share *during* the equity offering. Because the change in ownership during the equity offering is already published in the prospectus at the time of the filing with the SEC, the market should take this information into consideration and react according to this information. I use two different methodologies to define a sell during the offering.

The first approach calculates the raw difference in ownership and the second approach accounting for the dilution during the SEO:

Change in Ownership (without dilution) = % of insider shares after offering - % of insider shares before offering

Change in Ownership (with dilution) = Number of shares owned by insiders before the offering – number of shares owned by insiders after the offering[3]

Thus, the variable *Change in Ownership (without dilution)* indicates whether the total percentage of insider ownership decreases during the offering, regardless of the dilution due to primary shares issued. *Change in Ownership (with dilution)* takes the dilution due to new shares issued into account by focusing on the shares held by insiders before and after the offering.

INSERT TABLE 4 HERE

I create five portfolios according to the amount of change in insider ownership. Similar to the announcement day reaction whether (Table 3), I see in Table 4 a remarkably constant negative announcement abnormal return of -2% across all five portfolios along the degree in change of ownership. The market reacts even more negative if insiders sell a low percentage of shares during the offering. The difference between the two extreme portfolios is 5 basis points and not significant. Thus, the market views a SEO on average as negative news. The value of the company drops by approximately 2% on the four days around the announcement date which is consistent with earlier studies. The lack of a significant difference of the market reaction could be due to different reasons:

[3] Alternative formula: % Of Insider Shares After Offering – (% Of Insider Shares Before Offering / (1 + Primary Shares as Percentage of Shares out Before Offering))

a) The sells of the insiders which I observe have a true, or at least believable, story such as diversification, liquidity needs, etc. Thus, the market does not believe the trades incorporate inside information concerning the future performance of the company. Consequently, the market does not judge the insider trades as a bad signal and reacts indifferently.
b) The insiders who suspect their trades to cause a negative impact on the market refrain from selling (at least from selling publicly before the offering, hence before or during the offering).
c) The market believes that insiders fear juridical consequences from trading on inside information and thus expects that insiders refrain from trading on their inside information.
d) I can measure only legal insider trading which has been reported to the SEC. Insiders might trade on their most valuable inside information on different channels.

IV. Long term performance

A. Methodology

I calculate the three year abnormal buy and hold returns (BHRs) based on monthly returns as reported by the Center for Research on Security Prices (CRSP). For the long term performance calculation I use BHRs instead of cumulative average abnormal returns (CAARs) as Barber and Lyon (1997) show that CAARs suffer from a systematic bias. BHR returns are calculated in respect to two different reference returns: size and book-to-market matched firms as well as size and book-to-market matched portfolios

Portfolio construction:

My sample firms are matched to 14 size and five book-to-market portfolios as described in Barber and Lyon (1997) and Clarke, Dunbar and Kahle (2004). The portfolios are created once every year in June. First, I calculate the firm size (shares outstanding * share price in CRSP) in June

of each year. Following, all NYSE stocks are ranked each year in 10 portfolios according to their firm size. Afterwards, the NASDAQ and AMEX stocks are sorted into these 10 portfolios according to their size. As companies listed at the NASDAQ or AMEX tend to be smaller than the average company listed on the NYSE, the smallest size portfolio becomes disproportionately large. Hence I split this portfolio furthermore into 5 size portfolios without respect on which exchange the companies are listed.

To create the market-to-book portfolios, I use the book value of common equity (COMPUSTAT item 60) as reported in the balance sheet of the company in December in t - 1, divided by the market value of its common equity (see above) in December in t - 1. I subsequently create five market-to-book quintiles

In case the issuing firm is delisted before the end of the three year period I calculate the BHR until the delisting date.

Reference firms:

To check for the sensitivity and robustness of my data, I use as a second benchmark the long term performance of a size and market-to-book matched reference firm. For each company from my sample, I select the matching firm from the pool of firms listed on CRSP and which have not issued equity in the prior three year period. In a second step I create a pool of firms which have a size +/- 30% of the firm size of the sample firm in its issuing month. Out of this subsample, I choose the company which has the closest market-to-book value, in absolute terms, in respect to the market-to-book value of the issuing firm. If the matched firm, but not the issuer itself, is delisted during the three year period, I replace it with the next best fitting firm at the delisting time (chosen in the same procedure described above). Should the issuing firm be delisted before the end of the three year period, I calculate the BHR up to that point in time.

Fama-French three factor model:

As a third benchmark I calculate abnormal return as proposed by Fama and French (1993). Fama (1998) strongly advocates the use calendar time portfolios to measure long term performance as this methodology is more robust as other asset pricing models. In addition, the distribution of calendar time portfolios is better suited for traditional statistical calculation as it resembles better the normal distribution. Additionally, this methodology accounts for the cross-correlation of firm returns, which otherwise creates a potential bias in the statistical interferences. I calculate the abnormal long term results using the following model:

$$R_t - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + sSMB_t + hHML_t + \varepsilon$$

with R_t the calendar time sample return in month t, R_{ft} the risk free rate in month t and the three monthly Fama-French factors: excess market return (R_{mt}-R_{ft}), size factor (small minus large firms = SMB_t) and book to market factor (high BM firms minus low book to market firms = HML_t)

B. Long term performance results

INSERT TABLE 5 HERE

As illustrated in Table 5, IPOs as well as SEOs underperform their respective benchmark in the three year period following the offering. This finding is robust independent of the methodology employed or the reference measure chosen. I find a more pronounced underperformance of SEOs, which trail their benchmarks by 15% in a three year period. The IPOs underperform in a three year period by a lesser amount. They underperform 3% in case of the BHR portfolio firm approach as well as the Fama-French methodology, respective 9% with the matched firm approach.

V. Insider Trading and Underperformance

For my empirical tests I combine the long run performance of IPOs and SEOs with the insider trading behavior. In particular, I want to test three hypotheses possibly causing underperformance of IPOs and SEOs:

Optimistic Managers Hypothesis:

The optimistic manager hypothesis was first developed by Roll (1986), who called it the hubris hypothesis. In his paper, Roll looks into corporate takeovers and argues that bidders will pay more than the actual stock price for a company, even if no synergies arise in the merger. This behavior is caused by the hubris of the managers. According to Roll, this behavioral bias explains the negative stock reaction of bidders at the announcement of a merger. Heaton (2002) advances this idea. His theory is based on the assumption that managers are optimistic. The markets are in contrast rational (or at least less biased than the managers). The optimistic manager is defined as a manager who systematically overestimates good firm performance and systematically underestimates bad firm performance. This theory derives from well established evidence in psychological research as shown foe example by Weinstein (1980). His experiments demonstrated that people have a tendency to be more optimistic about processes which they believe they can control. Additionally, people tend to be more optimistic about projects they are highly committed to. Both specifications are typical for the job as a manager.

Proposition I:

The Optimistic Manager Hypothesis predicts that companies with overconfident managers will underperform on the long run. This implies that the more proceeds from primary shares are raised in the offering, conditional on insider buying, the worse the future performance will be.

This prediction is an extension to the existing literature on underperformance of equity offerings. Earlier papers focused solely on the predictive power of insider trading per se and were not able to detect a significant effect. As insiders might trade for very different reasons, linking insider trading to the amount of free cash raised identifies optimistic managers at a reduced level of noise.

Finding a proxy for optimistic managers is challenging. Malmendier and Tate (2003) use the trading pattern and the timing by CEOs of their stock option. However, this data is not available for my sample. Instead, I identify optimistic managers by means of their share trading. An optimistic manager believes in the good performance of the company he is leading. He consequently assesses it as a good investment for his private funds as well and will buy shares.

My proposition 1 translates into the following regression:

Long term performance = $\alpha + \beta$ (Proceeds from primary shares x Dummy Insider Buy) + ε

with β negative and significant

In terms of corporate decision-making, optimistic managers will believe to have more positive NPV projects and as they rationally would. Thus, he is more likely to invest the proceeds in projects resulting in an increase in Capital Expenditures and decrease in cash and cash equivalents.

Window of Opportunity Hypothesis (Privately informed managers)

In case the market is too optimistic about the future prospects of a company and thus values the stock of a company higher than its true value, the managers will be tempted to take advantage of this "window of opportunity". One possibility to profit in such a situation would be to sell overvalued shares, either in form of an SEO or IPO. The managers assume that, in the long run, the

share price will revert back to its true value and consequently fall. Thus issuing overvalued shares will be in itself a positive NPV project, which the manager will try to optimize by maximizing the proceeds.

In this scenario managers are raising money because raising funds is in itself the objective and not because they have a certain set future projects they need the funds for. Hence I expect managers to use the proceeds mainly to reduce debt or to keep a high amount of cash to fund possible future projects. Managers believing in the current overvaluation sell part of their shares of the company to avoid its expected decrease in value.

However, managers may sell due to a wide variety of reasons. Besides selling because of inside information, managers might sell part of their shares for liquidity reasons or risk diversification. Those reasons might have different impact on long term performance. Thus to isolate how the window of opportunity effects long term performance, I am focusing on the cross-product of proceeds from primary shares conditional on insider selling.

Proposition 2:

The window of opportunity hypothesis predicts that managers of overvalued companies will take advantage of this miss-pricing by selling new shares. Thus, the higher the proceeds raised, conditional on insiders selling, the worse the long run underperformance of the company. Debt levels will decrease and cash levels will stay high.

Free Cash Flow / Empire Building Hypothesis (Privately Informed Managers):

The Free Cash Flow theory has been first developed by Jensen (1986). He claims that a reduction of the free cash flow subjects the managers increasingly to the monitoring of the stock market. Jensen assumes managers act in their self-interest and will thus grow the company beyond its optimal size, the so-called empire-building, in order to gain more power, prestige and to increase their salary. In such a setting, the manager will consciously act in his own interest and at the expense of his shareholders.

Free cash flow is defined by Jensen as "cash flow in excess of that required to fund all projects that have a positive net present value when discounted at the relevant cost of capital" (p.323). However, I argue that at least part of the money raised in an equity offering causes similar agency conflicts. The *use of proceeds* described in the prospectus of the equity offering describes only very vaguely at best the intended investments by the managers. This gives the manager leeway on how to invest the generated funds and renders at least part of the proceeds "free cash" after the offering.

Proposition 3

The Free Cash hypothesis predicts that managers will knowingly invest into non value-maximizing projects in order to maximize their own benefits on the expense of their shareholders. Consequently, the more proceeds from primary shares are raised in an offering, conditional on insiders selling, the worse the company will perform on the long term. Capital Expenditure will increase and cash holdings will be low or decreasing.

In my statistical analysis, I aggregate the Free Cash Flow Hypothesis and the Windows of Opportunity Hypothesis as they both predict a long term underperformance after the offering, which the manager expects. I label managers of these two groups *privately informed managers* and test it on my data as follows:

Long term performance = $\alpha + \beta$ (Proceeds from primary shares x Dummy Insider Sell) + ε

with β negative and significant

INSERT TABLE 6 HERE

VI. Empirical Results

A. Long term performance by optimistic and privately informed managers

In a first effort to screen my data and see the effects of insider trading, I create a two-by-two table to detect any striking difference in performance whether and how insider trade before or after the offering. I find no significant differences in the long-term performance of a company whether insiders sell or buy. The company underperforms on average in both cases in the three year period following its equity offering as highlighted in Figure 7. I even see that managers who buy shares underperform selling managers on average. Companies, in which no insiders trade, perform better than companies in which insider do trade, but still underperform their reference group of non-issuing companies. However, the difference between the three insider trading portfolios is not statistically significant.

INSERT FIGURE 2 HERE

To get a more detailed picture I now use a robust ordinarily least square (OLS) analysis to shed light on the influence of privately informed and optimistic managers on firm performance. To correct for potential heteroskedacity, I employ the White (1980) methodology when estimating my standard errors. Eliminating outliers and taking the three year-matched-firm BHR as a left hand

variable, I focus on the variables of insider trading, the proceeds from primary shares and the cross product of both. Insider trading variables are created for each distinct time period (before the offering, during, after the lock up period ended) and are split up into sells and buys. I include furthermore control variables such as the log of firm size, log of the market-to-book-value and the exchange where the shares will be listed. Including year fixed effects do not change the results. To take into account the proportion of new cash to the size of the firm, I created the variable *Primary to shares out*. This measure calculates the ratio of primary shares (=new shares) offered to all shares outstanding after the offering. Insiders in this regression are defined as *managers*[4].

The degree of insider ownership may give an indication what type of manager is heading the company. The Free Cash Flow Hypothesis is assuming a conflict of interest between the owner of the company and the management. The manager is subsequently not maximizing the value of the company. Consequently, I assume this type of manager to have a minor ownership stake in the company. Thus, I create quintiles based on the managerial ownership of the company and inter-act these quintiles with the primary shares to shares outstanding. I find a negative coefficient (at the 10% percent level significant) for the latter cross product, supporting the above reasoning. Consistent with previous studies, I find a positive coefficient for the log MB variable and a negative coefficient for the log of the firm size, both significant at the 1 percent level.

In Table 7 (see Annex B for a complete overview of the regression) I observe a (at the 5% level significant) negative coefficient of the cross-product "insider pure buy after lockup * Primary to shares out", as predicted by my P*roposition 1*. The more proceeds are raised by the company, conditional on insiders buying shares in the open market after the offering, the worse the long term performance will be. This finding supports the Optimistic Managers Hypothesis for SEOs as

[4] Defined as CEO, COO, CFO, CIO, CTO or (Executive-)Vice President

described earlier. While I observe a negative coefficient for the same variable for IPOs as well, the coefficient lacks statistical significance (using robust t-statistics).

Testing for *privately informed managers*, I find a negative coefficient (significant at the 5% level) "*Insider Pure Sell after Lockup x Primary to Shares out*" for IPOs. Hence, the higher the proceeds in relation to the size of the company (conditional on insider selling), the worse the firm performance will be. This finding supports the privately informed manager hypothesis and my *Propositions II* and *III*, as I argue that the managers have negative expectations of the company and consequently raise as much money as possible before the share price falls.

INSERT TABLE 7 HERE

Director Share Programs (DSP), known as well as family and friends programs, do not distort my identification of optimistic and privately informed managers. These programs became increasingly popular during the late 90's. Employed in only 24.7% of all IPOs in the US in 1996, they were used in 92.6% of all IPOs in the US in 2000 (Ljungqvist and Wilhelm (2003)). Due to these program, managers might participate and thus buy at the offering not because they believe in a positive performance of the company (my identification for optimistic managers), but merely because they want to profit on the short term from the expected underpricing. In a Director Share Program, a manager is allowed to buy a certain number of shares of his company at the offer price. Additionally, shares of the DSP are not subject to the lock up agreement (Ray (2006)). Considering the average large first day returns of equity offerings, managers participate in such a program for the short term profit, not because of their long term beliefs and will sell their shares shortly after the IPO. Thus they do not influence my insider trading variables as I neither count these as buys during the offering. Nor do they distort my analysis of insider selling after the lock up period, because they will already sell shortly after the offering during the lockup period.

Furthermore, my identification of optimistic managers as well as privately informed managers is not distorted by insiders who flip shares on a short time horizon. Indeed, insiders have to adhere by law to a six month waiting period before being allowed to sell shares after they executed a buy (and vice versa)). In addition, insiders are not allowed to short sell stocks of their own companies, which additionally reduce noise in my insider trading variable.

B. Corporate decisions by optimistic and privately informed managers

After showing the impact of optimistic respectively privately informed managers on long term performance, I aim to shed light on how these types of managers differ in terms of the corporate decisions they take. In the following analysis I split my sample into three portfolios, optimistic managers, neutral managers (who do not trade around the equity offering) as well as privately informed managers.

For these three groups of managers I compare the change of key firm variables in the period of one year before the offering to one year following the offering. I examine the development of debt levels, capital expenditures and cash holdings. According to my Proposition I – III, I expect a different trading pattern by each type of manager. I summarize these differences in Figure 3.

INSERT FIGURE 3 HERE

Focusing on corporate decisions, I am now able to clearly distinguish between the Free Cash Flow Hypothesis and the Window of Opportunity Hypothesis. While the Window of Opportunity Hypothesis predicts a reduction of debt and a stable or insignificant increase in capital expenditures,

the Free Cash Flow Hypothesis predicts an increase in capital expenditures and a constant level or insignificant reduction in debt.

Debt level development

I create two portfolios (increase, decrease) according to the debt development one year after the offering compared to the level one year before the offering, normalized by assets in place. I use the data item 9 of Compustat to measure the debt level in a given year and normalize this figure by the assets in place in the same year (data item 6 in Compustat).

I compare the frequency with which each type of manger decreases respectively increases debt. Interestingly, privately informed managers tend to decrease their debt with a 55% (237 to 153) higher likelihood than increase debt in IPOs. In contrast, optimistic managers are 80% more likely to increase debt after the IPOs. These findings support Optimistic Managers Hypothesis and the Window Of Opportunity Hypothesis and are in contrast to the Free Cash Flow Hypothesis, as shown in Figure 4. The development of debt in SEOs is more evenly distributed.

INSERT FIGURE 4 HERE

Capital Expenditure development

In a next step I look at the capital expenditure development after the offering. Taking the identical methodology as to investigate the debt development, I partition my sample into two groups: companies which increase their capital expenditures and those which decrease capital expenditures (Data item 128 in the Compustat database) in the year prior to the offering compared to one year after the offering, normalized by the assets in place in the respective year (data item 6 in Compustat).

INSERT FIGURE 5 HERE

I see a remarkably similar pattern in capital expenditure by insider trading portfolios. While optimistic managers in SEOs overestimate their investment possibilities and increase their investments accordingly, two different forces are at play for privately informed managers. While managers according to the Windows of Opportunity Hypothesis are inclined to reduce their investments, managers according to the Free Cash Flow Hypothesis will increase investments in their pet projects. This might explain why I see no significant differences.

Cash development:

In the same spirit I examine the cash holding development by type of manager. Cash is measured by data item 1 in Compustat and normalized each year by the assets in place (data item 6). Sorting my sample in two portfolios, decreasing and increasing cash holdings, I compare the frequency with which each type of manager is represented in each portfolio.

INSERT FIGURE 6 HERE

Optimistic managers and privately informed managers appear to have a very different propensity towards cash. While companies of privately informed managers increase their cash holdings in 69% of all observations, only 50% of optimistic managers increase their cash holdings. While Optimistic Managers will reduce their cash holdings to invest into new projects, managers of the window of opportunity hypothesis will refrain from doing so.

VII. Conclusion

This paper is contributing to the existing literature in two ways. First, I give empirical evidence of the impact of optimistic and privately informed managers on firm performance. In a second step I show how the corporate decisions of these types of managers differ.

For this purpose I formulate three hypotheses predicting the impact of these types of managers on the firm performance and test these on the data. I use US data of companies undertaking either an IPO or a SEO from 1990 through 2001 which were subsequently listed on NYSE, NASDAQ or AMEX.

My first hypothesis is the Optimistic Managers Hypothesis. I define an optimistic manager as a manager who systematically overestimates good firm behavior and underestimates bad firm behavior. Thus, the Optimistic Manager Hypothesis predicts that the more proceeds are raised, the worse the future performance will be. In a new approach to test the impact on the long run performance and to enhance the identification of this effect, I focus on the cross product proceeds from primary shares conditional on insider selling. Indeed, I find a significant negative effect on the long term performance of the firm for SEOs. Still being negative, I lose significance of this coefficient for my IPO sample. Furthermore I see that optimistic managers take different corporate decisions: they tend to increase debt and reduce their cash holdings.

As a second possible explanation for the underperformance of the offering firms I investigate the impact of the Window of Opportunity Hypothesis. Managers believe in a temporary over-valuation of their company by the stock market and try to profit from it by issuing overpriced shares. According to the Free Cash Flow Hypothesis managers pursue their own interests on the expense of their shareholders. These managers prefer to invest free cash into pet projects to increase their perquisites or social status instead of maximizing the return for their shareholders. Consequently, the more proceeds from primary shares the manager can raise in the offering, the worse will be the performance of the company. I label managers of both hypotheses as privately

informed managers. Both predict a negative performance, which the manager foresees. I find significant impact on underperformance of privately informed managers for IPOs and loose some significance for SEOs.

Additionally, privately informed managers retain a higher level of cash holdings after the offering and have a higher propensity to reduce debt level after the offering compared to their optimistic counterparts. I show that both optimistic managers as well as privately informed managers help to explain the underperformance puzzle of equity offerings. I observe a distinct different behavior in corporate decisions after the offering by each type of manager.

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IX. Annex

A. Long Term Performance Calculation

I calculate the three year abnormal buy and hold returns (BHRs) based on monthly returns as reported by the Center for Research on Security Prices (CRSP). The returns are calculated as follows:

r(t) = [(p(t)f(t)+d(t))/p(t')]-1

For time t (a holding period), let:

t' = time of last available price < t

r(t) = return on purchase at t', sale at t

p(t) = last sale price or closing bid/ask average at time t

d(t) = cash adjustment for t

f(t) = price adjustment factor for t

p(t') = last sale price or closing bid/ask average at time of last available price < t.

For my long term performance calculation I use BHRs instead of cumulative abnormal returns (CAARs) as Barber and Lyon (1997) show that CAARs suffer from a systematic bias.

The Abnormal Returns are calculated as follows

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau})$$

with $R_{i\tau}$ = Buy and Hold Return (BHR) of firm i for period τ (one or three years or till the company is delisted)

$E(R_{i\tau})$ = Expected (=reference) BHR of firm i for period τ (one or three years)

BHR is hereby defined by the following formula

$$BHR = \sum_{i=1}^{n} \frac{p_i(T) - p_i(t)}{p_{Index}(T) - p_{Index}(t)}$$

with p_i = price of stock i

t = month after Issue

T = end of time period (one / three years) or delisting date of the issuing firm

BHR returns are calculated in respect to two different reference returns: size and book-to-market matched firms as well as size and book-to-market matched portfolios

B. Regression analysis on insider trading

I use the different right hand side variables depending if I use the whole sample, SEO subsample and the IPO subsample. The variable PS, which represents my normalized free cash proxy, stands for ratio of primary shares offered to shares outstanding after the offering.

Whole Sample:

$$BHR3y_i = \alpha_0 + \alpha_1 NYSE + \alpha_2 NASDAQ + \alpha_3 IPOdummy + \alpha_4 \log MB + \alpha_5 \log firm_size$$
$$+ \alpha_6 \Pr imaryShare + \alpha_7 PS + \alpha_8 LowOwner + \alpha_9 LowOwner * PS + \alpha_{10} HighOwner$$
$$+ \alpha_{11} HighOwner * PS + \alpha_{12} InsBuyBef + \alpha_{13} InsBuyBef * PS + \alpha_{14} InsSellBef + \alpha_{15} InsSellBef * PS$$
$$+ \alpha_{16} NetSell_in_Offer(no_dilution) + \alpha_{17} NetSell_in_Offer(no_dilution) * PS$$
$$+ \alpha_{18} InsBuyAfter + \alpha_{19} InsBuyAfter * PS + \alpha_{20} InsSellAfter + \alpha_{21} InsSellAfter * PS + \varepsilon_i$$

IPO Subsample:

$$BHR3y_i = \alpha_0 + \alpha_1 NYSE + \alpha_2 NASDAQ + \alpha_4 \log MB + \alpha_5 \log firm_size + \alpha_6 \Pr imaryShare + \alpha_7 PS +$$
$$+ \alpha_{12} InsBuyBef + \alpha_{13} InsBuyBef * PS + \alpha_{14} InsSellBef + \alpha_{15} InsSellBef * PS$$
$$+ \alpha_{16} NetSell_in_Offer(no_dilution) + \alpha_{17} NetSell_in_Offer(no_dilution) * PS$$
$$+ \alpha_{18} InsBuyAfter + \alpha_{19} InsBuyAfter * PS + \alpha_{20} InsSellAfter + \alpha_{21} InsSellAfter * PS + + \varepsilon_i$$

SEO Subsample:

$$BHR3y_i = \alpha_0 + \alpha_1 NYSE + \alpha_2 NASDAQ + \alpha_4 \log MB + \alpha_5 \log firm_size + \alpha_6 \Pr imaryShare$$
$$+ \alpha_7 PS + \alpha_8 LowOwner + \alpha_9 LowOwner * PS + \alpha_{10} HighOwner + \alpha_{11} HighOwner * PS$$
$$+ \alpha_{12} InsBuyBef + \alpha_{13} InsBuyBef * PS + \alpha_{14} InsSellBef + \alpha_{15} InsSellBef * PS$$
$$+ \alpha_{16} NetBuy_in_Offer(with_dilution) + \alpha_{17} NetBuy_in_Offer(with_dilution) * PS$$
$$+ \alpha_{16} NetSell_in_Offer(with_dilution) + \alpha_{17} NetSell_in_Offer(with_dilution) * PS$$
$$+ \alpha_{18} InsBuyAfter + \alpha_{19} InsBuyAfter * PS + \alpha_{20} InsSellAfter + \alpha_{21} InsSellAfter * PS$$

Independant Variables	Dependant Variable: 3 year BHR (matched firm approach) with robust t-stats		
	Full Sample	IPO	SEO
NYSE dummy	0.1369 (0.93)	0.6030*** (3.59)	-0.1281 (-0.69)
NASDAQ dummy	-0.1054 (-0.82)	0.2236+ (1.51)	-0.3012* (-1.85)
IPO dummy	0.0526 (0.84)	(dropped)	(dropped)
log MB	0.2537*** (6.09)	0.2272*** (6.12)	0.2611*** (4.07)
log firm size	-0.1228*** (-4.54)	-0.1633*** (-6.56)	-0.0934** (-2.28)
% of primary shares to total shares offered	-0.08 (-0.60)	-0.2699 (-1.07)	0.2040+ (1.52)
Primary shares to shares out after offering	-0.0728 (-0.44)	0.021 (0.49)	-0.1186 (-0.21)
Insider ownership lowest quintile			0.1621 (1.18)
Insider ownership lowest quintile x primary shares to shares out			-1.1536* (-1.68)
Insider ownership highest quintile			-0.0682 (-0.56)
Insider ownership highest quintile x primary shares to shares out			0.277 (0.41)
Insider Buy before offering	-0.2796* (-1.71)	-0.1006 (-0.62)	-0.7722** (-2.35)
Insider Buy before offering x primary shares to shares out	0.2295 (0.79)	0.3605+ (1.59)	2.4804* (1.72)
Insider Sell before offering	-0.146 (-1.37)	-0.1645 (-0.70)	-0.2952** (-2.18)
Insider Sell before offering x primary shares to shares out	-0.3252 (-0.76)	0.2355 (0.41)	-0.0099 (-0.01)
NetSell in offering (without dilution)	-0.0131 (-0.13)	0.151 (1.32)	
NetSell in offering (without dilution) x primary shares	0.1476 (0.64)	-0.2863* (-1.83)	
Insider Buy after lockup	0.3432* (1.77)	0.1555 (0.88)	0.8175*** (2.73)
Insider Buy after lockup x primary shares to shares out	-1.2003** (-2.48)	-0.3933 (-1.18)	-1.9837** (-2.40)
Insider Sell after lockup	0.3050*** (3.26)	0.1035 (1.06)	0.4695*** (3.15)
Insider Sell after lockup x primary shares to shares out	-0.6544*** (-2.78)	-0.4055** (-2.42)	-1.1306 (-1.35)
NetBuy in Offering (with dilution)			-0.2779+ (-1.48)
NetBuy in Offering (with dilution) x primary shares			0.6211 (1.00)
NetSell in Offering (with dilution)			0.2998** (2.32)
NetSell in Offering (with dilution) x prim shares			-1.5686** (-2.04)
Constant	1.1573*** (3.14)	1.4993*** (3.89)	0.7442 (1.38)
R-squared	0.024	0.024	0.046
N	3001	2473	1273

+ p<0.15, * p<0.10, ** p<0.05, *** p<0.01

C. Tables

Table 1: Summary Statistics whole sample

The sample consists of companies issuing equity, either in an IPO or an SEO, starting January 1st, 1990 until December 31st, 2001 as listed by the Security Data Corporation (SDC Platinum). Firms trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. I excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database are excluded. We winsorize the MB at the 2.5% level.

Proceeds are shown in million $. Age reports the age of the firm in years when it issues equity. Firm size is calculated with the Compustat variables "Shares outstanding" * "Share Price" as of July of each respective year (in case of an IPO or if the data is not available in Compustat, the we calculate firm size with the variables "shares outstanding after IPO" * "closing price of the first offer day" as reported by the SDC database.)

	SEO's			IPO's			Total		
	Obs	Mean	Median	Obs	Mean	Median	Obs	Mean	Median
N	3412			2895			6307		
Number of employees	1'912	6'484	898	1'615	1'695	300	3'527	4'291	519
Age	1'530	14	11	1'200	9	6	2'730	12	8
Proceeds	3'412	124	60	2'895	63	36	6'307	96	45
Shares out after the offering	3'016	64'000'000	21'000'000	2'823	19'000'000	9'236'694	5'839	42'000'000	14'000'000
Primary Shares offered	3'412	2'986'382	2'000'000	2'895	4'170'937	2'800'000	6'307	3'530'109	2'300'000
Primary Shares as Shares offered (in%)	2'896	85	100	2'868	91	100	5'764	88	100
Secondary Shares offered	3'412	1'538'808	0	2'895	407'032	0	6'307	1'019'307	0
Firm Size	3'331	2'574'217	474'598	2'599	536'940	135'349	5'930	1'681'319	263'151
MB	3'391	3.70	3.20	2'855	4.10	3.40	6'246	3.90	3.30

Table 2: Insider trading before, during and after the offering

Insider trading is obtained from Thompson Financial. For robustness I form four groups of insiders according to their level in the hierarchy of the company: CEOs, Directors, Managers (CEO, COO, CFO, CIO, CTO and (Executive-)Vice President) as well as insiders in general (Managers plus officers and directors).

I consider two distinct periods during which I analyze the trading by insiders: Trading Before: Six months before the equity issuance up to one day before the issuance. Trading After: Beginning from the end of the lockup period for three months. (In case I lack the exact duration of the lockup period, I assume a six month lockup period). Insider Pure Buys (Sells) equals one for a firm event if I see insiders buying and NO insider selling for a specific company during the time period.

The dummy variable NetSelling in Offering (without dilution) equals one if the share of insider ownership in percent of the company (as reported by SDC database) decrease after the offering. This variable does not take the dilution of their ownership stake due to newly issued primary shares into consideration. The dummy variable NetSelling (Netbuying) in Offering (with dilution) equals one if the number of shares owned by insiders of the company (as reported by SDC database) decreases (increases) after the offering. This variable accounts for the decrease in the ownership of insiders due to newly issued primary shares. # of Trades equals the number of trades undertaken by the insider in the given time period, # of Shares equals the number of shares traded per firm event in the given time period

		Type of Offering							
		SEO				IPO			
		Type of Insider				Type of Insider			
		Director	CEO	Manager	Insider	Director	CEO	Manager	Insider
Ins Pure Buys before	obs	113	25	48	99				
Ins Pure Sell before	obs	802	321	728	1'099				
NetBuying in Offering (with dilution)	obs	-	-	-	122	-	-	-	489
NetSelling in Offering (with dilution)	obs	-	-	-	670	-	-	-	628
NetSelling in Offering (without dilution)	obs	-	-	-	1'735	-	-	-	969
Ins Pure Buys after lockup	obs	132	39	63	113	138	48	79	144
Ins Pure Sell after lockup	obs	731	368	772	1'024	386	216	388	560
# of Shares traded by Insiders before	mean	-312'608	-20'548	-29'826	-377'975	-4'446	-2'350	-2'881	-12'361
# of Shares traded by Insiders after	mean	-270'803	-29'152	-38'996	-377'975	-86'933	-17'433	-25'592	-132'395

Table 3: Announcement effect per type of manager

Cumulative average abnormal returns (CAARs), calculated on basis of the market model, starting 2 days before the announcement day up to 2 days after the announcement day (=filing date in SDC) for a SEO. The sample is divided into three portfolios: insider selling. insider buying in a time period 6 months prior up to the SEO offering and no trading. I discern between three different groups of insiders: CEOs, Managers (CEO, COO, CFO, CIO, CTO and (Executive-)Vice President), as well as Insiders in general (Managers plus officers and directors).

The sample consists of companies issuing equity, either in an IPO or an SEO, starting January 1st, 1990 until December 31st, 2001 as listed by the Security Data Corporation (SDC Platinum). Firms trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. I excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database are excluded. We winsorize the MB at the 2.5% level.Aggregate insider selling (buying) equals one if the difference of insider sells - buys is positive (negative) for a given company in the respective time period. Insider Pure Buys (Sells) equals one if we see insiders buying and NO insider selling of the same company during the time period.

		Insider		Managers		CEO	
		Aggr.	Pure	Aggr.	Pure	Aggr.	Pure
Sell	obs	1223	1064	729	707	317	314
	mean	-2.90%	-2.90%	-2.80%	-2.90%	-3.60%	-3.60%
	median	-2.80%	-2.80%	-2.70%	-2.80%	-2.80%	-2.80%
Neutral	obs	1817	1998	2377	2401	2812	2816
	mean	-3.30%	-3.20%	-3.20%	-3.20%	-3.10%	-3.10%
	median	-3.20%	-3.10%	-3.00%	-3.00%	-2.90%	-2.90%
Buy	obs	115	93	49	47	26	25
	mean	-2.50%	-2.90%	-3.30%	-3.60%	-4.10%	-4.00%
	median	-1.90%	-2.70%	-3.30%	-3.60%	-3.30%	-3.30%
Difference Buy - Sell	mean	0.40%	0.00%	-0.50%	-0.70%	-0.50%	-0.40%
	median	0.90%	0.10%	-0.60%	-0.80%	-0.50%	-0.50%

Table 4: Announcement period (-2d to +2d) abnormal return by type of insider trading DURING the offering

Cumulative average abnormal returns (CAARs) calculated on basis of the market model, starting 2 days before the announcement day up to 2 days after the announcement daay (=filing date in SDC) for SEOs. Our sample is divided into 5 portfolios according to the degree of change of ownership by insiders DURING the offering (Source: SDC). The degree of change in insider ownership is calculated in two possible ways: by comparing the percentage of ownership of insiders in the firm before and after the offering (= *Change in ownership without dilution*) and by comparing the number of shares held before and after the offering by insiders (= *Change in ownership with dilution*).

The sample consists of companies issuing equity, either in an IPO or an SEO, starting January 1st, 1990 until December 31st, 2001 as listed by the Security Data Corporation (SDC Platinum). Firms trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. I excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database are excluded. We winsorize the MB at the 2.5% level.

Degree of change of insider ownership during SEO		Change in Ownership with dilution	Change in Ownership without dilution
highest decrease	obs	224	301
	mean	-1.60%	-2.10%
	median	-1.20%	-1.40%
	obs	280	250
	mean	-2.00%	-1.80%
	median	-2.10%	-1.90%
	obs	483	360
	mean	-2.00%	-2.10%
	median	1.20%	-2.00%
	obs		219
	mean		-1.70%
	median		-1.40%
highest increase	obs	109	218
	mean	-2.00%	-1.40%
	median	-1.80%	-1.90%

Table 5: Long term performance of equity issuing firms

BHR versus matched firm **is the Buy and Hold return (BHR) compared to a size and book to market matched firm. If an offering firm is delisted prior to its 1st respectively 3rd anniversary, the BHR is calculated from the issuing date until the delisting date. If the matched firm delists during the one respectively three year period, I choose the next best matching firm to the offering firm. Matching firms are chosen from all firms listed on the NYSE not having undertaken an IPO or SEO in the prior three year period and if their firm size is +/-30% of the issuing firm size. From this group the firm with the closest MB Value is selected. BHR versus matched portfolio is the abnormal BHR of the issuing firms in comparison to a rebalanced portfolio of firms with similar size and MB values. Each June 70 portfolios (14 size and 5 MB portfolios) are calculated and matched to each issuing firm. For robustness checks I calculate the Cumulative Average Abnormal Return (CAAR) benchmarked against the value-weighted return as well as equally-weighted return of the S&P 500. Fama-French Abnormal Return is the abnormal return of the issuing firm calculated on the basis of the Fama-French three factor model. I omitted firms with no or negative Book Value as well as the 5% outliers in MB value**

	Obs	Mean	Std. Dev.	Min	Max
SEO					
BHR versus matched firm 1y	1629	-0.75%	0.946	-6.860	8.822
BHR versus matched firm 3y	1629	-14.98%	1.703	-18.011	15.543
BHR versus matched portfolio 1y	1744	0.89%	0.701	-1.629	7.355
BHR versus matched portfolio 3y	1744	-15.90%	1.136	-3.153	16.452
CAAR versus market portfolio (equal weighted) 3y	1797	-14.06%	0.883233	-4.18076	4.772244
CAAR versus market portfolio (value weighted) 3y	1797	-5.77%	0.90449	-3.77964	5.281382
BHR Issuer 3y	1744	19.76%	0.171	0.003	18.625
Fama French Abnormal Return 3y	*179*	*-15.30%*			
IPO					
BHR versus matched firm 1y	2674	-2.32%	1.152316	-8.58293	10.94406
BHR versus matched firm 3y	2674	-9.04%	2.990897	-40.2378	54.56193
BHR versus matched portfolio 1y	2599	-0.92%	0.860	-2.694	10.307
BHR versus matched portfolio 3y	2599	-2.83%	2.210	-2.712	53.122
CAAR versus market portfolio (equal weighted) 3y	2895	-11.85%	1.202	-4.450	6.521
CAAR versus market portfolio (value weighted) 3y	2895	-8.55%	1.196	-4.161	6.595
BHR Issuer 3y	2599	23.36%	2.272	0.002	55.591
Fama French Abnormal Return 3y	*179*	*-3.80%*			

Table 6: Predictions of each hypothesis on the effect on long term performance and corporate decision making

		Optimistic Manager	**Privately Informed Manager**	
			Free Cash Flow	**Window of Opportunity**
Dependant Variable: **Long-Term Performance**	Insiders Buy x Primary Shares Offered (=Free Cash)	—		
	Insiders Sell x Primary Shares Offered (=Free Cash)		—	—
	Insiders Sell			—
	Or			
	Insiders Sell * Percentage of Secondary Shares Offered to Total Shares Outstanding			
Change in Level	Capital Expenditures	+	+	
	Cash Holdings	—	—	—
	Debt Level	+	+	—

Table 7: Robust OLS regression

Dependent variable is the 3-year BHR calculated versus a size and MB matched firm. Insiders are defined as managers and officers in the respective firm. The sample consists of companies issuing equity, either in an IPO or an SEO, starting January 1st, 1990 through December 31st, 2001 as listed by the Security Data Corporation (SDC Platinum). Firms trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. I excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database are excluded. I consider two distinct periods during which I analyze the trading by insiders: Trading Before: Six month before the equity issuance up to one day before the issuance. Trading After: Beginning from the end of the lockup period for three months. (in case I lack the exact duration of the lockup period, I assume a six months lockup period).The dummy variable Pure Sells (Buys) equals one if all insiders only sell (buy) in the respective period. Prim_to_share_out represents the ratio of primary shares offered to all shares outstanding.

Independant Variables	Dependant Variable: 3 year BHR (matched firm approach) with robust t-stats		
	Full Sample	IPO	SEO
Insider Buy before offering	-0.2796*	-0.1006	-0.7722**
	(-1.71)	(-0.62)	(-2.35)
Insider Buy before offering x primary shares to shares out	0.2295	0.3605+	2.4804*
	(0.79)	(1.59)	(1.72)
Insider Sell before offering	-0.146	-0.1645	-0.2952**
	(-1.37)	(-0.70)	(-2.18)
Insider Sell before offering x primary shares to shares out	-0.3252	0.2355	-0.0099
	(-0.76)	(0.41)	(-0.01)
NetSell in offering (without dilution)	-0.0131	0.151	
	(-0.13)	(1.32)	
NetSell in offering (without dilution) x primary shares	0.1476	-0.2863*	
	(0.64)	(-1.83)	
Insider Buy after lockup	0.3432*	0.1555	0.8175***
	(1.77)	(0.88)	(2.73)
Insider Buy after lockup x primary shares to shares out	-1.2003**	-0.3933	-1.9837**
	(-2.48)	(-1.18)	(-2.40)
Insider Sell after lockup	0.3050***	0.1035	0.4695***
	(3.26)	(1.06)	(3.15)
Insider Sell after lockup x primary shares to shares out	-0.6544***	-0.4055**	-1.1306
	(-2.78)	(-2.42)	(-1.35)
NetBuy in Offering (with dilution)			-0.2779+
			(-1.48)
NetBuy in Offering (with dilution) x primary shares			0.6211
			(1.00)
NetSell in Offering (with dilution)			0.2998**
			(2.32)
NetSell in Offering (with dilution) x prim shares			-1.5686**
			(-2.04)
Constant	1.1573***	1.4993***	0.7442
	(3.14)	(3.89)	(1.38)
R-squared	0.024	0.024	0.046
N	3001	2473	1273

+ p<0.15, * p<0.10, ** p<0.05, *** p<0.01

Figure 1: The predicted announcement day reaction of SEOs according to different hypotheses

Hypothesis	Observed Insider Trading	Predicted Anouncement Reaction by the Market	
Market values insider trading as a valuable signal for future performance and believes they have private (better) information and trades accordingly	Insider Buy	positiv	
	Insider Sell	negative	
Market believes manager to be optimistic und thus to underperform	No Insider Trading	positiv	
	Insider Buy	negative	

Figure 2: 3-year BHR performance by type of insider trading

IPO respectively SEO 3-year BHR against a size and MB machted firm. Divided in terciles according to the aggregated insider trading. A buy (sell) is selected if the difference shares bought – sold is positive (negative) in the time period 6 month before the offering up to 3 month after the lock up period expired. I omit return outliers at the 5% level.
The sample consists of companies issuing equity, either in an IPO or an SEO, starting January 1st, 1990 through December 31st, 2001 as listed by the Security Data Corporation (SDC Platinum). Firms trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. I excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database are excluded.

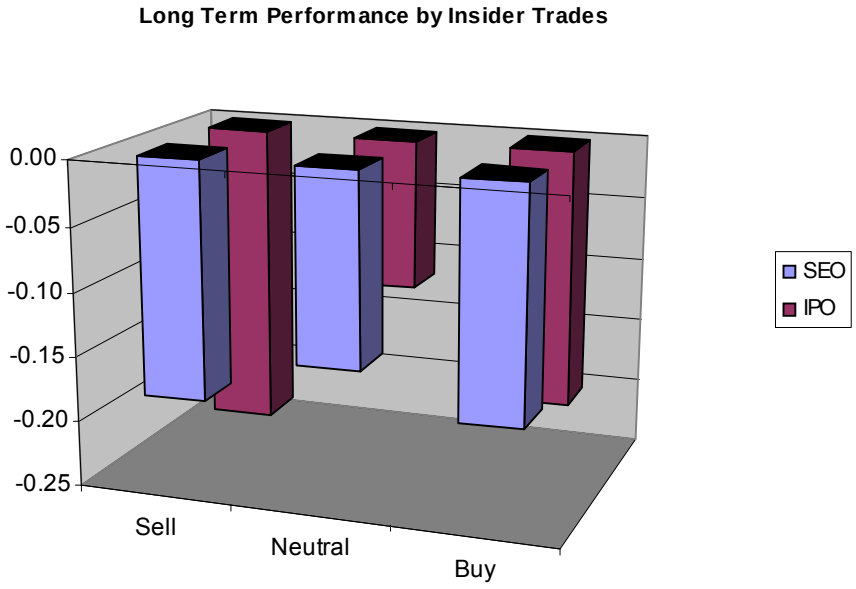


Figure 3: The distinctive corporate decisions per type of manager

Corporate Decisions by Type of Manager				
		Optimistic Manager	**Free Cash Flow**	**Window of Opportunity**
Change in Level	Capital Expenditures	+	+	
	Cash Holdings	−	−	+
	Debt Level	+	+/const.	−

Figure 4: Debt levels development after the offering debt levels by type of manager
This figure displays the number of companies which increase respectively decrease their debt normalized by assets in place. I compare the debt-level one year before the offering to one year after the offering as listed in data item 9 in the Compustat database, normalized by assets in place in the respective year (data item 6). Optimistic (privately informed) managers are defined as such if the managers buy (sell), on an aggregate level, in the six month period before the offering up to three months after the lockup period has ended.
The sample consists of companies issuing equity, either in an IPO or an SEO, starting January 1st, 1990 through December 31st, 2001 as listed by the Security Data Corporation (SDC Platinum). Firms trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. I excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database are excluded.

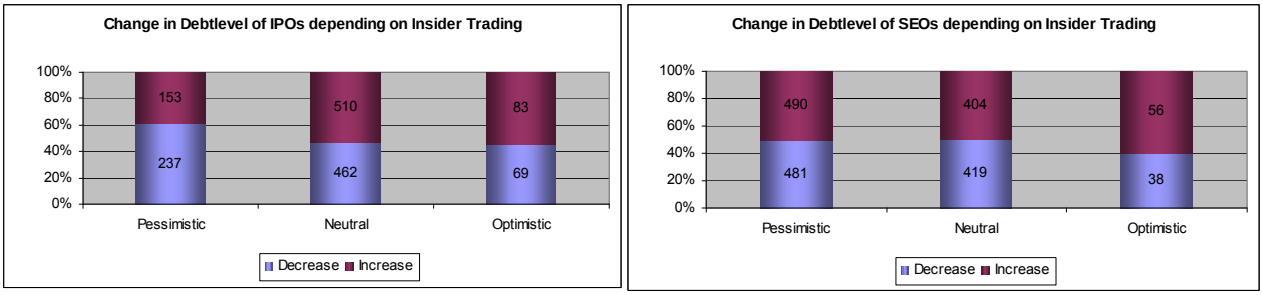


Figure 5: Capital Expenditure development after the offering by type of manager
This figure displays the number of companies which increase respectively decrease their capital expenditures normalized by assets in place. I compare the level in capital expenditures one year before the offering to one year after the offering as listed in data item 128 in the Compustat database, normalized by assets in place in the respective year (data item 6). Optimistic (privately informed) managers are defined as such if the managers buy (sell), on an aggregate level, in the six month period before the offering up to three months after the lockup period has ended.
The sample consists of companies issuing equity, either in an IPO or an SEO, starting January 1st, 1990 through December 31st, 2001 as listed by the Security Data Corporation (SDC Platinum). Firms trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. I excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database are excluded.

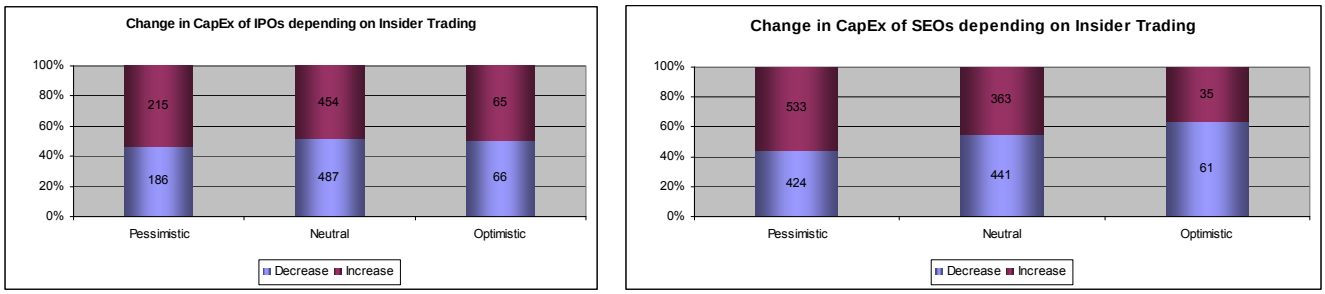
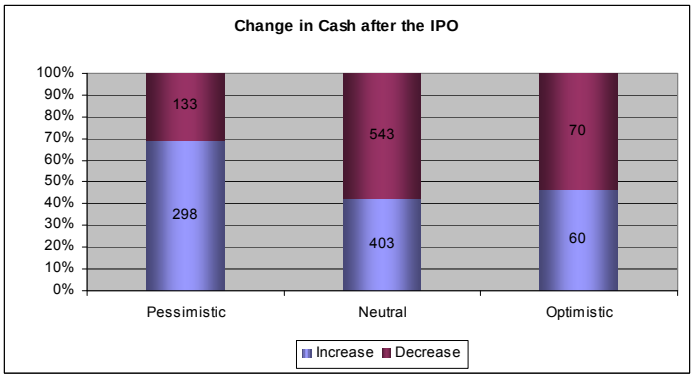
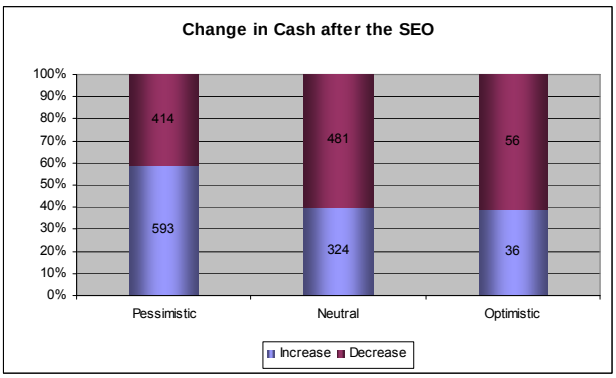


Figure 6: Cash development after the offering by type of manager.
This figure displays the number of companies which increase respectively decrease their cash holdings normalized by assets in place. I compare the cash level one year before the offering to one year after the offering as listed in data item 1 in the Compustat database, normalized by assets in place in the respective year (data item 6). Optimistic (privately informed) managers are defined as such if the managers buy (sell), on an aggregate level, in the six month period before the offering up to three months after the lockup period has ended.
The sample consists of companies issuing equity, either in an IPO or an SEO, starting January 1st, 1990 through December 31st, 2001 as listed by the Security Data Corporation (SDC Platinum). Firms trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. I excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database are excluded.





Chapter III

The Pre-IPO Dividend Payment Puzzle

The Pre-IPO Dividend Payments Puzzle

Jens Martin[1]

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We investigate dividend payments of companies prior to their IPOs. Our data sample consists of U.S. companies conducting an IPO between 1990 through 2006. These dividend payments are significant both in number and size. We find support for the hypothesis that pre-IPO shareholders seeking to exit use dividends as a means to avoid selling a large number of secondary shares in the IPO. Furthermore, managers are actively managing their cash holdings prior the IPO. They fear the market undervalues the marginal dollar of excess cash in the IPO and reduce their cash holdings. We reject the hypothesis that managers can take advantage of a window of opportunity, strip the company of its hard assets before going public.

JEL Classification Code: G32; G35
Keywords: Initial Public Offerings, Dividend Payments

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1. Introduction

In May 2006, Burger King conducted an Initial Public Offering (IPO). The company sold primary shares to raise 400 million USD in new funds. However, before going public, they paid out in February 2006 a dividend of 367 million USD to old shareholders. In addition, they paid 33 million USD to its senior management as compensation payment at the same time. This anecdote illustrates the puzzle we investigate here: Why does a company choose to pay dividends only to pay fees shortly afterwards to raise monies in an IPO? An extensive literature exists concerning cash holdings after IPOs, such as McLean (2008), as well as research on dividend initiations after the IPO, such as Lipson, Maquieira and Megginson (1998). Surprisingly, the phenomenon of dividend payments prior to an IPO has received little attention. This paper seeks to help to fill this gap.

First, we develop three different potential explanations as to why a firm contemplating an IPO, and its shareholders, would prefer to receive dividends prior to going public. The first two involve the avoidance of negative signals. The third is the avoidance of insufficient valuation: cash on hand is undervalued in an IPO.

Leland and Pyle (1977) argue that stock sales by insiders as part of an IPO send a negative signal to the market. Investors are afraid that inside shareholders are trading on private information and will potentially avoid the issue. Brau and Fawcett (2006) find that managers are indeed concerned about this signal. Thus, managers might try to use dividends as a means to circumvent sending this negative signal: either by substituting the dividend payment prior to the IPO for selling secondary shares to secure liquidity. Alternatively, a manager might split the amount of liquidity he receives into two parts, dividend payments prior to the IPO and secondary shares in the IPO.

In a second explanation, managers believe their company to be temporarily overvalued. The managers want to take the advantage of this window of opportunity to go public. High levels of cash provoke the question of potential investors as to why a company needs the new funds of the equity issuances. In addition, the manager assumes a long term underperformance due to the

overvaluation. Consequently, the manager will reduce the level of cash and strip the company of its hard and liquid assets before going public.

Our third hypothesis argues that the market undervalues excess cash in an IPO. The market focuses foremost on the prospects of the firm going public, such as new products, new technology and other stories surrounding the offering. In such a scenario, the market neglects the amount of liquidity in the company and undervalues it. Consequently it is optimal for managers to reduce the undervalued excess cash before the IPO.

Dividend payments are public information. Thus, our first two hypotheses imply that investors do not accurately monitor the company or do not fully understand the motivation behind these dividend payments.

We measure dividend payments in a period up to three years prior to an IPO as well as in the year the company goes public. Dividend payments, both three years as well as one year before the offering, are large in number and economically significant. This is true both in relation to proceeds raised in an IPO as well as in relation to the market value of the company. We find evidence supporting our hypothesis that pre-IPO shareholders use dividends as a means to extract value as they reduce ownership in the company. Pre-IPO shareholders split the amount they wish to sell and avoid, in such a way, the appearance of having lost the confidence in the company. We find that pre-IPO dividend payments help to explain the amount of secondary shares sold in the offering. Greater dividends imply a larger amount of secondary shares sold. Both of these are consistent with our hypothesis.

We reject the second hypothesis that manager believe their company to be overvalued and thus try to strip the company of part of its liquid assets. The differences in the long term performance between both groups are not significant or even in favor of dividend-paying companies, both in terms of descriptive statistics as well as in the regression findings.

We find evidence consistent with our overvaluation hypothesis. Under this hypothesis, managers will reduce their excess cash holdings until they believe the market values a dollar in cash

correctly. Even though companies that pay dividends prior to their IPO are bigger and have positive earnings, their cash holdings after dividends are remarkably similar to those of non-dividend paying companies in absolute terms, both on average and in the median. However, taking into consideration the dividends already paid out, they would exhibit significantly larger cash holdings than non-dividend paying companies, supporting our hypothesis. Normalizing cash holdings by assets in place yields a similar pattern as described above. In the next step we regress the impact of cash before the IPO on the valuation of the IPO at the offer day. We find that the coefficient of pre-IPO cash holdings on Tobin's Q at the time of the offering is positive. However, its square term is negative. This supports the hypothesis that value of each additional dollar of cash on the balance sheets is positive, whilst its incremental value on the firm valuation is decreasing. Thus, by managing their cash and paying out dividends prior to the IPO, companies minimize wealth losses due to undervaluation of excess cash.

The remainder of the paper proceeds as follows: Section 2 describes the literature. Section 3 illustrates three potential hypotheses explaining this phenomenon and subsequently discusses the costs and benefits of paying dividends versus selling secondary shares. In Section 4 we describe the data and Section 5 develops testable predictions and take these to the data. Section 6 concludes.

2. Literature

Several papers in the literature investigate the value of cash in established companies. Pinkowitz and Williamson (2007) look into the value of US companies across different industries. They find that on average the marginal market value of a dollar of cash in the balance sheet is one dollar. However, they observe a very pronounced cross-sectional variation across industries. Pinkowitz, Stulz and Williamson (2006) undertake a cross-country study. They show that cash holdings of companies are valued more highly in countries with good shareholder protection, whereas dividend payments are valued more highly in countries with low shareholder protection.

Both use a derivation of a Fama and French (1998) model to evaluate cash. Other papers investigated the cash holdings after the IPO and its implications, see for example McLean (2008). However, none to our knowledge have looked at the amount of cash and dividend payments prior to the IPO.

Faulkender and Wang (2006) investigate the marginal value of cash of publicly listed companies. They identify three different regimes that lead to significantly different valuations of the marginal dollar. They argue that cash distributing companies, which pay out dividends, will have a marginal value of less than one dollar, because of dividend taxes, corporate taxes and individual taxes that have to be subtracted. Thus a dollar in the balance sheet may be worth, in their numerical example, only 57 cents. Furthermore they argue that highly leveraged companies will have a lower marginal value of cash, as the cash will benefit debt holders. In contrast, companies which seek to raise cash are expected to have a marginal value of cash of more than one dollar. As they seek to raise capital for new projects, they have to pay a transaction costs for each dollar they need.

Cash raising companies are the focus of our interest. Leaving aside the costs of conducting a roadshow, and the increasing costs of raising even more capital, a firm with a 300 million USD IPO can expect to pay about 7% on the margin for each extra dollar of cash raised. This explains why paying dividends prior to an IPO represents a puzzle. Each dollar paid out gets replaced with a dollar that costs the firm at least $1.07. This figure will be even higher when we consider the costs incurred due to the underpricing of the offering.

Companies paying out dividends before a seasoned equity offering are not rare events, as has been shown by Deangelo, Deangelo and Stulz (2007). They find that a large number of companies conducting a Seasoned Equity Offering (SEO). 41.4% of companies in their sample pay dividends in the year prior to the equity offering. They find evidence that companies that conduct a SEO issue shares because they face a high probability of future liquidity needs.

3. Motivation and costs of paying out dividends prior to the IPO versus selling secondary shares in the IPO

In the first part of this section we will discuss the different potential hypotheses explaining the managers' motivation to partly exit via dividends prior to the IPO instead of selling secondary shares during the IPO. In the second part we highlight the different costs and tax treatments involved.

Potential motivation to exit via dividends

We identified three potential motivations of managers to pay out dividends prior to the offering. We discuss these three theoretically and will take them to the data in the following section.

Ritter and Welch (2002) cite several reasons for a company to go public. They argue that financial reasons are the primary motivation and non-financial reasons are of only minor importance. The two main financial reasons are raising new funds for the company for future investments as well as for old shareholders to diversify/exit (Zingales (1995). Additional reasons to conduct an IPO include the possibility to raise future funds via SEOs, higher stock liquidity, increased visibility by the firm or having a market price on the company to facilitate mergers and acquisitions.

The number of IPOs, as shown by Lowry (2003), varies greatly over time. She shows that the number depends on capital demand of businesses as well as investor sentiment, also called the "window of opportunity". Selling in favorable windows enables managers to take advantage of their knowledge of a temporary overvaluation of their company by the stock market.

Being aware of the informational advantage of managers, potential investors try to infer from managerial behavior and the balance sheet of the firm the motivation behind the equity issuance. By paying dividends/modifying their cash in the balance sheets, managers may try to alter or jam that signal.

Paying out dividends to avoid selling secondary shares to the market.

Managers and shareholders have the potential to significantly reduce the equity stake in the company during an IPO by issuing a large amount of secondary shares. However, they generally refrain from doing so. Managers correctly fear that selling a large number of secondary shares during the IPO will send a bad signal to the market as Leland and Pyle (1977) as well as Brau and Fawcett (2006) point out. The number and type of shares offered in an IPO are part of the registration statement and the prospectus, as required by the Securities Act of 1933 (Ellis, Michaely and O'Hara (2000)) and thus known to the public. Managers believe that selling a large number of secondary shares will lead to a lower offer price. To try avoid sending this negative signal, managers possibly revert to paying out the total or part of the amount by which shareholders wish to disinvest in the form of dividends prior to the IPO. During the IPO the company subsequently sells primary shares, which do not send a negative signal to the market, and raise in such a way the amount prior paid out in form of dividends,

Window of Opportunity - Stripping a company of its hard assets

Several papers have found evidence that managers act according to the "Window of Opportunity" theory, both for IPOs (Lowry (2003)) as well as for SEOs (Lee (1997), Clarke, Dunbar and Kahle (2004)). Managers believe that investor sentiment is sometimes high and thus that investors overvalue the company. Thus, the project of going public is in itself a positive net present value (NPV) project and managers do not seek the cash raised to be invested into new projects. Managers expect, however, that the value of the company will revert towards its true value and thus decrease from the offer price and underperform. Investors overvalue future investment opportunities and intangible assets, not the cash on the balance sheet. Thus, managers have an incentive to try to strip off the company of hard assets, such as cash, before bringing the overvalued company public, which consequently underperforms in the long run. In addition, the amount of cash held by a specific company prior to going public sends a certain signal to the market. Managers

might fear that a very high level in cash holdings provokes the question of potential investors as to why a company needs the new funds of the equity issuance. For example, the pecking order theory predicts that managers, due to agency costs, would first revert to internal funds, than debt and would only raise money at the stock market as the third option (Myers and Majluf (1984)). Investors might infer from an IPO where there is cash on hand that managers act on private information such as the window of opportunity. In such instances the management will try to reduce cash holding to levels of cash holdings of the average (non-dividend paying) IPO or to the average industry level in order to avoid this discount. Thus, managers have an additional motivation to decrease cash holdings under this hypothesis.

Undervaluation of cash

Under this hypothesis the market focuses on certain aspects of the firm going public. For example, it concentrates its attention to new technologies, new products or new patents. For example, during the internet bubble of the late 90's the market became very focused on new internet and biotech start-ups, which it thought would revolutionize business in the future. Other aspects of the company, such as cash, were possibly undervalued. Thus, a dollar of dividends paid out is more valuable than the (undervalued) marginal dollar in excess cash in the IPO. Hence, managers will reduce the amount of cash until the manager believes the cash in the company to be valued correctly.

Costs involved in paying dividends versus selling secondary shares

The tax treatment of paying dividends as opposed to selling secondary shares during the offering has differed historically. The U.S. tax system can be classified as a "classical tax system" (Graham (2003)). In such a system interest, capital gains and dividends are paid upon receipt by the individual investors. In the context of this paper, the investor has to pay dividend taxes in case of a

cash payout prior to the offering and capital gains tax in case he is selling shares during the IPO. In the following we will address first dividend taxation and then capital gains taxation.

Until 2003, dividends were taxed according to the marginal tax rate of the individual recipient, with a maximum of 35 percent. The Jobs and Growth Tax Relief Reconciliation Act of 2003 (thereafter "tax act 2003") provided a significant change of tax levels of dividend, reducing it to 15%[3] (Chetty and Saez (2005)). The impact of this reduction in dividend taxes has been investigated in several studies. Armstrong, Davila and Foster (2006) find a 20% increase in dividend enactments. These increases were especially strong for companies with an ownership structure that benefited most from this tax reduction. Moreover, companies with a high incentive for the manager to adapt to the new tax treatment, thus companies with high share ownership and low option holdings by executives, responded especially strongly.

In this study we focus on pre-IPO shareholders and their exit strategies. On average, these individuals, for example founders, business partners as well as managers, own a considerable stake of the company which they bring public. Thus, we argue that it is reasonable to assume that these investors will belong to a high income group and tax group. In the subsequent investigation we assume their dividend tax rate prior the tax act 2003 to be 33 or 35 percent and after the tax act to be 15 percent. Their capital gains taxes are assumed to be 28 percent up to 1997, 20 up to 2003 and 15 percent thereafter.

INSERT Figure 1 HERE

Figure 1summarizes the tax rate on dividends as well as capital gains for an individual with an income of $100,000. In summary we can deduct that, from a tax point of view, exiting via dividends is worse for pre-IPO shareholders than exiting via share-sales up until the tax act 2003. Between 1990 and 1997, the tax on dividends was 7 percent higher than the capital gains tax.

[3] See Appendix for a more detailed discussion on tax rate changes in our sample period

Between up until 2003 the difference increased to 15 percent. After 2003 they were taxed equally. In addition to the tax rate, the amount to be taxed differs. Investors have to tax the dividends as a whole, while they only have to tax the gains when selling during the IPO. From the standpoint of the company, paying out dividends or selling secondary shares does not alter its tax liabilities and is, hence, indifferent between these two payments to shareholders from a tax point of view.

We will examine how these different tax gaps affected the use of dividend payout prior to the IPO. We include dividend payouts up to three years before the IPO.

Exit costs

The point in time when shareholders exit, before or during the IPO, changes the type of charges incurred. We focus on companies conducting equity offerings. Hence, we assume that the company or other insiders are not able or willing to fully pay out existing shareholders from internal sources. The company is forced to refinance itself by raising equity.

The most relevant cost factors incurred during the IPO are the investment banking fees, which are proportional to the total proceeds raised. The gross spread, the sum of the management fee, the underwriting fee and the selling concession, refers to the total fees which investment banks charge in an IPO. It is clustered at 7% for the most U.S. IPOs as shown by Chen and Ritter (2000).

The gross spread is calculated as a percentage of total proceeds raised. Consequently, the exit costs via secondary shares compared to the costs of exiting via dividends plus primary shares are identical. In addition, the underpricing[4] of IPO can be viewed as an additional substantial cost[5] in going public. However, this cost is relative to the total proceeds and thus identical for both types of shares sold.

Alternatively pre-IPO shareholders can exit after the IPO, more precisely after the end of the lockup period of the IPO. IPOs are in general followed by a lockup period of 180 days. The lockup

[4] The difference between the offer price and the share price at the end of the first trading day
[5] Underpricing varies over time with an average of 22% over the past 20 years and a maximum average in 1999 of 71%

period is a voluntary agreement between the underwriter and the investment bank in which the pre-IPO shareholders agree not to sell, short sell or in any other way disinvest from the company. Thus, if pre-IPO shareholders do not exit during or before the IPO, the first time they could sell their shares is 180 after the offer day, but with lower exiting costs. The costs incurred at this point in time results only from the actual selling of the shares.

4. Data and descriptive statistics

Our sample consists of companies conducting an IPO and issuing common class A shares from the years 1996 until 2006, as recorded in the Securities Data Company (SDC) database. All firms included are listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) or NASDAQ subsequent to their offering are included in the sample with the following exceptions. Consistent with previous research we omit unit offerings, Real Estate Investment Trusts (REITS), American Depository Receipts (ADRs), closed-end mutual funds, financial companies and utilities. Consistent with IPO literature (Ritter and Zhang (2007)), we also drop all offerings with an offer price of less than $5. We omit companies with a negative book value. We screen for and correct the data on possible errors such as inconsistencies in primary and secondary shares offered and the resulting proceeds, the number of shares outstanding, missing or erroneous sales, and errors in the high tech firms' classification. Our final sample consists of 4,228 companies

From SDC we obtain information on the IPO, the offer price, insider ownership at the time of the offering, and primary and secondary shares offered. Stock returns, share volume traded and shares outstanding are from the Center for Research in Security Prices (CRSP). Data on dividends, cash, assets and other financial variables used in this study are obtained from Compustat. We use third-party sources, for example as provided by Jay Ritter (2006), to correct our sample. As robustness checks, we cross-check the pre-IPO dividend payments obtained from the databases with the information provided in the offering prospectus.

Are cash dividend pay-outs economically significant?

To address the question if dividend payments of companies prior to the IPO are economically significant, we investigate both the frequency of cash dividends paid out by issuing firms as well as their magnitude. We look at dividends paid out both in the time period starting three years and alternatively starting one year before the IPO up until the offering[6]. We define magnitude in this context as the amount of proceeds that had to be raised in the IPO in order to refill the cash distributed via dividends beforehand. Hence, we normalize the sum of these cash dividends by the proceeds of the primary shares offered during the IP. We focus on proceeds from primary shares which benefit the company. Selling shareholders, on the other hand, receive the proceeds from secondary shares sold. In a second analysis we relate the dividends paid to the total market capitalization of the respective company.

Are cash dividend payouts before an IPO a rare event?

We find companies pay out dividends frequently prior to their IPO. We observe a total of 1,282 IPOs, out of 4,228 IPOs in total, in which companies paid out cash dividends during the three years before the IPO. This represents 30% of all IPOs in our dataset. In the year leading up to the IPO we observe 1,036 companies paying out dividends, representing 25% of our sample.

Number of companies paying cash dividends before the IPO

Companies paying cash dividends		Number of companies	% of companies
1 year prior the IPO	Yes	1'282	30.3%
	No	2'943	69.7%
3 years prior the IPO	Yes	1'036	24.5%
	No	3'192	75.5%

[6] We use the annual Compustat database, because the quarterly Compustat database lists dividends sometimes twice. In future work we will reduce the one year window to a three month window prior to the IPO.

Do companies paying out pre-IPO dividends differ?

Both types of companies have roughly the same market capitalization. However, dividend paying firms are 60% larger in terms of total assets in place. Table 1 illustrates the differences in the descriptive statistics between the two types of companies.

INSERT Table 1 HERE

Dividend paying companies tend to be older, and larger in terms of both sales and assets in place. They are strikingly more profitable, with positive EPS, as opposed to negative EPS for companies not paying dividends. The pattern applies both on average and at the median. Paying dividends despite negative earnings almost certainly would appear suspicious. Interestingly, we observe that both groups exhibit very similar cash amounts in their balance sheet *before* the IPO and *after* the dividends have been paid out

In a next step and as a robustness check, we normalize firm variables by assets in place. We observe similar trends to Table 1. Dividend-paying companies tend to have larger normalized sales, higher long-term debt and higher earnings normalized by assets in place compared to non-dividend paying companies, as shown in Table 2. Comparing the normalized cash holdings, we see that dividend paying companies have actually less cash holdings than non-dividend paying firms after dividends. Non dividend paying companies have a higher market-to-book ratio and lower, indeed negative, EPS ratio.

INSERT Table 2 HERE

While Table 1 and Table 2 show the characteristics of companies paying out dividends up to three year prior to their IPO, the firm characteristics of companies paying out dividends in the year leading up to the IPO are very similar (not shown).

Did dividend payout respond to tax changes?

To see whether the dividend payouts responded to significant tax changes, especially the tax act of 2003, we investigate their time path over the past decade. We find them to be closely related to the number of total IPOs in our sample, both for companies paying out dividends up to three years as well as one year before the IPO ,as can be seen in Figure 2.

INSERT Figure 2 HERE

The ratio of cash dividends paying to non-paying firms prior to their IPO varies between 20% and 60% during the issuing years. As shown in Figure 1, the tax act in 2003 reduced the dividend taxes and closed the gap between the capital gains tax and the dividend tax. Both were set hence at 15 percent for the upper income brackets. The effect of this regulatory change is visible in the data. Beginning in 2002, we observe an increase in the ratio of pre-IPO dividend paying companies, topping 70% in 2005. However, the sample size in these years due to the relatively small numbers in IPOs is not large.

INSERT Table 3 HERE

In the following we seek to answer if the amount of cash paid out is different over time. We split our sample into quartiles according to the dividends paid out prior its IPO, normalized by either assets in place at the time of the offering or by the proceeds from primary shares. It is hard to see a clear pattern. Interestingly, we detect a much higher payout rate in the last years compared to the beginning of the 90s, which indicates the impact of the 2003 tax act. We see a larger number of dividend payments and especially a higher amount of the dividends paid out after 2003.

INSERT Figure 3 HERE

Is the size of the cash dividend paid out before the offering significant?

So far we have shown that the number of firms paying out dividends prior to the IPO is consistent over time and significant in terms of IPO volume. Next, we want to see whether these money transfers to existing shareholders constitute a significant percentage of the proceeds raised during the offering and if these transfers are significant in terms of market valuation of the company.

Figure 4 shows the amount of cash dividends paid out up one year respectively three years before the offering, normalized by the amount of proceeds raised from primary shares.

INSERT Figure 4 HERE

We find that, on average, dividend paying IPOs use 26% (median 9.1%) of their proceeds from primary shares to refinance their dividends paid out in the three years before the offering. 20% (median 7.1%) of the proceeds raised has been paid out in the year prior to the offering in form of dividends. 120 companies, representing 10% of our sample, use 60% of their proceeds to pay for earlier dividends. Out of dividend paying companies, 429 paid out more than 20% of the IPO proceeds raised from primary shares. 191 companies redistributed 50% or more to their old shareholders before the IPO. The 90th percentile of dividend paying companies paid out 66% or more of their IPO proceeds from primary shares in the three years prior to the IPO and 53.3% in the year leading up to the IPO.

The dividends paid are economically significant in terms of market valuation of the dividend paying companies as well. Their mean represents 1.6% of the market capitalization for all IPOs and 6.4% for the subsample of companies paying out dividends 3 years before their IPO (as shown in Figure 5). While we observe that a large majority of payouts represents less than 2% (the median for dividend paying firms is 1.8%) in terms of market valuation, we observe a substantial number of economically large payouts.

INSERT Figure 5 HERE

5. Testing possible hypotheses to explain dividend payments prior to an IPO

In this section, we seek to test empirically the hypotheses laid out in theory earlier in this paper. In particular, we seek to test whether managers try to avoid of sending a bad signal of selling secondary shares in IPO, if they try to time the market and strip their company of liquid asset or if they pay out dividends in reaction to an undervaluation of cash by the market.

Do managers try to avoid selling secondary shares during an IPO to avoid sending a negative signal to the market?

Brau and Fawcett (2006) show that managers are well aware of the negative signal that selling a high amount of shares during the offering sends to the market. CFOs believe that the market interprets this signal as a sign that managers are pessimistic about the future performance of the firm. Even if this selling may be due to reasons independent of future performance, such as diversification or liquidity, the market will fear this trading to be based on the informational advantage of the managers. However, managers and their counseling investment bankers might believe that not the insider selling itself, but a certain level of insider selling is sending the bad signal. Thus they might aim to avoid a certain threshold of secondary shares sold in the IPO, and split the envisioned amount existing shareholders seeks to sell during the IPO, into two parts: a cash dividend prior to the offering followed by the offering of secondary shares in the IPO.

We first investigate whether managers see dividends as a substitute of secondary shares or as a means to avoid surpassing a certain threshold in secondary shares sold at the IPO. We normalize the primary and secondary shares valued at the offer prize by assets in place and compare these values if a firm issues a cash dividend prior to its IPO. As shown in Table 4, the value of the normalized primary as well as secondary shares is higher for non-dividend paying companies. The

percentage of primary shares offered as the percentage of all shares offered decreases from 91.6 % to 85.6 % for dividend payers. This increase is an indication that dividend payers issue dividends in addition to selling secondary shares during the IPO, and not as a substitute.

INSERT Table 4 HERE

However, the level of dividend payouts before an offering might distort the above table. We thus test if the large number of dividend paying companies is paying out a relative low dividend before the IPO tends to be similar to non-dividend payers. Companies paying out a large dividend before the IPO possibly exhibit a different pattern. We divide our sample of dividend paying companies into quartiles according to the amount of dividends paid, normalized by the proceeds raised. Additionally we add, as the fifth and biggest group, the non-dividend paying companies.

INSERT Table 5 HERE

The percentage of secondary shares offered increases with the value of dividends paid out before the IPO, normalized by assets in place. On the other hand, the normalized market value of secondary shares offered remains stable along the low to high dividend payer quartile. Only the highest dividend paying quartile exhibits a propensity to issue more secondary shares in terms of market value. This might serve as an indicator that companies try to avoid to exceed a certain threshold by splitting up the amount they seek to sell. The fact that we see an increase of secondary shares paid out leads us to the conclusion that the dividends paid out before an IPO are not a substitute for the offering of secondary shares. As a robustness check, we recalculate the table and normalize the market value of the primary and secondary shares by the proceeds raised instead of the assets in place. Consistent with our earlier findings, we observe that dividend paying companies tend to issue more secondary shares. Across the different dividend payout portfolios we see a

similar value of secondary shares paid out, confirming the assumption that firms use dividends as a compliment and not as a substitute for the issuance of secondary shares.

Thus managers seem to be willing to sell secondary shares in the IPO, but will try to split the amount they want to sell between dividends paid out and secondary shares sold. In such a setting the amount of dividends paid out will be a strong predictor of secondary shares sold in an offering, but to a lesser extent a predictor of primary shares. We test this hypothesis in a robust OLS regression by examining if the number of secondary shares as well as primary shares is determined in part by the amount of cash dividends paid out earlier. Table 6 illustrates our findings.

INSERT Table 6 HERE

Consistent with our argument, we find that cash dividends paid out in the three years preceding the IPO are a strong and highly significant predictor of the number of secondary shares offered. These cash dividends have, on the other hand, no predictive power over the number of primary shares offered. The dividend payments in the year prior to the IPO have similar, highly significant, coefficient (not shown).

Do managers strip their companies of hard assets?

Managers conducting an equity offering, because they believe the company to be temporarily overvalued, will expect the company to revert to its true value in the long run. The market overvalues the companies because it believes the company has better current and future investment opportunities than the managers. Thus, managers might be tempted to strip the company of its hard and liquid assets, for example by paying cash dividends prior to going public. After its IPO, the company will revert toward its true, lower value. In addition, managers fear that having too much cash on their balance sheet will worry investors. Potential investors will raise doubts about

the true intentions of the IPO if the company has already a high amount of excess cash. To avoid sending this signal to investors, managers will reduce the amount of excess cash.

From the above discussion we are able to derive the following testable conjecture: dividend payments prior to the IPO will predict IPO underperformance. We calculate the three year abnormal buy and hold returns (BHRs) based on daily returns as reported by the Center for Research on Security Prices (CRSP). For our long-term performance calculation we use BHRs as Barber and Lyon (1997) suggest. For robustness we calculate Cumulative Average Abnormal Returns (CAARs). BHR returns are calculated by matching the IPO company to its size decile composed of companies listed at the NYSE, Amex as well as NASDAQ. Furthermore we use as a return benchmark the value weighted as well as equally weighted market portfolio. For further details on the calculation please refer to the Appendix.

Comparing long-term performance between dividend paying companies and non-dividend payers, we see that pre-IPO dividend paying companies perform as well as non pre-IPO paying dividend companies up to the first year after the offering, as shown in Figure 6.

INSERT Figure 6 HERE

However, after three years we find that non-dividend paying companies underperform dividend paying companies. This contradicts the notion that managers strip their company of hard assets due to an overvaluation of the firm. The difference in performance is significant if benchmarked against the value weighted market portfolio. It is statistically significant at 1% level using a non-parametrical test such as the Kruskal-Wallis test. However, the difference in performance is insignificant when benchmarked against the size matched portfolio. The observable pattern of no-underperformance in the first year and subsequent underperformance after three years by our IPO sample is consistent with earlier studies on the performance of IPOs, such as Ritter

(1991). In a next step we want to test the impact of dividends on long-term performance using a robust OLS regress.

INSERT Table 7 HERE

As Table 7 shows, the impact of dividend payments on long-term performance is insignificant. We include the year fixed effects as well as industry fixed effects to account for potential variations on these dimensions. From these results, we can conclude that managers do not use pre-IPO dividend payments to strip a company of its hard assets prior to its IPO. As a robustness check we calculate the BHR against size and book-to-market matched portfolios which yields similar results (not shown).

Does the market undervalue excess cash?

If the market overemphasizes its focus on certain aspects of the firm, such as technology, future projects, etc., it will put less emphasis on other parts of the company, for example the cash levels of a company. Thus, it potentially undervalues excess cash, the level of cash above a certain threshold. It is, under this hypothesis, optimal for the manager to reduce the level of cash berfor the IPO. If all managers maximize the wealth of their shareholders in such a manner, the level of cash in non dividend paying companies gives us an indication on the level of this threshold.

We reconstruct the cash holdings prior to the IPO as if no dividends would have been paid out. Indeed, the data draws a very clear picture and is consistent with the prediction that companies actively manage their cash holdings prior to an IPO. Comparing the levels of cash if no dividends would have been paid out, as shown in Figure 7, dividend paying companies would have a 74 % higher amount of cash, both on average and in the median, than non-dividend paying companies.

INSERT Figure 7 HERE

However, after the actual payment of dividends prior to the IPO, both groups of companies have very similar cash holdings. This finding is consistent with the hypothesis that managers try to actively manage their cash holdings prior to an IPO and to reduce those cash to the threshold of non-dividend paying companies. This behavior is even more striking as paying out dividends prior the IPO is more costly than selling secondary shares in an IPO, as we have seen from the discussion on costs and taxes. In a second step in this analysis we want to test whether the coefficient of cash prior to the IPO on the valuation of the IPO value (we take the Market-to-Book value as a proxy) is linear. If, on the other hand, the market increasingly undervalues the marginal dollar in excess cash, the slope of the coefficient of cash on the valuation of the IPO should be concave. We test this assumption in a robust OLS regression. We regress the amount of cash prior to the IPO as well as its square term on the Market to Book value at the time of the offering.

INSERT Table 8 HERE

Table 8 shows that, while cash prior to the IPO has an (insignificant) positive coefficient, the square term of the cash variable has a at, the 9% level, negative impact on the Market-to-Book value of the company at the time of the offering. This indicates that the positive impact of cash on the company is decreasing with the amount of cash in the books of a company prior to its IPO. This finding is consistent with the notion that the market puts less value on each marginal dollar in excess cash. Managers reacting to this market behavior will seek to reduce their cash holding before the IPO accordingly.

6. Conclusion

In this paper we investigate dividend payments of companies prior to their IPO. We find these payments to be significant economically across our whole sample period from 1990 through 2006. These payments are a puzzle, as, especially before the 2003 tax act, dividends were taxed

higher than capital gains and thus it was more costly for shareholders to receive dividends than selling secondary shares in an IPO.

We develop and test three hypotheses which could explain this phenomenon. We find evidence that pre-IPO shareholders use dividends as a means to exit the company before the IPO itself. In such a way they are able to avoid sending a negative signal to the market by selling a large amount of secondary shares during the IPO itself. We reject the second hypothesis that managers believe their company to be in a window of opportunity and thus temporarily overvalued. After the IPO, the company would revert to its true, lower, level. Managers will consequently strip the company of its hard assets and reduce the cash levels in a company, in order to avoid suspicion by potential investors about the true motivation for the IPO. However, we do not find that pre-IPO dividend paying companies underperform non-dividend paying IPOs. However, we fund support for our third hypothesis. The market focuses on certain aspects of company going public such as products, technology and industry performance and ignores and thus undervalues cash levels. As a consequence, managers try to actively manage the cash levels of a company by reducing the excess cash to levels of non pre-IPO dividend paying companies. Consistent, we observe that the market decreases the value it attributes on an incremental dollar in cash of an IPO.

7. Figures

Figure 1: Capital gains and dividend tax rates for an individual with an income of $100,000

Figure 2: Number of companies paying out cash dividends before the IPO in relation to the whole sample per year

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend one respectively three years prior to the offering date, as reported in CRSP.

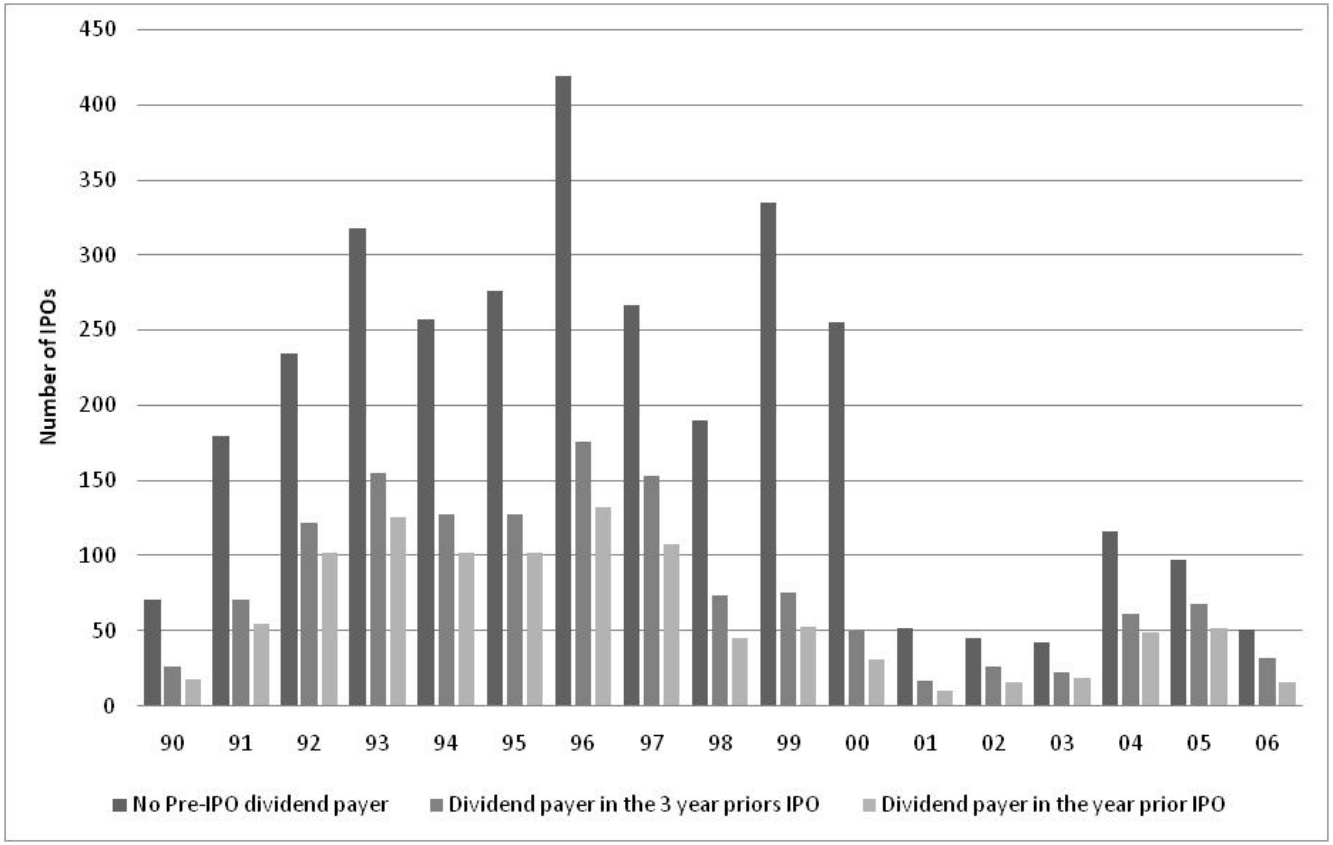


Figure 3: The number of companies paying out dividends, per quartile and normalized by proceeds raised from primary shares per year

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend one respectively three years prior to the offering date, as reported in CRSP. Cash dividends are obtained from CRSP. We split our sample into quartiles according to the dividend paid out normalized by the value of primary shares offered at the IPO.

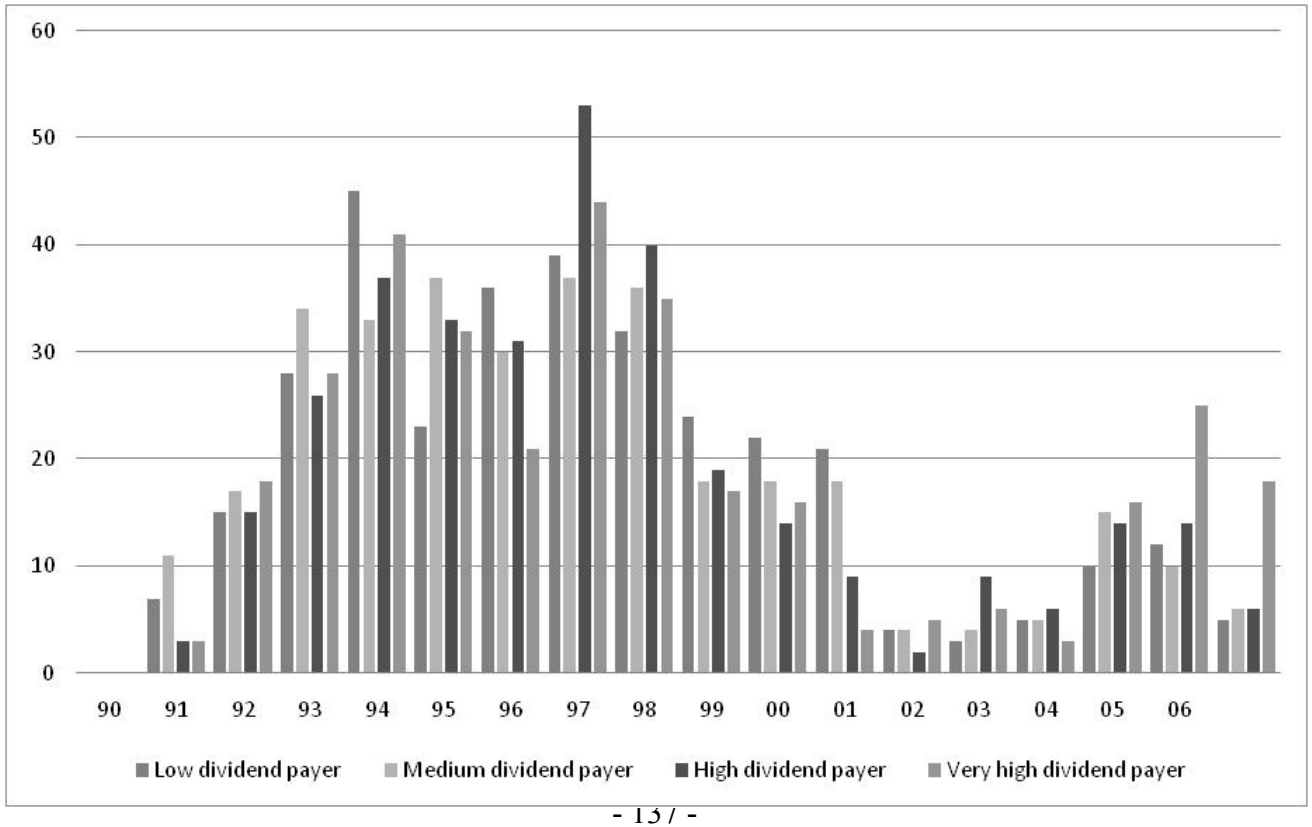


Figure 4: Cash dividend paid out before IPO normalized by proceeds raised from primary shares

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend one respectively three years prior to the offering date, as reported in CRSP. Cash dividends are obtained from CRSP and normalized by the primary shares offered at the IPO.

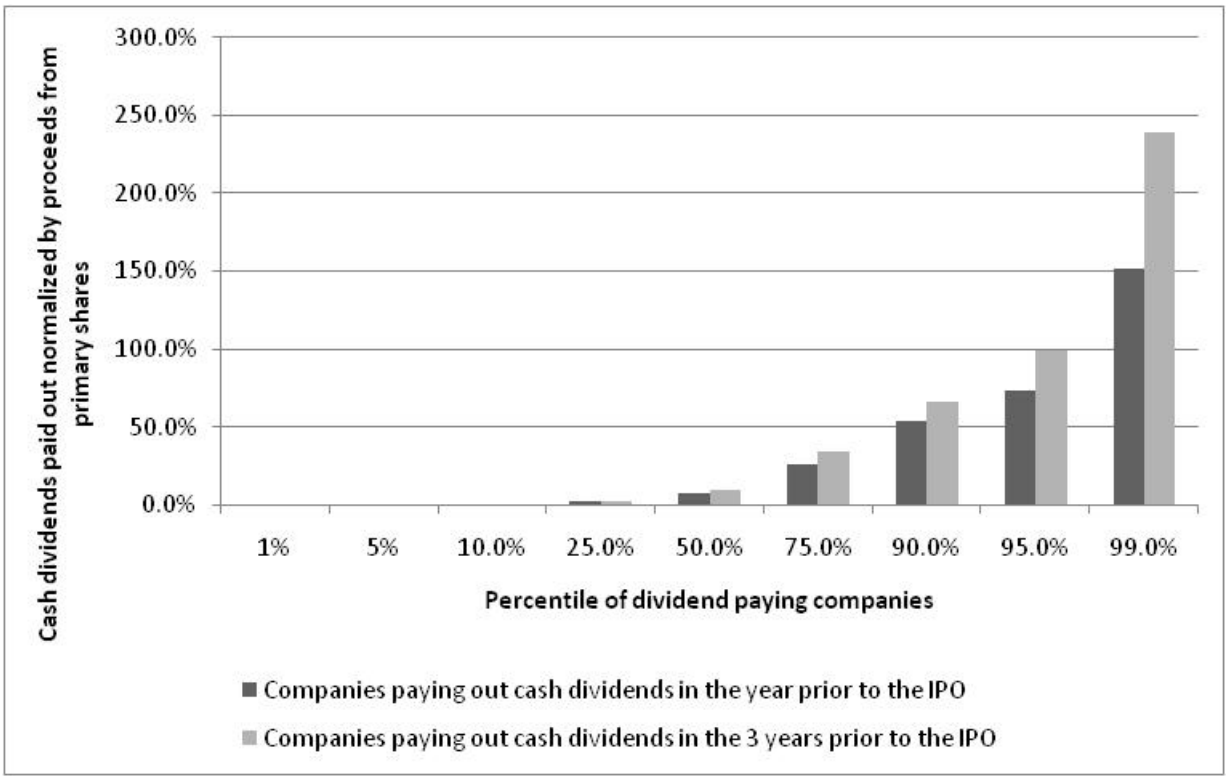


Figure 5: Distribution of the value of dividend payments prior to the IPO normalized by the market valuation of the firm

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend one respectively three years prior to the offering date, as reported in CRSP. Cash dividends are obtained from CRSP and normalized by the market valuation at the offer date of the IPO (shares outstanding after IPO * Offer Price).

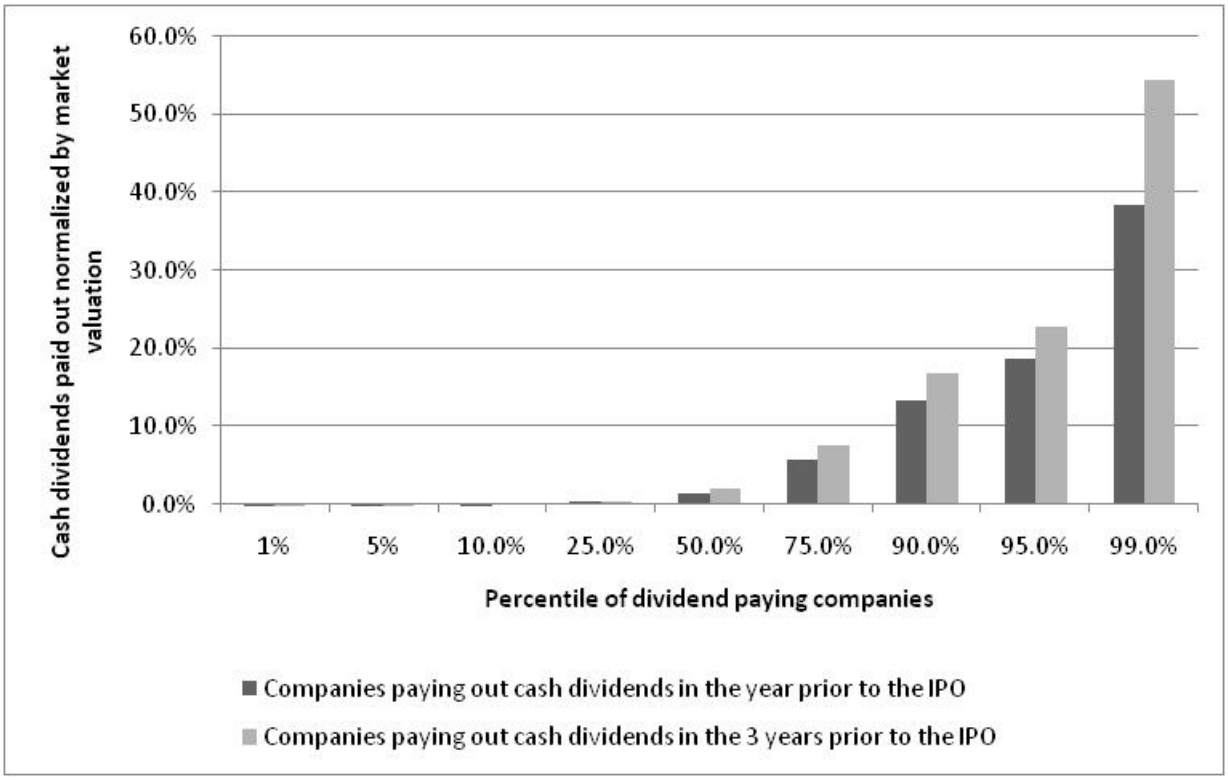
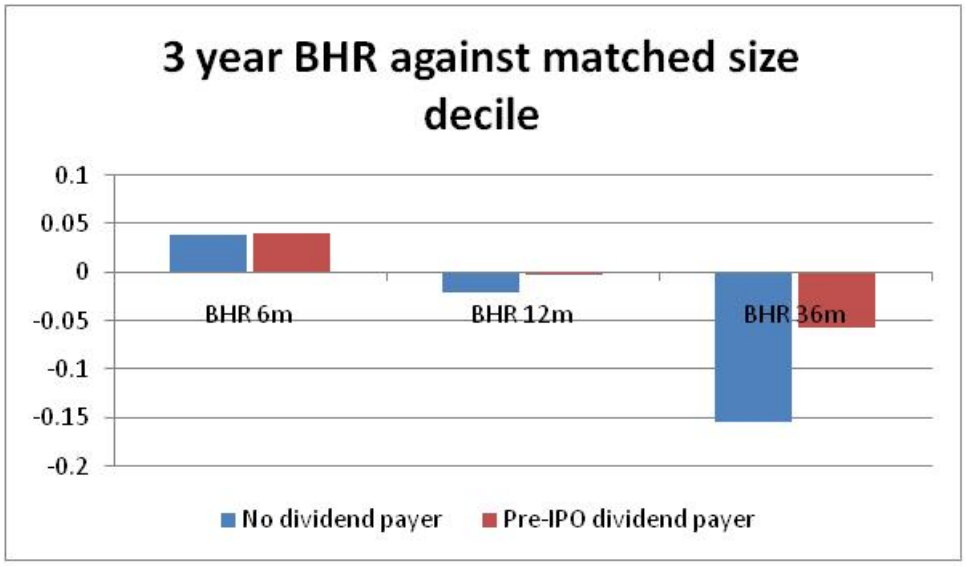


Figure 6: Long-term performance by type of company

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend three years prior up to the offering date, as reported in CRSP. We calculate the three year abnormal buy and hold returns (BHRs) based on daily returns as reported by the Center for Research on Security Prices (CRSP). BHR returns are calculated by matching the IPO company to its size decile composed of companies listed at the NYSE, Amex as well as NASDAQ.



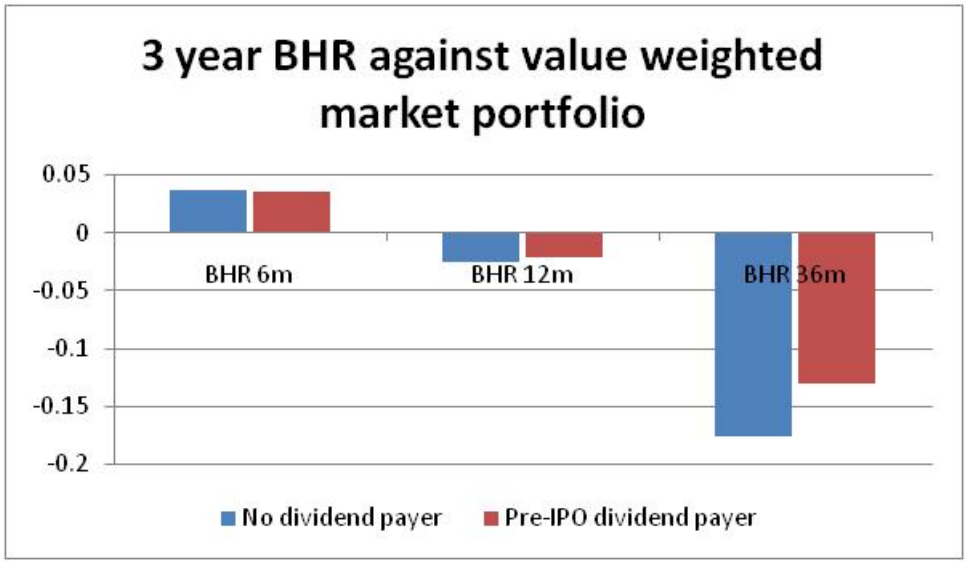
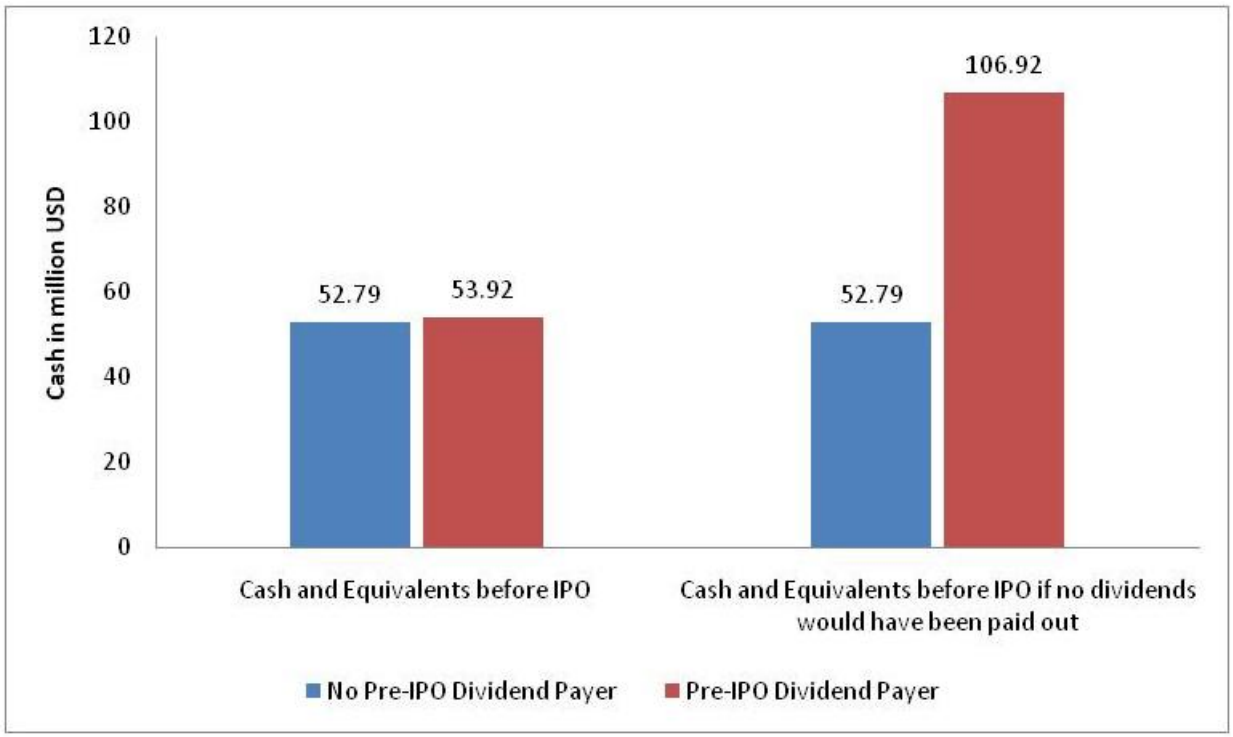


Figure 7: Amount of cash at time of IPO with and without dividends

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend three years prior up to the offering date, as reported in CRSP. Cash and Equivalents are obtained from Compustat, Cash and Equivalents before IPO if no dividends would have been paid out are Cash and Equivalents plus dividends paid in the three years prior to the IPO



8. Tables

Table 1: Sample descriptive

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a dummy variable equaling 1 if a company is paying a cash dividend three years prior up to the offering date, as reported in CRSP.

Firm age was obtained from Fay Ritter's website. Other variables are from the merged Compustat/CRSP database. Proceeds are shown in million $. Market Capitalization ss defined as shares outstanding after IPO * Offer Price and displayed in million USD. Cash and Equivalents, Long Term Debt, R&D, Advertising Expenses, Non Cash Assets, Net Sales, Cost of Sales as well as SGA are expressed in million USD. Cash and Equivalents before IPO if no dividends would have been paid out are Cash and Equivalents plus dividends paid out prior to the IPO. Non-Cash Assets are defined as all assets minus cash and equivalents.

	No Pre-IPO Dividend Payer			Pre-IPO Dividend Payer			Ratio (Paying - No-Paying)/No-Paying	
	Obs	Mean	Median	Obs	Mean	Median		
Market Capitalization (valued at offer price)	2704	598	148	1161	668	185	10.5%	19.6%
Cash and Equivalents before IPO	3015	52.79	2.64	1350	53.92	2.81	2.1%	6.1%
Cash and Equivalents before IPO if no dividends would have been paid out	3015	52.79	2.64	1350	106.92	9.96	50.6%	73.5%
Long Term Debt	3015		0.47	1374	196.08	5.61	#VALUE!	91.6%
R&D	3104	6.26	0.67	1374	6.71	0.00	6.6%	
Advertising Expenses	3175	7.51	1.07	364	16.36	2.50	54.1%	57.1%
Non Cash Assets	920	418.12	25.42	1377	1185.64	80.60	64.7%	68.5%
Net Sales	3106	175.96	31.67	1378	551.56	105.54	68.1%	70.0%
Cost of Sales	3097	121.46	17.27	1378	393.60	63.85	69.1%	72.9%
SGA	3095	41.36	16.05	1156	84.92	20.04	51.3%	19.9%
Dilution	2633	0.04	0.00	449	0.06	0.00	42.3%	
EPS	1191	-0.50	-0.03	1370	0.48	0.60	203.2%	104.2%
Firm Age	3000	13	7	1313	22	12	43.1%	41.7%

Table 2: Sample descriptive, normalized

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a dummy variable equaling 1 if a company is paying a cash dividend three years prior up to the offering date, as reported in CRSP.

All below variables are from the merged Compustat/CRSP database. Total Asstes are in million USD. Market Capitalisation as defined as shares outstanding after IPO * Offer Price and then normalized by Total Assets. Cash and Equivalents, Long Term Debt, R&D, Advertising Expenses, Non Cash Assets, Net Sales, Cost of Sales as well as SGA are normalized by Total Assets in place. Cash and Equivalents before IPO if no dividends would have been paid out are Cash and Equivalents plus dividends in the three years prior to the IPO

	No Pre-IPO Dividend Payer			Pre-IPO Dividend Payer			Ratio (Paying-Not-Paying)/Not-Paying	
	Obs	Mean	Median	Obs	Mean	Median		
Total Assets	3110	497	61	1378	1263	107	60.7%	42.8%
Market Capitalisation normalized by Assets	2631	3.98	2.40	1151	2.41	1.45	-65.2%	-65.7%
Cash and Equivalents before IPO normalized by Assets	2967	0.08	0.04	1341	0.05	0.02	-52.3%	-65.8%
Cash and Equivalents before IPO if no dividends would have been paid out, normalized by Assets	2967	0.08	0.04	1341	0.15	0.09	45.5%	54.2%
Long Term Debt normalized by Assets	3104	0.10	0.01	1374	0.16	0.06	38.5%	81.4%
R&D normalized by Assets	3090	0.08	0.03	1363	0.02	0.00	-290.7%	#DIV/0!
Advertising Expenses normalized by Assets	919	0.06	0.02	363	0.06	0.02	4.9%	27.3%
Net Sales normalized by Assets	3092	0.78	0.57	1377	1.16	0.96	32.7%	40.8%
Cost of Sales normalized by Assets	3092	0.52	0.31	1377	0.79	0.59	33.9%	47.5%
SGA normalized by Assets	2630	0.35	0.28	1155	0.29	0.23	-19.8%	-20.4%
Dilution	1191	0.04	0.00	449	0.06	0.00	42.3%	
EPS	3090	-0.50	-0.03	1370	0.48	0.60	203.2%	104.2%

Table 3: Number of companies paying / non-paying dividends before undertaking an IPO 1990-2006

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend one year repectively three years prior up to the offering date, as reported in CRSP.

Issue Year	No Pre-IPO dividend payer	Dividend payer in the year prior IPO	Ratio Dividend payer in the year prior IPO/ Non-Payer	Dividend payer in the 3 years priors IPO	Ratio Dividend payer in the 3 years priors IPO / Non-Payer	Total IPOS
1990	71	18	0.27	26	0.37	97
1991	180	55	0.31	71	0.39	251
1992	234	102	0.45	122	0.52	356
1993	318	126	0.41	155	0.49	473
1994	257	102	0.42	128	0.50	385
1995	276	102	0.36	128	0.46	404
1996	419	132	0.33	176	0.42	595
1997	267	108	0.40	153	0.57	420
1998	190	45	0.23	74	0.39	264
1999	335	53	0.15	76	0.23	411
2000	255	31	0.12	50	0.20	305
2001	52	10	0.19	17	0.33	69
2002	45	16	0.36	26	0.58	71
2003	43	19	0.45	23	0.53	66
2004	116	49	0.42	61	0.53	177
2005	97	52	0.51	68	0.70	165
2006	51	16	0.31	32	0.63	75
Total	3'206	1'036		1'386		4'584

Table 4: Descriptive statistics of secondary and primary shares offered in an IPO in relation to whether a firm pays out cash dividends in the three years prior to its offering

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend in the three years prior up to the offering date, as reported in CRSP. The ratio measures the difference between dividend paying and not dividend paying firms, based on dividend paying firms, in percent. Market Value Primary (Secondary) Shares Normalized by Assets is the ratio of number of primary shares (secondary) shares offered valued at the offer price (both as recorded ba SDC) and divided by the total assets (data item 6 in Compustat).

		Market Value Primary Shares Normalized by Assets	Primary Shares as Percentage of Shares Offered	Market Value Secondary Shares Normalized by Assets	Secondary Shares as Percentage of Shares Offered	Ratio Market Value Primary Shares / Secondary Shares
No Prior Cash Dividend	N	3086	3172	3114	3201	
	mean	0.61	93	0.58	8	
	median	0.54	100	0.16	0	3.34
Prior Cash Dividend	N	1269	1280	1329	1340	
	mean	0.45	90	0.39	14	
	median	0.39	100	0.12	0	3.21
Total	N	4355	4452	4443	4541	
	mean	0.56	92	0.52	10	
	median	0.49	100	0.15	0	3.33

Table 5: Primary and secondary shares offered per dividend size portfolio normalized by assets in place

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a company paying a cash dividend in the three years prior up to the offering date, as reported in CRSP. The ratio measures the difference between dividend paying and not dividend paying firms, based on dividend paying firms, in percent. We divide the amount of cash dividends paid out, normalized by the proceeds raised in the offering, into four portfolios. *Market Value Primary (Secondary) Shares Normalized by Assets* is the ratio of number of primary shares (secondary) shares offered valued at the offer price (both as recorded by SDC) and divided by the total assets (data item 6 in Compustat).

		Market Value Primary Shares Normalized by Assets	Primary Shares as Percentage of Shares Offered	Market Value Secondary Shares Normalized by Assets	Secondary Shares as Percentage of Shares Offered	Ratio Market Value Primary Shares / Secondary Shares
No Prior Cash Dividend	N	3086	3086	3114	3115	
	mean	0.61	92	0.58	8	
	median	0.54	100	0.16	0	3.34
Low Prior Cash Dividend Quartile	N	322	322	333	333	
	mean	0.37	89	0.29	13	
	median	0.26	100	0.07	0	3.92
Medium Prior Cash Dividend Quartile	N	319	319	332	332	
	mean	0.44	91	0.40	12	
	median	0.37	100	0.11	0	3.34
High Prior Cash Dividend Quartile	N	322	322	331	331	
	mean	0.44	91	0.42	11	
	median	0.38	100	0.12	0	3.19
Highest Prior Cash Dividend Quartile	N	306	306	333	333	
	mean	0.55	87	0.44	19	
	median	0.51	100	0.20	0	2.59
Total	N	4355	4355	4443	4444	
	mean	0.56	92	0.52	10	
	median	0.49	100	0.15	0	3.33

Table 6: The predictive power of dividend payments prior to the offering on the amount of primary and secondary shares offered in an IPO

Robust OLS regression. The sample consists of companies undertaking an Initial Public Offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded.

Financial variables are from the merged Compustat/CRSP database. Dividends paid up to 3 years prior the IPO is the sum of the cash dividends paid by the company in the 3 years prior to going public. Proceeds are defined as primary and secondary shares offered times the offer price. Market Capitalization as defined as shares outstanding after IPO * Offer Price. Year founded is the founding year of the company as reported by Jay Ritter on his webpage. % of Insider Ownership prior IPO is the percentage of insider ownership as reported by SDC. Venture backed is a dummy variable equaling one if the company was backed by a venture capitalist, and issue year the year of the IPO as reported by SDC. We included two digit SIC codes to account for industry effects as well as offer year dummies to account for year effects.

	dependent variable:	
	primary shares offered	secondary shares offered
Dividends paid up to 3 years prior the IPO	-1620.502 -0.25	20990.154** 2.27
Cash and Short Term Assets before IPO	-1.10e+04*** -4.87	6329.009*** 3.38
Total Assets	1935.924*** 4.09	-1283.478*** -3.32
Year Founded	-6394.892 -1.43	-63.019 -0.02
% of Insider Ownership prior IPO	2592.33 1.52	-2714.225* -1.87
Proceeds of IPO	31824.430*** 10.13	9793.871*** 3.79
Market Capitalization	-0.001** -2.32	
Venture Backed	2.75e+05** 2.5	-1.70e+05* -1.84
Issue Year	yes	yes
Industry Effects	yes	yes
Constant	-3.01E+08 -0.08	-5.15E+07 -1.59
R-squared	0.817	0.464
N	2422	2844

* p<0.10, ** p<0.05, *** p<0.01

Table 7: Impact of Pre-IPO dividend paying companies on long-term performance

Robust OLS regression. The sample consists of companies undertaking an Initial Public Offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded.

Financial variables are from the merged Compustat/CRSP database. Dividends paid up to 3 years prior the IPO is the sum of the cash dividends paid by the company prior to going public. The log of the firm size as defined as the log of the shares outstanding after IPO * Offer Price. Log Market to Book ratio is the log of firm size divided by assets in place. Year founded is the founding year of the company as reported by Jay Ritter on his webpage. Venture backed is a dummy variable equaling one if the company was backed by a venture capitalist, and Issue year the year of the IPO as reported by SDC. We included two digit SIC codes to account for industry effects as well as offer year dummies to account for year effects.

	Benchmark: matched site decile			Benchmark: value weighted market portfolio		
	6 month BHR	12 month BHR	36 month BHR	6 month BHR	12 month BHR	36 month BHR
Dividends paid up to 3	0	0	0	0	-0.000*	-0.000*
years prior the IPO	0.18	-1.6	-1.4	0.26	-1.83	-1.75
Log Market to Book Value	-0.068***	-0.114***	0.035	-0.066***	-0.109***	0.049
	-3.6	-4.62	0.58	-3.47	-4.39	0.81
Log Firm Size	0.073***	0.142***	0.303***	0.064***	0.129***	0.269***
	5.05	8.09	5.99	4.44	7.32	5.3
Venture Backed	0.016	0.048	0.061	0.014	0.048	0.059
	0.58	1.42	0.75	0.52	1.43	0.73
Firm Age	0	0	0.002	0	0	0.002
	-0.33	0.51	1.39	-0.31	0.61	1.42
Exhange Listed	-0.077	-0.085	-0.135	-0.059	-0.081	-0.08
	-1.14	-0.7	-0.62	-0.86	-0.67	-0.37
Year Effects	yes	yes	yes	yes	yes	yes
Industry Effects	yes	yes	yes	yes	yes	yes
R-squared	0.043	0.048	0.05	0.05	0.036	0.039
N	3567	3568	3571	3567	3568	3571

* p<0.10, ** p<0.05, *** p<0.01

Table 8: Impact of Cash before the IPO on the Valuation of the Company

Robust OLS regression. The sample consists of companies undertaking an Initial Public Offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded.

Financial variables are from the merged Compustat/CRSP database and are normalized by assets (data item 6) in place. (Squared) Cash and Short Term Assets before IPO is the (squared) amount of cash and short term assets before going public. Dividends paid up to 3 years prior the IPO is the sum of the cash dividends paid by the company in the 3 years prior to going public (data item 127 from Compustat). Market Capitalization as defined as shares outstanding after IPO * Offer Price. RD is data item 46, Sales data item 12 and Cost of Sales data 41 from Compustat. Year founded is the founding year of the company as reported by Jay Ritter on his webpage. Venture backed is a dummy variable equaling one if the company was backed by a venture capitalist, and issue year the year of the IPO as reported by SDC. We included two digit SIC codes to account for industry effects, dummy variables for the exchange at which the company is listed as well as offer year dummies to account for year effects.

	Dependant Variable: Tobins' Q
Cash and Short Term Assets before IPO	4.03 0.96
Squared Cash and Short Term Assets before IPO	-10.779* -1.71
Dividends paid up to 3 years prior the IPO	3.374 1.2
Market Capitalisation	0.575*** 5.35
Long Term Debt	20.616*** 2.99
RD	9.287** 2.11
Non-Cash Asset	-2.53 -1.07
Sales	2.471* 1.77
Cost of Sales	-1.781 -1.21
Earnings per Share	-0.164 -1.13
Year Founded	0.044 0.78
Exhange Listed	yes
issue Year	yes
Year Effects	yes
Industry Effects	yes
Constant	0.98
R-squared	0.173
N	3937

* p<0.10, ** p<0.05, *** p<0.01

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10. Appendix

Tax Rate Changes in the U.S.

Shareholder capital gains taxes arise through trades on the secondary market, liquidating distributions and share repurchases. The amount is calculated by subtracting the value of the sell and the investor's tax base. The Tax Reform Act in 1986 equalized the capital gains tax and ordinary tax rates with a maximum rate of 28 percent. In 1997 the U.S. government passed the Taxpayer Relief Act which reduced the capital gains tax furthermore to 20 percent (Lang and Shackelford (2000). The tax act of 2003 furthermore reduced the capital gains tax. After 2003, the maximal capital gains tax equaled the dividend tax at maximal 15 percent. The Jobs and Growth Tax Relief Reconciliation Act of 2003 provided a significant change of tax levels of dividend. After the tax act 2003, taxpayers in the bottom two income tax brackets, with a marginal tax rate of 10 or 15 percent, face a 5 percent dividend tax. Taxpayers with marginal tax rates of 25, 28, 33 or 35 percent, which thus belong to the upper four tax brackets, face a reduced dividend tax rate of 15 percent[7] (Chetty and Saez (2005)).

Long Term Performance Calculation

We calculate the three year abnormal buy and hold returns (BHRs) based on monthly returns as reported by the Center for Research on Security Prices (CRSP). The returns are calculated as follows:

$r(t) = [(p(t)f(t)+d(t))/p(t')]-1$

For time t (a holding period), let:

t' = time of last available price < t

r(t) = return on purchase at t', sale at t

[7] Taxpayers participating in the Alternative Minimum Tax schedule with a 28 percent percent flat rate benefit as well from the 15 percent dividend tax.

p(t) = last sale price or closing bid/ask average at time t

d(t) = cash adjustment for t

f(t) = price adjustment factor for t

p(t') = last sale price or closing bid/ask average at time of last available price < t.

For our long term performance calculation we use BHRs instead of cumulative abnormal returns (CAARs) as Barber and Lyon (1997) suggest.

The Abnormal Returns are calculated as follows

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau})$$

with $R_{i\tau}$ = Buy and Hold Return (BHR) of firm i for period τ (one or three years or till the company is delisted)

$E(R_{i\tau})$ = Expected (=reference) BHR of firm i for period τ (one or three years)

BHR is hereby defined by the following formula

$$\text{BHR} = \sum_{i=1}^{n} \frac{\text{p}_\text{i}(\text{T}) - \text{p}_\text{i}(t)}{p_{Index}(T) - p_{Index}(t)}$$

with p_i = price of stock i

t = month after Issue

T = end of time period (one / three years) or delisting date of the issuing firm

Additional Tables

Table 9: Distribution of the amount of cash dividends paid out normalized by proceeds raised in the IPO for our whole sample

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. Pre-IPO Dividend Payer is a dummy variable equaling 1 if a company is paying a cash dividend two years prior up to the offering date, as reported in CRSP.

Percentile of whole sample	Cash dividends paid out before IPO in % of proceeds raised from primary shares
1	0.0%
…	…
25	0.0%
50	0.0%
75	0.1%
90	20.8%
95	45.2%
99	116.10%
mean	0.78%

Table 10: Distribution of amount of cash dividends paid out in relation to proceeds raised (subsample of dividend paying companies)

The sample consists of companies undertaking an initial public offering (IPO) starting January 1st, 1990 until December 31st, 2006 as listed by the Security Data Corporation (SDC Platinum). Firms included have to trade on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and the NASDAQ. We excluded unit offers as well as Real Estate Investment Trusts (REITS), American Depository Receipts (ADR), closed end mutual funds, utility companies and offerings by financial institutions. Furthermore we restrict equity offerings to common class A shares. Issuers with no listed or negative book value on either Compustat or the SDC database have been excluded. The amount of procceds is obtained from SDC. Pre-IPO Dividend Payer is a dummy variable equaling 1 if a company is paying a cash dividend two years prior up to the offering date, as reported in CRSP.

Percentile of cash dividend paying companies	Cash dividends paid out before IPO in % of proceeds raised
1	0.0%
5	0.2%
10	0.5%
25	1.9%
50	0.0%
75	29.9%
90	59.9%
95	78.4%
99	117.2%
mean	20.50%