Job Market Paper

Prop Ups During Lockups*

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November 2008

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

* Especially I am grateful to François Degeorge for his guidance and advice. I furthermore thank François Derrien, Francesco Franzoni, Patrick Gagliardini, Sebastien Michenaud, Erik Nowak**,** René Stulz, Rebecca Tekula, Christian Thomann and Richard Zeckhauser for their helpful comments. I furthermore appreciate the comments by the participants of the 7th Swiss doctoral workshop in Finance as well as seminar participants at the Vienna University of Economics and Business Administration. NCCR FIRNRISK, a research program supported by the Swiss National Science Foundation, provided generous financial support. All errors are my own.
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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 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 (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. Brav and Gompers (2003) stress the importance of the lockup period. 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 *sweet escape* 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.

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 *sweet escape* 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 *sweet escape* hypothesis is consistent with two alternative views. On the one hand, the market might be deceived by these biased 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 *sweet escape* 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. Firms included in this sample 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, spinoffs, reverse leveraged buyouts (LBOs), financial companies and utilities. Consistent with IPO literature (Ritter and Zhang (2007)), I 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 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 *sweet escape* 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: in order to give insiders and large shareholders a *sweet escape* from their investment as well as to maintain a reputation for propping up stocks until insiders are allowed to sell. As this support is costly, the analyst will revert to their true beliefs as soon as insiders have had the opportunity to sell and hence reduce the insider's pressure on the bank to boost its share price. This argument yields the first testable prediction of the *sweet escape* 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 *sweet escape* 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

To look into how analysts lower their recommendations in more detail, 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 to hold recommendations. 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 *sweet escape* 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 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

[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.

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 and support the results and thus the use of the probit 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 with large information asymmetries which very few analysts tend to follow (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

To consider alternative hypotheses explaining the downward revision, I investigate if this pattern is the result of analysts' issuance of overoptimistic recommendations at the time of the offering. In such a setting, analysts update their beliefs over time and thus revise their initially too optimistic recommendations continuously downward. However, after several tests, including a variable to account for analyst learning, I find analyst behavior to be consistent with the *sweet escape* hypothesis (see Section VII for the details of this robustness check).

The lockup period, company performance and analyst incentives

In this section I highlight 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 however, analysts are exposed to pressure of varying magnitude to support the stock, in part depending on the past performance of the share price. 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 decrease their ownership 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 *sweet escape* 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 *sweet escape* hypothesis will hence 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, any 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 *sweet escape* 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 *sweet escape* 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 all 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. 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 for the overperformer and, in contrast, is propping up the share price of the underperformer. Hence, one cannot statistically discern a difference between these two groups. After 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 inflated recommendations to recommendations according to his true belief after the lockup period has ended. This results in a 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 *sweet escape* hypothesis, this gap 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 in which I measures the performance, all yielding the same results). I subsequently regress the underperformer and average-performer tertile, together with the previously used control variables, on analyst recommendation in an ordered probit model depending on the timing of the recommendation: I run the ordered probit model once on the sample containing the analysts' recommendations before the end of the lockup period and a second time on the recommendations after the end of the lockup period, 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 *sweet escape* 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, instead of receiving similar

recommendations as observed 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 firm subsequent to their IPO. Indeed, Cliff and Denis (2004) demonstrate that companies conducting an IPO try to boost coverage by underpricing the equity offering. Investigating into the starting point of analyst coverage, Bradley, Jordan and Ritter (2003) find a sharp increase after the end of the quiet period. This finding is consistent with my findings (see Figure 6).

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 *sweet escape* hypothesis predicts that coverage will be sustained only until insiders are allowed 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.

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

The *sweet escape* hypothesis predicts that analysts will convey this bad signal only 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 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 of overoptimistic recommendations being issued during the lockup period and followed by downward revisions after the end of the lock period, I detect a strong increase in analyst coverage shortly during the lockup period followed by a large drop in coverage after the end of the lockup period.

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 pushing for and more prone to receive this service. In the following, I investigate two groups of stakeholders, both of which have a clear interest in a positive share price performance until the end of the lockup up. In addition, the two 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. They have a different type of leverage on investment banks: 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). 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. I add two variables on the right hand side to account if venture capitalists have invested in this company (obtained via SDC), and to control for the end of the lockup period as well

[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

as analyst affiliation. As a proxy for the strength of management leverage, 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. I correct for the possible econometric miscomputation of the coefficient of an interaction term including two dummy variables in a probit model using the Ai and Norton (2003) methodology:

$$\Pr(rec_j = i) = \Pr(\kappa_{i-1} < \beta_1 lockup\_ended\_x\_VC_j + \beta_2 lockup\_ended\_x\_high\_management\_ownership_j + \sum_{l=3}^{n} \beta_l firm\_control\_variables_{jl} + u_j < \kappa_i) \quad (5)$$

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

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, while I do not observe the same behavior by co-manager affiliated or unaffiliated analysts.

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. 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-SOX era. 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 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 and made it more difficult to issue biased recommendations in order to positively influence the market.

The *sweet escape* 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

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

[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.

regulation has been passed. This finding is consistent with earlier literature such as Kadan, Madureira, Wang and Zach (2008) and supports the *sweet escape* hypothesis. 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 *sweet escape* 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 analyst behavior as described by the *sweet escape* hypothesis.

VII. Robustness Checks

In this section I present two alternative hypotheses which have similar predictions as the *sweet escape* 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 period 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, 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 this alternative 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 *sweet escape* 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 in the time 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 *sweet escape* 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 *sweet escape* hypothesis.

B. Earnings announcements around the lockup period

The s*weet escape* 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. Only after the end of the lockup period, the company will release a more realistic future outlook and earnings. 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 15 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

For the vast majority of more than 90% of my sample firms, the length of the lockup period is 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 *sweet escape* hypothesis, exhibit a particularly strong predictable downward revision after the end of the lockup period. 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 *sweet escape* 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 a certain type 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 *sweet escapes* 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 that, indeed, 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, conditional on the past share performance, 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 *sweet escapes* 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 recommendation. The price reaction to downgrades after the end of the lockup period is less severe 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 to 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 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 dummy variables for these time periods. 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 the 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:

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 created in such a way 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.

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

Figure 1: Insider trading after the end of the lockup period, three years after the IPO and in the average U.S: company

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. Insider trading after the lockup period consists of 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.

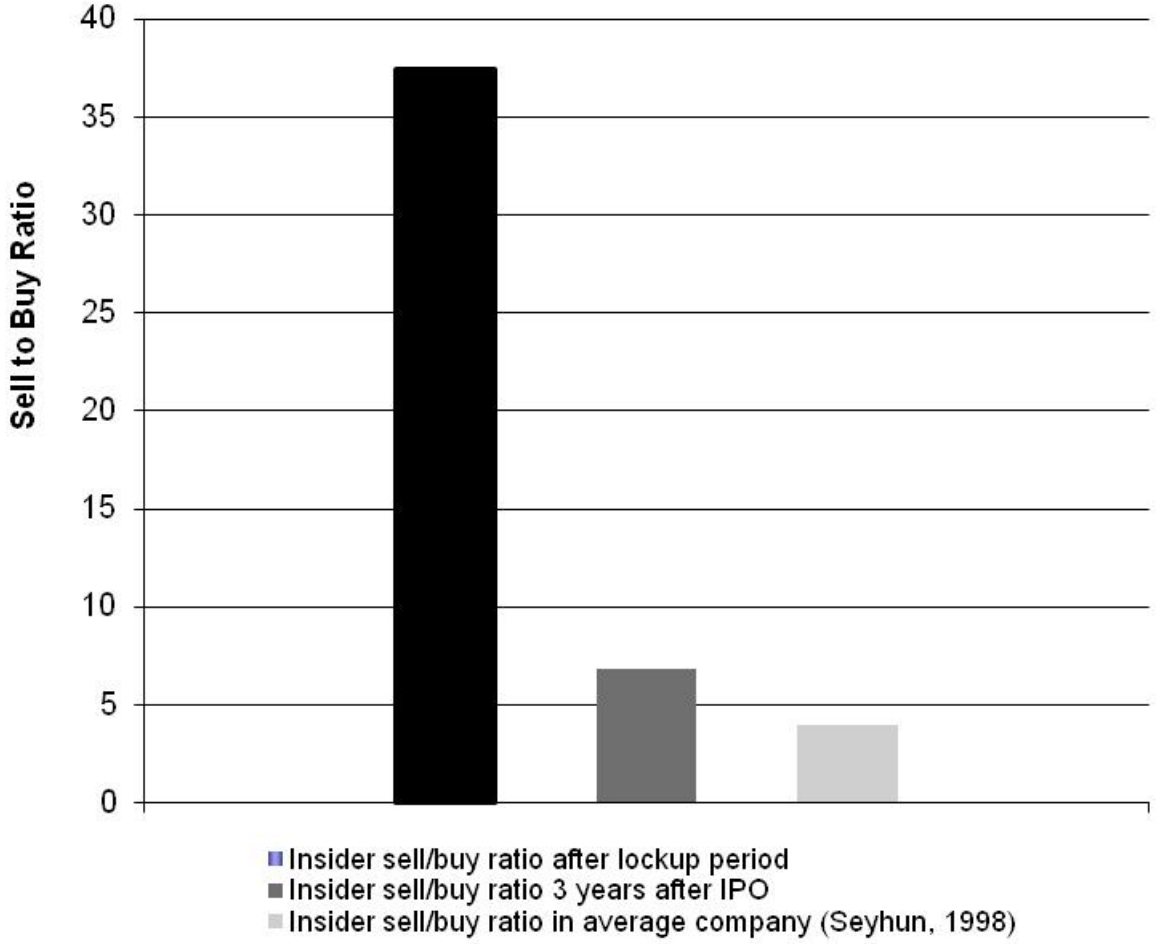
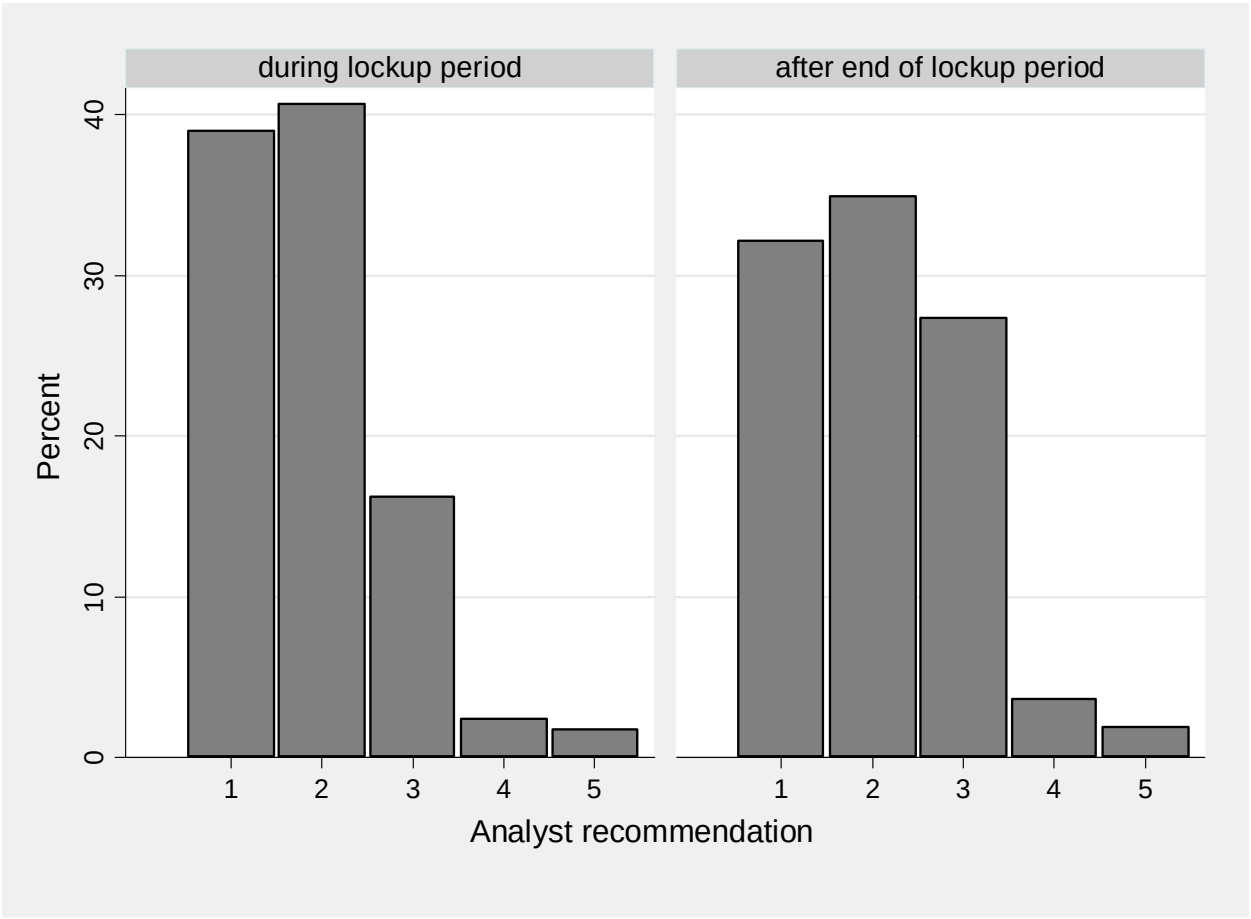


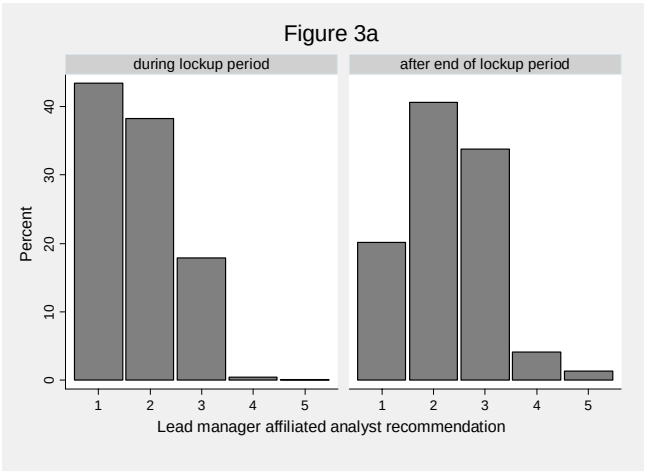
Figure 2: Distribution of analyst recommendation during and after the lockup period

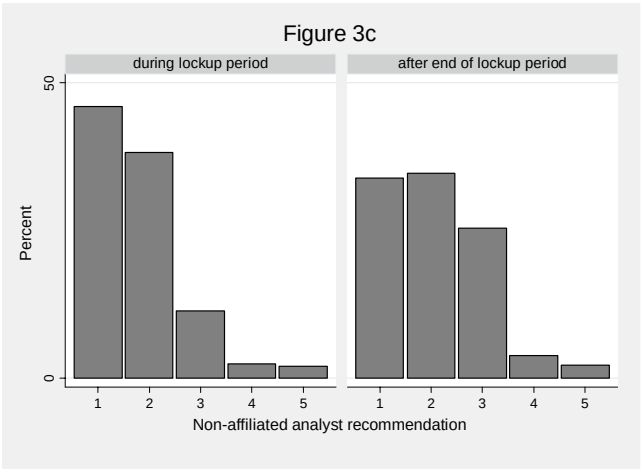
This histogram shows the distribution of analyst recommendations (on a 1 (=Strong Buy) to 5 (=Strong Sell) scale). Each bar denotes the percentage points the respective recommendation has been issued in comparison to all recommendations issued during this time period. The recommendations are divided 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, 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.



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 fraction 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, 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.





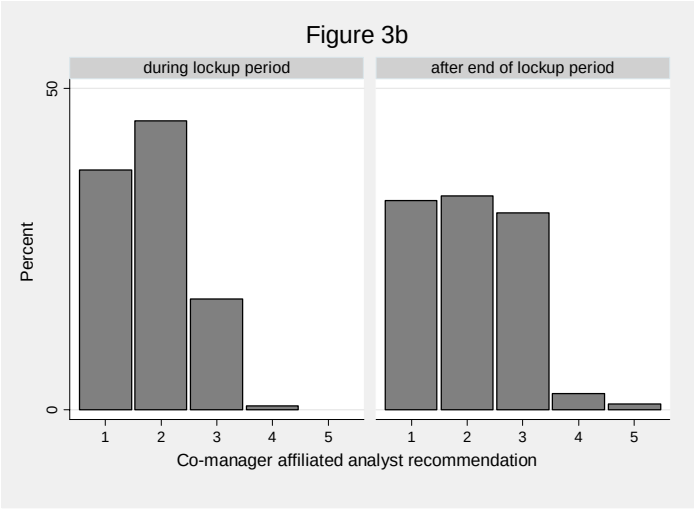
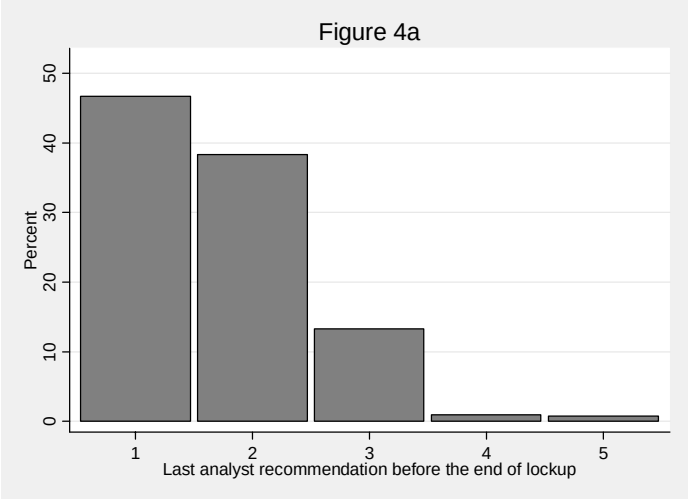


Figure 4: Distribution of the last analyst recommendation before the lockup period compared to the first recommendation after the end of the lockup period

Figure 4a shows the distribution of analyst recommendation 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, 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.



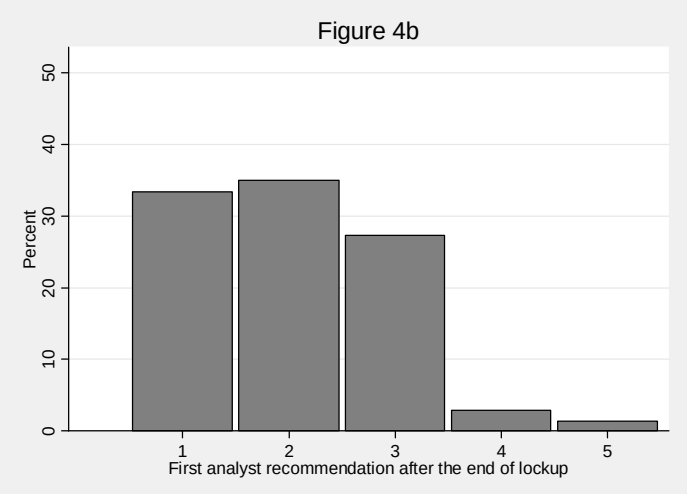
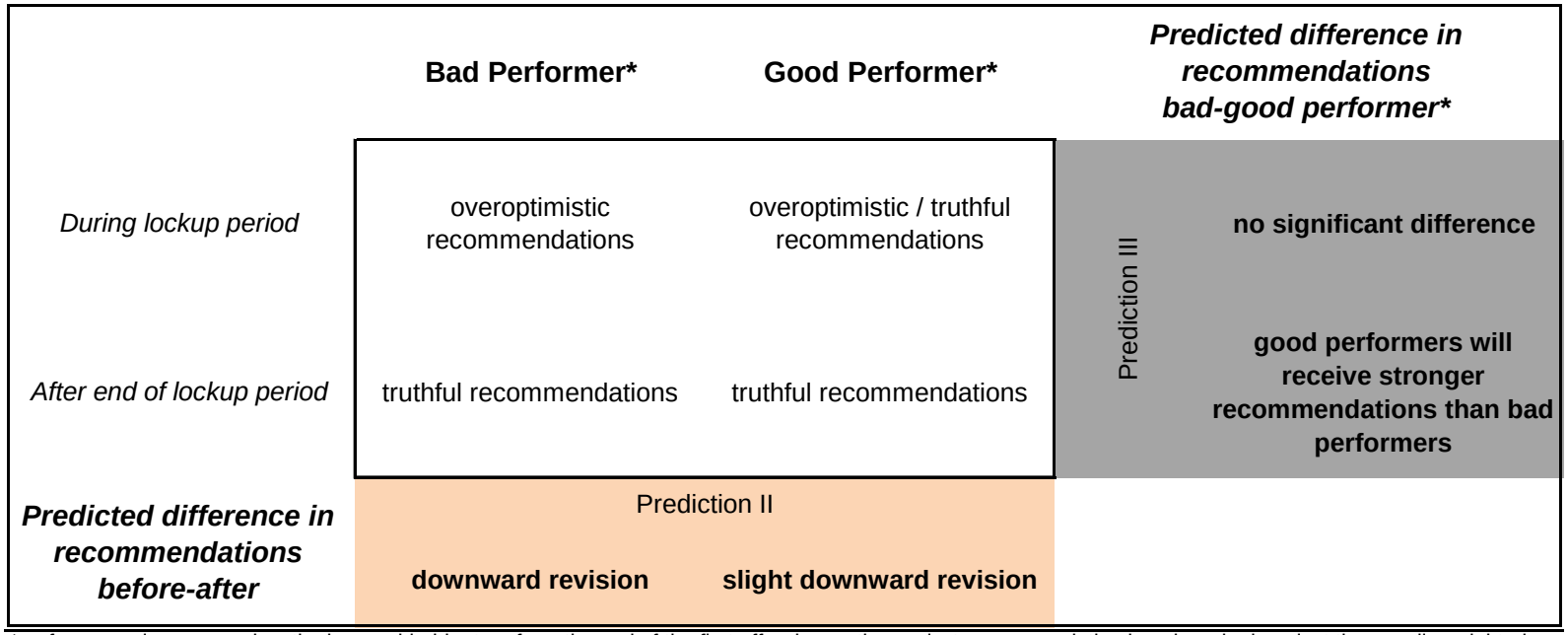


Figure 5: Prediction II and Prediction III of the s*weet escape* hypothesis in relation to firm performance and analyst recommendations



*performance is measured as the buy-and-hold return from the end of the first offer day up the analyst recommendation 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. I focus on analysts starting coverage up to 150 days after 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, 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.

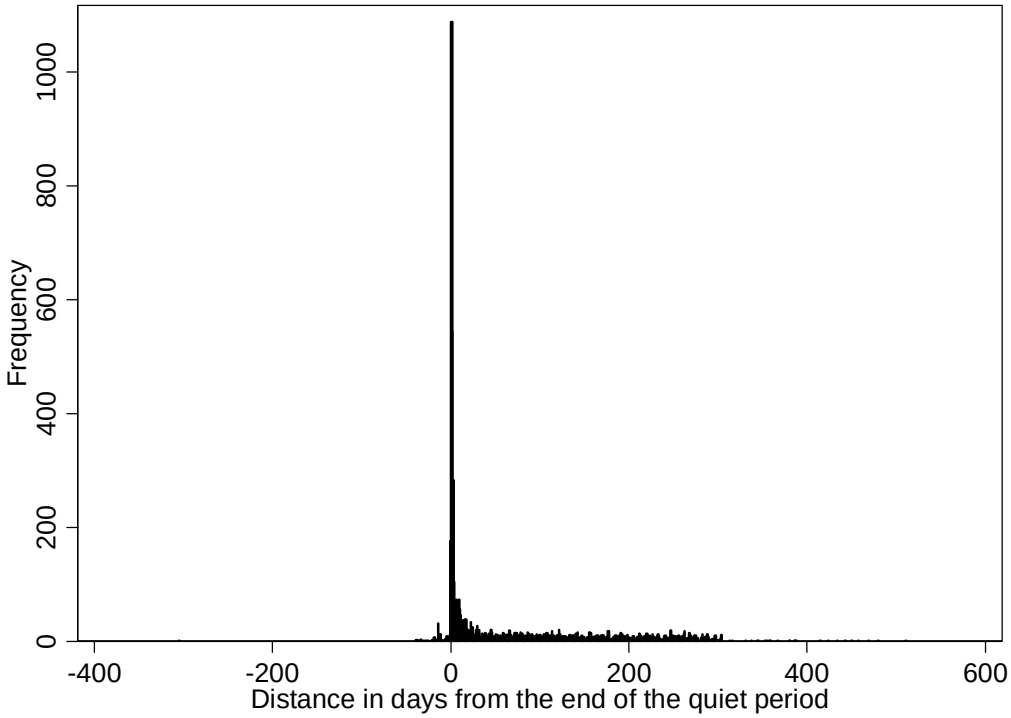


Figure 7: Analyst stopping coverage around the end of the lockup period

The end of broker coverage is defined as the recommendation by a broker if this broker did not issue a new recommendation for one year afterwards 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, 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. A Kruskal-Wallis test reveals that the difference in number of analysts stopping coverage before to after the end of the lockup test is highly significant at the 1% level.

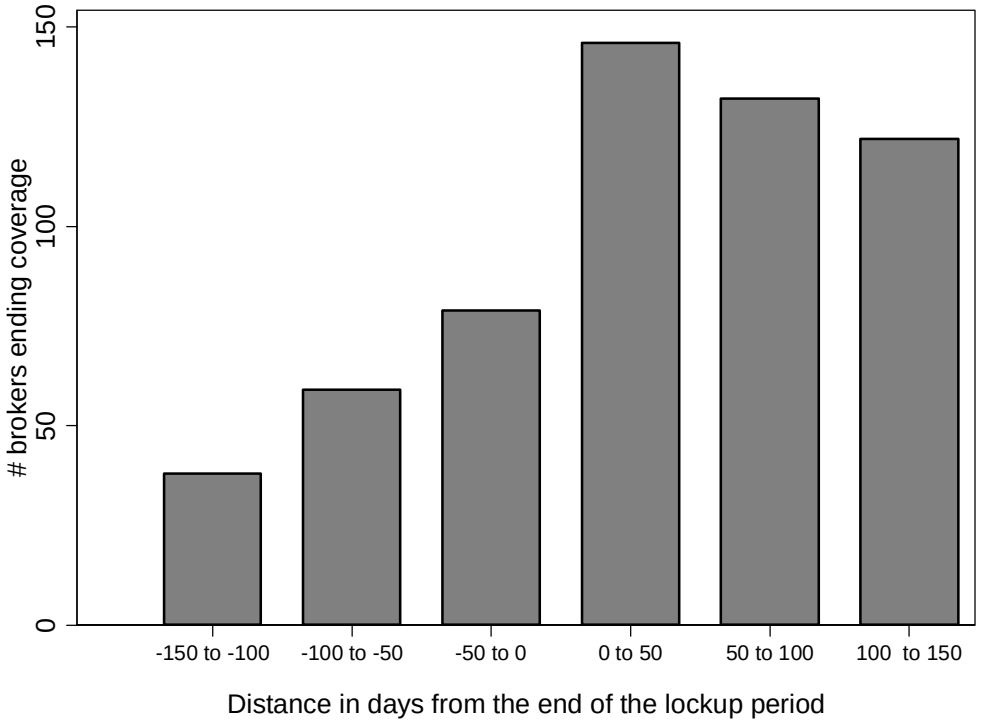


Table 1: Descriptive statistics of the sample

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, 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.

Panel A reports the firm characteristics of the offering companies. *Proceeds* are shown in $. *Firm size* is calculated with the Compustat variables "Shares outstanding" * "Share Price" as reported on the day of the offering by CRSP. *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	$82'000'000	$45'000'000	$4'000'000	$4'600'000'000	$48'000'000
	Firm size	1'017	$340'000'000	$180'000'000	$13'000'000	$10'000'000'000	$260'000'000
	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' recommendation around 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 Manater (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, 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. 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)***
Underwriter rank	0.225**	0.225**	0.232**	0.168
	(2.34)	2.4	(2.37)	(1.45)
Lead manager	0.027**	0.027**	0.020*	0.065***
	(2.28)	2.32	(1.68)	(4.6)
Lockup ended x 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 lockup**	N	1'709	1'696	5'159	
		mean	1.77	1.78	1.76	***-0.01***
	mean recommendation after 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 lockup**	N	685	771	674	
		mean	1.69	1.65	1.73	***0.04***
	first recommendation after 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: *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	***0.206****	
	(2.72)	
overperformance up to recommendation x lockup_ended	***-0.163****	
	-(2.14)	
overperformance up to recommendation	***0.004***	
	(0.16)	
underperformance up to mid of lockup period x lockup_ended		***0.280****
		(3.86)
overperformance up to mid of lockup period x lockup_ended		***-0.073***
		-(1.04)
overperformance up to mid of lockup period		***-0.018***
		-(0.79)
Lockup ended	0.308***	0.268***
	(5.3)	(4.84)
Underwriter rank	0.019	0.019
	(1.06)	(1.05)
Underpricing	-0.097**	-0.042
	-(2.27)	-(0.89)
Lead-manager	-0.032	-0.031
	-(0.6)	-(0.59)
Co-manager	0.001	-0.007
	(0.03)	-(0.16)
log_size	0.098***	0.105***
	(3.66)	(3.92)
NASDAQ	0.048	0.051
	(0.26)	(0.26)
NYSE	0.247	0.249
	(1.27)	(1.23)
Primary shares in % of shares offered	0.001	0.001
	(0.83)	(0.98)
Proceeds	0.001**	0.000**
	(2.35)	(2.07)
VC	0.06	0.062
	(1.48)	(1.51)
# Lead managers	0.249***	0.256***
	(5.81)	(6.)
# Co-managers	-0.012***	-0.012***
	-5.86	-5.86
R-squared	0.0465	0.0431
N	3725	3727

+ p<0.15, * 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, 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. 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 stakeholders 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 (Sarbanes-Oxley, 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 Manater (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, 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. 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 a continuously downward revision of recommendations explains impact of 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 Monaster (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 / 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, 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. 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 rec.
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 offered	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)	Earnings per share (diluted, winsorized)	Difference Eps to Eps of prior quarter (winsorized)
mean	-3	-1.56	-0.38	0.00
median		-0.02	-0.02	0.00
mean	-2	-0.56	-0.20	0.07
median		0.03	0.03	0.01
mean	-1	-0.04	-0.03	0.18
median		0.05	0.05	0.02
mean	1	-0.01	-0.01	0.03
median		0.06	0.06	0.01
mean	2	-0.01	-0.02	-0.02
median		0.07	0.07	0.00
mean	3	0.00	-0.01	0.00
median		0.06	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. These 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)	Earnings per share (diluted, winsorized)	Difference Eps to Eps of prior quarter (winsorized)
mean	-1	-0.17	-0.13	0.19
median		0.03	0.03	0.02
mean	0	-0.01	-0.01	0.11
median		0.05	0.05	0.03
mean	1	-0.09	-0.02	-0.01
median		0.04	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 Manater (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, 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. 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
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