Sweet escapes: analysts' recommendations and the lockup period[1]

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The end of the lockup period of initial public offerings constitutes in general the first time corporate insiders sell significant numbers of shares on the market. I test the hypothesis that selling 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 too optimistic recommendations up to the end of the lockup period. I find a significant downward revision of recommendations for the whole sample of firms as soon as the lockup period ends. The market takes this analyst behavior partly into account.

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I. Introduction

The first possibility for managers and large shareholder[3] to significantly reduce their ownership stake in an initial public offering (IPO) arises after the lockup period ends and when insiders are allowed to sell their shares on the open market. In contrast to the IPO offer price, the share price in this period of time is not set by the underwriter but is established by market forces usually several months after the offering, and determines to a large extent the profits earned by founders and investors who want to use the IPO to exit or diversify. Are those market players willing to leave the price development up to this crucial point in time to the market forces and take their chances?

This paper seeks to contribute to the existing literature on several dimensions: i) I give evidence that analysts behavior changes around the lockup period. Analysts issue significantly better recommendations before the lockup period. In particular, they do so for underperforming firms. ii) I highlight which incentives govern the analysts' post IPO behavior and that they act accordingly. iii) I investigate which stakeholders use their influence to push for these biased recommendations. The results point towards insiders and management as well as venture capitalists. iv) I show that the market is aware of and partly discounts this systematic bias in analyst behavior.

First, I develop and test the *sweet escape* hypothesis that analysts, and thus the investment banks they are working for, attempt to support and boost the share price of newly issued companies until the lockup period has ended. They do this in order to enable insiders to sell their shares at an increased price. Regressing analyst recommendations on an end-of-lockup dummy variable and controlling for firm and seasonal effects, I find that analysts issue significantly better recommendations during the lockup period than after its end. These results are even stronger when I compare the last recommendation issued before to the first recommendation after the end of the lockup period. The same pattern is observable if I focus on the revision of each individual analyst for a given firm. Analysts furthermore issue more optimistic recommendations, so called "booster shots" (Michaely and Womack, 1999), for companies which underperformed in terms of their buy and hold return since their offering.

Following an IPO analysts face a difficult tradeoff between credibility and their employer's future business opportunities. Issuing overoptimistic recommendations is costly for the analysts as they may lose their market credibility and thus jeopardize their future career. Because of these

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Brav, A., and P. Gompers, 2003, The Role of Lockups in Initial Public Offerings, *Journal of Financial Economics* 1-29. show that insiders will generally refrain from selling shares during the IPO and during the lockup period. This finding is consistent with our sample in which secondary shares make up only 8% of the proceeds raised during the IPOs.

career concerns, an analyst will try to limit the time he has to issue these excessively optimistic recommendations to a minimum. The investment bank faces the same tradeoff: on the one hand, the bank wants to please the management of the newly listed firm to gain future investment business as well as satisfy the venture capitalists who are repeated players in the IPO and the investment banking world. On the other hand, the bank's brokerage division and its clients rely on true and accurate information. These two contradicting goals suggest that this type of support will last only as long their clients insist on and can profit from it. Moreover, analysts should provide these biased recommendations chiefly to firms and insiders who believe they need these booster shots, namely underperforming firms. While it has been shown by James and Karceski (2006) that this support lasts for several months there have not been any articles investigating into when exactly this support ends. This paper provides strong evidence that the support lasts to the end of the lockup period.

If analysts are reluctant to offer booster shots at will, I expect that analysts will provide qualitative similar recommendations for both the overperformer and the underperformer, because analysts will issue recommendations according to their true belief for overperforming firms and too optimistic recommendations (booster shots) for underperforming firms. After the end of the lockup period and after management and investors are able to disinvest, the pressure on the analyst eases. Analysts will now follow their career concern incentives. As a consequence of the eased pressure the analyst will now issue recommendations according to his true beliefs not only for overperforming companies but as well for underperforming companies. This leads to a significant downward revision for underperforming firms. Taking this hypothesis to the data I find that, indeed, during the lockup period the recommendations for the two types of companies do not differ statistically. However, after the end of the lockup period analysts issue significantly worse recommendations for underperforming than for overperforming companies.

All stakeholders in a company, managers, venture capitalists or larger owners, who fall under the lockup agreement and wish to decrease their ownership stake in a company during an IPO, have an incentive to influence investment banks to offer biased recommendations around the lockup period. And parties (managers as well as block holders) have a potential lever on the investment banks: if managers/insiders are content with the support and service offered by the investment bank, future business, such as seasoned equity offerings, mergers & acquisitions etc., might flow in their direction and generate large fees for future profits. The business model of venture capitalists in this context focuses on investing in a young/startup company and exiting at a later stage by selling their stake either privately or along an IPO. Thus venture capitalists are repetitive players in the IPO game. This might induce bankers to please these parties in hope of gaining very lucrative future IPO mandates from these venture capitalists (Chen and Ritter, 2000). I

show that both groups gain more favorable recommendations. In my analysis, I find that companies belonging to the quartile with the highest insider ownership proportion are more prone to get too optimistic recommendations, suggesting that these insiders demand and receive these biased recommendations. This is also true for companies backed by venture capitalists. Investigating the difference in analyst behavior according to their affiliation I find, similar to Bradley, Jordan and Ritter (2008), no significant different behavior between lead-underwriter, co-underwriter and non affiliated analysts.

Next I pursue the question if the market discounts this ex ante predictable downgrading of underperforming firms after the lockup period. Consistent with the above reasoning, I find that the market reacts less negatively to the anticipated downgrading of the underperforming firm after the end of the lockup period than to a prior downgrade. The market reaction to downgrades of overperforming companies in contrast is independent whether recommendations have been issued during or after the end of the lockup period: the market reactions remains constant. These findings hold in a multivariate regression setting.

The remainder of this paper proceeds as follows: Section II describes the data sources and offers descriptive statistics of the sample. Section III investigates the lockup period in more detail. Section IV elaborates the hypothesis and shows the empirical results. Section V highlights the incentives and subsequent behavior of analysts, while Section VI investigates which group of insider is receiving these biased analyst recommendations. Section VII observes the market reaction, section VIII concludes.

II. Data sources and descriptive statistics

The sample consists of companies conducting an initial public offering (IPO) and issuance of common class A shares from the years 1996 until 2006, as recorded in the Thompson Financial Securities Data Company (SDC) database. Firms included in this sample have to be listed on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX) or NASDAQ subsequent to their offering. I omit unit offerings as well as real estate investment trusts (REITS), American depository receipts (ADRs), closed end mutual funds, spinoffs, reverse leveraged buyouts (LBOs), financial companies and utilities, consistent with earlier research in this area. Consistent with the existing IPO literature I omit IPOs with a very low offer price and drop all offerings with an offer price of less than 6 USD as well as firms for which no information on the lockup period has been provided. From SDC I obtain the offer price, insider ownership at the time of the offering as well as primary and secondary shares offered. Stock returns, share volume traded and shares outstanding

are downloaded from the Center for Research in Security Prices (CRSP). I screen the data for possible errors and use third party sources, for example as provided by Jay Ritter (2006), to correct my sample.

In a second step I download and match the analysts' recommendation history from the FirstCall (FC) database to the sample firms. Of these files I omit those records marked as deleted. The FC database stores the analyst recommendations on a 1 (strong buy) to 5 (strong sell) scale, the analyst's prior recommendation, the exact time of the recommendation, his affiliation and the ticker symbol and name of the company he is evaluating. I have to restrict my sample to the years 1996 up to 2006, because information of the FC database on analyst recommendation for earlier years is very sporadic. Throughout the paper, I partition the analyst recommendations into two distinct time periods. The first concerns analyst recommendation during the lockup period includes the issue day to one day before the end of the lockup, while the period after the lockup includes the day of the end of the lockup period and is measured for 50 days.

I group all recommendations published according to the type of analyst's affiliation: lead-underwriter, co-underwriters or non-affiliated analysts. I retrieve information about the lead-underwriter and co-underwriters from the SDC files and match these with the FC database. I consider an analyst to be affiliated if the analyst is working for the same bank or working for the same group of companies[4].

For each of the sample firms I collect insider trading data from Thomson Financial, who in turn use 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 days. I define insiders as employees in the following position: CEO, COO, CFO, CIO, CTO and (Executive-)Vice President, officers and directors.

Table 1 provides the descriptive statistics for this sample. Of the 1,128 firms, roughly half (689) were backed by venture capitalists. Two thirds of IPOs issued only primary shares[5]. The vast majority of funds raised came from primary shares. Only 8% of the proceeds went to existing shareholders from the sale of secondary shares.

INSERT Table 1 HERE

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

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

III. The lockup period and insider selling

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, usually (and consistent with our sample) 180 days after the IPO. Not only are insiders barred from selling shares on the open market, this agreement prohibits the insider to offer, contract to sell, short sell or in any way reduce their ownership stake (Bartlett, 1995) in the company. As the vast majority of insiders tend to refrain from selling secondary shares during the offering (as shown in Table 1) and are 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), insiders tend to significantly sell shares as soon as the lockup period is over: I look into each transaction by insiders and determine whether they have sold or bought shares on the open market. Measuring the amount of shares bought and sold on the open market, the sell-to-buy ratio in dollar terms is 35 to 1. This ratio is much larger than the average sell-to-buy ratio over the life of the company. Research on insider trading shows that insider sales outnumber insider purchases over the long horizon with a sell–to-buy ratio of 3 to 1 and that this ratio is increasing in the last decades (Seyhun 1998). In the 50 days following the end of the lockup period, managers, directors and officers sold shares worth 2,800,000 USD, 6% in terms of the median proceeds raised during the IPO. In the same period this group bought only shares worth 83,000 USD. Enlarging this sample to encompass all trades recorded by the SEC, I add large owners of company stock as well as other individuals with access to non-public, price relevant information[6], thus increasing the shares sold to 7,400,000 USD, 16% in terms of the median proceeds raised during the IPO. In contrast, shares worth only 203,400 USD are bought in the same time period.

Do insiders consider the two possible time slots in which they can sell substitutes or complements? I test if insiders who sell shares doing the offering will refrain from selling shares after the lockup. Insiders tend to sell shares after the end of the lockup period, independent of whether secondary shares have been sold in the IPO, as shown in Table 2. Insiders sell more shares, in total 3,400,000, after the lockup period if the company did not issue secondary shares during the IPO. Insiders sold 1,980,000 shares after the lockup period if the company did issue secondary shares in its IPO. Thus selling during the IPO itself and after the end of the lockup period are neither perfect substitutes not complements. Insiders are likely to cash out after the lockup period, regardless of whether their secondary shares were sold during the offering.

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

INSERT TABLE 2 HERE

IV. The *sweet escape* hypothesis and its predictions

As insiders tend to divest after the end of the lockup period, the share price during this time is of particular importance to them. 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. While Michaely et. al. showed that this bias applies to affiliated analysts, Degeorge, Derrien and Womack (2007) with their *currying favor* hypothesis as well as Bradley, Jordan and Ritter (2008), find evidence that this behavior extends to non-affiliated analysts as well. However, overoptimistic recommendations for their clients come at a cost for analysts and their investment banks in terms of loss of credibility. An analyst fears that loss of credibility will hurt his career as the market and clients will discount his recommendations. If the analyst's recommendations are discounted by the market, he has less impact on the market and community and is less interesting for his employer and his clients. Furthermore, an all-star analyst or an aspiring one will fear that it will hurt his chances to be elected as an all-star analyst[7] the next year.

It is in this context that I would like to develop and test the *sweet escape* hypothesis. Under this hypothesis, analyst will try to support the share price of a company in order to give insiders and large shareholders a sweet escape from their investment in a company by issuing overoptimistic recommendations. As this support is costly, they will revert to their true beliefs as soon as insiders had the possibility to sell and thus reduce the insider's pressure on the bank to boost its share price. This leads to the first testable prediction:

Prediction I: *Analyst recommendations before the end of the lockup period are significantly better than the 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 of 1.78 (on a scale of 1=strong buy to 5=strong sell) is significantly lower than the mean recommendation after the end of the lockup of 2.24, as reported in Figure 1.

INSERT Figure 1 HERE

[7] 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.

I detect a significant difference in the recommendation before and after the lockup period for lead-analyst, co-lead analyst and non-affiliated analysts. A Kruskal-Wallis test shows that these three types of analyst issue significantly different recommendations during the lockup period. Next, I move away from the average recommendation and focus on the last recommendation before the end of the lockup period compared to the first recommendation after its end of a specific analyst. As Figure 1b illustrates, the size of the revision increases with the level of affiliation. While lead analysts lower their recommendation by 0.54 and co-manager analyst by 0.42, non-affiliated analysts revise their last recommendation before and first recommendation after the lockup period by only 0,27.

Testing this prediction in a multivariate analysis, which I present in Table 3, I employ three different specifications. In Model 1, I run an ordered probit regression with a lockup dummy variable (*lockup_ended*) and standard firm control variables on the right hand side and the analyst recommendation (*rec*) on the left hand side.

$$\Pr(rec_j = i) = \Pr(\kappa_{i-1} < \beta_1 lockup\_ended_j + \sum_{l=2}^{n} \beta_l \, firm\_control\_variables_{jl} + u_j < \kappa_i)$$

with i = 1,2,3,4,5, the possible type of recommendation issued by the analyst and u_i normally distributed.

As predicted, the *lockup_ended* dummy variable is positive and significant at the 1% level. As FC records the analyst recommendation on a 1 (strong buy) to 5 (strong sell) scale, the positive coefficient is revealing the negative revision of analyst recommendations after the lockup period. Lead affiliated analysts issue furthermore significant better recommendations than unaffiliated analysts during the whole time period. Holding the other control variables constant, the probability of receiving a strong buy (=1 in the FC database) recommendation after the lockup period decreases by 11.4 percent. The probability of getting a good recommendation, defined as a buy or a strong buy recommendation drops by 13% after the end of the lockup period[8]. To check the robustness of this regression, I recalculate the standard errors by bootstrapping my sample and as well by using the jackknife algorithm. The results remain highly significant. To account for seasonal effects as well as 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 2. During the bubble period, analysts issued significantly better recommendations. The impact of the lockup dummy variable remains highly significant for the whole sample. To check whether theses

[8] See Greene, William H., 2003. *Econometric Analysis* (Prentice Hall, Upper Saddle River, New Jersey) for further information on the interpretation of ordered probit coefficients.

results are driven mainly by firms with very few analyst observations, I restrict my sample in Model 3 to companies with at least 5 analyst recommendations during the sample period. The highly significant lockup dummy variable shows that analysts downgrade their recommendations after the lockup period for this subsample to an extent in line with what is found in the entire sample. Running similar regressions with the last analyst revision as well as change in recommendations by each analyst instead the overall mean recommendation confirm the robustness of this finding.

INSERT TABLE 3 HERE

V. The lockup period, analyst incentives and their subsequent behavior

In this section I aim to shed light on the changing incentives analysts face during and after the IPO of a company and investigate their subsequent behavior. On the one hand, analysts want to built and maintain a reputation in the market. This implies issuing valid spot-on recommendations according to their true beliefs about a firm and its economic outlook. However, analysts are exposed to pressure in varying magnitude, depending on the past performance of the share price and the wish to sell by insiders, to respond to the desires of the bank's current and prospective clients and to act in their favor.

Although managers and large owners would always prefer to receive strong buy recommendations, they will attach even more importance to, and possibly push for, favorable analyst coverage if this significantly impacts their personal wealth. For example, they might signal ex-ante to the underwriting group that they would like to sell a large number of shares after the IPO. Insiders might be in an especially good bargaining position to insist on these biased recommendations because the duration of the lockup period is known to both parties, insiders as well as analysts / investment banks, far in advance and is fixed. Indeed, the resulting window is part of the IPO negotiations with the underwriting consortium. The ideal test would be to correlate the ex-ante envisioned and the investment banking signaled insider trades to the responding bias in analyst recommendation. However, this data is not observable as only the actual executed trades are registered. Consequently I seek to employ a different test for the above hypothesis.

I now assume two different scenarios, which I subsequently test on the data. Company A performed poorly since its IPO. Insiders pressure the analyst to issue positive recommendations to support the company by issuing over optimistic recommendation, which are in contrast to his true beliefs. The analyst's incentives are thus conflicting. He has now two possibilities: the *sweet escape* hypothesis predicts that he will issue over-optimistic recommendations. If he adheres on the other

hand to his career concern incentives, he will issue worse recommendations than demanded by insiders according to his true beliefs. The pressure by insiders eases as soon as they had the possibility to sell their equity. Hence the career concern incentive prevails and analysts issue their true recommendation, which in the case of the *sweet escape* hypothesis is worse than before.

In contrast, if the stock price performance of company B is positive after its IPO, the market and analysts are positive. Insiders are happy with the performance and will put less pressure than in the former example 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 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 2 illustrates the above described two scenarios. From these, two separate testable predictions can be derived.

INSERT Figure 2 HERE

Prediction II: After the end of the lockup period, analyst will revise their recommendations downwards to a higher degree for underperforming firms than for overperforming firms.

Prediction III: While analysts will issue qualitatively similar recommendations for under- and overperforming companies during the lockup period, after the end of the lockup period they will issue significantly worse recommendations for underperforming companies than for overperforming 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 and subsequently benchmarked against the equally weighted market index. As a robustness check I use a variety of different performance measures and the results remain the same. 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 as illustrated in Figure 2. The difference of the analyst recommendation for the overperforming tertile of 1.78 before the lockup period compared to 2.02 after the lockup period

ended 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 as the downward revision of the overperforming companies. This finding is consistent whether I use mean recommendation during the sample period or focus on the closet recommendations around the end of the lockup period. Next, I test prediction II in the following ordered probit regression.

$$\Pr(rec_j = i) = \Pr(\kappa_{i-1} < \beta_1 lockup\_ended_j + \beta_2 lockup\_ended\_x\_overperformance\_tertile_j + \sum_{l=3}^{n} \beta_l firm\_control\_variables_{jl} + u_j < \kappa_i)$$

with i = 1,2,3,4,5, the possible type of recommendation issued by the analyst and u_i normally distributed.

The crossproduct variable *lockup_dummy x underperformance tertile* equals one if the lockup has ended and the company belongs to tertile with the worst buy and hold share price performance, and equals zero otherwise. I find the coefficient on the variable *lockup_dummy x underperformance tertile* to be highly significant (at the 1 % level), which supports my reasoning. The marginal effects reveal that all firma have a 10% lower probability to receive a buy or a strong buy recommendation after the lockup period. Companies belonging to worst performance quartile have additionally an 8.5% lower chance to receive a strong buy or buy recommendation as soon as the lockup period finishes. The significance of these results holds whether I calculate the buy-and-hold return BHR performance benchmarked against the equal weighted CRSP market return from the closing price at the end of the offer day until the midpoint of the lockup period (Model 1), or through the day prior to each recommendation, both shown in Table 4. Overperforming companies, while showing a positive coefficient, loose significance. This is consistent with the notion that analyst issue fewer overoptimistic recommendations for these firms during the lockup period.

INSERT TABLE 4 HERE

I now test Prediction III which implies qualitative similar recommendations (a pooling equilibrium) in terms of analyst recommendations for companies with good and bad past-performance during the lockup period and a separating equilibrium between over- and underperforming companies after 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 overoptimistic about the underperformer. 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 thus switch from inflated recommendation to recommendations according to his true belief. This results in a downward revision of his recommendation and in turn a significant difference in recommendation (a separating equilibrium) between the over- and underperforming firm. Table 5 supports the above reasoning. In fact the difference during the lockup period between recommendations issued for under- and overperforming firms is slightly (not significantly) positive in favor of recently underperforming companies[9]. It turns significantly negative after the end of the lockup period. In line with Prediction III of the *sweet escape* hypothesis, this gap 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.

INSERT Table 5 HERE

To test if these descriptive and more intuitive statistics are significant, I run the following probit models: I first split my sample into two groups, before and after the end of the lockup period, and create tertiles according to the share performance. I measure the buy and hold return from the end of the first trading day through the middle of the lockup period. I choose this measurement period because on the one hand this time period gives 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 try to persuade the investment bank to support him). On the other hand, it leaves the analysts enough time to react (I run this regression with a multitude of different performance measures, all yielding the same results). I subsequently regress the underperformer and average-performer tertile, next to my earlier 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.

[9] As prior literature argued that underpricing is a possibly source of momentum and thus positive performance and analyst coverage, the buy and hold return is measured from the second day on and thus excludes underpricing. See Rajan, R.; Servaes, H., 1997, Analyst following of initial public offerings, *Journal of Finance* 52, 507-529.

$$\Pr(rec\_during\_lockup_j = i) = \Pr(\kappa_{i-1} < \beta_1 underpeformance\_tertile_j + \beta_2 average\_performance\_tertile_j + \sum_{l=3}^{n} \beta_l firm\_control\_variables_{jl} + u_j < \kappa_i)$$

$$\Pr(rec\_after\_lockup_j = i) = \Pr(\kappa_{i-1} < \beta_1 underpeformance\_tertile_j + \beta_2 average\_performance\_tertile_j + \sum_{l=3}^{n} \beta_l firm\_control\_variables_{jl} + u_j < \kappa_i)$$

with i = 1,2,3,4,5, the possible type of recommendation issued by the analyst and u_i normally distributed

Consistent with prior arguments, the coefficient of the underperformer tertile in Table 6 is insignificant (compared to the overperformer tertile which was left out of the regression). Thus the recommendations issued for underperforming companies are qualitative similar to those issued for the overperforming tertile. However, after the end of the lockup period the underperformer tertile variable has a highly significant negative impact on analyst recommendation as compared to overperforming tertile variable. Both types of companies receive now significantly different recommendations.

INSERT Table 6 HERE

VI. Which insiders try to push for overoptimistic recommendations?

The previous sections highlight that analysts cater for insiders in IPOs by offering biased recommendations. In this section I investigate which type of insider is pushing for and receiving this helpful service. I aim to distinguish two groups of stakeholders, which have both a vivid interest in a positive share price performance up to the time at the end of the lockup up and have as well a reasonable lever on the investment banks.

On the one hand there are the 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, mergers and acquisitions, & etc., 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 service offered. Venture capitalists (VCs) are a second group of stakeholders with an interest in a good share price performance after the lockup period. One of their main business models is based on discovering promising start-up companies at an early age, investing, and later exiting by either selling to another buyer or conducting an IPO. Thus 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. As IPO underwriting is a very lucrative business with high fees for both the underwriter and co-managers, often at 7 % of proceeds (Chen and Ritter, 2000) without considering additional kickbacks, investment banks have a high incentive to retain these VCs as customers for future deals.

To test which of these two, or possibly both, groups is responsible for these biased recommendations, I run an ordered probit model according to the regression below, with analyst recommendations as the dependent variable and focus on two variables: the cross-product *lockup_ended_x_VC*, equaling one if venture capitalist have invested in this company (obtained via SDC) and if the lockup period has ended. As a proxy for management interest, I split my sample into quartiles according to the degree of management ownership before the IPO (obtained via SDC) and interact this variable with the end of lockup variable:

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

with i = 1,2,3,4,5, the possible type of recommendation issued by the analyst and u_i normally distributed.

I find that both VCs as well as large ownership by management cause these biased recommendations. Either of the two variables, the cross-product of *venture backing and end of lockup period* as well as the *high insider ownership and end of lockup period* dummy, are positive and highly significant as shown in Table 7.

INSERT TABLE 7 HERE

VII. Is the market discounting inflated recommendations?

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 recommendation according to their own true belief, the market should anticipate these downgrades after the lookup period. I calculate the cumulative market adjusted abnormal returns (CMAR) starting one day before the recommendation until and including the day after the recommendation has been issued and benchmark these returns against the CRSP equal-weighted-market return. Table 8 shows the market return in relation to past share price performance through the day prior to the issuing of the recommendation and 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. For underperforming companies I find that the market recognizes the biased analyst behavior according to the *sweet escape* hypothesis. It predicts a downgrading of underperforming companies after the end of the lockup period. Thus, if the market is aware of this bias the market should discount downgrades after the end of the lockup period. I find that the market behaves accordingly and reacts less negatively to downgrades on average 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 -4.0% 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 8 HERE

However, the market reacts in this fashion only to downward and upwards revisions. Comparing the market reaction to the type of recommendation (buy, hold, etc.), I find no different magnitude during the lockup period compared to after the end of the lockup period. Thus I conclude that the market is not fully aware of this bias in analyst behavior.

VIII. Robustness Checks

In this section I present an alternative hypothesis which has a similar prediction as the *sweet escape* hypothesis I developed and which consequently might offer an alternative explanation for the results presented in this paper

Instead of supporting the share price of a newly issued company up to the lockup period, analysts might be on average too optimistic about a company when they initiate coverage for this company. Only afterwards they learn about the lower true value of the company and continuously downgrade their recommendations. This implies that the end of the lockup period per se is no significant event according to this hypothesis and should thus have no impact on the analysts' recommendations.

The difference in recommendations shown in Figure A and the significance of the end of the lockup dummy variable in Table 3 might stem from the fact the sample is divided 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 hypothesis the average recommendation during the lockup period is thus better than the one after the lockup period. However, even accounting for this possibility I find the *sweet escape* hypothesis to remain significant.

The first evidence contradicting this hypothesis, in particular the notion that the event "end of the lockup period" has no significant impact, can be found in Table 1B. Measuring the downward revision of specific analysts after the end of the lockup period, that is the difference between his last recommendation during the lockup period and his first recommendation after the end of the lockup period and comparing this revision to the revisions over my whole sampleperiod, reveals that the total magnitude of revision is largely captured by the revision around the lockup period. As a second test I add to the probit model 1 as run in Table 3 a variable accounting for the previous number of recommendations already issued for a specific firm. If analysts continuously downgrade their opinion with each recommendation from a too optimistic starting point, this variable should capture all significance and the "end of lockup" variable should not exhibit any significance. However, I find that the lockup dummy remains highly significant as shown in Table 9. This finding indicates that analysts indeed revise their recommendation downward after the end of the lockup period and thus supports the *sweet escape* hypothesis.

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 than for a time period of 50 days thereafter. I argue that insiders, who fall under the lockup agreement and thus are not permitted to sell shares until the end of the lockup period, expect and may even pressure investment banks to provide them with upwards-biased recommendations until the point in time at which insiders are allowed to sell shares on the open market. I predict that insiders will be more concerned and thus exercise more pressure if their firm has underperformed since its IPO and therefore insiders would consequently face a potential loss in comparison to a potential sale of secondary shares during the offering. 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 due to share performance furthermore leads to an additional testable prediction. During the lockup period, these positively biased recommendations for underperforming firms lead to recommendations qualitatively similar to those issued truthfully for overperforming companies. 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? Including a dummy for venture capitalist backed IPOs and a dummy representing the highest quartile of management ownership before the IPO, my ordered probit regressions indicate a significant impact of both groups. Thus managers as well as venture capitalist receive these biased recommendations. Testing whether the market anticipates this behavior indicates that it is only partly aware of this bias in analyst recommendation: the market reaction to downgrades by analysts who revise, after the offering, their own prior recommendations downward is less severe than a downgrade during the lockup period, consistent with the predictions by the *sweet escape* hypothesis.

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XI. Appendix

Why do insiders not sell secondary shares during the IPO?

Why do insiders not sell their shares doing the IPO itself? Even though insiders and shareholders are theoretically able to significantly reduce their equity stake in the company pursuing an IPO, they in general 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 (Brau and Fawcett (2006)) and that they will consequently realize a possibly worse offer price. If insiders use underpricing to gain momentum Aggarwal, Krigman and Womack (2002) or as a marketing tool Habib and Ljungqvist (2001), Demers and Lewellen (2003)they would leave money at the table if they were to sell at the offer price, as the offer price was knowingly set to low.

Robustness Checks

To account for the sensitivity of certain performance measurement methodologies and the time frames, in which the performance has been measured, I recalculate my regressions and finding using a variety of benchmarks. Next to the firm performance from the closing price up to one day prior to recommendation, I used several other possible focal points: the midpoint of the lockup period, the end of the lockup period, up to ten days before the end of the lockup period as well as 50 days after the lockup period. I benchmarked theses buy and hold returns against the equally weighted market portfolio, the value weighted market portfolio as well as taking the pure raw returns. My results remain quite stable across these different methods.

Instead of taking the average analyst recommendation in each time period, I rerun my test with only the revision around the lockup period, that is the first recommendation after the end of the lockup period minus the last recommendation before it as issued either from any analyst, a lead affiliated, co-lea affiliated or the same specific analyst. Again, my results hold. Good (1 or 2 in the FC database) and bad (3,4 of 5) recommendations as shown in paper are replaced by the difference from the prior recommendation or the mean recommendation up to this point in time. I find qualitative similar results with each of these alternative measurements.

To account for seasonal influences resp. effects of certain time periods such as the bubble period 1998-2000, I create a dummy variable for this time period. The results remain the same.

Figure 1: Analyst recommendation around the end of the lockup period

The left table shows the average recommendation (on a 1 (=Strong Buy) to 5 (=Strong Sell) scale) by analyst affiliation (Lead – Co-manager – Non-aff.) to the underwriting group organizing the IPO. The mean is the average 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). The right table shows the difference between the first recommendation issued after the end of the lockup period minus the last recommendation issued during the lockup period of the same analyst. The sample consists of IPOs which went public from 1995 - 2006 and were subsequently registered either at the NYSE, NASDAQ or AMEX.

Figure 1a

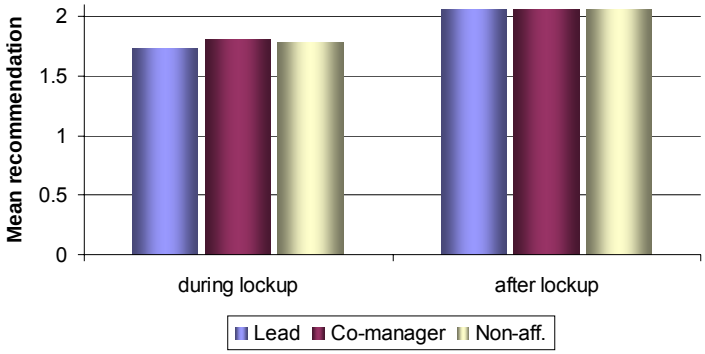

Figure 1b

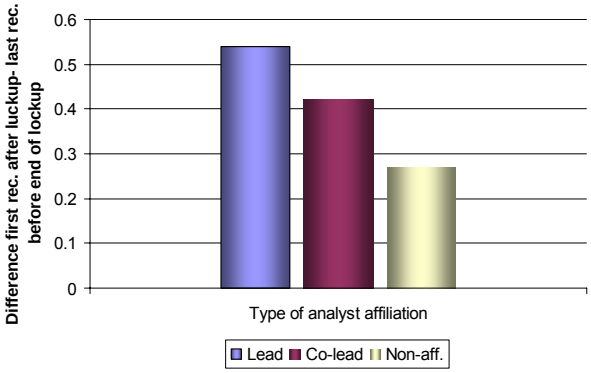

Figure 2: Predictions of the s*weet escape* hypothesis related to firm performance and analyst recommendations

		Bad Performer	**Good Performer**	*Predicted Δ in recommendation bad-good*
Testable Predictions Sweet Escape Hypothesis	*During lockup period*	overoptimstic recs	positive (= truthful recommendations) to optimstic recommendations	no sign. difference
	After end of lockup period	truthful reporting	positive = truthful recommendations	positive difference
	Predicted Δ in recommendation before-after	downward revision	slight downward revision	

Table 1: Descriptive statistics of the sample

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 offering with an offer price below 6 USD. 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-underwriters and co-managers are taken from the SDC database. Analyst recommendations are taken from First Call, insider trading from Thompson Financial.

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. 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 out after IPO" measrues the percentage of shares offered during the IPO as a percentage of total shares outstanding after the offering. "Primary shares as % shares offered" mesures the ratio of primary shares offered in the IPO to the total amount of shres offered (primary and secondary shares) in the IPO. Data is obtained from SDC Platinum.

		Obs	Mean	Median
Panel A	Proceeds	1,228	82,000,000	45,000,000
	Firm size	1,134	350,000,000	190,000,000
	Length of lockup period	1,228	185	180
	VC backing	539		
	% of insider ownership	1,078	45%	46%
Panel B	Shares out after the offering	1,150	23,000,000	15,000,000
	Shares offered in IPO as % of total shares out after IPO	1,150	32%	26%
	Primary shares offered	1,202	4,499,462	3,350,000
	Primary shares as % shares offered	1,202	92%	100%
	Secondary shares offered	421	3,417,518	0

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 offering with an offer price below 6 USD. 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-underwriters and co-managers are taken from the SDC database. Analyst recommendations are taken from First Call, insider trading from Thompson Financial.

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 herein 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 data base. Data on these trades is obtained from the Thompson Insider Trading database.

	No Secondary Shares Sold in IPO			Secondary Shares Sold in IPO			Total
	Obs	Mean	Median	Obs	Mean	Median	Mean
Value of total shares traded by *insiders* after lockup period	807	$3,356,547	0	421	$1,984,910	0	$2,886,303
Value of shares sold by *insiders* after lockup period	807	$3,427,276	0	421	$2,101,036	0	$2,972,596
Value of shares bought by *insiders* after lockup period	807	$66,624	0	421	$116,127	0	$83,595
Value of *all* shares traded after lockup leriod	807	$7,421,627	0	421	$7,387,198	0	$7,409,824
Value of *all* shares sold after lockup period	807	$7,660,840	0	421	$7,529,819	0	$7,615,922
Value of *all* shares bought after lockup period	807	$235,108	0	421	$142,621	0	$203,400

Table 3: 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 additionally controls for the buuble period of 1999 and 2000 ass well for the industry in terms of the 2 digit SIC codes. Model 3 omits firms with less than 5 analyst recommendations.

Lockup ended is a dummy variable equalling 1 if the recommendation was issued after the end of the lockup period. *Lead* 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 capitalisation 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). *Prim sh in % of sh 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 underwriter (co-managers) during the IPO process. *Bubble* is a dummy variables equalling 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 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. We furthermore exclude offering with an offer price below 6 USD. Companies have to have information on shares outstanding and stock returns in the CRSP database. The number of lead-underwriters and Co-managers are taken from the SDC database. Analyst recommendations are taken from First Call, insider trading from Thompson Financial. The t-values are shown below the coefficients.

	dependent variable: analyst recommendation		
	Model 1	Model 2	Model 3
Lockup ended	***0.335****	***0.320****	***0.210****
	7.87	***7.42***	***4.22***
Lead manager affil.	-0.111***	-0.128***	-0.193***
	-2.61	-2.97	-3.69
Co-manager affil.	0.028	0.015	-0.090**
	0.8	0.42	-2.09
log_size	0.144***	0.175***	0.043*
	7.98	8.33	1.84
NASDAQ	0.093	0.127	0.099
	0.58	0.77	0.44
NYSE	0.199	0.252+	0.254
	1.22	1.47	1.1
Prim sh in % of sh	0.001	0.001	0.001
	0.62	1.06	1.19
Proceeds	0.001***	0	0.001***
	3.93	1.34	4.05
# Lead managers	0.248***	0.241***	0.217***
	6.77	6.13	5.73
# Co-managers	-0.011***	-0.008***	-0.014***
	-6.55	-4.53	-6.1
Bubble		-0.182***	
		-4.72	
SIC 2 Digit dummy	No	Yes	No
R-squared	0.042	0.056	0.031
N	5846	5843	3568

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

Table 4: Impact of underperforming companies and the end of the lockup period on analyst recommendation

Dependent variable is the current analyst recommendation, which is on a 1 (=Strong Buy) to 5 (=Strong Sell) scale and obtained from the FC database. I add the crossproduct lockup_ended (=1 if lock period has ended, 0 otherwise) x underperforming tertile as well as the crossproduct lockup_ended x overperforming tertile as well as the performance measure itself. In Model 1 I measure the performance as the BHR from end of first trading day up to the midpoint of the lockup period, benchmarked against the equally weighted CRSP market return. In model 2 i calculate the BHR performance from the first trading day up one day prior to the recommendation date. Lockup ended is a dummy variable equalling 1 if the recommendation was issued after the end of the lockup period.

Additional control variables are: Underpricing, measured as the differnce between closing price of the first trading day minus the offer price.Lead 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 capitalisation 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). Prim sh in % of sh 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.

	Dependent variable: analyst recommendation	
	Model 1	Model 2
underperf up to rec x lockup	***0.184****	
	1.84	
overperf up to rec x lockup	***-0.04***	
	-0.41	
performance up to rec	***-0.011***	
	-0.59	
underperf mid lockup x lockup		***0.371****
		3.79
overperf mid lockup x lockup		***-0.012***
		-0.13
performance up to mid lockup		***-0.013***
		-0.77
lockup_ended	***0.264****	***0.201****
	3.66	***2.9***
Underpricing	-0.054	-0.028
	-1.44	-0.68
Lead-manager	-0.131***	-0.137***
	-3.01	-3.14
Co-manager	0.013	0.009
	0.37	0.26
log_size	0.153***	0.158***
	6.96	7.22
NASDAQ	0.027	0.025
	0.18	0.17
NYSE	0.171	0.172
	1.08	1.08
Prim sh in % of sh	0	0
	0.36	0.5
Proceeds	0.001***	0.001***
	3.29	3.02
VC	0.080**	0.078**
	2.49	2.42
nr_underwriters	0.259***	0.265***
	6.77	6.95
nr_co	-0.010***	-0.010***
	-5.89	-5.93
R-squared	0.043	0.044
N	5831	5837

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

Table 5: Average recommendation around the lockup period by past firm performance

Average recommendation (on a 1 (=Strong Buy) to 5 (=Strong Sell) scale) by analyst affiliation (Lead – Co-manager – Non-aff.) 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 tertiles according to their stock BHR 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.

			Company stock performance up to one day			
			Under-perform	Over-perform	Total	***Δ Under - Overperf.***
Panel A	**mean recom bef lockup**	N	1,709	1,696	5,159	
		mean	1.77	1.78	1.76	***-0.01***
	mean recom after lockup	N	321	333	930	
		mean	2.13	2.02	2.04	***0.11****
	Δ before - after lockup		***0.36****	***0.24****		
Panel B	**last recom bef lockup**	N	685	771	674	
		mean	1.69	1.65	1.73	***0.04***
	first recom after lockup	N	213	183	203	
		mean	2.15	2.01	1.91	***0.14****
	Δ before - after lockup		***0.46****	***0.36****		

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

Table 6: Ordered probit regression of past firm performance on analysts recommendations

Dependent variable	Recs before end of lockup	Recs after end of lockup	Last rec before end of lockup	First rec after end of lockup	Δ of first rec. after lockup and last rec. before end of lockup
Underpeformer	***0.057***	***0.317****	***0.019***	***0.483****	***0.354****
	0.98	***3.23***	***0.23***	***3.98***	***2.25***
Average peformer	-0.037	0.044	-0.045	0.187*	0.293*
	-0.78	0.51	-0.64	1.75	1.84
Underpricing	-0.02	-0.226***	-0.018	-0.158	-0.172
	-0.4	-2.63	-0.25	-1.54	-1.06
Lead manager	-0.130**	-0.093	-0.01	-0.199	0.112
	-2.13	-0.89	-0.12	-1.58	0.58
Co-manager	0.032	0.058	0.178**	0.034	0.106
	0.65	0.61	2.42	0.29	0.65
log_size	0.185***	0.05	0.151***	-0.033	-0.254***
	5.67	0.98	3.06	-0.55	-2.75
NASDAQ	0.321	0.075	0.167	0.152	0.314
	1.62	0.14	0.67	0.27	1.45
NYSE	0.380*	0.337	0.195	0.231	0.292
	1.84	0.6	0.73	0.39	1.02
Prim sh in % of sh	-0.002	0.001	-0.003	0.002	0.004
	-1.21	0.71	-1.42	0.82	1.08
proceeds_amt	0.001***	0	0.001*	0.001**	0
	2.59	1.31	1.9	2.32	0.47
VC	0.125***	-0.022	0.178***	-0.01	0.003
	2.75	-0.26	2.64	-0.1	0.02
nr_underwriters	0.339***	0.155*	0.285***	0.157	0.007
	5.91	1.66	2.76	1.29	0.03
nr_co	-0.009***	-0.009**	-0.015***	-0.010**	0.019***
	-3.76	-2.19	-4	-2.03	2.78
R-squared	0.044	0.046	0.023	0.024	0.048
N	3005	898	1388	583	281

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

Table 7: Influence of different stakeholders on analyst recommendation

Dependent variable is the current analyst recommendation, which is on a 1 (=Strong Buy) to 5 (=Strong Sell) scale and obtained from the FC database. *Lockup ended* is a dummy variable equalling 1 if the recommendation was issued after the end of the lockup period. *VC x lockup* is a dummy variable equalling 1 if the company is VC backed and the lockup period is over. *High Insider Ownersh x lockup* is a dummy variable if the company belongs to the highest quartile in terms of ownership by management before the lockup and the lockup period is over. *High Insider Ownership before* measures the ownership of managers before the IPO in percent (Obtained from SDC).

Lead 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 capitalisation 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). *Prim sh in % of sh offered i*s 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.

	Dependent variable Analayst Recomm.
VC x lockup	***0.280******
	3.86
High insider ownersh x lockup	***0.338******
	3.04
VC	0.103***
	2.86
Insider Ownership before IPO	-0.002***
	-3.21
Lead-manager	-0.087*
	-1.85
Co-manager	0.004
	0.1
log_size	0.174***
	8.7
NASDAQ	0.172
	0.82
NYSE	0.294
	1.36
Prim sh in % of sh	0
	0.1
Proceeds	0.001***
	2.8
nr_underwriters	0.279***
	6.46
nr_co	-0.014***
	-7.9
R-squared	0.049
N	4982

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

Table 8: 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 tertiles of overperformer, average performer and underperformer according to their buy and hold return.
Revisions issued before the end of lockup include all change 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 change in recommendations from the day of the end of the lockup period up to 50 day 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. We exclude REITS, utilities and financial institutions. We furthermore exclude offering with an offer price below 6 USD. Companies have to have information on shares outstanding and stock returns in the CRSP database. The number of lead-underwriters and Co-managers are taken from the SDC database. Analyst recommendations are taken from First Call, 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	Avg. 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%
Δ before - after		**-5.90%**	**4.60%**	**2.20%**	**-0.70%**
lockup		-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%
Δ before - after		**-1.20%**	**-2.50%**	**-5.8%*** **	**-3.20%**
lockup		1.00%	-0.20%	5.10%	1.80%

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

Table 9: 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 equalling 1 if the recommendation was issued after the end of the lockup period. Lead 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 capitalisation 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).

Prim sh in % of sh 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 underwriter (co-managers) during the IPO process. *Bubble* is a dummy variables equalling 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 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. We furthermore exclude offering with an offer price below 6 USD. Companies have to have information on shares outstanding and stock returns in the CRSP database. The number of lead-underwriters and Co-managers are taken from the SDC database. Analyst recommendations are taken from First Call, insider trading from Thompson Financial. The t-values are shown below the coefficients.

	Dependent variable: analyst recommendation
recommendation number	***0.035****
	8.48
lockup_ended	***0.144****
	3.08
Lead-manager	-0.098**
	-2.26
Co-manager	0.027
	0.78
log_size	0.099***
	5.24
NASDAQ	0.019
	0.13
NYSE	0.113
	0.72
Prim sh in % of sh	0.001
	0.78
Proceeds	0.001***
	3.16
VC	0.060*
	1.88
nr_underwriters	0.249***
	6.57
nr_co	-0.010***
	-5.89
R-squared	0.048
N	5837

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