When and Why do IPO Firms Manage Earnings? *

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Abstract: We provide new evidence on the timing and motives behind earnings management by IPO firms. The period around IPOs is characterized by two distinct events: the IPO itself and the lockup expiration. Both the raising of capital at the time of the IPO and the large-scale exit by pre-IPO shareholders at lockup expiration approximately 180 days later create incentives for firms to engage in earnings management. To disentangle the effect of these two events, we examine quarterly, rather than annual, abnormal accruals. We find no evidence of income-increasing earnings management in anticipation of the IPO. However, IPO firms exhibit positive abnormal accruals in the quarter before and the quarter of the lockup expiration. We demonstrate that positive abnormal accruals are concentrated in firms for which we predict intense selling by pre-IPO shareholders at lockup expiration. We also confirm the findings of Teoh, Welch and Wong (1998) that positive abnormal accruals are associated with long-run IPO underperformance.

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1. Introduction

Earnings management benefits informed parties at the expense of those with limited access to information, resulting in a wealth transfer from one group of investors to another. The issue is of particular importance in the context of Initial Public Offering (IPO) firms. These firms exhibit long-run underperformance, on average, suggesting that informed shareholders can benefit from transferring ownership to (less informed) new investors at an opportune time (Ritter 1991; Derrien 2005; Field and Lowry 2009). In an influential study, Teoh, Welch and Wong (1998a) document high abnormal accruals in the year firms go public, link these accruals to long-run underperformance and interpret their findings as evidence of earnings management to inflate the issue price. However, there are two distinct events within a short time span around the IPO where strategic earnings management could result in wealth transfers from new investors. First, the firm sells shares to investors at the time of the IPO. Second, approximately six months after the IPO, pre-IPO shareholders reduce or even liquidate their stake in the firm when firm-imposed selling restrictions, known as lockups, expire.[1] Empirical studies to date have focused on the first event, remaining largely silent on earnings management around the lockup expiration. In this paper, we provide evidence that IPO firms manage earnings not around the IPO but around the lockup expiration in response to the selling incentives of pre-IPO shareholders.

Inflating the stock price at lockup expiration increases gains to pre-IPO shareholders, who can sell or distribute their shares once the lockup expires, but not before. Indeed, following lockup expiration, trading volume increases (permanently) by 40%, on average, suggesting a significant reduction of ownership by pre-IPO shareholders (Field and Hanka, 2001). Importantly, pre-IPO shareholders have the ability to influence managerial actions through their

[1] Lockup agreements are voluntary contracts between the underwriter and pre-IPO shareholders that restrict the ability of pre-IPO shareholders to sell their shares in the IPO firm for a specified period of time after the offering, typically 180 days.

ownership stakes, their presence on the board, their role in designing managers' compensation contracts, and their relationships with management (Barry, Muscarella, Peavy and Vetsuypens 1990; Lerner, 1995; Cadman and Sunder 2014). Managers may thus engage in upward earnings management around lockup expiration to help pre-IPO shareholders obtain a higher price for their shares. However, because the date of lockup expiration is publicly known and anticipated, there is significant market scrutiny at that point in time. Thus, whether firms manage earnings around lockup expiration is ultimately an empirical question.

Our empirical approach has three distinct features. First, in contrast to prior studies that focus on annual accruals or aggregate accruals over multiple quarters, we examine *quarterly* abnormal accruals around *both* the IPO and the lockup expiration. This enables us to pinpoint the timing of abnormal accruals. Second, we relate the abnormal accruals before lockup expiration to selling incentives of pre-IPO shareholders other than managers. Stringent insider trading regulation and high scrutiny of IPO firms deter managers from earnings management for their own benefit but are less of a concern for other pre-IPO shareholders. Third, throughout our tests, we control for IPO proceeds to capture the economic effect of cash infusion on working capital which, in turn, increases abnormal accruals.

Undoubtedly, firms have incentives to manage earnings prior to the IPO. To the extent that it inflates the issue price, income-increasing earnings management prior to the IPO increases the proceeds to the firm.[2] However, studies after Teoh et al. (1998) argue that the extensive scrutiny of financial statements reported in the prospectus discourages earnings management to inflate the issue price and find that firms report conservatively in the year *before* going public

[2] Firms sometimes offer secondary shares belonging to pre-IPO shareholders along with the primary offering. However, secondary shares are sold only in 25% of our sample, and the number of shares sold is economically insignificant in most cases.

(Ball and Shivakumar 2008; Venkataraman, Weber and Willenborg 2008).[3,4] We re-examine these conclusions using quarterly accruals and identifying the quarter which precedes the IPO. In a comprehensive sample of IPO firms that went public from 1990 through 2013, we do not find evidence of positive abnormal accruals in the quarter immediately preceding the IPO. Our conclusions are thus consistent with prior studies that examine annual accruals from the year before the IPO (Ball and Shivakumar 2008; Venkataraman et al. 2008).

Next, we turn our attention to the lockup expiration and, as predicted, find positive abnormal accruals in the quarter preceding and in the quarter of the lockup expiration. Then, using a panel data of firm-quarters that start after the IPO and span the lockup expiration quarter, we compare abnormal accruals around the lockup expiration with those from other quarters in our multivariate tests. This enables us to test for significant spikes in abnormal accruals at opportune times while accounting for the typical magnitudes of abnormal accruals for a given IPO firm. We also control for various firm characteristics that may affect accruals. In line with our univariate analyses, these multivariate tests provide evidence of significant positive abnormal accruals in the quarter before and the quarter of the lockup expiration.

To the extent that positive abnormal accruals in the quarter before and the quarter of the lockup expiration stem from earnings management activities, we expect our documented patterns to be less pronounced for more visible firms. Because they are subject to greater scrutiny, earnings management by these firms is more likely to be detected. Newly public firms also face higher than average litigation risk (Lowry and Shu 2002), increasing the potential costs of

[3] Teoh et al. (1998a and 1998b) recognize that measuring accruals using pre-IPO data would be ideal to empirically support earnings management to inflate the issue price but, as a result of scant data availability, they focus on the IPO year accruals instead, presumably to capture the effects of some pre-IPO quarters.

[4] Consistent with those studies, Billings and Lewis (2015) do not find positive abnormal accruals, on average, in the year prior to the IPO. They document, however, that lawsuits emerge when new economy firms record positive abnormal accruals prior to the IPO, obtain higher initial valuation and experience long-run underperformance.

earnings management. Visible firms are likely more vulnerable to this risk. We partition sample firms into two groups based on visibility (as captured by firm size and analyst following) and find evidence of higher abnormal accruals in the quarter before and the quarter of the lockup expiration only among the less visible firms.

If IPO firms manage earnings before the lockup expiration in anticipation of share sales or distributions by pre-IPO shareholders, we expect a positive relation between abnormal accruals in the quarter preceding lockup expiration and the selling incentives of pre-IPO shareholders. We document this using an ex ante measure of selling incentives: predicted abnormal trading volume upon lockup expiration. Following Field and Hanka (2001), we employ a number of variables known ahead of lockup expiration to estimate a model of abnormal trading volume immediately after the expiration. The predicted value from this model is our ex ante measure of the selling incentives of pre-IPO shareholders. This measure has three advantages: (1) it is based on factors known to managers when they decide whether to manage earnings, (2) it eliminates the need for using actual post-lockup-expiration sales by pre-IPO shareholders, which are not readily available, and (3) it mitigates reverse-causality concerns associated with actual sales (i.e., pre-IPO shareholders sell shares when artificially inflated earnings result in higher stock price).[5] We find evidence of positive abnormal accruals only when pre-IPO shareholders are predicted by the model to sell. Thus we not only provide evidence of positive abnormal accruals at an opportune time but also link these accruals to an incentive for earnings management: inflating the selling price when pre-IPO shareholders sell shares.

[5] While predicted abnormal trading volume is typically not synonymous with selling incentives, it is an appropriate proxy in our setting, because the additional trading volume after lockup expiration has been attributed to selling of previously locked up shares (Field and Hanka 2001). The alternative proxy, realized sales by pre-IPO shareholders, is not only undesirable because of endogeneity concerns but also infeasible. Shares in IPO firms are typically held by a variety of shareholders, many of whom are not required to report changes in ownership to the SEC on Form 4.

In additional analyses, we do not find a relation between abnormal accruals in the quarter before lockup expiration and incidence of net selling of shares by officers. Thus managers do not seem to inflate earnings to benefit from the trades personally, perhaps because of particularly high litigation risk associated with "pumping and dumping." Instead, their decision to inflate earnings is likely influenced by large, powerful pre-IPO shareholders and by the desire to maintain a positive outlook for the company at the time of expected high selling pressure.

Next we turn our attention to what motivates earnings management in the quarter of the lockup expiration. We investigate two possible explanations for this finding. First, firms may continue to inflate earnings in the quarter of lockup expiration to prevent earnings management from unravelling too quickly and attracting scrutiny. Inconsistent with this explanation, we find a negative autocorrelation between abnormal accruals in the quarter before and the quarter of the lockup expiration.

Second, firms may manage earnings in the quarter of lockup expiration only when pre-IPO shareholders cannot sell enough shares between lockup expiration date and the next quarterly earnings announcement. Many firms impose so-called "blackout" restrictions on trading by insiders. Influential pre-IPO shareholders, such as venture capitalists, angel investors and private equity funds, commonly serve on boards of directors, potentially subjecting them to blackouts. Blackouts typically begin at or before the end of the fiscal quarter and end after earnings are announced.[6] When the period between lockup expiration and the fiscal period-end is not sufficiently long, pre-IPO shareholders will have to postpone most of their selling to the subsequent quarter. Thus, in these cases, we expect earnings management to shift from the

[6] Most common blackout restrictions prohibit insiders from selling shares starting, at a minimum, at the end of the fiscal period-end, when insiders are privy to information about the quarterly performance and the firm has not yet released this information to the public (Jagolinzer, Larcker and Taylor 2011). We define the period in which selling is restricted accordingly.

quarter before lockup expiration to the quarter afterward. Our evidence confirms this conjecture. The shift in positive abnormal accruals from the quarter before to the quarter of lockup expiration, depending on when trading is likely to happen, underlines the importance of selling incentives in earning management around lockup expiration.

Finally, we re-examine the role of earnings management in explaining long-run IPO underperformance (Teoh et al. 1998a). On one hand, if high abnormal accruals before lockup expiration stem from earnings management, we expect the accruals to eventually reverse, leading to long-run negative abnormal returns. On the other hand, if the abnormal accruals result from the growth of IPO firms, we would not expect to find a significant association between abnormal accruals and long-run underperformance. We partition firms into two groups based on the magnitude of abnormal accruals in the quarter before lockup expiration and calculate value-weighted buy-and hold returns adjusted for size, industry, and market-to-book for firms in each group. Based on traditional as well as bootstrapped p-values that adjust for distributional biases with long-run returns, we find that firms with high accruals earn significantly negative returns over the one, two, and three years following lockup expiration. Firms with low accruals do not experience significantly negative returns, and the difference in returns between the two groups is significant over all windows.[7]

Our paper makes several contributions to the literature. First, our study adds to the literature on earnings management, particularly to the stream of studies that examine accruals management around equity issues (e.g., Teoh et al. 1998a; Teoh et al. 1998b; Morsfield and Tan 2006; see Dechow, Ge and Schrand (2010) for an overview of this literature). We document that firms manage their earnings around the lockup expiration, resulting in a wealth transfer from less

[7] These results persist after we consider the effect of low cash flows on long-run underperformance, documented by Armstrong et al. (2015).

informed new investors to relatively better informed pre-IPO shareholders, as is evidenced by the subsequent long-run underperformance.

Second, we unify the seemingly contradictory findings in the literature on earnings management around the IPO. Studies subsequent to Teoh et al. (1998a and 1998b) question their conclusion that IPO firms manipulate earnings. Ball and Shivakumar (2008) and Venkataraman et al. (2008) find no evidence of earnings management *prior to* the IPO, casting doubt on earnings management to inflate the issue price. While Armstrong et al. (2015) document positive abnormal accruals *in the IPO year*, they do not find a link between these accruals and the trading incentives of officers and directors. They conclude that abnormal accruals arise from the investment of IPO proceeds in the working capital. The absence, thus far, of conclusive evidence linking abnormal accruals to incentives has been the primary limitation of the earnings management explanation. We fill this gap in the literature by pinpointing the timing of abnormal accruals and relating it to ex ante trading incentives of pre-IPO shareholders.

Finally, we contribute to the literature on the role of lockup periods. Lockup periods are typically perceived as means to reduce information asymmetry between pre-IPO owners and new, less informed investors in public firms (Brav and Gompers 2003). Our study shows that lockups can create perverse incentives when they expire: pre-IPO shareholders take advantage of the information asymmetry by inflating earnings and exiting at a more beneficial price.

2. Earnings Management by IPO Firms: Prior Literature and Predictions

Teoh et al. (1998a and 1998b) provide evidence of high abnormal accruals in the year firms go public. They propose that earnings management at the time of the offering results in buyers paying too high a price and that ultimately, as more information about the firm is released by the media, financial analysts and subsequent financial reports, the firm experiences a price

correction. Teoh et al. (1998a and 1998b) recognize that measuring accruals using pre-IPO data would be ideal to empirically support earnings management to inflate the issue price but, as a result of scant data availability, they focus on the IPO year accruals instead, presumably to capture the effects of some pre-IPO quarters. A number of subsequent studies confirm that accruals are abnormally high in the IPO year and continue to attribute these accruals to managers' incentives to manipulate earnings *before* stock issues (see, for example, DuCharme, Malesta and Sefcik 2004).

Other studies question the typical interpretation of the findings in Teoh et al. (1998a and 1998b). The results of these studies suggest that intense scrutiny of firms' prospectuses makes firms report less, not more aggressively in the year *prior to* IPO (Ball and Shivakumar 2008; Venkataraman et al. 2008). Moreover, while researchers continue to document abnormal accruals in the IPO year, they do not find any significant association between these abnormal accruals and the issue price or trading by officers and directors, concluding that there is no opportunistic earnings management and that abnormal accruals result from strong growth experienced by the IPO firms (Armstrong et al. 2015).[8] These studies shifted the interpretation of positive abnormal accruals in the IPO year from strategic earnings management to normal economic activity. None of them, however, examined the possibility that accruals are abnormally high in the IPO year because of the pre-IPO shareholders' selling incentives around lockup expiration.

Apart from the incentive to increase the IPO issue price, Teoh et al. (1998a and 1998b) list a number of potential reasons why firms might *maintain* earnings management after the IPO, including share sales by original entrepreneurs. They also mention that motivation to maintain earnings management might arise from: (1) pressure to meet optimistic earnings projections

[8] The growth is fueled by the investment of IPO proceeds in the working capital, which, in turn, can be reflected in the measures of abnormal accruals.

made during road shows, (2) preventing earnings management from unravelling to avoid lawsuits, (3) pressure from investment bankers to report high earnings to help support the price. Yet, Teoh et al. (1998a and 1998b) do not empirically examine any of these explanations, leaving unanswered the question why IPO firms manage earnings in the IPO year. Wongsunwai (2013) studies the monitoring role of high reputation VCs and shows that firms backed by high quality VCs do not record positive abnormal accruals after the IPO. In his research design, Wongsunwai (2013) recognizes the importance of the lockup expiration: he studies accruals over four phases, each encompassing multiple quarters, with the second phase ending before lockup expiration. However, the second phase includes all quarters subsequent to the IPO and prior to the lockup expiration. Thus, any of the incentives to maintain earnings management discussed by Teoh et al. (1998a and 1998b) as well as the economic effects of post-IPO cash infusion can affect accruals from this period.[9] Unlike Wongsunwai (2013), we wish to examine whether earnings management in IPO firms is, at least partly, driven by original owners selling their shares after lockup expiration. Consequently, we not only identify the exact timing of earnings management but also test directly whether abnormal accruals are related to pre-IPO shareholders' selling incentives.

Pre-IPO shareholders into voluntary lockup agreements that restrict their ability to sell shares for a specific period of time after the IPO. Most lockup periods expire 180 days after the

[9] Because Wongsunwai (2013) focuses on demonstrating the monitoring role of high reputation VCs, he examines differences in accruals based on the shareholder profiles of IPO firms rather than on the selling incentives at lockup expiration. He interprets his finding that firms backed by large reputable VCs exhibit lower abnormal accruals as evidence that high quality VCs constrain earnings management. However, this finding is also consistent with the alternative explanation that abnormal accruals result from strong post-IPO growth in working capital due to cash infusion from IPO proceeds. More specifically, IPO firms not backed by high quality VCs are relatively cash constrained and therefore more likely to invest their IPO proceeds in working capital, giving the appearance of earnings management. In contrast, firms backed by high quality VCs have better access to capital pre-IPO and their working capital accruals are less sensitive to the post-IPO cash infusion (Carpenter and Petersen 2002; Bertoni, Colombo, and Croce 2010).

IPO and lockup expiration is followed by intense selling by pre-IPO shareholders.[10] These first-time sales by pre-IPO shareholders generate a large spike in trading volume, which initially increases to 185% of the previous average volume and eventually settles at a level approximately 40% higher than the lockup period volume (Field and Hanka 2001; Bradley, Jordan, Roten and Yi 2001). To the extent that pre-IPO shareholders sell significant amounts of shares after lockup expiration, they have incentives to use earnings management to favorably influence prevailing stock prices.

We posit that the incentives to manage earnings around lockup expiration arise because of large scale exit by pre-IPO shareholders once the lockup expires. These shareholders have incentives to present a positive image of the firm's financial performance in anticipation of the lockup expiration. Further, many large pre-IPO shareholders such as angel investors, private equity firms, venture capitalists, etc. can influence managers to inflate accruals before lockup expiration. These shareholders provide funding and advice starting from the early stages of the firm's development and often occupy board positions, influencing managerial compensation and career outcomes (Hellmann and Puri 2000, 2002). Consistent with pre-IPO shareholders' ability to influence management, Ertimur, Sletten and Sunder (2014) provide evidence that managers delay disclosure of bad news to enable pre-IPO shareholders to sell their shares at more favorable prices upon lockup expiration. Even in the absence of pre-IPO shareholders' direct influence, managers may choose to inflate earnings because it helps to ensure sufficient demand from new shareholders to absorb the dramatic increase in the supply of shares at lockup expiration. While the managers of the firms also have incentives to sell their stock for

[10] Lockup agreements are widespread and over time their length has been standardized to 180 days after the IPO. For example, Brav and Gompers (2003) find lockup agreements in 99% of the firms in their sample of 2,871 IPOs. Field and Hanka (2001) report that the fraction of firms with a 180-day lockup period increased from 43% in 1988 to 91% in 1996.

diversification reasons, insider trading laws likely prevent them from managing earnings for personal gain and many executives sell infrequently and only small quantities after lockup expiration (Ertimur et al. 2014).

The incentive to manage earnings around lockup expiration is likely mitigated by scrutiny from investors, regulators and financial intermediaries. Earnings management at the largest firms or firms followed by the largest number of analysts can be detected more easily and so the costs of inflating financial performance for these firms likely outweigh the benefits. Consequently, we do not expect to find evidence of earnings management at the largest firms and at firms most intensely followed by analysts.

3. Sample

To construct a sample of IPO companies we proceed as follows. We first retrieve all initial public offerings from SDC over the 1990 – 2013 period.[11] We obtain offer dates from the "Founding dates for 9,902 IPOs from 1975-2014 (updated April 14, 2014)" dataset provided by Jay Ritter and rely on these offer dates when there is a divergence between the SDC issue date and the offer date from Ritter. We retain IPOs with issue/offer dates within 30 days of the start date of price data on CRSP. As in Loughran and Ritter (2004), we focus on IPOs with an offer price of at least $5.00 and exclude ADRs, unit offers, closed-end funds, REITs, banks, S&Ls and stocks not listed on CRSP (i.e., Amex, NYSE and NASDAQ). We impose the following additional sample selection criteria: (1) lockup expiration date is available and lockup expiration is not confounded by the effect of an earnings announcement (i.e. earnings announcement does not fall within the three days starting on the lockup expiration date), and (2) the lockup period

[11] We begin our sample period in 1990 as our measures of abnormal accruals are based on the information derived from the cash flow statement to avoid the pitfalls of constructing accruals from the balance sheet (Hribar and Collins 2002; Ball and Shivakumar 2008). Cash flow statement for interim periods (i.e. quarterly) was only required by SFAS 95 for the fiscal years ending after July 15 1989.

does not exceed two years, to avoid the impact of confounding events over such a long horizon. To correctly identify the quarter that we expect to be subject to earnings management, we require the earnings announcement date for the quarter immediately preceding lockup expiration.

We use the abnormal accruals from the modified cross-sectional Jones (1991) model (Dechow, Sloan and Sweeney 1995). First, we estimate the following specification for each industry (based on two-digit SIC codes), fiscal quarter and fiscal year[12]:

$$\frac{Accruals_{i,q,t}}{Average\ TA_{i,q,t}} = \beta_0 \frac{1}{Average\ TA_{i,q,t}} + \beta_1 \frac{\Delta \mathrm{REV}_{i,q,t}}{Average\ TA_{i,q,t}} + \beta_2 \frac{PPE_{i,q,t}}{Average\ TA_{i,q,t}} + \varepsilon_{1,q,t}$$

$Accruals_{i,q,t}$ is total accruals using the cash flow method (Hribar and Collins 2002) and is defined as earnings before extraordinary items (Compustat item *IBCY*) less cash flow from operations (Compustat item *OANCFY* minus Compustat item *XIDOCY*).[13] $\Delta REV_{i,q,t}$ is the change in total revenues (Compustat item *SALEQ*) between quarter *q-1* and quarter *q*. $PPE_{i,q,t}$ is gross property, plant and equipment (Compustat item *PPEGTQ*). Ball and Shivakumar (2008) point out that pre-IPO assets do not reflect the impact of IPO proceeds on total assets and therefore scaling by the pre-IPO total assets "artificially" inflates scaled post-IPO accruals. To alleviate this problem, we use average total assets ($Average\ TA_{i,q,t}$, Compustat item *ATQ*) over quarters *q* and *q-1* instead of lagged assets to scale all variables.

Next, we calculate expected and abnormal accruals for our sample firms as follows:

$$Expected\ Accruals_{i,q,t} = \widehat{\beta_0} \frac{1}{Average\ TA_{i,q,t}} + \widehat{\beta_1} \frac{\Delta \mathrm{REV}_{i,q,t} - \Delta \mathrm{REC}_{i,q,t}}{Average\ TA_{i,q,t}} + \widehat{\beta_2} \frac{PPE_{i,q,t}}{Average\ TA_{i,q,t}}$$

$$Abnormal\ Accruals_{i,q,t} = \frac{Accruals_{i,q,t}}{Average\ TA_{i,q,t}} - Expected\ Accruals_{i,q,t}$$

$\Delta REC_{i,q,t}$ is the change in total receivables (Compustat item *RECTQ*) between quarter *q-1*

[12] We exclude firms that had an IPO in the previous five years from the estimation.
[13] Because *IBCY*, *OANCFY* and *XIDOCY* are year-to-date values, for fiscal quarters 2 – 4 we adjust the values as the reported value in quarter *q* less the reported value in quarter *q-1*.

and quarter q.

Since abnormal accruals are our primary variable of interest, we require their availability for a given firm-quarter to be included in our analyses. After imposing this restriction, there are 11, 605 firm-quarters (corresponding to 3,417 IPOs) available for our univariate examination of abnormal accruals around the IPO issue date ("IPO sample"). This sample includes quarters starting from the quarter before the quarter that includes the IPO and ending four quarters after the IPO quarter. Figure 1 depicts the timeline of event quarters relative to the IPO for this sample.

We then construct another sample – a sample of firm-quarters relative to the quarter which includes the lockup expiration ("lockup expiration sample"). This sample includes all quarters starting two quarters before and ending four quarters after the quarter of lockup expiration, as long as the quarters fall after the IPO date. For this sample, we also require the availability of all control variables necessary for our multivariate analysis and listed in Section 4.1. The final number of quarters in our lockup expiration sample is 10,778 (corresponding to 2,666 IPOs). Figure 2 depicts the timeline of event quarters relative to the lockup expiration for this sample.

We provide descriptive statistics on the lockup expiration sample characteristics in Table 1. The average quarterly abnormal accruals scaled by average total assets are positive at 0.001 but we observe significant variation from -0.028 at the first quartile to 0.034 at the third quartile. The IPO firms in our sample are small growth firms with total assets of $393 million, return on assets of -2.3%, sales growth of 33.5% and book-to-market of 0.519. The average IPO proceeds are 91% of average assets and 42% of the sample is backed by venture capitalists; both statistics are comparable to those reported in Armstrong et al. (2015). The mean institutional ownership is

28%, similar to that reported by Field and Lowry (2009). We find that our sample firms have an analyst following of about 2.7 on average. However, there is significant variation in the level of market scrutiny because the first quartile of analyst following is zero and the first quartile of institutional ownership is less than 10%.

4. Research Design and Results

4.1. Timing of Earnings Management in IPO firms

We begin by examining quarterly abnormal accruals around the first of the two key dates for IPO firms—the IPO issue date. We identify the "announcement quarter" in which the IPO falls, $Quarter_{IPO}$, and define event quarters relative to $Quarter_{IPO}$ (see Figure 1).[14] If IPO firms manage earnings to maximize the proceeds from the IPO, we will observe income-increasing accruals in $Quarter_{IPO-1}$, i.e., the latest quarter with an earnings announcement before the IPO issue date. This is because for earnings management to influence investors' assessment of the firm value at the time of the offering, earnings has to be publicly announced by the issue date. In contrast, earnings for $Quarter_{IPO}$ are announced only after the issue date, by which time it is too late to influence the IPO price.

Table 2, Panel A reports mean and median quarterly accruals from $Quarter_{IPO-1}$ to $Quarter_{IPO+4}$. We find no evidence of upward earnings management in $Quarter_{IPO-1}$—median abnormal accruals are not significantly different from zero at conventional levels and mean abnormal accruals are significantly *negative* with a p-value less than 0.05. The results are thus inconsistent with IPO firms inflating earnings to secure a higher issue price. Our conclusion from the analysis of quarterly accruals is in line with the findings in Ball and Shivakumar (2008),

[14] An announcement quarter starts on the earnings announcement date of quarter *t-1* and ends on the day before the earnings announcement date of quarter *t*.

Venkataraman et al. (2008), and Wongsuwai (2012) who compute accruals over more extended pre-IPO fiscal periods and do not find positive abnormal accruals before the IPO.

Interestingly, we observe positive and statistically significant (p-value less than 0.01) mean and median abnormal accruals in $Quarter_{IPO+1}$ and $Quarter_{IPO+2}$. Given that a typical lockup period lasts for 180 days from the issue date, most lockup periods expire in $Quarter_{IPO+2}$ or $Quarter_{IPO+3}$, making the immediately preceding quarters (i.e., $Quarter_{IPO+1}$ and $Quarter_{IPO+2}$) attractive for earnings management. In our sample, about 53% and 32% of lockup expirations occur in $Quarter_{IPO+2}$ and $Quarter_{IPO+3}$, respectively. This analysis provides preliminary evidence for our hypothesis that the timing of upward earnings management is in anticipation of lockup expiration.

Next, we turn our attention to quarterly abnormal accruals around the second of the two key dates for IPO firms and the main focus of this study—the IPO lockup expiration date. We denote the announcement quarter in which the lockup expiration falls as $Quarter_{Lockup}$ (see Figure 2). Our focus is abnormal accruals in $Quarter_{Lockup-1}$. The earnings for this quarter are the last earnings information investors observe before the expiration of the lockup period.

Table 2, Panel B reports the results. As expected, we find significant positive mean and median abnormal accruals in $Quarter_{Lockup-1}$. We also observe significant positive abnormal accruals in $Quarter_{Lockup}$. One potential explanation is that firms continue to engage in earnings management in the lockup expiration quarter to prevent $Quarter_{Lockup-1}$ accruals from unraveling too quickly and attracting scrutiny. Another possibility is that in some cases lockup expiration falls too close to the fiscal period end of $Quarter_{Lockup}$, leaving pre-IPO shareholders very little time to trade in the lockup expiration quarter, forcing these investors to shift their selling to the

next quarter. This makes earnings from $Quarter_{Lockup}$ relevant at the time of share sales by pre-IPO shareholders. We discuss and test the two explanations in Section 4.4.

We observe significant negative mean and median abnormal accruals in $Quarter_{Lockup+4}$, suggesting that accruals reverse around that time. Finally, and somewhat surprisingly, median abnormal accruals are weakly positive in $Quarter_{Lockup+3}$. This result is not reflected in the mean which is not significantly different from zero. Overall, our univariate tests indicate that there is no upward earnings management in the quarter before the IPO, but that young public firms manage earnings around lockup expiration.

We next examine abnormal accruals around the lockup expiration in a multivariate framework:

$$\begin{aligned} Abnormal\ Accruals = {} & \beta_0 + \beta_1\, Quarter_{Lockup-1} + \beta_2\, Quarter_{Lockup} + \beta_{3\text{-}12}\, Controls \\ & + Year\ Fixed\ Effects + \varepsilon \end{aligned} \tag{1}$$

Abnormal Accruals denotes quarterly abnormal accruals obtained from the cross-sectional modified Jones model and adjusted for the growth in total assets as explained in Section 3. $Quarter_{Lockup-1}$ is an indicator variable which takes the value of one for the quarter prior to lockup expiration and zero for all other quarters. $Quarter_{Lockup}$ is an indicator variable which takes the value of one for the quarter in which the lockup expiration date falls and zero for all other quarters. We single out these two quarters based on our univariate evidence that IPO firms display positive abnormal accruals both in the quarter before and the quarter of the lockup expiration. The intercept captures the other quarters ($Quarter_{Lockup-2}$, and $Quarter_{Lockup+1}$ through $Quarter_{Lockup+4}$ relative to lockup expiration). These quarters constitute our benchmark, allowing

us to evaluate whether accruals depart from normal levels in time-series, and not just vary cross-sectionally. [15]

We control for a number of variables that are likely to affect accruals: firm size, sales growth, book to market ratio, return on assets, and operating cycle (Fairfied, Whisenant, and Yohn 2003; Francis, LaFond, Olsson and Schipper 2005; Ashbaugh-Skaife, Collins, Kinney and LaFond 2008). We also control for the fourth fiscal quarter because financial reporting attracts much more attention from financial intermediaries and investors in the fourth quarter and a firm's ability to manage earnings is likely to be more limited in that quarter (Baginski and Hasell 1990; Roychowdhury and Sletten 2012). Our regressions include a number of variables that capture institutional characteristics: VC backing, percentage of institutional investors holding shares in the firm and a dual class status of the shares. Finally, we control for IPO proceeds to address the concerns put forward by Ball and Shivakumar (2008) and Armstrong et al. (2015) that high abnormal accruals post-IPO can result from the investment of IPO proceeds in the working capital. Our multivariate results can thus be interpreted as testing whether accruals are unusually high even after controlling for the effect of IPO proceeds. We include year fixed effects and cluster standard errors by fiscal year and quarter. See Appendix A for detailed descriptions of control variables.

Table 3 presents results from the estimation of equation (1). Consistent with our univariate evidence, we find that the coefficients on $Quarter_{Lockup-1}$ and on $Quarter_{Lockup}$ are positive and statistically significant at the 1% level. Abnormal accruals are thus significantly

[15] Our results are qualitatively similar when we: (1) include an indicator variable only for $Quarter_{Lockup-1}$ and let the intercept capture $Quarter_{Lockup}$, and (2) include an indicator variable for each quarter and let the intercept capture $Quarter_{Lockup+1}$. In the first specification, the coefficient on $Quarter_{Lockup-1}$ remains positive and significant with a p-value of less than 0.01. In the second specification the coefficients on $Quarter_{Lockup-1}$ and $Quarter_{Lockup}$ are positive and statistically significant while the coefficients on $Quarter_{Lockup+2}$ and $Quarter_{Lockup+4}$ are significantly negative, and the coefficients on $Quarter_{Lockup-2}$, and $Quarter_{Lockup+3}$ are insignificant.

higher in these two quarters than in other quarters, consistent with firms inflating earnings around lockup expiration. Control variables are generally significant and in the expected direction: larger firms, with shorter operating cycle and backed by VCs have lower levels of abnormal accruals. The fourth fiscal quarter is characterized by lower abnormal accruals. Finally, IPO proceeds are positively related to abnormal accruals indicating that there is a link between the investments of proceeds in the working capital and the measures of abnormal accruals. Importantly, even after controlling for that link, there is evidence of higher accruals in the quarter prior to and the quarter of lockup expiration.

4.2. The Effect of Scrutiny on Earnings Management in IPO Firms

As we discuss above, if the positive abnormal accruals in the quarter before and the quarter of the lockup expiration stem from earnings management activities, we expect the documented patterns to be less pronounced for more visible firms, which are subject to higher levels of market scrutiny. To examine this conjecture, we estimate a modified version of Equation (1) where we split $Quarter_{Lockup-1}$ and $Quarter_{Lockup}$ into two based on whether a given firm is likely to be subject to intense scrutiny from investors, regulators or financial intermediaries (*High Scrutiny*). Specifically, we classify a firm-quarter as subject to *High Scrutiny* if the firm's size or analyst following is in the top quartile of the distribution, and as *Low Scrutiny* otherwise. We then replace $Quarter_{Lockup-1}$ and $Quarter_{Lockup}$ with four terms: *High Scrutiny* x $Quarter_{Lockup-1}$, *Low Scrutiny* x $Quarter_{Lockup-1}$, *High Scrutiny* x $Quarter_{Lockup}$, and *Low Scrutiny* x $Quarter_{Lockup}$.

Table 4 reports the results. The coefficients on *Low Scrutiny* x $Quarter_{Lockup-1}$ and *Low Scrutiny* x $Quarter_{Lockup}$ are both positive and significant at the 1% level. In contrast, abnormal accruals in firms subject to high scrutiny (captured by coefficients on *High Scrutiny* x

Quarter$_{Lockup-1}$ and *High Scrutiny* x *Quarter*$_{Lockup}$) are not significantly different from zero. Moreover, the coefficients on *High Scrutiny* x *Quarter*$_{Lockup-1}$ and *Low Scrutiny* x *Quarter*$_{Lockup-1}$ are significantly different from each other as well as the coefficients on *High Scrutiny* x *Quarter*$_{Lockup}$ and *Low Scrutiny* x *Quarter*$_{Lockup}$. The economic magnitudes of the coefficients are quite different as well: firms subject to low scrutiny have positive abnormal accruals in excess of 1% of the firm's average quarterly assets, while abnormal accruals at firms classified as subject to high scrutiny represent less than 0.1% of the average assets. Overall, these results suggest that the positive abnormal accruals in the quarter prior to and the quarter of lockup expiration are evidence of earnings management in IPO firms.

4.3. The Role of Selling Incentives

We conjecture that the positive abnormal accruals in the quarter preceding lockup expiration result from earnings management to benefit pre-IPO shareholders who exit the firm upon lockup expiration. If that is indeed the case, we should observe a positive relation between accruals in the quarter preceding lockup expiration and the intensity of selling incentives of pre-IPO shareholders.

In our analyses so far we use event time indicators to proxy for the presence of selling incentives. In this section, we allow for cross-sectional variation in the intensity of selling incentives. The main empirical challenge we face is the potential endogenous relation between earnings management and post-lockup-expiration sales by pre-IPO shareholders. Managers who anticipate sales by pre-IPO shareholders may inflate earnings announced right before lockup expiration. At the same time, pre-IPO shareholders likely sell shares subsequent to lockup expiration only when the latest earnings announcement was favorable enough to secure a high price for the shares, i.e. the earnings management was successful in inflating the stock price. To

address this issue, instead of realized sales after lockup expiration, we use an ex ante measure of selling incentives: predicted abnormal trading volume upon lockup expiration.[16]

The abnormal volume prediction model we use is based on Field and Hanka (2001) and Ertimur et al. (2014) and utilizes independent variables that are known well ahead of lockup expiration: percentage of shares outstanding that are subject to lockup agreements (*% Shares_Locked*), the length of the lockup period (*Lockup Length*), share run-up (*Runup*), whether the firm is VC-backed (*VC Backed*), has a top-tier underwriter (*Top-tier Underwriter*), and is from one of the high-technology industries (*High Tech*). The dependent variable is abnormal trading volume on the lockup expiration day and the following day. All variables are defined in detail in Appendix A. We estimate this model for the sample of IPO firms for which all the above variables are available—see Appendix B for the estimation results. We then use the coefficients from this model to construct predicted abnormal trading volume for each firm in our final sample.

To examine whether positive abnormal accruals in the quarter before lockup expiration are related to selling incentives, we modify equation (1) and split $Quarter_{Lockup-1}$ into two groups: those with positive predicted abnormal trading volume (*High Selling Incentives* x $Quarter_{Lockup-1}$) and those with zero or negative predicted abnormal trading volume (*Low Selling Incentives* x $Quarter_{Lockup-1}$). If there is a link between selling incentives at lockup expiration and abnormal accruals in the quarter leading up to it, we expect to find significant positive abnormal accruals for *High Selling Incentives* x $Quarter_{Lockup-1}$ but not for *Low Selling Incentives* x $Quarter_{Lockup-1}$.

The results in Table 5 are consistent with our expectations—the coefficient on *High Selling Incentives* x $Quarter_{Lockup-1}$ is positive and significant while the coefficient on *Low*

[16] The IPO literature considers abnormal trading volume shortly after lockup expiration as arising from the sales by pre-IPO shareholders (Field and Hanka 2001; Bradley et al. 2001; Ertimur et al. 2014).

Selling Incentives x $Quarter_{Lockup-1}$ is insignificant. The two coefficients are also significantly different from each other with a p-value of 0.05. These results point to a link between positive abnormal accruals in the quarter before lockup expiration and selling incentives of pre-IPO shareholders.

As discussed before, given particularly high litigation risk associated with "pumping and dumping," we do not expect managers to benefit personally from inflating the stock price around lockup expiration (Ertimur et al. 2014). Nevertheless, for completeness, we examine the potential effect of managers' personal selling incentives in our next set of tests. We conjecture that if managers use earnings management in the current quarter to influence the price at which they trade in the subsequent quarter, earnings management in any given quarter is influenced by managers' insider trading plans for the next quarter.[17] Accordingly, we supplement equation (1) with: (1) an interaction term between an indicator variable for officer net sales during the lockup quarter and an indicator variable for the quarter before lockup expiration: $Quarter_{Lockup-1}$ *x Officer Lead Net Sales*, and (2) an interaction term between an indicator variable for officer net purchases during the lockup quarter and an indicator variable for the quarter before lockup expiration: $Quarter_{Lockup-1}$ *x Officer Lead Net Purchases.* In this specification, the indicator variable $Quarter_{Lockup-1}$ captures abnormal accruals in cases in which there was no officer trading activity in lockup quarter. The interaction terms, which are the variables of interest in this specification, capture the incremental abnormal accruals in $Quarter_{Lockup-1}$ when managers are net sellers or net buyers of stock in the lockup expiration quarter.

The results, reported in Table 6, provide evidence of significant positive abnormal accruals in the quarter before lockup expiration when there is no insider trading activity.

[17] We do not include directors in our definition of insiders because many pre-IPO shareholders have board representation. For instance, Cadman and Sunder (2014) find that VCs sit on the board in 98% of firms with VC-backing.

$Quarter_{Lockup-1}$ is positive and significant at the 5% level. However, the interaction terms *Officer Lead Net Sales x* $Quarter_{Lockup-1}$ and *Officer Lead Net Purchases x* $Quarter_{Lockup-1}$ are not statistically significant. As indicated by the Wald test reported at the bottom of the table, the sum of the coefficients on $Quarter_{Lockup-1}$ and *Officer Lead Net Sales x* $Quarter_{Lockup-1}$ is also not statistically different from zero, implying no significant abnormal accruals when managers sell shares. This is consistent with the deterring effect of litigation. Overall, we rule out managerial personal gain as an explanation for high abnormal accruals in $Quarter_{Lockup-1}$.

4.4. Earnings Management in the Quarter of Lockup Expiration

Consistent with our expectations, the analyses in Tables 2 and 3 provide evidence of positive abnormal accruals in the quarter before lockup expiration. In addition, we document positive abnormal accruals in the quarter of lockup expiration, a result that warrants further investigation. In this section, we examine two possible explanations for this finding: (1) firms continue to inflate earnings in the quarter of lockup expiration to prevent earnings management from unravelling too quickly and attracting scrutiny, and (2) firms manage earnings in the quarter of lockup expiration when pre-IPO shareholders are not able to sell shares between lockup expiration date and the next quarterly earnings announcement.

To test the first explanation above, we analyze the relation between abnormal accruals in the quarter before and the quarter of lockup expiration. If managers continue to manage earnings after the lockup expires to prevent prior earnings management from becoming apparent, we would expect to find a positive association between abnormal accruals from these two adjacent quarters. To test whether this is the case, we re-estimate equation (1) with one modification: we split the indicator variable for the lockup quarter ($Quarter_{Lockup}$) into two groups depending on whether the abnormal accruals in the quarter before lockup expiration were above or below the

median. The coefficient on *High Lag Accruals* x $Quarter_{Lockup}$ (*Low Lag Accruals* x $Quarter_{Lockup}$) captures abnormal accruals in the lockup expiration quarter for firms with above (below) median abnormal accruals in the previous quarter.

Table 7, Panel A presents the results from this estimation.[18] We find no support for the explanation that firms that engage in earnings management in the quarter before lockup expiration continue to do so in the quarter of lockup expiration. The coefficient on *High Lag Accruals* x $Quarter_{Lockup}$ is not significantly different from zero. In fact, we find evidence to the contrary: the coefficient on *Low Lag Accruals* x $Quarter_{Lockup}$ is positive and highly statistically significant, indicating that firms that did not manage earnings up in $Quarter_{Lockup-1}$ display positive abnormal accruals in $Quarter_{Lockup}$. The coefficients corresponding to the two groups of firms are significantly different from each other (see Wald test reported in Panel A). Overall, the results from this test suggest a substitution between earnings management in $Quarter_{Lockup-1}$ and $Quarter_{Lockup}$.

We try to understand this substitution further by relating the timing of abnormal accruals to selling restrictions (explanation (2) proposed at the beginning of this section). First, insider sales are subject to volume limitations of Rule 144.[19] Second, diversifying shareholders may prefer to execute a number of smaller trades, potentially spread over more than one quarter, to avoid a negative price impact from their sales. Finally, many firms have "blackout" provisions which prevent insiders from selling shares when in possession of material private information, typically between the fiscal period end and the earnings announcement (Jagolinzer, Larcker and Taylor 2011). These provisions may not apply to all pre-IPO shareholders but many influential

[18] Because we require the availability of accruals from quarter minus one in addition to our regular set of control variables, our sample declines to 8,594 observations.

[19] Under Rule 144, in any quarter an insider is prohibited from selling shares that exceed the greater of one percent of the total shares outstanding or the average weekly trading volume.

shareholders such as VCs, angel, private equity and institutional investors are represented on boards, making their status ambiguous and potentially preventing them from selling during blackouts. We thus take into consideration the duration of the period during which pre-IPO shareholders are typically able to sell shares—from the lockup expiration date to the fiscal period end date (when blackout restrictions usually start) for the same quarter. When this period is short, pre-IPO shareholders may have to shift (some of) their trades to the subsequent quarter ($Quarter_{Lockup+1}$). This would make the lockup quarter earnings relevant for influencing the stock price at which pre-IPO shareholders exit.

To examine this explanation empirically, we partition firm-lockup quarter observations into two based on pre-IPO shareholders' ability to sell shares in the lockup expiration quarter (i.e. based on the share price that reflects earnings news from the quarter before lockup expiration). Specifically, we create two indicator variables, *Trading Restricted* and *Trading Not Restricted*. *Trading Restricted* (*Trading Not Restricted*) takes the value of one if there are seven or fewer (more than seven) days between the lockup expiration date and the fiscal period end date of the lockup quarter.[20, 21] We then modify equation (1) by replacing $Quarter_{Lockup-1}$ and $Quarter_{Lockup}$ with the following interaction terms: *Trading Not Restricted* x $Quarter_{Lockup-1}$ and *Trading Restricted* x $Quarter_{Lockup-1}$, *Trading Not Restricted* x $Quarter_{Lockup}$ and *Trading Restricted* x $Quarter_{Lockup}$.

The results of this estimation, reported in Table 7, Panel B, show that abnormal accruals are positive and significant in $Quarter_{Lockup-1}$ only when trading is not restricted in the period immediately following lockup expiration (*Trading Not Restricted* x $Quarter_{Lockup-1}$). Further,

[20] In addition, earnings from $Quarter_{Lockup-1}$ are less salient as the earnings announcement of $Quarter_{Lockup}$ approaches.

[21] Our results are robust to using 1, 3, and 5 days as alternative thresholds for *Trading Restricted* and *Trading Not Restricted* variables.

abnormal accruals are positive and significant in the lockup expiration quarter only when trading is restricted shortly after lockup expiration (*Trading Restricted* x $Quarter_{Lockup}$), consistent with some pre-IPO shareholders delaying sales until after the lockup quarter earnings announcement. The coefficients on *Trading Restricted* x $Quarter_{Lockup}$ and *Trading Not Restricted* x $Quarter_{Lockup}$ are significantly different from each other at the 5% level. However, the difference between the coefficient on *Trading Not Restricted* x $Quarter_{Lockup-1}$ and *Trading Restricted* x $Quarter_{Lockup-1}$ is not statistically significant. Because data on the specific blackout periods for each company is not available, our proxy captures trading restrictions with some measurement error. Overall, our findings indicate that IPO firms inflate earnings ahead of the quarter when pre-IPO shareholder sales are likely.

4.5. Earnings Management and Long-Run Stock Performance

The incentive to manage earnings in anticipation of sales by pre-IPO shareholders implies that positive abnormal accruals result in inflated stock prices. If high abnormal accruals cause the stock price at the time of lockup expiration to be overstated relative to its fundamental value, then over time, as information about the firm's true earnings arrives, the stock price will decline, resulting in negative returns. Consequently, firms with high abnormal accruals in $Quarter_{Lockup-1}$ will have lower long-run returns compared to firms with low abnormal accruals. We form two sub-samples based on whether the abnormal accruals in $Quarter_{Lockup-1}$ are above or below the median. For each sub-sample, we compute the long-run abnormal buy-and-hold returns over 12, 24 and 36 months starting in the month following the lockup expiration. We compute the abnormal returns as the value-weighted average monthly size- and book-to-market-adjusted buy-and-hold returns.[22]

[22] In untabulated tests, we also compute equal-weighted average abnormal buy-and-hold returns and the inferences are unchanged.

Table 8, Panel A reports these returns. We find significant negative abnormal buy-and-hold returns over the one-year period after lockup expiration for firms with high abnormal accruals in $Quarter_{Lockup-1}$. Moreover, negative and significant returns persist for these firms over longer windows (24 and 36 months). In contrast, abnormal returns over the 24- and 36-month periods are not significantly different from zero for the sub-sample of firms with low abnormal accruals and significantly positive over the 12-month period. Finally, long-run returns for firms with high and low abnormal accruals are significantly different from each other.

We address the potential misspecification of tests for long-run returns (Kothari and Warner 1997; Barber and Lyon 1997) in two ways. First, following Mitchell and Stafford (2000) and Bhojraj, Hribar, Picconi and McInnis (2009), we calculate bootstrapped p-values. Specifically, we match each observation in the sample to another firm in the CRSP/Compustat universe (with replacement) in the same year and size-, book-to-market category from the Compustat/CRSP. This results in a control sample with similar size and book-to-market characteristics and dispersion in calendar time. We repeat this process 1,000 times, resulting in 1,000 control samples. We then calculate buy-and-hold-return for each one of the 1,000 control samples, yielding an empirical distribution for the buy-and-hold-returns. The bootstrapped p-value represents the proportion of buy-and-hold returns from the control samples that are larger in magnitude, but of the same sign, as the buy-and-hold returns of the event sample. We bootstrap standard errors and continue to find significantly negative abnormal buy-and-hold returns for firms with above-median abnormal accruals across all three return windows. In contrast, the buy-and-hold returns for firms with below-median abnormal accruals are not statistically different from zero for any of the time horizons. The difference in long run abnormal returns between the two groups is statistically significant in all cases.

Second, we use the calendar time portfolio approach to calculate returns. We group firms into portfolios (separately for those with above and below median abnormal accruals in $Quarter_{Lockup-1}$) by event month. A given firm enters the portfolio for all months that fall in the window for long-run returns computation. For example, when we calculate calendar-time abnormal returns for one year after the lockup, a given firm is included in the portfolio in each of the 12 months that follows its lockup expiration. Following the practice in prior literature, we require at least five firms in each monthly portfolio and, as a result, lose a significant fraction of observations. Further, because IPOs are not evenly distributed in time, we disproportionately drop IPOs from certain cold IPO markets. Given the limited sample, we treat this approach only as a robustness test. We regress the calendar portfolio excess returns (value-weighted monthly returns) on the momentum and three Fama-French factors. The intercept or alpha is the measure of average abnormal monthly returns in the first year following lockup expiration. We find that the portfolio alpha is negative and significant for the first 12 months following the lockup expiration. The negative returns in the 12 months following lockup taken together with the abnormal accruals reversal documented in $Quarter_{Lockup+4}$ in Table 2 suggest that the negative returns are driven by the reversal of the earnings management from before lockup expiration. However, we no longer observe significant abnormal returns over the 24- and 36-month horizon.

Finally, we address the concern that the relation between high accruals and negative long-run returns is driven by low cash flows generated by firms with high accruals (Armstrong et al. 2015). We split the subsample of firms with high accruals into two groups based on the median cash flow from operations. If the documented negative long-run returns are driven by cash flows alone, we would find significant negative returns for firms with high accruals only in the sub-sample with below median cash flows. Instead, as reported in Table 8, Panel B, we find

significant negative long-run returns both in the high cash flow and in the low cash flow group providing reassurance that high accruals in $Quarter_{Lockup-1}$ indeed affect the long run returns after lockup expiration. For completeness, we also report the results for the subsample of firms with below median accruals. We do not observe any significant abnormal returns in that subsample.

5. Conclusion

In this study we examine quarterly abnormal accruals of newly public firms around the IPO and the lockup expiration dates. Our findings show that while firms do not display positive abnormal accruals in anticipation of the IPO issue date, they engage in earnings management in the quarter before and the quarter of the lockup expiration. Our analyses establish a link between earnings management by IPO firms and the selling incentives of pre-IPO shareholders. Using the lockup expiration event to capture the incidence of selling incentives and predicted volume of share sales by pre-IPO shareholders to proxy for the intensity of selling incentives, we find evidence consistent with firms managing earnings ahead of anticipated selling. We find positive abnormal accruals around the lockup expiration only at less scrutinized firms, consistent with attention from investors, intermediaries and regulators mitigating firms' incentives to manage earnings. Finally, we document that long-run IPO underperformance is indeed related to abnormal accruals (Teoh et al. 1998a). Firms with high accruals in the quarter before lockup expiration subsequently experience significant negative abnormal returns over 12-, 24-, and 36-month windows following the lockup expiration. In contrast, long-run returns in firms with low abnormal accruals are not significantly different from zero.

Overall, our evidence speaks to the exact timing and motivation behind earnings management at IPO firms: firms attempt to inflate the stock price in anticipation of selling by pre-IPO shareholders. Our research addresses seemingly contradicting conclusions from prior

literature. While Teoh et al. (1998a) find positive abnormal accruals in the IPO year and link these accruals to long-run IPO underperformance, Ball and Shivakumar (2008) argue that IPO year accruals affect earnings that are announced after the IPO—too late to influence the issue price. Instead of managerial discretion, they attribute abnormal accruals in the year of the IPO to economic growth and investment of IPO proceeds in working capital. In addition, Ball and Shivakumar (2008) and Venkataraman et al. (2008) find that firms report *conservatively* in the year before the IPO. Consistent with these studies we find no positive abnormal accruals in the quarter preceding the IPO. However, even after controlling for the investment of IPO proceeds, we find evidence of positive abnormal accruals in the year of the IPO—in the quarter before and the quarter of lockup expiration. Linking these accruals to selling incentives of pre-IPO shareholders and showing that they are mitigated by market scrutiny allows us to conclude that at least some of these accruals reflect managerial discretion. Thus, we unify the seemingly contradictory findings in the prior literature and contribute to the debate on whether firms engage in earnings management around the IPO.

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Appendix A – Variable Definitions

Variable Name	Variable Definition
Abnormal Accruals	Quarterly abnormal accruals from the modified cross-sectional Jones model. Accruals are obtained from the statement of cash flows and the model is further modified to deflate by average total assets in quarter t, rather than total assets at the end of quarter t-1. Source: COMPUSTAT.
Abnormal Volume	The average daily abnormal trading volume multiplied by the number of days in the trading window (lockup expiration day and the following day). The average daily abnormal trading volume is the difference between the average volumes over the trading window and days -50 to -6 relative to the lockup expiration, scaled by shares outstanding. Source: CRSP.
Analyst Following	Number of analysts that issue at least one one-quarter-ahead earnings forecast for the firm during the announcement quarter. Source: IBES.
Buy -Hold Abnormal Returns	Buy and hold abnormal returns over 12, 24 and 36 months starting in the month following the lockup expiration. The abnormal returns are computed as the value-weighted average monthly size- and book-to-market-adjusted buy-and-hold returns. Source: CRSP.
Dual Class	An indicator variable which takes the value of one for IPO firms with dual class shares. Source: Jay Ritter's website.
High Lag Accruals	An indicator variable which takes the value of one if abnormal accruals in *Quarter* $_{Lockup-1}$ are above the median.
High Scrutiny	An indicator variable which takes the value of one if *Size* or *Analyst Following* are in the top quartile, and zero otherwise. Source: COMPUSTAT, IBES.
High Selling Incentives	An indicator variable which takes the value of one if predicted abnormal volume is greater than zero.
High Tech	An indicator variable that is equal to one for firms in the following SIC industries: 2833, 2834, 2835, 2836, 3570, 3571, 3572, 3576, 3577, 3661, 3674, 4812, 4813, 5045, 5961, 7370, 7371, 7372, 7373. Source: COMPUSTAT.
Lockup Length	Number of days between the issue date and the lockup expiration date. Source: SDC.
Low Lag Accruals	An indicator variable which takes the value of one if abnormal accruals in *Quarter* $_{Lockup-1}$ are at or below the median.
Low Scrutiny	An indicator variable which takes the value of one if neither *Size* nor *Analyst Following* are in the top quartile, and zero otherwise. Source: COMPUSTAT, IBES.
Low Selling Incentives	An indicator variable which takes the value of one if predicted abnormal volume is equal to or less than zero.

Market-to-Book Ratio	Market capitalization scaled by the book value of equity for a given quarter. Source: COMPUSTAT.
% of Institutional Ownership	Percentage of shares outstanding held by institutional shareholders measured at the latest TFN report date that falls in a given quarter. Source: Thomson Financial.
% of Shares Locked	One minus the percentage of shares outstanding sold in the IPO, following Field and Hanka (2001). Source: SDC.
Predicted Abnormal Volume	Predicted value from the Abnormal Volume Model in Appendix B.
Proceeds	IPO proceeds divided by average total assets for the fiscal year encompassing the IPO. Source: SDC, COMPUSTAT.
Officer Lead Net Purchases	An indicator variable that is equal to one if the number of shares purchased by company officers in the following quarter (*Quarter* $_{Lockup}$) exceeds the number of shares sold by the officers. Source: Thomson Financial.
Officer Lead Net Sales	An indicator variable that is equal to one if the number of shares sold by company officers in the following quarter (*Quarter* $_{Lockup}$) exceeds the number of shares purchased by the officers. Source: Thomson Financial.
Operating Cycle	Logarithm of the sum of days sales of inventory and days sales outstanding for quarter t, where days sales of inventory are computed as 365/(COGS/average inventory) and days sale outstanding are computed as 365/(Sales/average account receivables). Source: COMPUSTAT.
Quarter 4	An indicator variable equal to one for the fourth fiscal quarter, and zero for the remaining fiscal quarters. Source: COMPUSTAT.
Quarter $_{Lockup-1}$	An indicator variable equal to one for the last announcement quarter for which earnings announcement precedes lockup expiration. SOURCE: SDC, COMPUSTAT.
Quarter $_{Lockup}$	An indicator variable equal to one for the announcement quarter that encompassed lockup expiration date. SOURCE: SDC, COMPUSTAT.
Return on Assets	Income before extraordinary items for a given year scaled by the average total assets for the year. Source: COMPUSTAT.
Run-up	Natural logarithm of one plus market adjusted buy and hold returns over the window starting five days after the issue date of the IPO and ending on the fiscal quarter end date of the quarter before lockup expiration. Source: CRSP.
Sales Growth	Change in quarterly sales deflated by sales from quarter t-1. Source: COMPUSTAT.
Size	Log of total assets in quarter t. Source: COMPUSTAT.
Top-tier Underwriter	An indicator variable that is equal to one if the underwriter for the IPO has a modified Carter Manaster Rank of 9.1 (Carter and Manaster 1990, Loughran and Ritter 2004). We thank Jay Ritter for making the data available at http://bear.cba.ufl.edu/ritter/ipolink.htm.

Trading Restricted	An indicator variable which takes the value of one if there are seven or fewer days between the lockup expiration date and the fiscal period end date of the lockup quarter. Source: SDC, COMPUSTAT.
Trading Not Restricted	An indicator variable which takes the value of one if there more than seven days between the lockup expiration date and the fiscal period end date of the lockup quarter. Source: SDC, COMPUSTAT.
Venture Capital Backed	An indicator variable that is equal to one if the firm is venture capital backed and zero otherwise. Source: SDC.

Appendix B – Abnormal Trading Volume Prediction Model

The following table presents the results from an OLS regression in which *Abnormal Volume* is the dependent variable. The sample consists of 3,011 IPO-firm-lockup expiration quarters over the 1990-2013 period. ***, **, and * denote p-values less than 0.01, 0.05 and 0.1, respectively. All variables are defined in Appendix A.

	Dependent Variable = Abnormal Volume		
Variable	**Coefficient**		**t-statistic**
Intercept	-0.0779	***	-2.37
Run-up	0.0242	***	3.39
Venture Capital Backed	0.0464	***	6.21
% of Shares Locked	0.0007	***	3.26
Top-tier Underwriter	0.0097		1.32
High Tech Firm	0.0395	***	5.09
Lockup Length	-0.0001	*	-1.69
Observations	3,011		
Adjusted R^2	6.41%		

Table 1 Descriptive Statistics

Table 1 reports descriptive statistics for our final sample of 10,788 firm-quarter observations. Q1 and Q3 denote the first and the third quartile, respectively. All variables are defined in Appendix A.

	N	Mean	Q1	Median	Q3	Std. Dev.
Abnormal Accruals	10,778	0.001	-0.028	0.001	0.034	0.084
Assets (in millions)	10,778	393.5	35.3	77.1	196.7	3219.3
Size	10,778	4.462	3.565	4.345	5.282	1.433
Sales Growth	10,778	0.335	-0.022	0.078	0.215	5.605
Book-to-Market	10,778	0.519	0.279	0.461	0.694	0.327
ROA	10,778	-0.023	-0.038	0.008	0.025	0.107
Operating Cycle	10,778	5.816	5.391	5.922	6.454	1.232
Proceeds	10,778	0.905	0.435	0.757	1.234	0.660
VC-Backed	10,778	0.423	0.000	0.000	1.000	0.494
% Institutional Ownership	10,778	0.282	0.098	0.233	0.405	0.238
Analyst Following	10,778	2.672	0.000	2.000	4.000	2.921
Dual Class	10,778	0.065	0.000	0.000	0.000	0.246
Quarter 4	10,778	0.381	0.000	0.000	1.000	0.486

Table 2 Univariate Analyses of Abnormal Accruals

Table 2 reports descriptive statistics on abnormal accruals. Panel A provides these statistics by quarter relative to the IPO, and Panel B by quarter relative to the lockup expiration. ***, **, and * denote p-values less than 0.01, 0.05 and 0.1, respectively. Quarters relative to the IPO and to the lockup expiration are outlined in Figures 1 and 2, respectively. Abnormal accruals are defined in Appendix A.

Panel A Abnormal Accruals around the IPO Date

	N	Mean *Abnormal Accruals*	t-statistic	Median *Abnormal Accruals*	z-statistic
$Quarter_{IPO-1}$	623	-0.007 **	-2.01	-0.004	-1.56
$Quarter_{IPO}$	1,632	0.001	0.26	-0.001	-0.89
$Quarter_{IPO+1}$	2,159	0.010 ***	4.97	0.005 ***	3.42
$Quarter_{IPO+2}$	2,237	0.010 ***	5.33	0.006 ***	5.44
$Quarter_{IPO+3}$	2,141	0.003	1.47	0.002	1.49
$Quarter_{IPO+4}$	2,273	-0.002	-1.16	-0.001	-0.58

Panel B Abnormal Accruals around the Lockup Expiration Date

	N	Mean *Abnormal Accruals*		t-statistic	Median *Abnormal Accruals*		z-statistic
$Quarter_{Lockup-2}$	1,080	0.002		0.72	-0.001		-0.50
$Quarter_{Lockup-1}$	1,571	0.008	***	3.70	0.002	*	1.73
$Quarter_{Lockup}$	1,791	0.005	**	2.35	0.004	***	3.44
$Quarter_{Lockup+1}$	1,672	0.001		0.51	0.001		0.59
$Quarter_{Lockup+2}$	1,591	-0.003		-1.55	0.000		-0.28
$Quarter_{Lockup+3}$	1,512	0.001		0.54	0.002	*	1.76
$Quarter_{Lockup+4}$	1,561	-0.008	***	-3.91	-0.003	**	-2.21

Table 3 Abnormal Accruals around Lockup Expiration – Multivariate Evidence

Table 3 reports results from an OLS estimation of equation (1). The dependent variable is *Abnormal Accruals*, quarterly abnormal accruals from the modified cross-sectional Jones model. Accruals are obtained from the statement of cash flows and the model is further modified to deflate by average total assets in quarter *t*, rather than total assets at the end of quarter *t-1*. ***, **, and * denote p-values less than 0.01, 0.05 and 0.1, respectively. Year fixed effects are not reported. Standard errors are clustered by fiscal quarter. All explanatory variables are defined in Appendix A.

	Dependent Variable = *Abnormal Accruals*		
	Coefficient		**t-statistic**
$Quarter_{Lockup-1}$	0.0088	***	3.96
$Quarter_{Lockup}$	0.0072	***	3.33
Size	-0.0021	*	-1.71
Sales Growth	-0.0002		-0.77
Book-to-Market	-0.0084	***	-2.65
ROA	0.0306	***	7.79
Operating Cycle	0.0047	***	4.79
Proceeds	0.0045	*	1.98
VC-Backed	-0.0106	***	-6.07
% Institutional Ownership	0.0058		1.65
Dual Class	-0.0032		-0.94
Quarter 4	-0.0058	***	-5.21
Intercept	-0.0095		-0.53
Year Fixed Effects	Included		
N	10,778		
Adjusted R^2	4.39%		

Table 4 Abnormal Accruals around Lockup Expiration – Role of Scrutiny

Table 4 reports results from an OLS estimation of equation (1), interacting $Quarter_{Lockup-1}$ and $Quarter_{Lockup}$ with two mutually exclusive indicators: *High Scrutiny* and *Low Scrutiny*. The dependent variable is *Abnormal Accruals*, quarterly abnormal accruals from the modified cross-sectional Jones model. Accruals are obtained from the statement of cash flows and the model is further modified to deflate by average total assets in quarter *t*, rather than total assets at the end of quarter *t-1*. ***, **, and * denote p-values less than 0.01, 0.05 and 0.1, respectively. Year fixed effects are not reported. Standard errors are clustered by fiscal quarter. All explanatory variables are defined in Appendix A.

	Dependent Variable = *Abnormal Accruals*		
	Coefficient		**t-statistic**
$Quarter_{Lockup-1}$ x *High Scrutiny*	0.0007		0.21
$Quarter_{Lockup-1}$ x *Low Scrutiny*	0.0124	***	4.28
$Quarter_{Lockup}$ x *High Scrutiny*	0.0004		0.13
$Quarter_{Lockup}$ x *Low Scrutiny*	0.0112	***	4.04
High Scrutiny	0.0019		0.77
Size	-0.0018		-1.44
Sales Growth	-0.0002		-0.77
Book-to-Market	-0.0083	**	-2.57
ROA	0.0306	***	7.78
Operating Cycle	0.0047	***	4.83
Proceeds	0.0046	**	2.00
VC-Backed	-0.0107	***	-6.09
% Institutional Ownership	0.0052		1.51
Dual Class	-0.0032		-0.93
Quarter 4	-0.0059	***	-5.34
Intercept	-0.0132		-0.73
Year Fixed Effects	Included		
N	10,778		
Adjusted R^2	4.45%		

Wald Tests	**Coefficient**		χ^2
$Quarter_{Lockup-1}$ x *Low Scrutiny* vs. $Quarter_{Lockup-1}$ x *High Scrutiny*	0.0117	**	6.02
$Quarter_{Lockup}$ x *Low Scrutiny* vs. $Quarter_{Lockup}$ x *High Scrutiny*	0.0108	**	6.17

Table 5 Abnormal Accruals around Lockup Expiration – Role of Selling Incentives

Table 5 reports results from an OLS estimation of equation (1), interacting $Quarter_{Lockup-1}$ with two mutually exclusive indicators *High Selling Incentives* and *Low Selling Incentives*. The dependent variable is *Abnormal Accruals*, quarterly abnormal accruals from the modified cross-sectional Jones model. Accruals are obtained from the statement of cash flows and the model is further modified to deflate by average total assets in quarter t, rather than total assets at the end of quarter t-1. ***, **, and * denote p-values less than 0.01, 0.05 and 0.1, respectively. Year fixed effects are not reported. Standard errors are clustered by fiscal quarter. All explanatory variables are defined in Appendix A.

	Dependent Variable = *Abnormal Accruals*		
	Coefficient		**t-statistic**
$Quarter_{Lockup-1}$ x *High Selling Incentives*	0.0114	***	4.96
$Quarter_{Lockup-1}$ x *Low Selling Incentives*	-0.0019		-0.29
$Quarter_{Lockup}$	0.0072	***	3.27
High Selling Incentives	-0.0045		-1.60
Size	-0.0013		-1.08
Sales Growth	-0.0002		-0.76
Book-to-Market	-0.0072	*	-1.95
ROA	0.0315	***	7.82
Operating Cycle	0.0048	***	4.91
Proceeds	0.0045	*	1.97
% Institutional Ownership	0.0018		0.52
Dual Class	-0.0015		-0.43
Quarter 4	-0.0061	***	-5.33
Intercept	-0.0145		-0.84
Year Fixed Effects	Included		
N	10,778		
Adjusted R^2	4.09%		

Wald Tests	**Coefficient**		χ^2
$Quarter_{Lockup-1}$ x *High Selling Incentives* vs. $Quarter_{Lockup-1}$ x *Low Selling Incentives*	0.0133	**	3.80

Table 6 Abnormal Accruals around Lockup Expiration – Role of Insider Trades

Table 6 reports results from an OLS estimation of equation (1) modified to include additional variables that capture insider trading activity: *Quarter*$_{Lockup-1}$ x *Officer Lead Net Purchases, Quarter*$_{Lockup-1}$ x *Officer Lead Net Sales*. The dependent variable is *Abnormal Accruals*, quarterly abnormal accruals from the modified cross-sectional Jones model. Accruals are obtained from the statement of cash flows and the model is further modified to deflate by average total assets in quarter *t*, rather than total assets at the end of quarter *t-1*. ***, **, and * denote p-values less than 0.01, 0.05 and 0.1, respectively. Year fixed effects are not reported. Standard errors are clustered by fiscal quarter. All explanatory variables are defined in Appendix A.

	Dependent Variable = *Abnormal Accruals*	
	Coefficient	**t-statistic**
Quarter$_{Lockup-1}$ x *Officer Lead Net Purchases*	0.0034	0.24
Quarter$_{Lockup-1}$ x *Officer Lead Net Sales*	-0.0014	-0.23
Quarter$_{Lockup-1}$	0.0056 **	2.50
Quarter$_{Lockup}$	0.0040 *	1.72
Size	-0.0069 ***	-6.52
Sales Growth	-0.0001	-0.62
Book-to-Market	0.0010	0.35
ROA	0.3561 ***	19.60
Operating Cycle	0.0060 ***	6.39
Proceeds	0.0114 ***	5.21
VC-Backed	-0.0061 ***	-3.53
% Institutional Ownership	-0.0068 *	-1.67
Dual Class	0.0000	0.01
Quarter 4	-0.0013	-1.15
Intercept	-0.0135	-0.77
Year Fixed Effects	Included	
N	8,866	
Adjusted R^2	18.30%	
Wald Tests	**Coefficient**	**χ^2**
Quarter$_{Lockup-1}$ + *Quarter*$_{Lockup-1}$ x *Officer Lead Net Sales*	0.0042	0.46

Table 7 Abnormal Accruals in the Quarter of Lockup Expiration

Table 7 reports results from an OLS estimation of equation (1) modified to examine abnormal accruals in $Quarter_{Lockup}$. In Panel A we interact $Quarter_{Lockup}$ with two mutually exclusive indicators *High Lag Accruals* and *Low Lag Accruals*. In Panel B, we interact both $Quarter_{Lockup-1}$ and $Quarter_{Lockup}$ with mutually exclusive indicators *Trading Not Restricted/ Trading Restricted*. The dependent variable is *Abnormal Accruals,* quarterly abnormal accruals from the modified cross-sectional Jones model. Accruals are obtained from the statement of cash flows and the model is further modified to deflate by average total assets in quarter *t*, rather than total assets at the end of quarter *t-1*. ***, **, and * denote p-values less than 0.01, 0.05 and 0.1, respectively. Year fixed effects are not reported. Standard errors are clustered by fiscal quarter. All explanatory variables are defined in Appendix A.

Panel A Role of Abnormal Accruals in in the Quarter before Lockup Expiration

	Dependent Variable = *Abnormal Accruals*		
	Coefficient		**t-statistic**
$Quarter_{Lockup-1}$	0.0089	***	4.09
$Quarter_{Lockup}$ x *High Lag Accruals*	-0.0039		-1.12
$Quarter_{Lockup}$ x *Low Lag Accruals*	0.0161	***	5.75
High Lag Accruals	0.0259	***	11.58
Size	-0.0019		-1.55
Sales Growth	-0.0002		-0.95
Book-to-Market	-0.0095	**	-2.35
ROA	0.0282	***	5.87
Operating Cycle	0.0045	***	4.19
Proceeds	0.0045	*	1.92
VC-Backed	-0.0105	***	-4.75
% Institutional Ownership	0.0068		1.50
Dual Class	-0.0013		-0.34
Quarter 4	-0.0051	***	-3.65
Intercept	-0.0147		-0.57
Year fixed effects	Included		
N	8,594		
Adjusted R^2	7.23%		

Wald Tests	**Coefficient**		χ^2
$Quarter_{Lockup}$ x *High Lag Accruals* vs. $Quarter_{Lockup}$ x *Low Lag Accruals*	-0.0200	***	22.29

Panel B Role of Trading Restrictions in the Lockup Expiration Quarter

	Dependent Variable = *Abnormal Accruals*		
	Coefficient		**t-statistic**
$Quarter_{Lockup-1}$ x *Trading Not Restricted*	0.0065	**	2.36
$Quarter_{Lockup-1}$ x *Trading Restricted*	0.0041		1.13
$Quarter_{Lockup}$ x *Trading Not Restricted*	0.0015		0.54
$Quarter_{Lockup}$ x *Trading Restricted*	0.0080	***	2.86
Trading Not Restricted	-0.0011		-0.64
Size	-0.0066	***	-6.48
Sales Growth	-0.0001		-0.47
Book-to-Market	-0.0023		-0.85
ROA	0.3737	***	25.27
Operating Cycle	0.0046	***	5.18
Proceeds	0.0111	***	5.52
VC-Backed	-0.0055	***	-3.44
% Institutional Ownership	-0.0070	**	-2.22
Dual Class	0.0018		0.53
Quarter 4	-0.0017	*	-1.79
Intercept	-0.0031		-0.18
Year fixed effects	Included		
N	10,778		
Adjusted R^2	20.70%		

Wald Tests	**Coefficient**		χ^2
$Quarter_{Lockup-1}$ x *Trading Not Restricted* vs. $Quarter_{Lockup-1}$ x *Trading Restricted*	0.0024		0.26
$Quarter_{Lockup}$ x *Trading Not Restricted* vs. $Quarter_{Lockup}$ x *Trading Restricted*	-0.0065	**	4.28

Table 8 Long-Run Underperformance

Table 8 reports buy and hold abnormal returns over 12, 24 and 36 months starting in the month following the lockup expiration. The abnormal returns are computed as the value-weighted average monthly size- and B/M-adjusted buy-and-hold returns. In Panel A, we compute and report buy and hold abnormal returns for two sub-samples based on whether the abnormal accruals in $Quarter_{Lockup-1}$ are above or below the median. In Panel B, we compute and report buy and hold abnormal returns for the two sub-samples of firms based on median *Abnormal Accruals* in $Quarter_{Lockup-1}$, further splitting it into sub-samples with cash flow from operations (CFO) above and below the median in $Quarter_{Lockup-1}$.

Panel A Abnormal Accruals and Long-Run Underperformance

Window		Buy-and-Hold Abnormal Returns	Standard p-value	Bootstrap p-value
12 Months	Above Median *Abnormal Accruals*	-12.34	0.0000	0.0580
	Below Median *Abnormal Accruals*	5.88	0.0195	0.6900
	Difference	-18.23	<.0001	0.1000
24 Months	Above Median *Abnormal Accruals*	-17.54	0.0000	0.0260
	Below Median *Abnormal Accruals*	3.44	0.3304	0.5920
	Difference	-20.98	<.0001	0.0060
36 Months	Above Median *Abnormal Accruals*	-19.24	0.0000	0.0300
	Below Median *Abnormal Accruals*	8.01	0.3165	0.8960
	Difference	-27.25	0.0044	0.0660

Panel B Abnormal Accruals, CFO and Long-Run Underperformance

Window		Buy-and-Hold Abnormal Returns	Standard p-value	Bootstrap p-value
Above Median *Abnormal Accruals*				
12 Months	Above Median *CFO*	-8.72	0.0016	0.1580
	Below Median *CFO*	-18.52	0.0000	0.0000
	Difference	9.80	0.0297	0.3980
24 Months	Above Median *CFO*	-14.54	0.0006	0.0600
	Below Median *CFO*	-22.63	0.0001	0.0000
	Difference	8.09	0.2514	0.2080
36 Months	Above Median *CFO*	-16.13	0.0026	0.0600
	Below Median *CFO*	-24.54	0.0001	0.0000
	Difference	8.41	0.3068	0.5880
Below Median *Abnormal Accruals*				
12 Months	Above Median *CFO*	7.34	0.0350	0.9660
	Below Median *CFO*	4.45	0.2226	0.6160
	Difference	2.89	0.5656	0.9760
24 Months	Above Median *CFO*	2.47	0.6120	0.4820
	Below Median *CFO*	4.40	0.3913	0.7740
	Difference	-1.93	0.7855	0.7920
36 Months	Above Median *CFO*	6.91	0.3155	0.9240
	Below Median *CFO*	9.10	0.5284	0.9440
	Difference	-2.18	0.8914	0.7920

Figure 1 – Timeline of Announcement Quarters Relative to IPO

Figure 1 depicts how announcement quarters relate to the Initial Public Offering (IPO). QEA stands for quarterly earnings announcement.

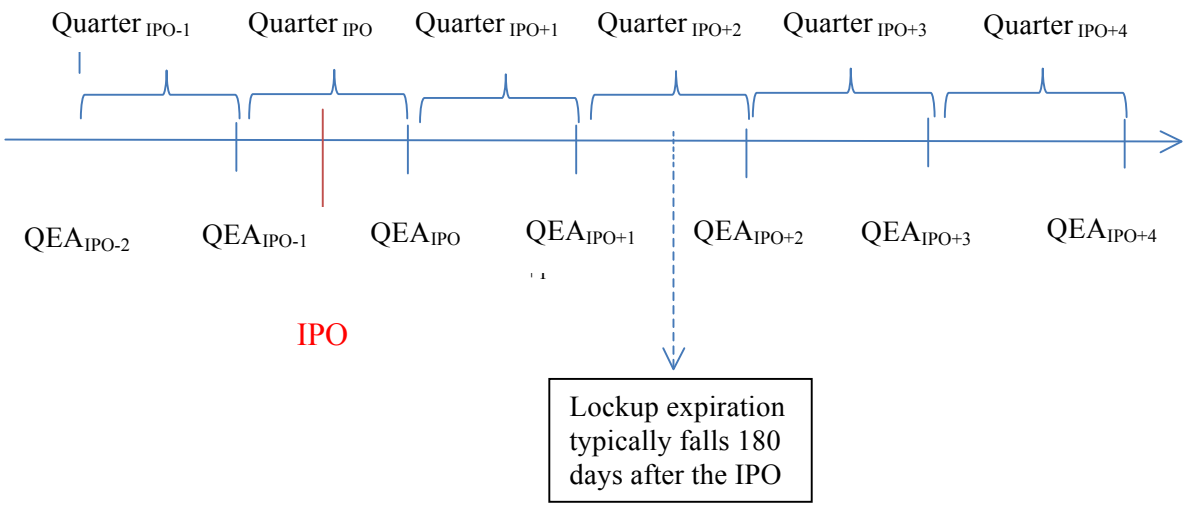

Figure 2 – Timeline of Announcement Quarters Relative to Lockup Expiration

Figure 2 depicts how announcement quarters relate to lockup expiration. QEA stands for quarterly earnings announcement.