CANADIAN IPO SHARE RELEASES: LOCKUP DESIGNS, TRANSPARENCY AND MARKET BEHAVIOR

Siyi Liang

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ABSTRACT

CANADIAN IPO SHARE RELEASES: LOCKUP DESIGNS, TRANSPARENCY AND MARKET BEHAVIOR

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Since no Canadian evidence exists on Canadian IPO lockups, this thesis examines the design, impact and market behavior of two types of lockups for Canadian IPOs listed on the TSX during the 1997-2005 period. We find that the existence of lockup information in an issuer's prospectus does not significantly reduce IPO underpricing by underwriters. We also find that IPO firms with dual-class share structures tend to have higher proportions of shares locked up and longer escrow lockup periods, and that larger firms have higher proportions of shares locked up as "escrow shares". These findings partially support the evidence reported by Brau et al. (2005) that firms with less transparency will provide a signal that the interests of their insiders are better aligned with outside investors by including lockups in their prospectuses. Significant negative (cumulative) abnormal returns are found only for high-tech firms immediately around unlock days. Lower abnormal trading volumes and relative spreads are found after unlock days for only the sample of IPOs with escrow lockups with stipulated non-zero lockup length.

Keywords: IPO, lockup, escrow, abnormal market behavior.

JEL Classification: G10, G15.

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1. INTRODUCTION

Many firms undertake IPOs to obtain financial support from the outside market when expanding their businesses. Consequently, protection of outside shareholders from appropriation from insiders is a hotly debated issue given the information asymmetries between insiders and outsiders that favor the former. Most of the previous research has examined the efficiency of various corporate governance tools for firms whose stocks already trade publicly.

The literature on the tools used to restrict insiders from exploiting outside investors after firms go public is not extensive. Ofek and Richardson (2000) find that existing shareholders, or insiders, usually issue about 15-20% of the total shares outstanding during their IPOs. As a result, insiders who maintain significant holdings of shares post-IPO need to signal to the public that their interests are aligned with those of the new shareholders. Share lockups are one of the devices by which existing shareholders can convey such intentions to new investors. Brau, Lambson, and McQueen (2005) find that firms with higher degrees of transparency (i.e., with lower information asymmetry between insiders and the public market) tend to have shorter lockup periods. Brav and Gompers (2003) find evidence supporting the commitment theory where lockups serve as commitment devices to overcome moral hazard problems subsequent to the IPOs.

To our knowledge, no study examines share lockups for Canadian IPOs where both lockup and escrow agreements are used to restrict share transfers post-IPO for specified periods of time for specified pre-IPO investors. Furthermore, not only is the role of overallotment options for IPOs markedly different in Canadian versus U.S. markets (Chung et al., 2000) but the first-day mean returns for Canadian IPOs also are among the smallest of any country where formal studies have been conducted (e.g., Kryzanowski et al., 2007; Jay Ritter's website at http://bear.cba.ufl.edu/ritter/Int.pdf).

Given this deficiency in the literature, this thesis focuses on examining whether share lockups for firm IPOs serve as one of the ways to signal that insider interests are aligned with those of outside investors. Thus, the objectives of this thesis are five-fold. The first objective is to examine if IPO underpricing is related to the existence of lockup provisions in IPO prospectuses and to the lengths of the lockup periods. The second objective is to determine whether the design of share lockups in terms of lockup proportions and lengths are related to measures of the relative transparency of IPO firms. The third objective is to examine the market behavior of firms with different share lockups and degrees of transparency around lockup expirations. The fourth objective is to identify the determinants of any abnormal market behavior of firms with different share lockups and degrees of transparency around lockup expirations. The fifth and final objective is to examine the behavior of trading volumes and bid-ask spreads around IPO unlock days.

The remainder of this thesis is organized as follows. In the next section, the literature on share lockup expiries for firm IPOs is briefly reviewed. In the third section, some descriptive information on share lockups for Canadian IPOs is presented. In the fourth section, the samples and data are described. In the fifth section, the relationship between IPO pricing and the existence of lockup information is tested. In the sixth section, the relationships between each of the two design features of share lockups for IPOs and issuer transparency are estimated and analyzed. In the seventh section, the market price behavior around unlock days is examined for two types of share lockups for Canadian IPO firms. In the eighth section, possible determinants of market price behavior on unlock days are assessed. In the ninth section, the behavior of volumes and spreads around the unlock days are examined. The tenth section concludes the thesis.

2. LITERATURE REVIEW

Many of the previous studies examine the efficient market hypothesis around lock-up expiration days and try to identify the reasons for negative abnormal returns (ARs) on and after lockups expire. For example, Ofek and Richardson (2000) find a significant decrease in

the stock price although the timing of the lockup expiration is totally anticipated. They also find that the effect seems to be caused by a downward sloping demand curve that is likely to be permanent. Brau et al. (2004) find a negative abnormal return around the lockup expiration date that they attribute to information asymmetry and decreased incentive alignment between insiders and outside shareholders.

Some lockup studies test the effect of lockup expirations on market liquidity. For instance, Cao et al. (2002) examine three proxies for market liquidity and find that lockup expirations only improve quote depth and trading activity while having little effect on effective spreads. Bradley et al. (2001) find that negative ARs are concentrated more in firms with venture versus non-venture capital backing.

Tolia and Yip (2003) classify IPOs into four categories. They conclude that the decline in price on the lockup expiration dates is only significant for those lockups that have first-day returns over 60 percent. However, they observe price declines about 20 days before the lockup expiration dates, not just around the unlock days. In contrast, Field and Hanka (2001) find an average three-day abnormal return of -1.5% centered on the unlock day. They are unable to provide a conclusive explanation for why the negative abnormal returns occur on the lockup expiration dates since the lockup expiration dates are known (i.e., fully anticipated) by the market. Aggarwal et al. (2002) build a model in which insiders underprice IPOs to maximize personal wealth when selling their shares at lockup expiration. They argue that research coverage is positively correlated with stock returns and insider selling at the unlock days.

Espenlaub et al. (2001) examine IPO lockup expirations in the UK. They not only find (insignificant) negative abnormal returns on and around lockup expirations but also find that sponsor reputations act as signaling substitutes to lockup agreements. Bessler and Kurth (2004) study lockups in Germany and find that venture-backed IPOs outperform during the lockup periods and underperform thereafter.

3. SHARE "LOCKUPS" FOR CANADIAN IPOs

Two types of "lockups" appear in Canadian IPO prospectuses. The first type, which is referred to as "non-escrow lockups" herein, is included in the "Plan of distribution" section of the IPO prospectuses. A non-escrow lockup refers to the time period after a company goes public during which company insiders and all or almost all other pre-IPO shareholders are not allowed to sell their shares in the market. Parties so affected usually include directors, officers, all principal and selling shareholders, and sometimes even firm employees.

Typical wordings for such lockups read as follows: "The underwriters have requested that certain holders of common shares each enter into a lock-up agreement...to not sell that shareholder's common shares for a period of X days..." or "for a period of Y days after the closing of this offering, each of the former shareholders of XYZ Company, who retain an interest in the Company and the Company, will not, subject to certain exceptions, offer, sell, transfer or otherwise dispose of any common shares...".

The second type of share lockup places shares into escrow. These agreements require that certain shares must be held, usually by a third party (i.e., an escrow company), and thus cannot be traded or transferred for a period of time. Since escrow lockups are used for executive incentive purposes and as payment for property vended into the firm, escrow shareholders usually include directors, officers and venders of property (such as patents or mineral rights).

The "Escrow shares" sections of prospectuses usually state the number of shares, length, and proportion to be released in each period of the escrow lockup. Typical wording is: "in accordance with X Policy, Y escrow shares will be subject to an Z month time release escrow, to be released in equal tranches at V month intervals...". The breadth of previous holdings locked up appears to be higher for non-escrow versus escrow lockups based on the data examined subsequently for our sample of Canadian IPOs. This may be due to the fact that the former involves not only directors and officers, but also all principal and selling shareholders in the company.

4. SAMPLE AND DESCRIPTION OF DATA

The initial sample consists of 97 firms that issued common shares during their IPOs and were listed on the TSX during the period from January 1997 through December 2005.[1] Data regarding the IPOs are drawn from the Financial Post New Issues Database. Price and return data for these IPO firms are extracted from the CFMRC database. Information on the lockups and escrowed shares is hand-collected from firm prospectuses that are available electronically on the Sedar public company database from 1997.

4.1 Sample of Share Releases from Non-escrow Lockups for IPO Firms

A sample of 59 IPOs with specified lockup periods for non-escrow lockups is identified in our initial sample. Based on the summary statistics for this sample as reported in Table 1, the average lockup proportion after the IPOs is 55%. The IPO lockup lengths vary from 90 days to 540 days, with 180 days being the IPO lockup length for 78% of the IPO firms. In this IPO sample, 27% of the firms are defined as high-tech firms, 15% of the firms have dual-class share structures post-IPO, and 41% of the firms issue secondary shares as part of their IPOs.

4.2 Sample of Share Releases from Escrow Lockups for IPO Firms

Of the 97 IPO firms in our initial sample, 44 have the precise date of the lockup period for their escrowed shares in their prospectuses.[2] Based on the summary statistics for this sample as reported in Panels A, C and D of Table 2, the average lockup proportion post-IPO is 33%, and the length of the lockup periods varies from 0 to 365 days, with a length of 0 days for 16% of the firms. The proportions of high-tech firms and firms with dual-class shares post-IPO are 30% and 20%, respectively, for this sample. About 27% of these firms issue secondary shares as part of their IPOs.

When this sample is further restricted by removing 7 IPO firms with lockup periods of 0 days, the sample is reduced to 37 firms. Based on the summary statistics for this constrained sample as reported in Panels B, C and D of Table 2, the average lockup proportion post-IPO

[1] This is after excluding 95 firms with issue prices per share that were less than two dollars and 2 firms that are not listed firstly on the TSX.
[2] This is after excluding one firm that has a lockup expiration date that depends on the level of future profits.

is higher than that for the unconstrained sample at 36%, and the length of the lockup periods varies from 90 to 365 days. Similarly, the percentages of high-tech firms, firms with dual-class share structures post-IPO, and firms that issue secondary shares as part of their IPOs are also higher for this constrained sample compared to the unconstrained sample at 35%, 24% and 32%, respectively.

5. DO LOCKUPS REDUCE UNDERWRITER UNDERPRICING OF IPOs?

Since the lockup expiry dates are reported in the prospectuses and are thus known to investors at the time of the IPOs, we conjecture that the existence of a lockup may be reflected in the initial pricing of an IPO by the underwriters. In this section, we test whether IPO pricing is related to the existence of a lockup and its length. To this end, we test the following hypotheses:

H_0^1: The existence of a lockup does not reduce IPO underpricing by the underwriters, if underpricing is present.

H_A^1: The existence of a lockup does reduce IPO underpricing by the underwriters, if underpricing is present.

According to Brav and Gompers (2003), lockup agreements serve as commitment devices to signal that the interests of insiders are better aligned with those of outsiders. As a result, outsider investors are more likely to perceive firms with lockups as having less information asymmetry. In turn, underwriters are more likely to underprice IPOs less when lockups exist.

To test the relationship between IPO pricing and lockups, we perform the following three regressions:

$$1^{st}\,dayreturn_i = \alpha_i + \beta_{1i} \times D_1 + \varepsilon_i \tag{5.1}$$

where D_1 is equal to 1 if lockup information is mentioned in the prospectus, and 0 otherwise;

$$1^{st}\,dayreturn_i = \alpha_i + \beta_{1i} \times D_1 + \varepsilon_i \tag{5.2}$$

where D_1 is equal to 1 if the lockup length is longer than 0, and 0 otherwise; and

$$1^{st}\,dayreturn_i = \alpha_i + \beta_{1i} \times D_1 + \beta_{2i} \times D_2 + \varepsilon_i \tag{5.3}$$

where D_1 is equal to 1 if the non-escrow lockup length is longer than 0, and 0 otherwise; and D_2 is equal to 1 if the escrow lockup length is longer than 0, and 0 otherwise.

Two types of first-day returns are used in tests of the means and medians for the various samples and for the regressions above. The first type of return is calculated as the first-day opening price minus the issue price, all divided by the issue price. The second type of return is calculated as the first-day closing price minus the issue price, all divided by the issue price.

The mean and median values of the first-day returns for the various sub-samples are reported in Table 3. All mean and median first-day returns for all sub-samples are significantly positive. This implies that these IPOs are underpriced by underwriters. However, for tests of the above hypotheses, we find that neither the existence nor the length of the lockups significantly reduces underpricing by underwriters (See Appendix 1 for details).

6. RELATIONSHIP BETWEEN TWO LOCKUP DESIGN FEATURES AND INFORMATION ASYMMETRY

6.1 Hypotheses and Test Methodology

Previous studies by Brau et al. (2005) examine the effect of various possible determinants on lockup length. However, our IPO samples have much less variability in their lockup lengths since more than 75% of the firms have an IPO lockup length of 180 days. Thus, to examine heterogeneity in the lockup decisions of Canadian IPOs, we search for possible determinants of both lockup length (*LockupLength*) and the percentage of shares outstanding that are locked up post-IPO (*%Lockup*) for both samples. Larger values of both of these lockup design features are regarded herein as signaling the use of stronger lockup protection.

To this end, we test the following null and alternate hypotheses:

H_0^2: The strength of the lockup design feature (either proportion of outstanding shares subject to lockup post-IPO or the length of the lockup period) does not depend upon information asymmetry.

H_A^2: The strength of the lockup design feature (either proportion of outstanding shares subject to lockup post-IPO or the length of the lockup period) increases with higher information asymmetry in order to signal a greater alignment of the interests of insiders and outside investors.[3]

The specific regressions run to test the first null hypothesis are:

$$\%\text{Lockup}_i = \alpha_i + \underline{\beta_i}\,\theta_i + \gamma_i\,\text{LockupLength}_i + \varepsilon_i \quad (6.1)$$

$$\text{LockupLength}_i = \alpha_i^* + \underline{\beta_i^*}\,\theta_i + \gamma_i^*\,\%\text{Lockup}_i + \varepsilon_i^* \quad (6.2)$$

In (6.1) and (6.2), α, α^*, γ and γ^* are parameters; $\underline{\beta}$ and $\underline{\beta^*}$ are vectors of parameters; θ is a vector of five firm-specific transparency variables; and *i* refers to IPO firm *i*. The first transparency proxy is firm size, which is measured by the book value of assets. The expected sign of this variable is indeterminate. The lockup devices are enforced more strongly if larger firms are considered to be less transparent given more complicated structures or are expected to be enforced less strongly if large firms are followed by more analysts and have a longer public history of performance than smaller firms. The second transparency proxy is book runner reputation, as measured by the market share of new issues for each investment bank in the prior year (as in Hanley, 1993).[4] The sign of this variable is also ambiguous. A negative sign is expected if firms use book runners with high reputations to convey their firm quality to the public. A positive sign is expected if book runners with high prestige require the firm to lock up a higher proportion of shares after IPOs, and/or have longer lockup lengths in order to protect their reputation. The third transparency proxy is a high-tech dummy variable, which is equal to one for IPOs of firms with SIC codes starting with 357, 367, 369, 382, 384 and 737, and zero otherwise (Field and Hanka, 2001). The expected sign of this variable is positive since high-tech firms are perceived as being less transparent. The fourth transparency proxy is a dual class dummy variable, which is equal to one when a class of shares with superior

[3] This alternative hypothesis is also known as the "commitment hypothesis". Results supporting this hypothesis may also support the "signaling hypothesis". Brau et al. (2005) show that the two hypotheses have parallels to each other, and they make similar predictions about lockups and firm transparency.

[4] Information on book runner reputations begin in year 1999 and are available for 44 firms in the non-escrow sample, for 20 firms in the escrow sample, and for 13 firms in the constrained escrow sample.

voting rights exists for insiders and is equal to zero otherwise. The expected sign of this variable is also positive since dual-class shares increase information asymmetry. The fifth and final transparency proxy is a dummy variable, which is equal to one when firms issue secondary shares during their IPOs and zero otherwise. The expected sign of this variable is indeterminate. The expected sign is negative if these firms are more transparent because they are more established, and is expected to be positive if such sales by insiders suggest a lower ongoing commitment to the firm.

LockupLength and *%Lockup* are added to regressions (6.1) and (6.2), respectively, to examine whether these two lockup devices are correlated with each other. The expected signs of the lockup device variables are significantly negative if they are used as substitute devices for each other to convey commitment.

The Pearson correlation statistics for various pairs of dependent and independent variables for the non-escrow and the escrow samples are reported in the upper and lower diagonal cells of Table 4, respectively. For the 59 IPOs in the non-escrow sample, all transparency proxies have their expected signs. However, only the dummy variable for dual-class shares is significant, which implies that firms with dual-class share structure after their IPOs tend to have higher proportions of shares locked up. In addition, larger firms and firms issuing secondary shares tend to use book runners with higher reputations, which in turn require firms to enforce lockup devices more (higher proportions locked up and longer lockup periods). We also find that firms issuing secondary shares during their IPOs typically have book runners with higher reputations.

For the 44 IPOs in the escrow sample, all transparency proxies have their expected signs, with firm size and the dummy variable for SEO firms being positive and significant. This evidence shows that larger firms may perceive themselves as having more complicated structures and thus enforce the lockup devices more strongly. Moreover, SEO firms have a greater need to use lockups to commit to the public since sales by insiders at IPOs may suggest a lower ongoing commitment to the firm. Consistent with the evidence for the 59 IPOs in the non-escrow sample, larger firms and SEO-issuing firms are more likely to use

book runners with higher reputations. Not consistent with the 59 IPOs in the non-escrow sample, lockup length is significantly and positively correlated with all transparency proxies; high-tech firms are more likely to issue secondary shares as part of their IPOs; larger firms are more likely to have dual-class share structures post-IPO; and larger firms are more likely to issue secondary shares as part of their IPOs.

6.2 Empirical Findings

Results for equations (6.1) and (6.2) for the non-escrow and escrow samples are reported in Panels A and B of Table 5, respectively. Based on the equation (6.1) results for the non-escrow sample (Panel A) for various combinations of the explanatory variables, the estimated coefficients for the dummy variable for dual-class firms remain significant in all cases, which is consistent with the results reported in Table 4. This evidence shows that firms with dual-class share structures after their IPOs have higher proportions of shares locked up when compared to other firms. This may be due to the fact that the dual-class share firms are less transparent to the public because they contain insiders that have more rights over other investors. As a result, these firms have a greater requirement to display their commitment to other investors when going public. Larger firms tend to have higher proportions of shares locked up (only marginally significant in one case in Column 2). However, we do not find any significant relationship of firm transparency with non-escrow lockup lengths of the IPOs. (None of the F-values for the regressions are significant.) Thus, the lockup length for non-escrow IPOs appears to be exogenous.

Based on the results of equation (6.1) for the escrow sample, we find that firm size has a significant and positive relationship with the percentage of shares locked up in escrow after the IPOs for 44 IPOs in the escrow sample. Thus, larger firms tend to have higher portions of shares locked up as "escrow shares" post-IPO. In addition, the dummy variable for the dual-class share structure after the IPOs is significant and has its expected sign in Equation (6.2) for the 44 IPOs in the escrow sample where the regression as measured by the F-value is significant. This implies that firms with dual-class share structures after the IPOs tend to have longer escrow lockup periods.

In both Panels A and B, we find a positive relationship between lockup proportions and lockup lengths, although the parameter is only significant for some regressions for the escrow sample. This suggests that the two types of lockup devices are not necessarily substitutes for each other.

7. MARKET PRICE REACTION AROUND LOCKUP EXPIRATIONS

In this section of the thesis, we test the following null and alternative hypotheses:

H_0^3: Market prices do not react to the expiration of the lockup periods for IPO firms.

H_A^3: Market prices do react to the expiration of the lockup periods for IPO firms.

Our expectation is that the market price reaction will be negative (e.g., Brau et al, 2004), and will be more negative for less transparent firms. The following market model is run to test this null hypothesis:

$$R_{it} = \alpha_i + \beta_{1i} R_{mt} + \beta_{2i} D_1 R_{mt} + \sum_{j=-10}^{10} \gamma_{ij} D_{2j} + \varepsilon_{it} \qquad (7.1)$$

In (7.1), $R_{i,t}$ is the return on IPO firm i for day t; R_{mt} is the return on the S&P TSX Composite Index on day t; α_i is the intercept for stock i; β_{1i} is the estimated beta for stock i for the pre-expiration period; D_1 is a dummy variable that is equal to one from the lockup expiration date onwards; D_{2j} is the event dummy that is equal to one for day j in the event window [-10:+10] and zero otherwise; and γ_{ij} is the abnormal return or AR for day j in the event window for stock i. The cumulative abnormal return or CAR for stock i in event window [m: n] is calculated as $\sum_{j=m}^{n} \gamma_{ij}$ where m and n are days relative to the event date.

The (C)ARs are reported in Tables 6, 7 and 8 for the non-escrow sample and its high-tech and non-high-tech sub-samples, respectively. We only find a significantly negative AR on day 1 of -1.6% for the 16 less transparent high-tech IPOs (see Table 7). The CAR around the lockup expiration dates are also significant (and negative) only for the high-tech firms, which have a significant CAR of -2.5% for the window [-1: +1]. This CAR appears to be driven to a large extent by the negative AR on day [+1].

The (C)ARs for the constrained escrow sub-sample (i.e., the sub-sample in which IPOs with a lockup length of 0 days are eliminated) and its high-tech and non-high-tech sub-samples are reported in Tables 9, 10 and 11. Once again, we find a significant (negative) AR on day 0 of -1.8% only for the high-tech sub-sample. The CARs for the high-tech sub-sample for windows [-1:+1] and [0:+1] are highly significant with values of -3.4% and -2.4%, respectively. In contrast to the non-escrow (sub-)sample(s), significant and negative CARs are present during the event windows [-10:+10], [+2:+5] and [+2:+10] for the 37 IPOs in the constrained escrow sample. In addition, the negative CAR for the 21-day event window is mainly driven by the negative CAR after the unlock day.

In summary, the evidence reported in this section of the thesis supports the third alternative hypothesis only for high-tech IPOs (for both non-escrow and escrow lockups). Thus, the Canadian results differ from those in the U.S. for the lockup design (namely, non-escrow) that is more like that used in the U.S.

The mean and median market betas are reported in Table 12. We find a significant and positive β_{1i} in all (sub-)samples. However, the market betas do not change significantly after the unlock days, and all betas are less than one.

8. DETERMINANTS OF THE MARKET PRICE REACTION AROUND LOCKUP EXPIRATIONS

To assess potential determinants of the market reaction when lockups expire, we test the following null and alternative hypotheses:

H_0^4: Market price reactions around lockup expirations do not depend on firm transparency.

H_A^4: Market price reactions around lockup expirations do depend on firm transparency.

The generic format of the regressions used to test this null hypothesis for CAR [-1:+1] and CAR [0: +1] is as follows: [5]

[5] Due to autocorrelation problems, lockup length and lockup proportion are not included as explanatory

$$CAR_i[\bullet,\bullet] = \alpha_i + \underline{\beta_i}\underline{\theta_i} + \varepsilon_i \qquad (8.1)$$

where all the terms are as defined previously.

The Pearson correlations between various pairs of variables for the 59 IPOs in the non-escrow sample were reported earlier in Table 4. High-tech firms and firms with dual-class share structures have lower CARs and SEO-issuing firms have marginally higher CARs than other firms around IPO lockup expirations. However, when examining the statistics for firms in the constrained escrow sample, we find that only the CARs in event window [-1:+1] are marginally correlated with the dummy variable for high-tech firms.

The Pearson correlations between pairs of variables for the constrained escrow sample are reported in Table 13. Larger firms tend to use book runners with higher prestige and are more likely to have dual-class share structures after their IPOs. In addition, firms issuing secondary shares in their IPOs and those with longer escrow lockup periods tend to use book runners with higher reputations. High-tech firms are more likely to issue secondary shares as part of their IPOs. These findings are consistent with what was reported earlier for the 44 IPOs in the initial escrow sample, which also includes firms with 0-day escrow lockups.

When comparing the statistics in the lower diagonal cells in Table 4 and those in Table 13, we find that the biggest difference is the correlation between lockup length and the other variables. When firms with zero lockup lengths are excluded (Table 13), lockup length is not correlated with any of the other variables with the exception of book runner reputation. This evidence shows that firms tend to have escrow lockup lengths greater than zero if they are of larger size, use book runners with higher reputations, are defined as high-tech firms, have dual class shares, or issue secondary shares in their IPOs.

Results for regression (8.1) are reported in Tables 14 and 15 for the 59 IPOs in the non-escrow sample and for the 37 IPOs in the constrained escrow sample, respectively. In Table 14, the cumulative abnormal returns or CAR around lockup expirations are significantly lower for high-tech firms, which is consistent with the evidence reported in Table 4. The

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variables.

greater drop in stock prices for high-tech firms around unlock days may be due to the fact that high-tech firms are those that are more hard-to-value and are riskier from the market's point of view. When book runner reputations are not considered, the dummy variable for SEO-issuing firms has a marginally significant and positive relation with CAR around the unlock days. This can be explained by the observation that SEO firms usually have longer performance histories and are more stable. The dummy variable for dual-class share structures has a significant and negative relation with CAR[0: +1] only when book runner reputation is present.

When examining regression (8.1) for the 37 IPOs in the constrained escrow sample, we find that none of the regressions are significant (see Table 15). This implies that the market reaction around IPO lockup expiries depends on some proxies of firm transparency (high-tech and SEO), while the market reaction around escrow lockup expiries does not depend on any of the transparency factors examined herein.

9. BEHAVIOR OF ABNORMAL VOLUMES AND SPREADS AROUND UNLOCK DAYS

In this section, we test the behavior of abnormal volumes and spreads of firms in the non-escrow and constrained escrow IPO samples for days in the unlock event window [-10: +10]. The hypotheses that are tested are as follows:

H_0^5: The expiry of (non)escrow lockups for IPO firms does not significantly affect trading volumes nor spreads.

H_A^5: The expiry of (non)escrow lockups for IPO firms significantly affects trading volumes and spreads.

To test these hypotheses, we use abnormal share volume and spread ratios, which are calculated as follows:

$$AbnormalVolumeRatio_{ij} = \frac{Volume_{ij} - MeanVolume_i[-50:-11;+11:+125]}{MeanVolume_i[-50:-11;+11:+125]} \qquad (9.1)$$

$$AbnormalSpreadRatio_{ij} = \frac{Spread_{ij} - MeanSpread_i[-50:-11;+11:+125]}{MeanSpread_i[-50:-11;+11:+125]} \quad (9.2)$$

where i refers to firm i in the (non)escrow IPO sample, j refers to day j in the event window [-10:+10], n refers to the number of firms in the (non)escrow IPO sample, $Volume_{ij}$ is the number of shares traded for firm i on day j, and $Spread_{ij}$ is either the absolute or relative spread for firm i on day j. Our benchmark period for firm i is based on the values of the same metric for firm i for the period that runs from day -50 to day -11 and from day +11 to day +125. Following Cao et al. (2002), we define the absolute spread as the difference between the bid and ask price, and the relative spread as the absolute spread divided by the average of the bid and ask price.

Some previous studies find that trading volumes increase right after lockup expirations. For instance, Cao et al. (2002) find that the mean and median trading volumes increase significantly after lockup expirations. If insiders tend to sell their shares when lockups expire, we expect to find that the abnormal volume ratios increase after the lockups expire.

The mean and median abnormal volume ratios for the two samples are reported in Tables 16 and 17. The mean abnormal trading volume ratio increases from -0.28 on day -1 to 0.29 on day 1 for the non-escrow sample, and decreases from -0.28 on day -1 to -0.49 on day 1 for the constrained escrow sample. Although the abnormal volume ratio increases for the non-escrow IPO sample, the ratio on day 1 is not significantly different from zero. The signs and significance of the median ratios are not consistent with those of the mean due to the skewness in the volume data.

According to Field et al (2001), the absolute spreads change slightly and the relative spreads widen slightly immediately after unlock days. In addition, Cao et al. (2002) find no clear change in spreads before and after lockups expire.

The mean and median abnormal absolute and relative spread ratios are reported in Tables 18 through 21 for our samples. The absolute spread ratios are only marginally greater immediately before the unlock days compared to that during the benchmark periods. The relative spread ratio is significantly negative on day 1, which implies that the relative spread

gets smaller immediately after the unlock days for the 37 IPOs in the constrained escrow sample.

10. CONCLUSION

To our knowledge, this study is the first to examine lockups for Canadian IPOs. To this end, we conducted a number of tests for two types of lockups commonly associated with Canadian IPOs. We found that IPOs with lockup information in their prospectuses and with positive lockup periods are not underpriced less at issue in contrast to the initial underpricing associated with the remaining IPOs.

We find that IPOs with dual-class shares have higher proportions of their pre-IPO shares locked up in lockup agreements and have longer escrow lockup periods, while larger firms have higher proportions of pre-IPO shares locked up as "escrow shares". These results support the conjecture that IPOs that are less transparent are more likely to use lockups to signal that the interests of insiders are aligned with outside investors, at least for the lockup periods.

Unlike previous studies for other markets, we find significant negative CAR around IPO escrow lockup expiries only for Canadian high-tech firms. IPOs that include an SEO have significantly higher cumulative abnormal returns (CARs) around unlock days than those that do not include SEOs. The CARs around escrow expiry dates do not depend on any of the transparency proxies used herein. We do not find any pattern of significant abnormal volume, absolute or relative spreads around unlock days for the non-escrow IPO sample. In contrast, we find significant abnormal volume and relative spread changes for the constrained escrow IPO sample.

REFERENCES

Aggarwal, R. K., L. Krigman, and K. L. Womack, 2002, "Strategic IPO underpricing, information momentum, and lockup expiration selling", *Journal of Financial Economics*, 66, 105-137.

Bessler, W., and A. Kurth, 2004, "The performance of venture-backed IPOs in Germany: Exit strategies, lock-up periods, and bank ownership", Working paper, Justus-Liebig-University Giessen.

Bradley, D.J., B. D. Jordan, I.C. Roten, and H. Yi, 2001, "Venture capital and IPO lockup expiration: An empirical analysis", *Journal of Financial Research*, 24, 465-493.

Brau, J. C., D. A. Carter, S. E. Christophe, and K. G. Key, 2004, "Market reaction to the expiration of IPO lockup provisions", *Managerial Finance*, 30 (1), 75-91.

Brau, J. C., V. E. Lambson, and G. McQueen, 2005, "Lockups revisited", *Journal of Financial and Quantitative Analysis*, 40 (3), 519-571.

Brav, A., and P.A. Gompers, 2003, "The role of lockups in initial public offerings", *The Review of Financial Studies*, 16 (1), 1-29.

Cao, C., L.C. Field, and G. Hanka, 2004, "Does insider trading impair market liquidity? Evidence from IPO lockup expirations", *Journal of Financial and Quantitative Analysis*, 39 (1), 25-64.

Chung, R., L. Kryzanowski and I. Rakita, 2000, "The relationship between overallotment options, underwriting fees and price stabilization for Canadian IPOs," *Multinational Finance Journal*, 4: 1&2 (March/June), 5-34.

Espenlaub, S., M. Goergen, and A. Khurshed, 2001, "IPO lock-in agreements in the UK", *Journal of Business Finance and Accounting*, 28 (9 & 10), Nov./Dec., 1235-1278.

Field, L.C., and G. Hanka, 2001, "The expiration of IPO share lockups", *The Journal of Finance*, 56 (2), 471-500.

Hanley, K., 1993, "The underpricing of initial public offerings and the partial adjustment phenomenon", *Journal of Financial Economics*, 34, 231-250.

Kryzanowski, L., S. Lazrak and I. Rakita, 2007, "The behaviour of prices, trades and spreads for Canadian IPOs", forthcoming *Multinational Finance Journal*.

Ofek, E., and M. Richardson, 2000, "The IPO lock-up period: Implications for market efficiency and downward sloping demand curves", Working paper.

Tolia, B., and Y. M. Yip, 2003, "Hot IPOs and lockup expiration – an anomaly?", *Competitiveness Review*, 13 (2), 53-59.

Table 1. Descriptive statistics for the sample of IPOs with non-escrow lockups with specified lockup dates

This table reports summary statistics for the 59 IPO firms that have specified lockup dates for non-escrow lockups. The sample size is reduced to 44 firms for book runner reputation.

Panel A: Summary statistics for four firm/lockup characteristics				
Firm/lockup characteristics:	**Mean**	**Std Dev**	**Minimum**	**Maximum**
Lockup proportion after IPO	0.5501	0.2487	0.0180	0.9800
Firm size (in C$000's)	328972	1015687	477	6893500
Book runner reputation	0.1261	0.1159	0.0000	0.3340
Lockup length (days)	183	64.3135	90	540

Panel B: Proportion of sample for 3 firm characteristics	
Firm characteristics:	**Proportion**
High-tech firms	27%
Dual-class firms	15%
SEO-issuing firms	41%

Panel C: Proportion of sample for various lockup period lengths	
Lockup length:	**Proportion**
Lockup length < 180 days	14%
Lockup length = 180 days	78%
Lockup length > 180 days	8%

Table 2. Descriptive statistics for the sample of IPOs with specified escrow lockup dates

This table reports the summary statistics for 44 firms that have specified IPO lockup dates in the escrow sample. The sample size is reduced to 20 firms for book runner reputation

Panel A: Summary statistics for 4 firm/lockup characteristics for the sample of 44 IPO firms				
Final IPO sample:	**Mean**	**Std Dev**	**Minimum**	**Maximum**
Lockup proportion after IPO	0.3323	0.2091	0.0000	0.7885
Firm size (in 000's)	78165	248689	426.319	1508366
Book runner reputation	0.0712	0.1086	0.0000	0.3340
Lockup length	232	129	0	365
Panel B: Summary statistics for 4 firm/lockup characteristics for the sample of 37 IPO firms				
Final IPO sample:	**Mean**	**Std Dev**	**Minimum**	**Maximum**
Lockup proportion after IPO	0.3625	0.2100	0	0.7885
Firm size (in 000's)	91114	269730	426	1508366
Book runner reputation	0.0869	0.1198	0.0000	0.3340
Lockup length	276	88	90	365

Panel C: Proportion of sample for 3 firm characteristics for both samples		
	Proportion	
Firm characteristics:	**44 IPOs**	**37 IPOs**
High-tech firms	30%	35%
Dual-class firms	20%	24%
SEO-issuing firms	27%	32%

Panel D: Proportion of sample for various lockup period lengths for both samples		
	Proportion	
Lockup length:	**44 IPOs**	**37 IPOs**
Lockup length = 0 days	16%	0%
Lockup length < 180 days & > 0 days	7%	8%
Lockup length = 180 days	4%	5%
Lockup length > 180 days	73%	86%

Table 3. The tests of mean and median values of first-day returns for different sub-samples

This table reports the mean and median values of first-day returns for different sub-samples. In Panel A, the mean and median values of first-day returns for 80 IPOs with lockup information in their prospectus are reported and tested for statistical significance using t- and Wilcoxon sign tests, respectively. In Panel B, the mean and median values of first-day returns for 78 IPOs with non-zero lockup periods are reported and tested for statistical significance. In Panel C, the mean and median values of first-day returns for 59 IPOs with non-zero non-escrow lockup periods are reported and tested for statistical significance. In Panel D, the mean and median values of first-day returns for 38 IPOs with non-zero escrow lockup period are reported and tested for statistical significance.[6] In the three panels, *Return1* is equal to *(1st dayOpenPrice-IssuePrice)/ IssuePrice*, and *Return2* is equal to *(1st day ClosePrice-IssuePrice)/IssuePrice*. *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively.

Panel A	*Mean and median of 1st-day return for 80 IPOs with lockup information in prospectus*					
	Mean	***t-value***	***p-value***	***Median***	***Wilcoxon***	***p-value***
Return1	0.0521***	3.97	0.0002	0.0055***	559.0	<.0001
Return2	0.0616***	3.96	0.0002	0.0207***	588.0	0.0001

Panel B	*Mean and median of 1st-day return for 78 IPOs with non-zero lockup periods*					
	Mean	***t-value***	***p-value***	***Median***	***Wilcoxon***	***p-value***
Return1	0.0517***	3.84	0.0003	0.0039***	504.5	<.0001
Return2	0.0623***	3.9	0.0002	0.0163***	548.5	0.0002

Panel C	*Mean and median of 1st-day return for 59 IPOs with non-zero non-escrow lockup periods*					
	Mean	***t-value***	***p-value***	***Median***	***Wilcoxon***	***p-value***
Return1	0.0389**	2.47	0.0165	0***	236	0.0084
Return2	0.0478***	2.74	0.0082	0.0011***	227	0.0223

Panel D	*Mean and median of 1st-day return for 38 IPOs with non-zero escrow lockup periods*					
	Mean	***t-value***	***p-value***	***Median***	***Wilcoxon***	***p-value***
Return1	0.0668***	4.01	0.0003	0.0068***	132.5	<.0001
Return2	0.0787***	3.43	0.0015	0.0218***	181.5	<.0001

[6] This includes one firm with a tentative escrow lockup expiry that depends on future profit earned. We assume that the firm has a greater-than zero escrow lockup period.

Table 4. Pearson correlation coefficients for various pairs of dependent and explanatory variables for both samples

This table reports the Pearson correlation coefficients between the various pairs of variables (dependent and explanatory) used in regressions (6.1) and (6.2) for the IPO samples of non-escrow and escrow lockups. The table also includes the correlations that refer to the subsequent equation (8.1) for the non-escrow sample for compactness. The correlations are reported in the upper and lower diagonal cells for the IPO samples of 59 non-escrow and 44 escrow lockups, respectively. The diagonal cells are bolded to provide for a better separation between these values. To include firms with a lockup length of 0 days in the sample of escrow lockups, *LockupLength* and not *Log LockupLength* is used for this sample. *, ** and *** represent significance at the 0.10, 0.05 and 0.01 levels, respectively.

Variable	CAR [-1:+1]	CAR [0: +1]	Lockup %	Log size	Book runner reputation	High-tech firm	Dual-class firm	SEO-issuing firm	Log LockupLength
CAR [-1: +1]	**1.0000**	0.9012^{***}	-0.2169^{*}	0.0859	-0.1000	-0.3282^{**}	-0.2243^{*}	0.2219^{*}	0.0059
CAR [0: +1]		**1.0000**	-0.1720	0.0743	-0.0834	-0.2775^{**}	-0.2400^{*}	0.2389^{*}	0.0489
Lockup %			**1.0000**	0.1702	0.1026	0.1158	0.2804^{**}	-0.1455	0.1645
Log size			0.3477^{**}	**1.0000**	0.3977^{***}	-0.1523	-0.0196	0.1477	0.1863
Book runner reputation			0.2809	0.4824^{**}	**1.0000**	-0.0570	-0.0051	0.2951^{*}	0.2585^{*}
High-tech firm			0.1014	-0.1103	-0.0161	**1.0000**	-0.0467	0.1158	-0.1881
Dual-class firm			0.0061	0.3862^{***}	0.1535	-0.2049	**1.0000**	-0.2554^{*}	0.1626
SEO-issuing firm			0.3246^{**}	0.1317	0.6951^{***}	0.3864^{***}	-0.0575	**1.0000**	0.0176
LockupLength			0.3796^{**}	0.4293^{*}	0.4293^{*}	0.2290^{*}	0.3114^{**}	0.3255^{**}	**1.0000**

Table 5. Summary of regressions of lockup proportions and lockup lengths with potential explanatory variables

This table reports the regression results for regression equation (6.1) and (6.2) for the sample of non-escrow lockups associated with IPO firms and for the sample of escrow lockups associated with IPO firms. The dependent variables are the lockup proportions of shares post-IPO, and the log of the non-escrow lockup length for the non-escrow sample and escrow lockup length (divided by 100) for the escrow-sample in regression equations (6.1) and (6.2), respectively. *, ** and *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively. T-values are reported in the parentheses.

Panel A. The relationship between firm transparency and lockup enforcement for IPO firms in the non-escrow sample										
Variables	Based on Regression Equation (6.1) for Non-escrow Sample Dependent variable is IPO lockup %						Based on Regression Equation (6.2) for Non-escrow Sample Dependent variable is Log (lockup length)			
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)
Constant	-0.3300 (-0.54)	0.2391 (1.40)	-0.2952 (-0.49)	-0.3906 (-0.53)	-0.2039 (-0.33)	-0.5405 (-0.74)	4.9329*** (21.46)	4.9013*** (24.52)	4.9331*** (21.75)	5.0046*** (70.92)
Log (size)	0.0245 (1.55)	0.0270* (1.72)	0.0219 (1.40)			0.0305 (1.55)	0.0083 (0.36)	0.0170 (0.92)	0.0081 (0.36)	
Book runner reputation				0.1425 (0.41)		0.0459 (0.12)	0.5284 (1.26)		0.5249 (1.30)	0.5769 (1.47)
Dummy (high-tech)	0.1098 (1.52)	0.0982 (1.38)	0.0991 (1.39)	0.0720 (0.76)	0.0868 (1.21)	0.0865 (0.92)	-0.0517 (-0.48)	-0.1154 (-1.38)	-0.0518 (-0.48)	-0.0574 (-0.54)
Dummy (dual class after IPO)	0.1626* (1.80)	0.1777* (2.00)	0.1871** (2.14)	0.2549* (1.88)	0.1805** (2.05)	0.2696* (2.00)	0.1536 (0.96)	0.1045 (0.98)	0.1536 (0.97)	0.1438 (0.92)
Dummy (SEO)	-0.0702 (-1.06)	-0.0666 (-1.00)				-0.0895 (-1.08)	-0.0036 (-0.04)	0.0422 (0.55)		0.0028 (0.03)
Log (lockup length)	0.1152 (0.97)		0.1081 (0.91)	0.1679 (1.17)	0.1360 (1.16)	0.1426 (1.00)				
Escrow lockup %							0.1863 (1.00)	0.1526 (0.97)	0.1876 (1.04)	0.2037 (1.15)
Adjusted R^2	0.0864	0.0873	0.0845	0.0690	0.0686	0.0957	0.0069	0.0205	0.0330	0.0297
F-value	2.10*	2.39*	2.34*	1.80	2.42*	1.76	1.05	1.24	1.29	1.26
DF	53	54	54	39	55	37	37	53	38	38
N	59	59	59	44	59	44	44	59	44	44

Panel B The relationship between firm transparency and lockup enforcement for IPO firms in the escrow sample									
Variables	Based on Regression Equation (6.1) for Escrow Sample Dependent variable is IPO lockup %					Based on Regression Equation (6.2) for Escrow Sample Dependent variable is Lockup Length/100			
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)
Constant	-0.4380 (-1.69)	-0.3489* (-1.79)	-0.1177 (-0.62)	-0.1968 (-0.98)	-0.2210 (-1.08)	2.4815 (1.60)	1.1595*** (3.37)	0.2443 (0.20)	0.3716 (0.30)
Log (size)	0.0751** (2.60)	0.0633** (2.91)	0.0345* (1.69)	0.0431* (2.01)	0.0458** (2.09)	-0.2571 (-1.29)		0.1029 (0.76)	0.0904 (0.67)
Book runner reputation	-0.5097 (-1.04)	-0.2828 (-0.70)				2.3353 (0.79)			
Dummy (high-tech)	-0.0857 (-0.90)	-0.0590 (-0.64)			0.0060 (0.09)	0.8228 (1.53)	0.5813 (1.43)	0.7744** (2.03)	0.6108 (1.48)
Dummy (dual class after IPO)	-0.1905 (-0.85)			-0.0973 (-1.23)	-0.1147 (-1.40)	1.6212 (1.26)	1.1464** (2.70)	1.0153** (2.18)	1.0248** (2.21)
Dummy (SEO)	0.0828 (0.49)		0.1008 (1.49)	0.0843 (1.23)		1.0365 (1.08)	0.4827 (1.12)		0.4572 (1.05)
Lockup Length/100	0.0574 (1.30)	0.0589 (1.45)	0.0373 (1.51)	0.0455* (1.79)	0.0553** (2.14)				
Escrow lockup %						2.0169 (1.30)	1.8656** (2.18)	1.9067** (2.14)	1.6544* (1.80)
Adjusted R^2	0.3169	0.3247	0.1867	0.1968	0.1658	0.2026	0.2608	0.2481	0.2502
F-value	2.47*	3.28**	4.29**	3.63**	3.14**	1.80	4.79***	4.55***	3.87***
DF	13	15	40	39	39	13	39	39	38
N	20	20	44	44	44	20	44	44	44

Table 6. Abnormal returns for various windows centered on the unlock days for non-escrow lockups of IPO firms

This table reports the mean and median daily abnormal returns (AR) for the 21 days centered on the lockup expiration dates (the event window) for the sample of 59 IPO firms with non-escrow lockups. The ARs are calculated using a dual beta single-factor market model that is estimated over the window of [-50: +125]. The table also reports the mean and median CARs for various multi-day periods based on the [-10:+10] event window. The mean and median values are tested using t- and Wilcoxon signed rank tests, respectively. *, ** and *** indicate statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

Day	Mean(%)	t-value	p-value	Median(%)	Wilcoxon	p-value
-10	0.2871	0.74	0.4603	-0.1560	1.0	0.9941
-9	0.1668	0.50	0.6224	0.0130	-1.0	0.9941
-8	0.1245	0.26	0.7976	0.0232	-57.0	0.6708
-7	-0.5280	-1.02	0.3132	-0.2990	-113.5	0.3962
-6	0.6558	1.46	0.1505	0.1030	138.0	0.3016
-5	0.3516	0.64	0.5216	0.0690	60.5	0.6518
-4	-0.2924	-0.74	0.4631	-0.2170	-89.0	0.5064
-3	0.9509	1.53	0.1310	0.0917	107.0	0.4240
-2	0.1023	-0.15	0.8811	-0.5640*	-251.0	0.0575
-1	-0.1629	-0.44	0.6608	-0.2200	-180.0	0.1764
0	0.2193	0.46	0.6478	-0.1410	-77.5	0.5630
1	-0.7111	-1.08	0.2852	-0.3240	-100.0	0.4551
2	-0.2439	-0.48	0.6358	-0.2350	-127.0	0.3421
3	0.5366	1.41	0.1652	0.4290	204.0	0.1246
4	0.6260	1.10	0.2745	0.0509	59.0	0.6599
5	-0.8222**	-2.13	0.0370	-0.2910**	-283.0	0.0314
6	-0.3445	-0.95	0.3440	-0.1030	-138.5	0.2998
7	0.3775	1.16	0.2510	-0.0660	67.0	0.6172
8	-0.1724	-0.44	0.6647	0.0630	-2.0	0.9881
9	0.3623	0.70	0.4856	0.3050	-92.0	0.4921
10	0.6415	1.45	0.1530	0.0499	64.0	0.6331
[-10:+10]	1.9203	0.94	0.3497	0.5047	77.0	0.5656
[-5:+5]	0.3496	0.18	0.8609	-0.5940	-49.0	0.7149
[-1:+1]	-0.6547	-0.77	0.4418	-0.5840	-170.0	0.2020
[0:+1]	-0.4919	-0.61	0.5445	-0.2380	-86.0	0.5209
[-10:-2]	1.6140	1.04	0.3026	0.3701	47.0	0.7260
[-5:-2]	0.9078	0.65	0.5176	-0.0130	35.0	0.7942
[+2:+5]	0.0965	0.11	0.9100	-0.2780	-86.0	0.5209
[+2:+10]	0.9610	0.94	0.3505	0.6260	67.0	0.6172

Table 7. Abnormal returns for various windows centered on the unlock days for non-escrow lockups of high-tech IPO firms

This table reports the mean and median daily abnormal returns (AR) for the 21 days centered on the lockup expiration dates (the event window) for the sample of 16 high-tech IPO firms with non-escrow lockups. The ARs are calculated using a dual beta single-factor market model that is estimated over the window of [-50: +125]. The table also reports the mean and median CARs for various multi-day periods based on the [-10: +10] event window. The mean and median values are tested using t- and Wilcoxon signed rank tests, respectively. *, ** and *** indicate statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

Day	Mean(%)	t-value	p-value	Median(%)	Wilcoxon	p-value
-10	-0.7837	-1.06	0.3038	-1.1920	-19.0	0.3484
-9	-0.5603	-1.01	0.3300	-0.6490	-17.0	0.4037
-8	-0.8747	-0.83	0.4183	-1.2740	-21.0	0.2979
-7	-1.5651	-1.26	0.2282	-0.4950	-17.0	0.4037
-6	1.5575	1.33	0.2030	1.0835	21.0	0.2979
-5	0.9262	0.60	0.5568	-0.3260	5.5	0.7920
-4	-0.6484	-0.71	0.4886	-0.0950	-12.0	0.5619
-3	-0.7033	-1.30	0.2138	-0.4870	-26.0	0.1928
-2	-0.3261	-0.34	0.7386	-1.2910	-28.0	0.1591
-1	-0.9918	-1.56	0.1405	-0.5810	-28.0	0.1591
0	0.0615	0.08	0.9394	-0.6510	-2.0	0.9399
1	-1.5655**	-2.38	0.0310	-1.3550**	-41.0	0.0335
2	-0.1074	-0.08	0.9355	-0.3650	-13.0	0.5282
3	0.9245**	2.29	0.0369	1.3970**	39.0	0.0443
4	0.4323	0.35	0.7336	0.0421	-2.0	0.9399
5	-0.5656	-0.81	0.4310	-0.3540	-13.0	0.5282
6	-0.8728	-1.67	0.1150	-0.5700	-32.0	0.1046
7	.0.1819	0.37	0.7130	-0.1470	-4.0	0.8603
8	-0.5356	-0.44	0.6639	0.3160	4.0	0.8603
9	0.7020	0.69	0.5001	-0.6260	-6.0	0.7820
10	1.7308	1.55	0.1422	0.7470	28.0	0.1591
[-10:+10]	-3.5835	-1.28	0.2190	-3.1490	-21.0	0.2979
[-5:+5]	-2.5636	-1.00	0.3336	-2.0610	-19.0	0.3484
[-1:+1]	-2.4958**	-2.33	0.0341	-2.2660**	-38.0	0.0507
[0:+1]	-1.5041	-1.54	0.1450	-1.5790	-28.0	0.1591
[-10:-2]	-2.9778	-1.78	0.0955	-2.6600	-30.0	0.1297
[-5:-2]	-0.7516	-0.34	0.7422	-0.8040	-11.0	0.5966
[+2:+5]	0.6838	0.34	0.7367	-0.0920	0.0	1.0000
[+2:+10]	1.8902	1.02	0.3241	1.2170	15.0	0.4637

Table 8. Abnormal returns for various windows centered on the unlock days for non-escrow lockups of non-high-tech IPO firms

This table reports the mean and median daily abnormal returns (AR) for the 21 days centered on the lockup expiration dates (the event window) for the sample of 43 non-high-tech IPO firms with non-escrow lockups. The ARs are calculated using a dual beta single-factor market model that is estimated over the window of [-50: +125]. The table also reports the mean and median CARs for various multi-day periods based on the [-10: +10] event window. The mean and median values are tested using t- and Wilcoxon signed rank tests, respectively. *, ** and *** indicate statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

Day	Mean(%)	t-value	p-value	Median(%)	Wilcoxon	p-value
-10	0.6855	1.55	0.1296	0.0800	63.0	0.4533
-9	0.4373	1.07	0.2913	0.0700	48.0	0.5683
-8	0.4963	0.93	0.3566	0.0455	31.0	0.7128
-7	-0.1421	-0.26	0.7936	-0.2990	-48.0	0.5683
-6	0.3203	0.73	0.4689	0.0655	39.0	0.6432
-5	0.1378	0.28	0.7816	0.0960	36.0	0.6690
-4	-0.1599	-0.37	0.7115	-0.2170	-39.0	0.6432
-3	1.5664*	1.93	0.0602	0.3190*	147.0	0.0755
-2	-0.0191	-0.02	0.9826	-0.4960	-107.0	0.1999
-1	0.1456	0.33	0.7439	-0.1590	-54.0	0.5207
0	0.2780	0.47	0.6397	-0.1060	-37.5	0.6560
1	-0.3932	-0.45	0.6536	0.0070	44.0	0.6011
2	-0.2947	-0.57	0.5740	-0.1940	-63.0	0.4533
3	0.3923	0.78	0.4395	0.1260	50.0	0.5522
4	0.6981	1.10	0.2779	0.1570	49.0	0.5602
5	-0.9177*	-1.98	0.0546	-0.2910**	-168.0	0.0410
6	-0.1479	-0.32	0.7471	-0.0090	-17.5	0.8355
7	0.4503	1.10	0.2797	-0.0660	57.0	0.4977
8	-0.0373	-0.12	0.9072	0.0630	-18.0	0.8309
9	0.2359	0.39	0.6987	-0.2360	-51.0	0.5443
10	0.2362	0.54	0.5922	-0.0750	-41.0	0.6262
[-10:+10]	3.9682	1.56	0.1259	1.6665	112.0	0.1792
[-5:+5]	1.4336	0.56	0.5770	-0.5940	4.0	0.9622
[-1:+1]	0.0303	0.03	0.9777	-0.1950	-22.0	0.7940
[0:+1]	-0.1153	-0.11	0.9128	-0.0020	19.0	0.8216
[-10:-2]	3.3226	1.68	0.1013	1.4159	103.0	0.2175
[-5:-2]	1.5253	0.88	0.3822	0.3293	64.0	0.4461
[+2:+5]	-0.1220	-0.13	0.8945	-0.2780	-62.0	0.4606
[+2:+10]	0.6153	0.50	0.6190	-0.5200	5.0	0.9527

Table 9. Abnormal returns for various windows centered on the unlock days for escrow lockups of IPO firms

This table reports the mean and median daily abnormal returns (AR) for the 21 days centered on the lockup expiration dates (the event window) for the sample of 37 IPO firms with escrow lockups. The ARs are calculated using a dual beta single-factor market model that is estimated over the window of [-50: +125]. The table also reports the mean and median CARs for various multi-day periods based on the [-10: +10] event window. The mean and median values are tested using t- and Wilcoxon signed rank tests, respectively. *, ** and *** indicate statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

Day	Mean(%)	t-value	p-value	Median(%)	Wilcoxon	p-value
-10	-0.3418	-0.46	0.6472	-0.1870	-40.5	0.5485
-9	0.5984	0.81	0.4257	0.1160	27.5	0.6841
-8	-0.8689	-0.93	0.3562	-1.3140	-102.5	0.1235
-7	0.4996	0.62	0.5377	0.1480	43.5	0.5191
-6	-0.6349	-1.13	0.2661	-0.3140	-62.5	0.3528
-5	0.4432	0.48	0.6340	0.1260	-29.5	0.6624
-4	-1.2405*	-1.89	0.0673	-0.5160	-101.5	0.1273
-3	-0.7083	-1.42	0.1651	-0.1460	-83.5	0.2122
-2	0.6297	0.55	0.5887	0.0016	3.5	0.9587
-1	0.5192	0.75	0.4594	0.3340	69.5	0.3007
0	-0.1446	-0.12	0.9024	-0.2590	-57.5	0.3930
1	-0.2524	-0.41	0.6815	-0.0950	-32.5	0.6305
2	-1.2006**	-2.45	0.0192	-0.6740**	-158.5	0.0146
3	-0.5303	-0.79	0.4370	-0.0940	-33.5	0.6199
4	-0.8487*	-1.80	0.0801	-0.3210	-104.5	0.1161
5	-0.4133	-0.81	0.4226	-0.1060	-52.5	0.4359
6	-1.6462*	-1.91	0.0638	-0.0960	-84.5	0.2067
7	-0.5813	-0.79	0.4360	-0.3130	-102.5	0.1235
8	-0.0753	-0.11	0.9166	-0.1360	-60.5	0.3686
9	0.0195	0.03	0.9789	-0.2790	-52.5	0.4359
10	-0.1702	-0.22	0.8256	-0.5380	-86.5	0.1959
[-10:+10]	-6.9476**	-2.29	0.0277	-6.0040**	-156.5	0.0160
[-5:+5]	-3.7465*	-1.80	0.0797	-1.8400*	-121.5	0.0660
[-1:+1]	0.1222	0.08	0.9352	0.2900	3.5	0.9587
[0:+1]	-0.3970	-0.36	0.7230	-0.6210	-51.5	0.4447
[-10:-2]	-1.6235	-0.81	0.4234	-2.1260	-58.5	0.3848
[-5:-2]	-0.8759	-0.52	0.6038	-0.7730	-57.5	0.3930
[+2:+5]	-2.9929**	-2.71	0.0102	-1.4470**	-150.5	0.0210
[+2:+10]	-5.4463***	-3.53	0.0011	-2.3790***	-190.5	0.0027

Table 10. Abnormal returns for various windows centered on the unlock days for escrow lockups of high-tech IPO firms

This table reports the mean and median daily abnormal returns (AR) for the 21 days centered on the lockup expiration dates (the event window) for the sample of 13 high-tech IPO firms with escrow lockups. The ARs are calculated using a dual beta single-factor market model that is estimated over the window of [-50: +125]. The table also reports the mean and median CARs for various multi-day periods based on the [-10: +10] event window. The mean and median values are tested using t- and Wilcoxon signed rank tests, respectively. *, ** and *** indicate statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

Day	Mean(%)	t-value	p-value	Median(%)	Wilcoxon	p-value
-10	1.7951	1.34	0.2061	0.6950	13.5	0.3757
-9	2.0689	1.17	0.2638	0.5510	14.5	0.3396
-8	-0.5240	-0.32	0.7547	-1.3140	-10.5	0.4973
-7	0.9559	0.65	0.5256	0.0107	8.5	0.5879
-6	-0.4162	-0.39	0.7047	-0.5490	-7.5	0.6355
-5	0.6161	0.33	0.7435	-0.3860	-7.5	0.6355
-4	-1.9455*	-1.93	0.0781	-0.8550	-21.5	0.1465
-3	0.9337	-1.39	0.1909	-0.1860	-13.5	0.3757
-2	1.6262	0.93	0.3686	0.4960	10.5	0.4973
-1	-0.9840	-1.00	0.3368	-1.2480	-13.5	0.3757
0	-1.7834*	-1.95	0.0754	-1.6020*	-25.5	0.0803
1	-0.6578	-0.91	0.3802	-0.5550	-9.5	0.5417
2	-1.5704*	-1.79	0.0988	-0.9390*	-25.5	0.0803
3	-1.0518*	-1.96	0.0734	-0.8200*	-24.5	0.0942
4	-0.6444	-0.71	0.4921	-0.3210	-10.5	0.4973
5	-1.2580	-1.21	0.2503	0.0470	-11.5	0.4548
6	-1.4645	-1.72	0.1107	-0.3360	-20.5	0.1677
7	0.1235	0.09	0.9269	-0.7240	-9.5	0.5417
8	0.5017	0.29	0.7786	-0.1360	-5.5	0.7354
9	-0.2323	-0.15	0.8806	-1.0780	-10.5	0.4973
10	-1.0122	-1.18	0.2619	-1.1970	-13.5	0.3757
[-10:+10]	-6.7907	-1.36	0.1978	-4.5670	-15.5	0.3054
[-5:+5]	-8.5867**	-2.85	0.0147	-7.6620**	-34.5	0.0134
[-1:+1]	-3.4252**	-2.78	0.0166	-3.5780**	-31.5	0.0266
[0:+1]	-2.4412**	-2.38	0.0349	-2.5390**	-30.5	0.0327
[-10:-2]	3.2429	1.12	0.2851	5.2780	16.5	0.2734
[-5:-2]	-0.6368	-0.24	0.8128	-1.9300	-5.5	0.7354
[+2:+5]	-4.5246**	-2.88	0.0138	-3.9640**	-32.5	0.0215
[+2:+10]	-6.6083*	-2.15	0.0526	-6.2510*	-24.5	0.0942

Table 11. Abnormal returns for various windows centered on the unlock days for escrow lockups of non-high-tech IPO firms

This table reports the mean and median daily abnormal returns (AR) for the 21 days centered on the lockup expiration dates (the event window) for the sample of 24 non-high-tech IPO firms with escrow lockups. The ARs are calculated using a dual beta single-factor market model that is estimated over the window of [-50: +125]. The table also reports the mean and median CARs for various multi-day periods based on the [-10: +10] event window. The mean and median values are tested using t- and Wilcoxon signed rank tests, respectively. *, ** and *** indicate statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

Day	Mean(%)	t-value	p-value	Median(%)	Wilcoxon	p-value
-10	-1.4993*	-1.86	0.0755	-0.3360	-48.0	0.1753
-9	-0.1981	-0.32	0.7484	-0.1470	-5.0	0.8900
-8	-1.0557	-0.92	0.3680	-1.3490	-49.0	0.1661
-7	0.2524	0.26	0.7973	0.2845	13.0	0.7187
-6	-0.7534	-1.14	0.2654	-0.2800	-21.0	0.5597
-5	0.3496	0.33	0.7417	0.1900	1.0	0.9979
-4	-0.8586	-1.00	0.3277	-0.2010	-28.0	0.4354
-3	-0.5862	-0.85	0.4027	-0.1430	-31.0	0.3871
-2	0.0899	0.06	0.9535	-0.1550	-19.0	0.5980
-1	1.3333	1.48	0.1514	0.6420**	70.0	0.0428
0	0.7431	0.43	0.6704	-0.0260	8.0	0.8247
1	-0.0327	-0.04	0.9700	-0.0280	-3.0	0.9338
2	-1.0003	-1.68	0.1073	-0.5720*	-58.0	0.0981
3	-0.2477	-0.25	0.8072	0.2850	13.0	0.7187
4	-0.9594*	-1.75	0.0935	-0.3220	-53.0	0.1327
5	0.0443	0.08	0.9356	-0.1320	-16.0	0.6573
6	-1.7446	-1.39	0.1788	-0.0270	-20.0	0.5787
7	-0.9630	-1.07	0.2939	-0.1780	-48.0	0.1753
8	-0.3879	-0.65	0.5238	-0.2000	-29.0	0.4190
9	0.1559	0.20	0.8469	-0.1250	-9.0	0.8032
10	0.2858	0.26	0.7952	-0.3340	-32.0	0.3717
[-10:+10]	-7.0327*	-1.81	0.0835	-6.0670**	-74.0	0.0312
[-5:+5]	-1.1248	-0.43	0.6746	-0.9780	-15.0	0.6775
[-1:+1]	2.0437	0.96	0.3448	1.7200	54.0	0.1252
[0:+1]	0.7103	0.45	0.6593	0.0690	14.0	0.6980
[-10:-2]	-4.2595	-1.68	0.1075	-5.9830*	-67.0	0.0534
[-5:-2]	-1.0053	-0.46	0.6505	-0.5900	-29.0	0.4190
[+2:+5]	-2.1632	-1.47	0.1545	-1.0300	-41.0	0.2497
[+2:+10]	-4.8169**	-2.77	0.0108	-1.8200**	-82.0	0.0156

Table 12. The mean and median market betas around the lockup expiration dates

This table reports the mean and median betas and tests of their significance prior to the share lockup expiry dates for the non-escrow and constrained escrow samples of all, high-tech and non-high-tech IPO firms. The table also reports the mean and median changes in the betas on and after the lockup expiration dates and tests of their significance for these samples. The mean and median values are tested using t- and Wilcoxon signed rank tests, respectively. *, ** and *** indicate statistical significance at the 0.10, 0.05 and 0.01 levels, respectively.

Coefficient	Mean	t-value	p-value	Median	Wilcoxon	p-value
Panel A: Non-escrow sample of 59IPO firms						
β_{1i}	0.6296***	7.86	<0.0001	0.5915***	797.0	<0.0001
β_{2i}	-0.0933	-1.10	0.2761	-0.2327	-192.0	0.1488
Panel B: Non-escrow sub-sample of 16 high-tech IPO firms						
β_{1i}	0.5535***	3.17	0.0063	0.5079**	48.0	0.0110
β_{2i}	0.0783	0.53	0.6057	0.0078	4.0	0.8603
Panel C: Non-escrow sub-sample of 43 non-high-tech IPO firms						
β_{1i}	0.6579***	7.34	<0.0001	0.5915***	464.0	<0.0001
β_{2i}	-0.1572	-1.54	0.1301	-0.2562*	-149.0	0.0715
Panel D: Constrained escrow sample of 37 IPO firms						
β_{1i}	0.5475***	3.83	0.0005	0.3149***	256.5	<0.0001
β_{2i}	-0.1001	-0.64	0.5246	-0.0089	8.5	0.9000
Panel E: Constrained escrow sub-sample of 13 high-tech IPO firms						
β_{1i}	0.6276***	3.47	0.0046	0.7407***	38.5	0.0046
β_{2i}	0.1290	0.74	0.4741	-0.0089	8.5	0.5879
Panel F: Constrained escrow sub-sample of 24 non-high-tech firms						
β_{1i}	0.5041**	2.52	0.0189	0.2099***	94.0	0.0046
β_{2i}	-0.2242	-1.02	0.3170	0.0582	-14.0	0.6980

Table 13. Pearson correlation coefficients for various pairs of dependent and explanatory variables for constrained escrow lockups

This table reports the Pearson correlations for various pairs of variables (dependent and explanatory) used in regression (8.1) for 37 firms in the constrained escrow sample. The correlations between Lockup Length and the other variables are reported in the upper diagonal cells, while those between Log LockupLength and the other variables are reported in the lower diagonal cells. The diagonal cells are bolded to provide for a better separation between these values. *, ** and *** represent significance at 0.10, 0.05 and 0.01 levels, respectively.

	CAR [-1:+1]	CAR [0: +1]	Lockup %	Log size	Book runner reputation	High-tech firm	Dual-class firm	SEO-issuing firm	Lockup Length
CAR[-1:+1]	**1.0000**	0.8986***	-0.0757	-0.0406	-0.2135	-0.2916*	0.1995	-0.1366	-0.1241
CAR[0:+1]		**1.0000**	0.0605	-0.1085	-0.1288	-0.2257	0.1219	-0.0274	-0.0927
Lockup %			**1.0000**	0.2588	0.3600	0.0078	-0.0758	0.2654	0.2031
Log size				**1.0000**	0.5735**	-0.2338	0.3524**	0.0489	0.1006
Book runner reputation					**1.0000**	-0.1106	0.1383	0.7588*	0.6231**
High-tech firm						**1.0000**	-0.2853*	0.3367**	0.0116
Dual-class firm							**1.0000**	-0.1237	0.2293
SEO-issuing firm								**1.0000**	0.1949
Log Lockup Length	-0.1069	-0.0759	0.2238	0.1356	0.5608**	0.0207	0.2440	0.1881	**1.0000**

Table 14. The relation between firm transparency and cumulative abnormal returns around lockup expiration days for the non-escrow sample

This table reports tests of the relationship between the transparency variables and the cumulative abnormal returns (CARs) around lockup expiration days for 59 firms in the non-escrow sample. The dependent variable is the CARs for the event window [-1:+1] in column (1) and [0:+1] in column (2). * and ** indicate significance at the 0.10 and 0.05 levels, respectively.

Variables	Coefficient Estimates with T-values in the Parentheses							
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Constant	-0.0277 (-0.66)	-0.0272 (-0.83)	0.0029 (0.07)	0.0040 (0.10)	-0.0065 (-0.60)	-0.0073 (-0.69)	0.0136 (1.07)	0.0091 (0.91)
Log (size)	0.0040 (0.96)	0.0035 (1.08)	-0.0002 (-0.04)	-0.0003 (-0.09)				
Book runner reputation	-0.1088 (-1.41)	-0.0879 (-1.46)					-0.0663 (-0.96)	-0.0494 (-0.91)
Dummy (high-tech)	-0.0688*** (-3.48)	-0.0561*** (-3.63)	-0.0525*** (-2.93)	-0.0435** (-2.51)	-0.0520*** (-2.94)	-0.0428** (-2.50)	-0.0712*** (-3.64)	-0.0582*** (-3.78)
Dummy (dual class after IPO)	-0.0355 (-1.28)	-0.0678*** (-3.13)	-0.0333 (-1.48)	-0.0337 (-1.55)			-0.0395 (-1.44)	-0.0715*** (-3.32)
Dummy (SEO)	0.0110 (0.63)	0.0107 (0.78)	0.0285* (1.70)	0.0284* (1.75)	0.0345** (2.16)	0.0344** (2.22)		
Adjusted R^2	0.2274	0.3566	0.1499	0.1278	0.1468	0.1212	0.2366	0.3556
F-value	3.53**	5.77***	3.56**	3.12**	5.99***	5.00**	5.44***	8.91***
DF	38	38	54	54	56	56	40	40
N	44	44	59	59	59	59	44	44

Table 15. The relation between firm transparency and cumulative abnormal returns around lockup expiration days for the constrained escrow sample

This table reports tests of the relationship between the transparency variables and cumulative abnormal returns (CARs) around lockup expiration days for the 37 firms in the constrained escrow sample. The dependent variable is the CARs in the event window [-1:+1] in columns (1) and [0:+1] in columns (2).

Variables	Coefficient Estimates with T-values in the Parentheses							
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Constant	-0.0327 (-0.17)	0.0388 (0.26)	0.1132 (1.02)	0.1017 (1.22)	0.0222 (1.14)	0.0055 (0.37)	0.0401 (1.01)	0.0085 (0.26)
Log (size)	0.0085 (0.39)	-0.0037 (-0.22)	-0.0102 (-0.92)	-0.0102 (-1.22)				
Book runner reputation	-0.0450 (-0.10)	0.2060 (0.59)					-0.1857 (-0.80)	-0.0852 (-0.45)
Dummy (high-tech)	-0.0598 (-0.91)	-0.0090 (-0.17)	-0.0516 (-1.48)	-0.0377 (-1.44)	-0.0520 (-1.59)	-0.0341 (-1.38)	-0.0596 (-1.02)	-0.0168 (-0.35)
Dummy (dual class after IPO)	-0.0611 (-0.40)	-0.0099 (-0.08)	0.0372 (0.98)	0.0210 (0.73)			0.0013 (0.01)	0.0114 (0.14)
Dummy (SEO)	-0.0749 (-0.62)	-0.0874 (-0.92)	-0.0026 (-0.08)	0.0130 (0.51)	-0.0083 (-0.25)	0.0078 (0.31)		
Adjusted R^2	-0.3740	-0.4385	0.0150	-0.0134	0.0329	-0.0021	-0.1362	-0.2879
F-value	0.35	0.27	1.14	0.88	1.61	0.96	0.52	0.11
DF	7	7	32	32	34	34	9	9
N	13	13	37	37	37	37	13	13

Table 16. Mean and median abnormal volume ratios for the days in the event window [-10:10] centered on the unlock days for lockups for IPOs in the non-escrow sample

This table reports the mean and median abnormal volume ratios and tests of their significance for each day in the event window [-10: +10] for 59 firms in the non-escrow IPO sample. The benchmark used is each IPO's mean volume for the period [-50:-11 ; +11:+125]. ***, ** and * represent significance at 0.01, 0.05 and 0.10 levels, respectively.

Day	Mean	t-value	p-value	Median	Wilcoxon	p-value
-10	4.5747	0.93	0.3548	-0.5725***	-482.0	0.0001
-9	-0.3261**	-2.10	0.0397	-0.6790***	-590.0	<0.0001
-8	-0.3728***	-2.68	0.0095	-0.7150***	-579.0	<0.0001
-7	1.1286	1.25	0.2178	-0.6226**	-266.0	0.0437
-6	-0.3509**	-2.34	0.0229	-0.7366***	-589.0	<0.0001
-5	-0.2060	-1.02	0.3116	-0.7188***	-571.0	<0.0001
-4	-0.3167**	-2.11	0.0391	-0.6312***	-622.0	<0.0001
-3	-0.1299	-0.78	0.4370	-0.6488***	-371.0	0.0042
-2	-0.2445	-1.43	0.1575	-0.6765***	-525.0	<0.0001
-1	-0.2786*	-1.76	0.0835	-0.7306***	-494.0	<0.0001
0	-0.0455	-0.16	0.8748	-0.7464***	-512.0	<0.0001
1	0.2857	0.92	0.3598	-0.5549**	-302.0	0.0213
2	0.1695	0.49	0.6288	-0.6747***	-356.0	0.0061
3	-0.0907	-0.50	0.6179	-0.5702**	-323.0	0.0135
4	0.8989	1.03	0.3067	-0.4005**	-283.0	0.0314
5	-0.4328***	-4.89	<.0001	-0.6523***	-633.0	<0.0001
6	0.3694	1.09	0.2798	-0.6295	-71.0	0.5963
7	-0.0438	-0.18	0.8539	-0.6165***	-399.0	0.0019
8	-0.1902	-1.26	0.2143	-0.6585***	-434.0	0.0007
9	0.1453	0.51	0.6095	-0.5028**	-308.0	0.0187
10	-0.0641	-0.27	0.7884	-0.5985***	-356.0	0.0061

Note: $AbnormalVolumeRatio_{ij} = \frac{Volume_{ij} - MeanVolume_i[-50:-11;+11:+125]}{MeanVolume_i[-50:-11;+11:+125]}$, where i refers to firm i in the non-escrow sample, and j refers to day j in the event window [-10:+10].

Table 17. Mean and median abnormal volume ratios for the days in the event window [-10: 10] centered on the unlock days for lockups for IPOs in the constrained escrow sample

This table reports the mean and median abnormal volume ratios and tests of their significance for each day in the event window [-10: +10] for the 37 firms in the constrained escrow IPO sample. The benchmark used is each IPO's mean volume for the period [-50:-11 ; +11:+125]. ***, ** and * represent significance at 0.01, 0.05 and 0.10 levels, respectively.

Day	Mean	t-value	p-value	Median	Wilcoxon	p-value
-10	-0.6581***	-9.14	<.0001	-0.8661***	-323.5	<0.0001
-9	0.2054	0.42	0.6801	-0.7755***	-192.5	0.0024
-8	-0.1930	-1.11	0.2749	-0.6493	-84.5	0.2066
-7	0.0571	0.14	0.8863	-0.7562**	-142.5	0.0295
-6	-0.3254	-1.29	0.2067	-0.9046***	-258.5	<0.0001
-5	-0.0677	-0.23	0.8230	-0.8244**	-149.5	0.0218
-4	-0.4634***	-3.69	0.0007	-0.7693***	-260.5	<0.0001
-3	0.2189	0.26	0.7975	-0.7855***	-282.5	<0.0001
-2	-0.0661	-0.14	0.8916	-0.8493***	-234.5	0.0001
-1	-0.2797	-1.21	0.2331	-0.7386***	-230.5	0.0002
0	-0.3687**	-2.62	0.0129	-0.7867***	-203.5	0.0012
1	-0.4859***	-4.39	<.0001	-0.7865***	-235.5	0.0001
2	-0.2119	-0.57	0.5695	-0.7436***	-269.5	<0.0001
3	0.2983	0.41	0.6842	-0.8909***	-240.5	<0.0001
4	-0.6248***	-6.94	<.0001	-0.8856***	-288.5	<0.0001
5	-0.4088**	-2.24	0.0312	-0.8755***	-224.5	0.0003
6	0.0118	0.02	0.9820	-0.8212***	-265.5	<0.0001
7	-0.2006	-0.82	0.4184	-0.7865***	-166.5	0.0100
8	-0.2315	-0.77	0.4437	-0.8154***	-227.5	0.0002
9	-0.1657	-0.67	0.5053	-0.8167**	-152.5	0.0191
10	2.0796	1.42	0.1640	-0.7471	-83.5	0.2122

Note: $AbnormalVolumeRatio_{ij} = \dfrac{Volume_{ij} - MeanVolume_i[-50:-11;+11:+125]}{MeanVolume_i[-50:-11;+11:+125]}$, where i refers to firm i in the non-escrow sample, and j refers to day j in the event window [-10:+10].

Table 18. Mean and median abnormal absolute spread ratios for the days in the event window [-10: 10] centered on the unlock days for lockups for IPOs in the non-escrow sample

This table reports the mean and median abnormal absolute spread ratios and tests of their significance for each day in the event window [-10: +10] for the 59 firms in the non-escrow IPO sample. The benchmark used is each IPO's mean absolute spread for the period [-50:-11 ; +11:+125]. ***, ** and * represent significance at 0.01, 0.05 and 0.10 levels, respectively.

Day	Mean	t-value	p-value	Median	Wilcoxon	p-value
-10	-0.0671	-0.98	0.3293	-0.1465	-182.0	0.1716
-9	-0.0350	-0.40	0.6934	-0.1152**	-261.0	0.0479
-8	-0.0156	-0.17	0.8660	-0.1185	-164.0	0.2187
-7	-0.0310	-0.38	0.7073	-0.1689*	-253.0	0.0554
-6	-0.0515	-0.76	0.4482	-0.1185	-207.0	0.1190
-5	0.0330	0.38	0.7047	-0.1451	-153.0	0.2515
-4	-0.0646	-0.90	0.3736	-0.1639	-164.0	0.2187
-3	-0.0505	-0.72	0.4769	-0.1525	-204.0	0.1246
-2	0.0283	0.30	0.7624	-0.1121	-107.0	0.4240
-1	-0.0533	-0.76	0.4529	-0.1211	-216.0	0.1035
0	-0.0027	-0.03	0.9744	-0.1966	-124.0	0.3537
1	0.0008	0.01	0.9924	-0.1649	-144.0	0.2808
2	-0.0319	-0.45	0.6549	-0.1137	-189.0	0.1554
3	0.0065	0.07	0.9422	-0.1373	-106.0	0.4283
4	0.0129	0.16	0.8752	-0.0382	-108.0	0.4196
5	0:1756*	1.94	0.0573	0.0041	156.0	0.2423
6	0.0195	0.26	0.7954	0.0385	-54.0	0.6872
7	-0.0528	-0.81	0.4188	-0.1376	-189.0	0.1554
8	-0.0529	-0.67	0.5055	-0.1465	-151.0	0.2579
9	0.0701	0.45	0.6548	-0.1894	-189.0	0.1554
10	0.0454	0.53	0.5991	-0.1250	-85.0	0.5258

Note: $AbnormalAbsoluteSpreadRatio_{ij} = \frac{AbsoluteSpread_{ij} - MeanAbsoluteSpread_i[-50,-11;+11,+125]}{MeanAbsoluteSpread_i[-50,-11;+11,+125]}$, where $AbsoluteSpread_{ij} = Askprice_{ij} - Bidprice_{ij}$, and i refers to IPO i in the non-escrow sample, and j refers to day j in the event window [-10: +10].

Table 19. Mean and median abnormal relative spread ratios for the days in the event window [-10: 10] centered on the unlock days for lockups for IPOs in the non-escrow sample

This table reports the mean and median abnormal relative spread ratios and tests of their significance for each day in the event window [-10: +10] for 59 IPOs in the non-escrow sample. The benchmark used is each IPO's mean relative spread for the period [-50:-11 ; +11:+125]. ***, ** and * represent significance at 0.01, 0.05 and 0.10 levels, respectively.

Day	Mean	t-value	p-value	Median	Wilcoxon	p-value
-10	-0.1254**	-2.22	0.0302	-0.1379**	-316.0	0.0157
-9	-0.0763	-0.97	0.3346	-0.1522**	-276.0	0.0361
-8	-0.0636	-0.92	0.3639	-0.1723	-201.0	0.1304
-7	-0.0563	-0.72	0.4749	-0.2141**	-281.0	0.0327
-6	-0.0844	-1.28	0.2047	-0.1615**	-289.0	0.0279
-5	0.0445	0.44	0.6621	-0.1754	-178.0	0.1813
-4	-0.0665	-0.87	0.3877	-0.1849	-165.0	0.2158
-3	-0.0970	-1.43	0.1569	-0.1868**	-314.0	0.0165
-2	-0.0170	-0.18	0.8582	-0.1707	-186.0	0.1622
-1	-0.0761	-1.01	0.3176	-0.1660**	-296.0	0.0242
0	-0.0168	-0.18	0.8608	-0.2846	-203.0	0.1265
1	-0.0213	-0.21	0.8312	-0.2070	-217.0	0.1019
2	-0.0699	-1.00	0.3202	-0.1300*	-243.0	0.0661
3	-0.0372	-0.42	0.6785	-0.1738	-173.0	0.1941
4	-0.0179	-0.21	0.831	-0.1738	-192.0	0.1488
5	0.1387	1.58	0.1192	0.0160	118.0	0.3776
6	-0.0257	-0.35	0.7285	-0.1281	-146.0	0.2741
7	-0.0756	-1.08	0.2826	-0.2068*	-235.0	0.0759
8	-0.0832	-1.06	0.2932	-0.2008*	-219.0	0.0987
9	0.0182	0.12	0.9031	-0.2369**	-271.0	0.0397
10	-0.0056	-0.07	0.9457	-0.1584	-154.0	0.2484

Note: $Abnormal\,\mathrm{Re}lativeSpreadRatio_{ij} = \dfrac{\mathrm{Re}lativeSpread_{ij} - Mean\,\mathrm{Re}lativeSpread_i[-50,-11;+11,+125]}{Mean\,\mathrm{Re}lativeSpread_i[-50,-11;+11,+125]}$, where $RelativeSpread_{ij} = \left(Askprice_{ij} - Bidprice_{ij}\right)/\left(0.5\left(Askprice_{ij} + Bidprice_{ij}\right)\right)$, and i refers to IPO i in the non-escrow sample, and j refers to day j in the event window [-10: +10].

Table 20. Mean and median abnormal absolute spread ratios for the days in the event window [-10: 10] centered on the unlock days for lockups for IPOs in the constrained escrow sample

This table reports the mean and median abnormal absolute spread ratios and tests of their significance for each day in the event window [-10: +10] for the 37 firms in the constrained escrow IPO sample. The benchmark used is each IPO's mean absolute spread for the period [-50:-11 ; +11:+125]. ***, ** and * represent significance at 0.01, 0.05 and 0.10 levels, respectively.

Day	Mean	t-value	p-value	Median	Wilcoxon	p-value
-10	0.0488	0.43	0.6692	-0.0466	-43.5	0.5191
-9	0.0341	0.43	0.6699	-0.0088	17.5	0.7958
-8	0.0847	0.71	0.4837	-0.1006	-1.5	0.9823
-7	0.2820	1.48	0.1489	0.0864	58.5	0.3848
-6	0.3780**	2.23	0.0321	0.2390	100.5	0.1313
-5	0.0397	0.34	0.7332	-0.0699	-17.5	0.7958
-4	0.2196**	2.34	0.0251	0.1848**	135.5	0.0391
-3	0.1907	1.61	0.1157	0.0771	73.5	0.2733
-2	0.1844*	1.74	0.0903	0.1734	99.5	0.1353
-1	0.2290*	1.69	0.0994	-0.1513	78.5	0.2415
0	0.1630	1.36	0.1836	-0.0146	28.5	0.6732
1	-0.1551	-1.58	0.1236	-0.3239*	-128.5	0.0512
2	0.0649	0.65	0.5205	-0.0143	10.5	0.8767
3	0.0171	0.16	0.8747	-0.0341	-35.5	0.5991
4	0.3096	1.32	0.194	0.1349	76.5	0.2539
5	0.1006	1.14	0.2637	-0.0058	42.5	0.5288
6	0.0662	0.49	0.6284	-0.1513	-23.5	0.7282
7	-0.0148	-0.17	0.8694	-0.0699	-34.5	0.6095
8	0.0902	0.81	0.4224	0.0258	10.5	0.8767
9	0.2209	1.54	0.1331	0.0258	60.5	0.3686
10	0.0019	0.02	0.9848	-0.1114	-37.5	0.5786

Note: $AbnormalAbsoluteSpreadRatio_{ij} = \frac{AbsoluteSpread_{ij} - MeanAbsoluteSpread_i[-50,-11;+11,+125]}{MeanAbsoluteSpread_i[-50,-11;+11,+125]}$, where $AbsoluteSpread_{ij} = Askprice_{ij} - Bidprice_{ij}$, and *i* refers to IPO *i* in the non-escrow sample, and *j* refers to day *j* in the event window [-10: +10].

Table 21. Mean and median abnormal relative spread ratios for the days in the event window [-10: 10] centered on the unlock days for escrow lockups for IPOs in the constrained escrow sample

This table reports the mean and median abnormal relative spread ratios and tests of their significance for each day in the event window [-10: +10] for the 37 firms in the constrained escrow IPO sample. The benchmark used is each IPO's mean absolute spread for the period [-50:-11 ; +11:+125]. *** ** and * represent significance at 0.01, 0.05 and 0.1 levels, respectively

Day	Mean	t-value	p-value	Median	Wilcoxon	p-value
-10	0.0084	0.06	0.9495	-0.2348	-98.5	0.1394
-9	-0.0331	-0.42	0.6782	-0.1168	-42.5	0.5288
-8	0.0486	0.36	0.7203	-0.1243	-57.5	0.3930
-7	0.1647	1.11	0.2761	-0.1124	11.5	0.8650
-6	0.3171*	1.8	0.0806	0.1274	54.5	0.4184
-5	-0.0019	-0.02	0.9879	-0.1168	-52.5	0.4359
-4	0.1325	1.43	0.1608	0.0380	56.5	0.4014
-3	0.1016	1.05	0.3021	-0.0248	35.5	0.5991
-2	0.0802	0.9	0.3736	0.0117	31.5	0.6411
-1	0.1359	1	0.3235	-0.1168	11.5	0.8650
0	0.0719	0.65	0.5173	-0.1880	-23.5	0.7282
1	-0.1969**	-2.07	0.0462	-0.3480**	-148.5	0.0229
2	0.0660	0.55	0.5844	-0.0877	-21.5	0.7505
3	0.0020	0.02	0.9859	-0.0838	-45.5	0.5000
4	0.3537	1.32	0.1949	-0.0499	44.5	0.5095
5	0.1023	0.99	0.3281	0.0199	29.5	0.6624
6	0.0507	0.36	0.7194	-0.2308	-39.5	0.5585
7	-0.0319	-0.34	0.7351	-0.1189	-65.5	0.3298
8	0.0541	0.53	0.5962	-0.0656	10.5	0.8767
9	0.2352	1.63	0.1113	-0.0369	53.5	0.4271
10	-0.0024	-0.02	0.9802	-0.0986	-45.5	0.5000

Note: $Abnormal\,\mathrm{Re}lativeSpreadRatio_{ij} = \dfrac{\mathrm{Re}lativeSpread_{ij} - Mean\,\mathrm{Re}lativeSpread_i[-50,-11;+11,+125]}{Mean\,\mathrm{Re}lativeSpread_i[-50,-11;+11,+125]}$, where $RelativeSpread_{ij} = \left(Askprice_{ij} - Bidprice_{ij}\right)/\left(0.5\left(Askprice_{ij} + Bidprice_{ij}\right)\right)$, and i refers to IPO i in the non-escrow sample, and j refers to day j in the event window [-10; +10].

Appendix 1. The relationship between IPO pricing and lockup existence and length

This appendix table reports the relationship between initial IPO pricing and lockup existence and length. In Panel A, D_1 is equal to 1 if lockup information is reported in the prospectus, and is 0 otherwise. In Panel B, D_1 is equal to 1 if the lockup length is longer than 0, and is 0 otherwise. In Panel C, D_1 is equal to 1 if the non-escrow lockup length is longer than 0, and is 0 otherwise; and D_2 is equal to 1 if the escrow lockup length is longer than 0, and is 0 otherwise. In the three panels, *Return1* is equal to *(1st dayOpenPrice-IssuePrice)/ IssuePrice*, and *Return2* is equal to *(1st day ClosePrice-IssuePrice)/IssuePrice*. The results of coefficient tests of joint parameters are also reported in each panel. *, ** and *** represent significance at 0.1, 0.05 and 0.01 levels, respectively.

Panel A	Test of IPO underpricing and the existence of lockups					
	Return1			Return2		
Variable	Estimate	t-value	p-value	Estimate	t-value	p-value
Intercept	0.0603	1.93*	0.0565	0.0553	1.57	0.1187
D1	-0.0082	-0.24	0.8112	0.0064	0.16	0.8700
R-square	-0.0099			-0.0102		
F-value	0.06			0.03		
N; DF	97; 95			97; 95		

Panel B	Test of IPO underpricing and the length of lockups					
	Return1			Return2		
Variable	Estimate	t-value	p-value	Estimate	t-value	p-value
Intercept	0.0613	2.07**	0.0409	0.0531	1.60	0.1131
D1	-0.0096	-0.29	0.7711	0.0092	0.25	0.8037
R-square	-0.0096			-0.0099		
F-value	0.09			0.06		
N; DF	97; 95			97; 95		

Panel C	Test of IPO underpricing and the length of two types of lockups, respectively					
	Return1			Return2		
Variable	Estimate	t-value	p-value	Estimate	t-value	p-value
Intercept	0.0685	2.76***	0.0069	0.0678	2.43***	0.0171
D1	-0.0346	-1.28	0.2048	-0.0280	-0.92	0.3606
D2	0.0156	0.58	0.5662	0.0249	0.82	0.4155
R-square	0.0031			-0.0017		
F-value	1.15			0.92		
N; DF	97; 94			97; 94		