The Journal of Small Business Innovation 2016 19(4), pp. 41-52

The Association between Underwriter Lockup and KOSDAQ IPO Initial Returns

by Jong-Ryong Lee*

This paper examines the effect of unique underwriter lockup on the initial returns of an initial public offering (IPO) in the Korean Securities Dealers Automated Quotation (KOSDAQ). Underwriter lockup induces underwriters to underprice IPOs and stabilize aftermarket prices. The inducement is explored with respects to the mixtures of distributions of the initial returns consistent with underpricing and stabilization. Whether the inducement is meaningful when other factors are controlled is also explored. These explorations provide evidence that underwriter lockup leads to more positive average initial returns in the three aftermarket months.

Keywords : *Initial Public Offering (IPO), Underwriter Lockup, Initial Returns, Mixture of Distributions, Underpricingand Stabilization*

Ⅰ. Introduction

This paper examines the open question of how a unique regulation imposed on underwriters of an initial public offering (IPO) listed in the Korean Securities Dealers Automated Quotation (KOSDAQ) affects the initial returns. KOSDAQ is one board of the Korea Exchange (KRX) where the stocks of small and medium-sized firms and venture enterprises are listed. To list an IPO of small and middle-sized firms in the KOSDAQ from 2013, the underwriters are regulated to allocate some shares to themselves at the issuing price and to hold the shares in the three aftermarket months. The unique regulation that locks up the share allocated for the period is named with underwriter lockup and is examined to work in the paper.

IPO lockups in financial markets are grouped into mandatory regulations and voluntary contracts. The voluntariness differs across markets and shareholders. US lockups are voluntary, very standardized and relatively short (Brav and Gompers, 2003; Field and Hanka, 2001), however, UK lockups are often mandatory, have different expiration dates, and last longer than US ones (Goergen, Renneboog, and Khurshed, 2006). The KOSDAQ regulates the managing shareholders of an IPO as primary insiders to hold their shares for one year (Byun and Cho, 2011; Yon and Park, 2002). Some ven-

* Associate Professor, Department of Business Administration, College of Business Administration (e-mail: leejr@kangwon.ac.kr)

ture capitalists voluntarily lock up their shares for a few aftermarket months. A certain number of the shares newly listed are also locked up. The shares newly issued are distributed into three groups: employees, retail investors, and institutional investors. Employees are restricted to sell the shares initially distributed for one year by a mandatory regulation. Retail investors purchase roughly 20% of the shares as financial instruments for subscription saving deposits. Institutional investors voluntarily agree to lock up the shares distributed for some aftermarket months. However, these kinds of lockups in the KOSDAQ have not been applied to underwriters before the introduction of underwriter lockup in 2013. Underwriter lockup requires the underwriters of an IPO to allocate shares to themselves initially at the issuing price and to hold the shares allocated during the three aftermarket months. The regulation could influence the initial returns in the aftermarket months.

It is well known that the initial returns of an IPO as calculated with the closing prices at the aftermarket dates over the issuing price at the issue date have been positive on average in many financial markets. The positivity has been explained by different stories and examined in many ways. Stories are roughly divided into two talks based on the consideration of the issuing price and the closing prices. The one talk is related to the underpricing of an IPO at the issuing date resulting from the existence of informational asymmetry among issuers, underwriters, and investors (i.e., Beatty and Ritter, 1986; Benveniste and Spindt, 1989; Hanley and Hoberg, 2016; Hanley, 1993; Rock, 1986). The other is linked to the stabilization activities at the aftermarket dates (i.e., Aggarwal, 2000; Cook, Kieschnick, and Ness, 2006; Corwin, Harris, and Lipson, 2004; Hanley, Kumar, and Seguin, 1993; Ruud, 1993). Both have some explanatory power on the average positive initial returns (Asquith, Jones, and Kieschnick, 1998; Chowdhry and Nanda, 1996; Sopranzetti, Venezian, and Wang, 2006).

From the abolition of put back option of an IPO as a regulation to protect the initial retail investors from down side risk, the initial returns of IPOs in the KOSDAQ have been often negative. The negativity means that the retail investors holding the shares that were initially distributed as financial instrument for subscription saving deposits ended up losing their money so as to lose interest in the investment of IPOs. Repeatedly negative initial returns could discourage investors not to participate in a secondary market. To encourage investors to participate in the depressed KOSDAQ and reactivate it, it is necessary for initial returns to become positive on average. This paper investigates the relation between the positivity and the introduction of the underwriter lockup.

This paper examines whether underwriter lockup affects the initial returns of IPOs in the KOSDAQ. The initial returns in the aftermarket months are measured with the closing prices at the 21st, 42nd, and 63rd aftermarket dates over the issuing price to avoid the effect of market microstructure like Lowry, Officer, and Schwert (2010) and to consider institutional investor lockups whose expiration dates are typically one, two, and three aftermarket months. The examination is replaced with estimations of the distributions consistent with stabilization and underpricing (Asquith et al., 1998; Sopranzetti et al., 2006). The measurement of initial returns is one of major differences between the paper and Asquith et al. (1998) and Sopranzetti et al. (2006). The other major difference is that the paper examines the effect of underwriter lockup on initial returns in stabilization at ex post as well as in underpricing at ex ante.

The paper analyzes the initial returns of IPOs listed in the KOSDAQ after the 2008 financial crisis and reports as follows. First of all, the average initial returns in the three aftermarket months significantly increase by underwriter lockup in underpricing as well as in stabilization. Second, underwriter lockup influences initial returns in underpricing and in stabilization even when controlling

for firm-specific, deal-specific, and market-specific factors. These imply that underwriter lockup works as a generator of the positive average initial returns with respects to underpricing and stabilization.

The rest of this paper is organized as follows. Section II briefly presents the institutional background of the paper, describes the data of IPOs listed in the KOSDAQ, and provides summary statistics of initial returns and variables. Section III presents results from a mixture of normal regressions models as well as parameter estimates of the distributions. Section IV concludes the paper.

Ⅱ. Data and Summary Statistics

The section introduce sunder writer lockup in KOSDAQ IPO underwriting, the data of IPOs used for the goal of this paper, and provides a summary statistics of initial returns and variables in the paper.

2.1 Institutional Background

This subsection briefly presents the institutional background and questions related to the underwriter lockup in the KOSDAQ. Before the 2008 financial crisis, the underwriters of an IPO in Korea had an obligation to buy back the shares allocated to the retail investors when the stock is traded at prices lower than the issuing price in the one aftermarket month. The obligation was named as a put back option (Choi, 2011; Lee, 2012; Shin, 2010). The put back option imposed a burden on the underwriters of an IPO to expose the downside risk. To lessen the burden, the underwriters were inclined to underprice the IPO at the issuing date. The inclination was reduced by the abolishment of the put back option in 2007. After the abolishment, IPOs listed in the KOSDAQ were inclined to be overpriced moreover, Korea's IPO market has become depressed due to the 2008 financial crisis.

The KOSDAQ newly introduced underwriter lockup in mid-2013. The consequence was that the underwriters of an IPO issued by small and middle-sized Korean firms have to buy the shares at the issuing price and hold the shares allocated during the lockup period. The shares amount to 3% of the IPOs at the issuing price or the amount equivalent to KRW 1 billion and the lockup period amounts to three aftermarket months. Underwriter lockup mandates that the underwriters are exposed to the potential losses resulting from the overpricing and the failure of stabilization. The exposure could influence underwriters to underprice IPOs and stabilize aftermarket prices, which would lead to positive initial returns. It is debatable whether underwriter lockup works as a generator of positive average initial returns to tempt investors to participate in the primary and secondary markets of the KOSDAQ. It is also debatable whether underwriter lockup reactivates the markets that have been depressed as a result of the 2008 financial crisis. To answer these questions is the goals of this paper.

2.2 Data and Summary Statistics

In consideration of the institutional background, the paper selected a sample of IPOs listed by nonbanking Korean firms in the KOSDAQ from 2009 to 2014.The sample consists of firm commitment offerings. Information related to the IPOs such as the issuing prices was hand-collected from the prospectuses for analyzing the effect of underwriter lockup on the initial returns. The initial returns were defined with the excess returns of the closing prices at the aftermarket dates. On the closing prices, information was obtained from the commercial data base of KIS-Value.

It is well known that the initial returns have been affected by several factors including regulations related to the IPO underwriting business. These several factors can be classified into three groups: firm-specific, deal-specific, and market-specific factors. The paper applies the main factors affecting the initial returns of IPOs in Korea (i.e., Byun and Cho, 2011; Cho, Lee, and Jang,

2015; Choi, 2011; Lee, 2012; Lee and Kim, 2014; Lee and Song, 2013; Shin, 2010; Yon and Park, 2002) to examine the ones obtained from the sample. As a firm-specific factor, IPOs issued by venture firms (VF) are on average underpriced to escape market failure risk from the existence of informational asymmetry between the issuing firms and investors (Megginson and Weiss, 1991). The VF of an IPO is assigned a score of 1 if the IPO is issued by a venture firm; otherwise, the VF is assigned a score of 0. The existence of informational asymmetry between issuing firms and underwriters also influences the underpricing (Beatty and Ritter, 1986). The underpricing might become reduced as the underwritten amount grows larger. As deal-specific factors, the logarithm value of the amount of each IPO as the issuing price multiplied by the shares is defined with Log Proceed. Investors are inclined to place a high trust in reputable underwriters to price an IPO so that reputable underwriters have the incentive to reduce the underpricing (Booth and Smith, 1986; Carter, Dark, and Singh, 1998). The reputation of each IPO is ranked in the total proceeds of IPOs underwritten by the lead underwriter in the IPOs of the paper (Carter et al., 1998; Lee, 2012). Underwriters collecting information on an IPO through the book-building method are inclined to adjust the issuing price partially so that the initial returns are affected by the partial adjustment (Benveniste and Spindt, 1989). The partial adjustment for each IPO is measured with the excess return of the issuing price over the mid-price of the price band (Hanley, 1993). Investor sentiments also influence the performance (Cornelli, Goldreich, and Ljungqvist, 2006; Griffin, Harris, Shu, and Topaloglu, 2011; Kaustia and Knüpfer, 2008). In the KOSDAQ, retail investors, as one group of main investors, cannot submit their orders at the book- building event of an IPO rather, only institutional investors can participate in the book- building event. After the book-building event, the lead underwriter sets up and announces the issuing price at the subscription date to the public to collect the orders from the group of investors including retail investors. After the collection, the underwriters distribute the shares of an IPO to the groups. The shares distributed to the employees of the issuing firm, retail investors, and the institutional investors participating in the book-building event are about 20%, 20%, and 60%. Retail investors are inclined to oversubscribe for IPOs. The oversubscription could affect the initial returns. By looking at the logarithm value of retail investors' subscription rates, the LogBid for each IPO are defined (Lee, 2012). The initial returns for each IPO are moreover affected by the market-specific factors as defined with the excess returns of the closing values of a market index at the aftermarket dates over the closing value at the issuing date (i.e., Lowry et al., 2010). As market-specific factors, the MKT21, MKT42, and MKT63 of each IPO are measured respectively by looking at the excess returns of the closing values of KOSDAQ index at the 21st, 42nd, and 63rd aftermarket dates over the closing value of KOSDAQ index at the subscription date.

Table 1 describes summary statistics for initial returns and the variables. The initial returns are defined by looking at the excess returns of the closing values of the IPOs at the 21st, 42nd, and 63rd aftermarket dates over the issuing prices. Between the aftermarket dates and the first aftermarket date, the periods are the ones of initial institutional investors' voluntary lockups. In Table 1, Panel A presents descriptive statistics of IPO initial returns by underwriter lockup. N, Mean, Std, Skew, Kurt, 25th, 50th, and 75th stand respectively for the number of IPOs, simple average, standardized deviation, skewness, kurtosis, and 25th, 50th, and 75th percentile locations obtainable from the initial returns. Panel B documents the means of the variables that stand for the several factors mentioned above. KS is referred to as Kolmogorov-Smirnov test statistics for comparison between the means by underwriter lockup. ** and * denote statistical significance respectively within the 1% level and the 5% level.

As Panel A in Table 1 shows, the overall average initial returns in the aftermarket dates are over 15%; however, the average initial returns differ in underwriter lockup. The averages of the initial returns of the IPOs that were regulated by underwriter lockup at the aftermarket dates are respectively much larger than the ones that were unregulated. Especially the averages of the initial return that were regulated by underwriter lockup at the 42nd and 63rd aftermarket datesare over eight times of the ones that were unregulated respectively. The medians of the initial returns that were unregulated at the 42nd and 63rd aftermarket dates are negative; however, the medians of the initial returns that were regulated are positive. These findings imply that underwriter lockup could be viewed as one factor that generates the positive average of initial returns. In consideration of the test statistics (KS) in Panel B, the means of the initial returns that were regulated by underwriter lockup or those unregulated differ in market conditions, MKT21, MKT42, and MKT63 within the significance level of 5%. Overall, Table 1 suggests that some factors including underwriter lockup and market conditions improve the initial returns. It is later investigated whether underwriter lockup, even when controlling other factors, affects initial returns. Figure 1 illustrates the empirical distributions of the initial returns from the sample by aftermarket month and underwriter lockup. The initial returns shown as IR21, IR42, and IR63 are defined with the excess returns of the closing prices at the 21st, 42nd, and 63rd aftermarket dates over the issuing prices. Lockup = 0% and Lockup = 3% stand for the initial returns that were unregulated and regulated, respectively, by underwriter lockup.

As the subfigures in Figure 1 shows, all of the distributions look skewed to the right and truncated to the left. These finding imply that all of the distributions are different from normal ones (Asquith et al., 1998; Sopranzetti

Table 1
Summary Statistics

Panel A: Descriptive Statistics

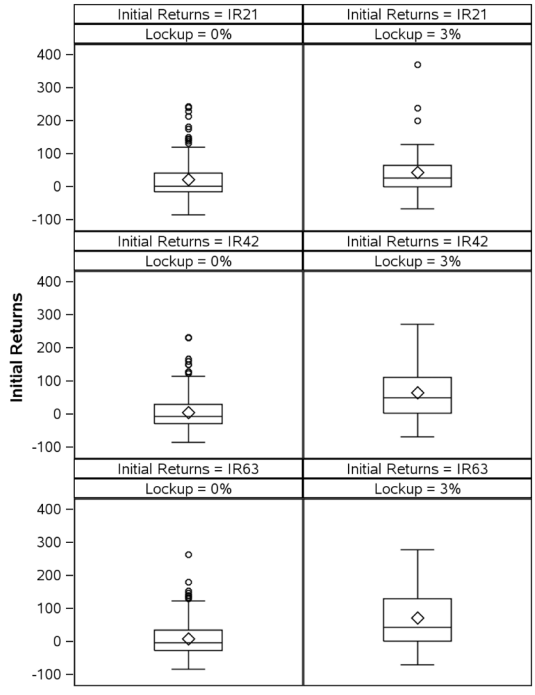
Initial Returns	N	Mean	Std	Skew	Kurt	25th	50th	75th
IR21	246	25.02	61.10	1.91	5.50	-14.29	6.09	47.94
IR42	246	15.92	62.57	1.37	2.44	-25.20	0.90	45.64
IR63	246	18.82	66.10	1.44	2.65	-24.26	1.46	49.41
				Lockup = 0%				
IR21	203	21.08	56.05	1.58	2.97	-14.62	1.77	42.00
IR42	203	5.51	53.81	1.34	2.69	-27.56	-6.29	30.77
IR63	203	7.79	53.56	1.19	2.40	-26.09	-4.00	35.63
				Lockup = 3%				
IR21	43	43.59	78.99	2.17	6.58	0.00	26.67	65.38
IR42	43	65.09	76.89	0.90	0.64	4.11	50.00	112.12
IR63	43	70.94	91.21	0.77	-0.27	2.07	42.75	130.77

Panel B: Comparison of Means in Underwriter Lockup

Variable		Lockup = 0%	Lockup = 3%	KS
VF	0.59	0.58	0.65	0.03
LogProceed	23.24	23.23	23.29	0.06
Reputation	6.93	6.88	7.19	0.04
Revision	5.25	5.33	4.84	0.07
LogBid	5.54	5.59	5.29	0.06
MKT21	1.12	0.81	2.58	0.09*
MKT42	2.31	1.49	6.15	0.11**
MKT63	3.82	2.63	9.43	0.16**

Figure 1

Distributions of Initial Returns by Aftermarket Month and Underwriter Lockup



et al., 2006). Distributions also look different by underwriter lockup. The initial returns that were unregulated are more located under 0 than the ones that were regulated, respectively, are done in the three aftermarket months. The initial returns that were regulated per aftermarket month have heavier right tails than the ones that were unregulated do so furthermore, distributions per aftermarket month appear to be shifted to the right by underwriter lockup, respectively. Thus, the distributions in Figure 1 imply that underwriter lockup could become a driver of initial returns to be better off in a distribution sense.

Ⅲ. Results

This section provides the estimation results of mixtures of distributions of initial returns by underwater lockup and the results from mixing regressions of variables, including underwriter lockup on initial returns.

3.1 Effect of Underwriter Lockup on Initial Returns

This subsection estimates the mixtures of distributions of initial returns by underwater lockup. The initial returns are defined in the previous section. The estimated distributions $f(IR_i)$ of the initial returns IR_i per aftermarket date are mixtures of two homogenous distributions: the first distribution and the second one $N(m_i,\ s_i^2),\ i=1,\ 2$ with mean m_i and variance s_i^2 being consistent, respectively, with stabilization and underpricing with the mixing proportion p of the normal distributions (Asquith et al., 1998; Sopranzetti et al., 2006), which stands for the probability of obtaining IR_i from $N(m_1,\ s_1^2)$, as follows,

$$f(IR_i)=pN(m_1,\ s_1^2)+(1-p)N(m_2,\ s_2^2) \quad (1)$$

Table 2

Estimated Parameters of Distributions by Aftermarket Month and Underwriter Lockup

Initial Returns	(m_1, z)		s_1	(m_2, z)		s_2	(p, z)		AIC
				Lockup = 0%					
IR21	-5.06	-1.37	22.30	67.54	5.52	77.79	0.64	1.73	2133.10
IR42	-11.77	-1.37	32.89	61.82	1.46	75.87	0.77	1.73	2197.20
IR63	-4.13	-0.98	38.87	70.30	2.82	90.08	0.84**	3.18	2195.32
				Lockup = 3%					
IR21	25.92	3.46	44.63	252.82	3.78	78.14	0.92**	3.61	500.78
IR42	37.34	1.18	53.67	162.05	0.69	76.00	0.78	0.38	498.50
IR63	17.02	1.62	40.51	153.18	2.28	89.11	0.60	0.47	519.15

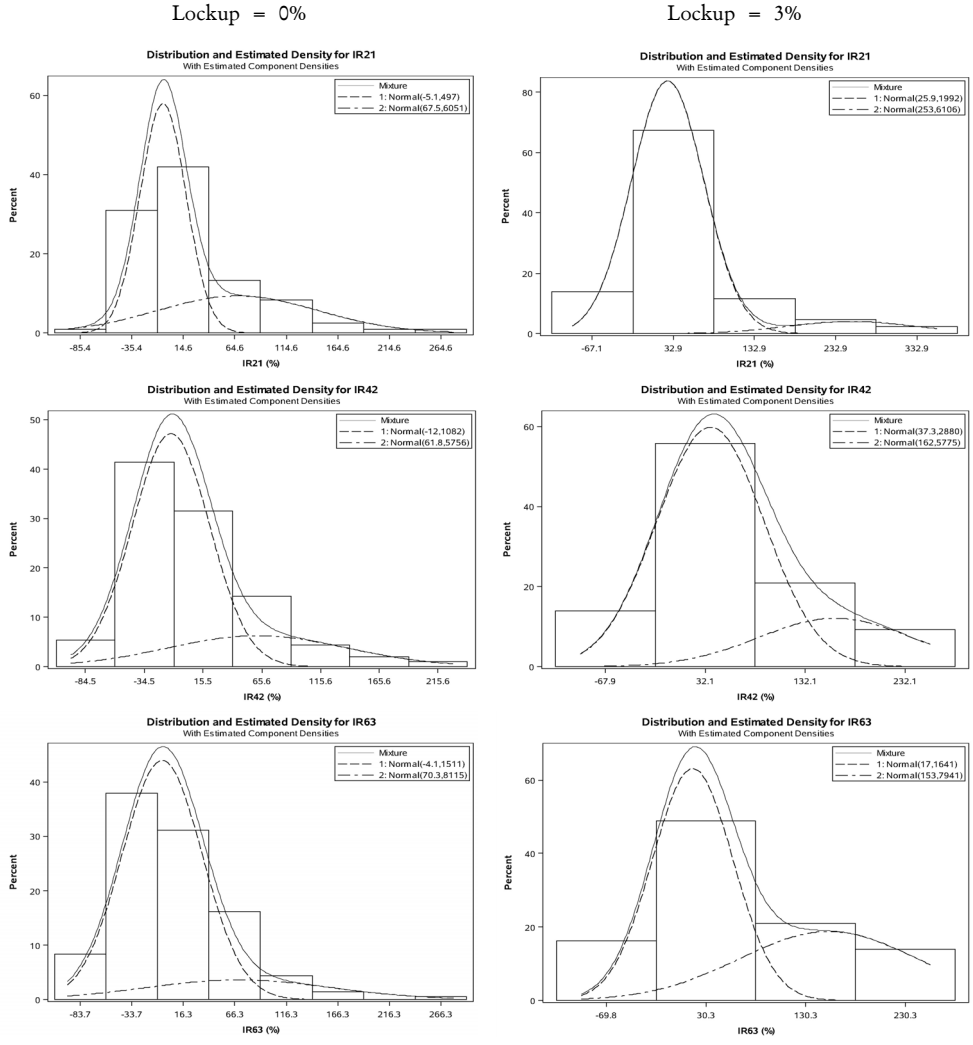
Aggarwal (2000) and Corwin et al. (2004) document that IPOs price stabilized in the aftermarket have a lower mean initial return in the first aftermarket date than the IPOs that were not price stabilized. Like Asquith et al. (1998) and Sopranzetti et al. (2006), it is assumed that the means of the initial returns of price-supported IPOs are less than those of the initial returns of underpriced ones, respectively: that is, $m_1 < m_2$. The parameters (m_1, s_1, m_2, s_2, p) of the mixtures are estimated by maximum likelihood estimation. The mixing proportions p and $1-p$ respectively denotes the probabilities of obtaining IR_i from $N(m_1, s_1^2)$ and $N(m_2, s_2^2)$ consistent with price stabilization and underpricing, respectively. The estimated results of the parameters are reported in Table 3. In Table 3, z is z statistics corresponding to the estimated mean (Est) of estimated normal distribution. ** and * denote statistical significance respectively within the 1% level and the 5% level. AIC is denoted onto Akaike's information criterion as the model test statistics values. On the estimation of parameters by mixtures by maximum likelihood estimation, further details are referred to as in Greene (2012).

As AIC column reports, the distributions in Lockup = 3% are closer to mixtures than those in Lockup = 0%. As columns of Lockup = 0% and Lockup = 3% show, the stabilization estimates (m_1) in Lockup = 0% in the three aftermarket months are negative but insignificant within the 5% significance level. In contrast, the stabilization estimates in Lockup = 3% are very positive; especially the stabilization estimate in the 1st aftermarket month is significant within the 1% significance level. The underpricing estimates (m_2) by underwriter lockup and aftermarket month are positive: the underpricing estimates in Lockup = 3% in the three aftermarket months are more than double those of Lockup = 0%, respectively. Especially, the underpricing estimates in Lockup = 3% in the 1st aftermarket month is significant within the 1% significance level moreover, the mixing proportion (p) is 0.92 and strongly significant within the 1% significance level. These findings imply that underwriter lockup strongly affect initial returns in the 1st after market month both in stabilization and in underpricing. The next subsection will examine whether underwriter lockup influence initial returns in stabilization and underpricing even when controlling for the influences for other variables such as revision. Figure 2 illustrates the estimated mixtures of distributions with (m_1, s_1^2, m_2, s_2^2) by aftermarket months.

3.2 Mixing Regression on Underwriter Lockup

It was examined whether the distributions of initial returns in stabilization and under-

Figure 2
Estimated Distributions of Initial Returns by Aftermarket Month and Underwriter Lockup



pricing were affected by underwriter lockup in the preceding subsection. This subsection analyzes whether underwriter lockup affects initial returns in the aftermarket months even when controlling for the effects of other variables such as market conditions, with consideration that the initial returns in the three aftermarket months are assumed to come from a mixture of distributions. To do this, the subsection applies a mixture of normal regressions models: the means m_1 and m_2 of the mixtures of distributions (1) depend on common variables X_j, $j=1, \cdots, n$ with its parameters b_{ij}, $j=1, \cdots, n$ and $i=1, 2$ as follows,

$$m_i = \Sigma_{j=1}^{n} b_{ij} X_j \qquad (2)$$

The common variables including revision (Asquith et al., 1998; Hanley, 1993) are pre-

Table 3
Mixture Regressions on Independent Variables by Aftermarket Month

Variable	IR21				IR42				IR63			
	m_1		m_2		m_1		m_2		m_1		m_2	
	Est	z	Est	z	Est	z	Est	z	Est	z	Est	z
Intercept	-147.65	-0.31	115.59	1.57	-279.75	-0.92	152.20	1.51	105.46	0.46	107.05	1.01
VF	-33.66	-1.43	-9.77	-2.10	-44.39	-1.97	-3.64	-0.51	-33.03	-2.23	0.18	0.03
LogProceed	6.63	0.33	-5.18	-1.74	9.77	0.76	-7.54	-1.84	-4.80	-0.51	-5.78	-1.35
Reputation	-1.85	-1.09	-0.52	-1.32	0.72	0.47	-0.56	-1.11	-0.66	-0.53	-0.12	-0.20
Revision	0.86	0.96	-0.10	-0.77	0.79	1.10	0.05	0.29	0.69	1.09	-0.06	-0.38
LogBid	18.77**	2.55	2.69	1.72	20.35**	3.16	2.98	1.49	10.33*	2.13	2.30	0.97
MKT21	4.67**	3.08	1.97**	5.29								
MKT42					1.25	1.34	1.81**	3.53				
MKT63									0.62	0.84	1.95**	3.40
Underwriter Lockup	64.20*	2.26	11.26	1.82	114.70**	5.02	30.51**	3.15	132.64**	6.50	12.23	1.37
AIC	2598.60				2632.80				2667.70			

sented in the previous section. General specifications on the mixture of normal regressions models such as the assumption of error terms are referred to as in Greene (2012). From the mixture of normal regressions models, the results are reported in Table 3. In Table 3, Est and z are, respectively, parameter estimates and the corresponding z statistics, which is similar to t statistics in the cases that sample size is sufficiently large. ** and * denote respectively statistical significance at 1% and 5% significance levels. AIC is for mixture normal regressions model statistics.

As the IR21, IR42, and IR63 columns in Table 3 show, all of the means in stabilization (m_1) are positively and significantly affected by underwriter lockup within the 5% significance level even when controlling for other variables, including market conditions shown as MKT21, MKT42, and MKT63. Underwriter lockup also positively influences the means of the 1st and 2nd aftermarket months in underpricing (m_2) within the 10% significance level. Thus, initial returns in the three aftermarket months are positively affected by underwriter lockup with respects to stabilization and underpricing especially, underwriter lockup positively affects in stabilization much more than it does underpricing.

IV. Conclusion

This section concludes this paper. The put back option of an IPO in the KOSDAQ, which imposed a direct burden to the underwriters, was abolished in 2007. The abolishment tempted underwriters to overprice IPOs, and the overpricing resulted in the monetary loss of retail investors participating in the primary market. Furthermore, the primary market became stagnant as a result the 2008 financial crisis. These conditions caused unique underwriter lockup, which was introduced in 2013. It is still up for debate whether underwriter lockup serves to protect initial retail investors from financial loss and whether it is an inducement that makes investors come back and reactivates the primary and secondary markets that have become depressed due to the 2008 financial crisis.

The paper examines whether underwriter lockup improves initial returns in stabilization as well as underpricing. The analysis results are as follows: first of all, underwriter lockup causes initial returns in the three aftermarket months to increase on average. The mean of the initial returns in the first aftermarket month increase from negative values to positive ones with respect to stabilization. With respect to underpricing, the means of the initial returns in the three aftermarket

months increases several times. Second, underwriter lockup has positive explanatory-power on the initial returns in the early aftermarket months even when controlling for other factors. These findings imply that underwriter lockup is highly effective.

Received 06 Jul. 2016
Revised 01 Nov. 2016
Accepted 16 Nov. 2016

References

Aggarwal, R. (2000). "Stabilization activities by underwriters after initial public offerings," *Journal of Finance* 55(3), 1075-1103.

Asquith, D. J., D. Jones, and R. Kieschnick (1998). "Evidence on price stabilization and underpricing in early IPO returns," *Journal of Finance* 53(5), 1759-1773.

Beatty, R. P. and J. R. Ritter (1986). "Investment banking, reputation, and the underpricing of initial public offerings," *Journal of Financial Economics* 15(1), 213-232.

Benveniste, L. M. and P. A. Spindt (1989). "How investment bankers determine the offer price and allocation of new issues," *Journal of Financial Economics* 24(2), 343-361.

Booth, J. R. and R. L. Smith (1986). "Capital raising, underwriting and the certification hypothesis," *Journal of Financial Economics* 15(1), 261-281.

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

Byun, J. and S. S. Cho (2011). "IPO lock-ups and underpricing," *Korean Journal of Financial Studies* 40(3), 405-429.

Carter, R. B., F. H. Dark, and A. K. Singh (1998). "Underwriter reputation, initial returns, and the long-run performance of IPO stocks," *Journal of Finance* 53(1), 285-311.

Cho, J. M., J. H. Lee, and B. G. Jang (2015). "Initial public offerings, earnings management and venture capital: Evidence of bull and bear market conditions in Korea," *Journal of Small Business Innovation* 18(1), 15-41.

Choi, M. S. (2011). "Review of empirical studies on IPO activity and pricing behavior in Korea," *Asian Review of Financial Research* 24(2), 621-663.

Chowdhry, B. and V. Nanda (1996). "Stabilization, syndication, and pricing of IPOs," *Journal of Financial and Quantitative Analysis* 31(1), 25-42.

Cook, D. O., R. Kieschnick, and R. A. Van Ness (2006). "On the marketing of IPOs," *Journal of Financial Economics* 82(1), 35-61.

Cornelli, F., D. Goldreich, and A. Ljungqvist (2006). "Investor sentiment and pre-IPO markets," *Journal of Finance* 61(3), 1187-1216.

Corwin, S. A., J. H. Harris, and M. L. Lipson (2004). "The development of secondary market liquidity for NYSE-listed IPOs," *Journal of Finance* 59(5), 2339-2374.

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

Goergen, M., L. Renneboog, and A. Khurshed (2006). "Explaining the diversity in shareholder lockup agreements," *Journal of Financial Intermediation* 15(2), 254-280.

Greene, W. H. (2012). *Econometric analysis 7th International ed*. Pearson Education.

Griffin, J. M., J. H. Harris, T. Shu, and S. Topaloglu (2011). "Who drove and burst the tech bubble?," *Journal of Finance* 66(4), 1251-1290.

Hanley, K. W. (1993). "The underpricing of initial public offerings and the partial adjustment phenomenon," *Journal of Financial Economics* 34(2), 231-250.

Hanley, K. W. and G. Hoberg (2016). "The information content of IPO prospectuses," *Review of Financial Studies* 23(7), 2821-2864.

Hanley, K. W., A. A. Kumar, and P. J. Seguin (1993). "Price stabilization in the market for new issues," *Journal of Financial Economics* 34(2), 177-197.

Kaustia, M. and S. Knüpfer (2008). "Do

investors overweight personal experience? Evidence from IPO subscriptions," *Journal of Finance* 63(6), 2679-2702.

Lee, J. R. (2012). "Downside risk and underpricing of IPOs: Evidence from put back options revisited," *Korean Journal of Financial Studies* 41(5), 705-721.

Lee, J. R. and H. J. Song (2013). "The effect of ownership structure of newly listed firms on IPO process: Evidence from Korea market," *Asia-Pacific Journal of Small Business* 35(1), 47-65.

Lee, J. R. and M. A. Kim (2014),"Controlling ownership, employee ownership, and returns of IPO stocks," *Journal of Small Business Innovation* 17(1), 55-72.

Lowry, M. M., S. Officer, and G. W. Schwert (2010). "The variability of IPO initial returns," *Journal of Finance* 65(2), 425-465.

Megginson, W. L. and K. A. Weiss (1991). "Venture capitalist certification in initial public offerings," *Journal of Finance* 46(3), 879-903.

Rock, K. (1986). "Why new issues are underpriced," *Journal of Financial Economics* 15(1), 187-212.

Ruud, J. S. (1993). "Underwriter price support and the IPO underpricing puzzle," *Journal of Financial Economics* 34(2), 135-151.

Shin, I. S. (2010). "Regulatory environment, changing incentives, and IPO underpricing in the Korean stock market," *Asia-Pacific Journal of Financial Studies* 39(2), 109-138.

Sopranzetti, B. J., E. Venezian, and X. Wang (2006). "The market for new issues: impact of offering price on price support and underpricing," *Review of Quantitative Finance and Accounting* 26(2), 165-176.

Yon, K. H. and S. H. Park (2002). "An empirical evidence on the uniform lock-up system in KOSDAQ," *Korean Journal of Financial Studies* 31, 323-364.

The Journal of Small Business Innovation 2016 19(4), pp. 41-52

매각제한제도와 KOSDAQ 공모주 상장초기 수익률의 관계

이종용*

본 연구에서는 중소기업의 상장시장인 KOSDAQ에서 신규공모(initial public offering) 인수회사에게 부과하는 공모주 매각제한제도(underwriter lockup)와 공모주 상장초기 수익률의 관계를 분석하였다. 2008년부터 KOSDAQ에 상장된 공모주의 상장초기 수익률 평균은 감소하였으며, 일부 공모주 상장초기 수익률은 음이었다. 이런 환경에서 KOSDAQ는 매각제한제도를 실행하였는데, 매각제한제도란 신규공모 인수회사가 공모주를 발행가격으로 매입하고 상장부터 3개월간 보유하는 의무를 의미한다. 따라서 매각제한제도에서 인수회사는 공모주를 저가(underpricing)로 매입하고 고가(stabilization)로 매각하려는 의도를 가지게 될 것이므로, 매각제한제도에서 상장초기 수익률이 증가할 수가 있다.

본 연구에서는 2009년부터 KOSDAQ에 상장된 공모주에 관한 자료들을 수집하고, 매각제한제도에 의해서 상장초기 수익률을 증가시키는지를 혼합분포(mixture of distributions) 관점에서 검증하였다. 분석결과 매각제한제도가 적용되지 않는 신규공모보다는 매각제한제도가 적용되는 신규공모에서 공모주 상장초기수익률은 유의적으로 증가하였다. 그리고 이런 결과는 상장초기 수익률에 영향을 주는 요인들을 통제하더라도 유의적으로 존재하였다. 이것은 매각제한제도가 상장초기 수익률의 상승에 매우 유효한 제도라는 것을 의미한다.

주제어 : 신규공모, 매각제한, 상장초기 수익률, 혼합분포, 저평가와 고가

* 강원대학교 경영학부 경영학과(e-mail: leejr@kangwon.ac.kr)