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Can Trading Restrictions Explain the Performance of Free-Bonus Issues?

Eunyoung Cho Institute of Finance and Banking, Seoul National University Business School
Cheol-Won Yang* Associate Professor, School of Business Administration, Dankook University

Abstract

This article investigates the relation between market's response to corporate events and trading restrictions in a unique setting of free-bonus issues in Korea. Specifically, bonus-seeking investors face the trading restrictions that they must hold their current shares until ex-date to receive new shares, and cannot trade non-listed new shares until pay-date, while stock price is adjusted on the ex-date according to the bonus ratio. Moreover, investors face short-sale ban between the ex-date and pay-date. These trading restrictions reduce potential liquidity suppliers in the market, and it causes the excess demand for the stock. We hypothesize that the greater the trading restriction, the higher stock price. We find positive abnormal returns around both announcement date and ex-date, and strong positive relation between event returns and the degree of trading restriction measured by bonus ratio. Moreover, significant negative returns are observed near the pay-date as trading restrictions are expected to disappear. This article provides an evidence that trading restriction, which is one of market frictions, contributes to explaining the abnormal returns around corporate events.

Keywords Free Bonus Issues, Abnormal Return, Trading Restriction, Bonus Ratio, Market Friction

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* **Address:** Dankook University, 152 Jukjeon-ro, Suji-gu, Yongin-si, Gyeonggi-do, Korea 16890, Korea;
E-mail: yang@dankook.ac.kr; **Tel:** 31-8005-3437.

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Ⅰ. Introduction

What can explain the market's response to corporate policy? Usually, it cannot be fully explained by fundamentals-based stories that reflects the intrinsic value of the firm. Rather, non-fundamental factors are filling the shortcomings of fundamental factors in understanding abnormal returns around the corporate events. The most prominent non-fundamental factors are market frictions or psychological biases. In particular, the paper focuses on the trading restriction, which is one of the market frictions. There is a growing literature supporting the important role of trading restrictions in the insider trading (Baiman and Verrechia, 1995; Roulstone, 2003; Denis and Xu, 2013), block share (Silber, 1991), IPO share (Brealey, Leland, and Pyle, 1977; Courteau, 1995; Lognstaff, 1995; Field and Hanka, 2001; Brav and Gompers, 2003; Cheng, Yan, Zhao, and Chang, 2012), short sale (Ho, 1996; Chang, Cheng, and Yu, 2007; Bettman, Maher, and Sault, 2009; Jung, Kim, and Lee, 2013), and PIPE (private investments in public equity) transactions (Bengtsson, Dai, and Henson, 2014).

In this paper, we deal with the corporate policy of free-bonus issue (hereafter, FBI) because it provides a good environment to verify a role of trading restrictions.[1] The FBI process in Korea includes distinctive features of trading restrictions. Specifically, bonus-seeking investors face the two time trading restrictions: the first trading restriction occurs because they must hold their current shares until ex-date to receive new shares, and the second occurs because new shares are not listed and cannot be traded until pay-date. Meanwhile, stock price is adjusted on the ex-date according to the bonus ratio, which is located before the new stocks are issued.

1) FBIs are the share distributions based on the number of shares owned by current shareholders without additional costs and taxes. In this process, there is only increase in number of shares and change in the accounting structure on the financial statement, but there is no change in market capitalization or shareholders' holding stake.

These trading restrictions reduce potential liquidity suppliers in the market, and it causes the excess demand for the stock. Moreover, investors face short-sale constraints between the ex-date and pay-date since the Capital Market Act banns short-selling during the issuance of bonus shares in Korea.[2] In this setting, the greater the desire of investors to trade stock with trading restriction, the stronger impact of the restriction, and the higher stock price. We conjecture that there are positive event returns around both announcement date and ex-date, and strong positive relationship between event return and the degree of trading restriction. Moreover, there will be negative returns around pay-date since trading restrictions are expected to disappear as pay-date approaches (Greenwood, 2009).

This trading restriction hypothesis differs from previous two explanations of market reactions following the news of bonus issues and stock splits: that is, the signaling and the liquidity hypothesis.[3] The signaling hypothesis expects positive abnormal returns around the announcement date as good news for future firm performance (Grinblatt, Masulis, and Titman, 1984; Brennan and Copeland, 1988; Brennan and Hughes 1999). The liquidity hypothesis predicts abnormal returns around ex-date (Copeland, 1979; Baker and Gallagher, 1980; Lakonishok and Lev, 1987; Baker and Powell, 1993; Ikenberry, Rankine, and Stice, 1996, Muscarella and Vetsuypens, 1996). However, trading restriction hypothesis argues that the two research strands could not fully explain the positive abnormal returns on both the announcement date and the ex-date of the same event, when there are market constraints such as trading restrictions under the issuance policy. Trading restrictions during firm events could constrain the demand and supply

2) See the Article 180 of the Capital Market Act.

3) See Grinblatt et al. (1984), Asquith, Healy and Palepu (1989), Lakonishok and Lev (1987), and Brennan and Compeland (1988) on the signal hypothesis. These studied suggest the managers of firms use stock events to communicate favorable information about their future performance. However, some of empirical research papers in this notion suggests that there is little evidence to support the signal hypothesis (see, Lakonishok and Lev, 1987; Mcnichols and Dravid, 1990; Kadiyala and Vetsuypens, 2002).

of stocks in the market and eventually lead to price drift in both announcement date and ex-date (Greenwood, 2009).

We start by calculating the abnormal returns around event date. And, we find that significant positive abnormal returns on announcement date and ex-date. Next, we divide the free-bonus stock into three groups according to the degree of the trading restrictions, which are measured by the bonus issue ratio. As a result, the abnormal returns on the announcement date and ex-date are significantly higher in stocks with strong trading restrictions. For example, characteristic adjusted returns of announcement date (or ex-date) at the highest trading restriction stocks are 6.11% (5.50%) compared with 1.76% (1.46%) at the lowest trading restriction stocks. The results of the pooled regressions are also consistent with the results of the portfolio analysis. Moreover, we show that the positive abnormal returns around the announcement and ex-date are reversed into negative as the pay-date approaches.

This paper contributes to the growing literature suggesting that prices may deviate from fundamental when there is limit of arbitrage. Previous studies analyzing the effects of trading restrictions mainly focus on insider trading, block share, IPO share, short sale, and PIPE transactions. In addition to the evidence of the previous researches, we show that the larger the trading restrictions, the more the price increases during FBI. Moreover, we suggest that the FBI without a fundamental value change results in a high abnormal event returns, which are explained by trading restrictions properly. In sum, we provide evidence that the trading restriction hypothesis could explain the return puzzle in the FBI.

The remainder of this paper proceeds as follows. In section 2, we will explain the FBI and the related literature. Here, we will define the FBI in the concrete, and discuss the systematic and procedural characteristic of FBI in Korea. Section 3 introduces our data and methodology, and

Section 4 contains main empirical results. Section 5 presents the empirical results from additional test. Finally, in section 6 we conclude the paper with summary and discussion of the results.

Ⅱ. Free Bonus Issues and Literature Review

2.1 The Singularity of Korea's Free Bonus Issue

The free-bonus issue (FBI) is a free share distribution without additional cost and tax given to current shareholders by reducing capital surplus, such as capital reserve and retain earnings, and transferring it to capital stock in stockholders' equity of the company balance sheet. Current shareholders receive a number of shares in proportion to their original holdings. There is an increase in the number of shares and changes in an accounting structure in a balance sheet without the change in market capitalization, the firm value and shareholder's holding stake. Especially, FBIs in Korea have the unique institutional processes and arrangements compared to other similar stock events, i.e. stock split.

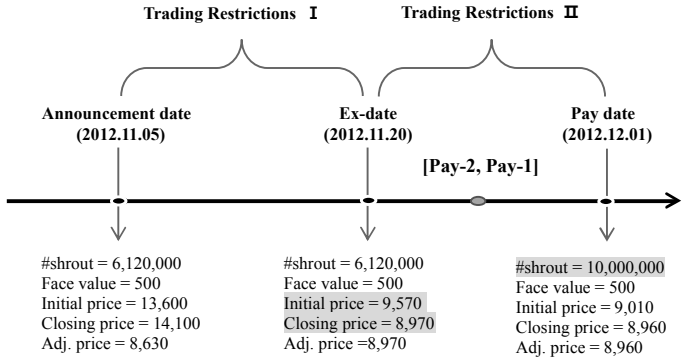
FBI and stock split, both do results in increase in quantity of stocks and adjustments of stock nominal price. However, several differences are found. Stock split refers to split the face value of the shares of firms, and thus we could not investigate net price impact. Above all, the key differential feature of stock splits from free bonus issues in Korea is that trading of stocks are be suspended during the period of arranging the transfer of the title/name of inscribed securities. Accordingly, the investors had not been given trading continuity during the stock split event. Meanwhile, during the free bonus issue, investors can trade stocks continuously.

We specify the difference in institution and processes arrangement between FBIs and stock splits in Korea in <Figure 1> Panel A and Panel B. The process of a FBI can be thought of as occurring in three stages, as illustrated in <Figure 1> Panel A. There are two interesting points of the process of FBI. First, the stock price would decrease on ex-date proportionately. Next, new shares are not distributed to shareholders until pay-date. If there are the bonus-seeking investors in the stock market, the bonus-seeking investors face the 'Trading restriction I' because they must hold current shares until ex-date to receive the new shares. And

<Figure 1> Time Line of Free Bonus Issues and Stock Splits

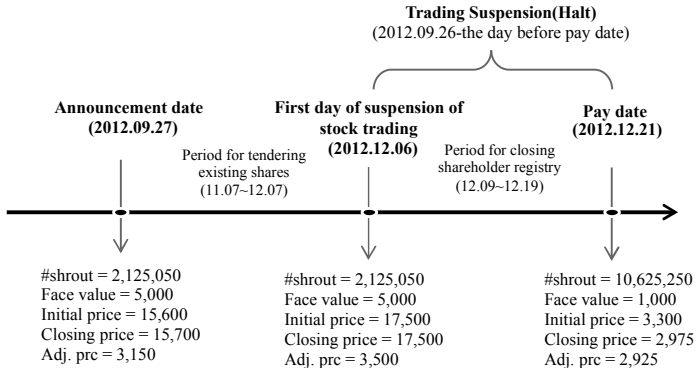
Panel A: Free Bonus Issues

Ex) KC-cottrell (A119650)



Panel B: Stock Splits

Ex) ORICOM (A010470)



they also face the 'Trading restriction Ⅱ' because they were not free to trade the new share until pay-date despite adjusting (downwards) the price at ex-date. Thus, free-bonus issues constrain investors who are willing to trade stocks. These features of FBI provide a good environment to investigate a role of trading restrictions.

2.2 Related Literatures

There are three prior strands of researches for the abnormal returns following stock splits or FBIs. The first literate strand investigates the signaling hypothesis (Grinblatt et al., 1984; Brennan and Copeland, 1988; Brennan and Hughes, 1991). The signaling hypothesis suggests that managers with good news use stock split or issue events to signal investors about his optimism about the future firm performance. In this setting, they expect positive abnormal returns around announcement date. Given this hypothesis, however, there are no reasons of positive abnormal returns around ex-date because there is no news at ex-date.

The second strand is the liquidity hypothesis (Copeland, 1979; Baker and Gallagher, 1980; Lakonishok and Lev, 1987; Baker and Powell, 1993; Ikenberry et al., 1996, Muscarella and Vetsuypens, 1996). The liquidity hypothesis requires positive abnormal returns around the ex-date and the pay-date by improving liquidity and lowering price following new stock issues. This hypothesis predicts negative or no returns around the announcement date. Thus, the signaling hypothesis focuses on the announcement date, but the liquidity hypothesis focuses on the ex-date or pay-date.

The next strand is the trading restriction hypothesis (Greenwood, 2009). Greenwood (2009) suggests the trading restrictions as a determinant of event returns for stock splits in Japan. He examines the excess returns during the stock split process with the trading restriction and finds that

both announcement date and ex-date returns appear to be positive. He also shows that there is strong positive relation between event return and the degree of trading restriction measured by split ratio. Moreover, there are negative returns around pay-date, when trading restrictions are removed.

The free-bonus issue is a stock issuance system that does not exist in many major stock market, including the United States. Although there are many existing studies on stock splits and stock dividends, few studies investigate the motivations and market responses for free bonus issues. Neglecting free-bonus issue is likely to lead to an incomplete understanding of the impact of free bonus issues on stock price and firm value.

Previous research on free-bonus issues in the Korean stock market examine the motivation of free-bonus issues (Kim, 1997), or the financial characteristics of firms issuing stocks as free bonuses (Im and Nam, 1993), or long-term performance of free-bonus issues (Kim, 2000). Kim (1997) find the positive abnormal return on the free-bonus issue announcement date, and he argue that this announcement effect is a reflection of investors' expectation for improving the firm's future cash flow. Im and Nam (1993) suggest that the firms with high current ratio, high operate profit ratio, and high large shareholder ownership ratio issue free-bonus shares. They also survey investors and find that investor perceive free-bonus issue stocks as free distributions of firm wealth. Kim (2000) tests the signal hypothesis through long-term performance analysis of free-bonus issue firms. He argues that the signal hypothesis is not supported in the free bonus issue event, suggesting that the free-bonus issue firms show lower stock performance and financial performance over the long term than benchmark firms. In a recent study, Cho and Yang (2017) show evidence that liquidity increase in the short and long term after the free bonus issues.

However, there are no research on the link between the procedural characteristics of the issuance of free-bonus issues and the significantly

abnormal returns during the free-bonus issues. As mentioned, prior works typically focus on the announcement date effect for the stock issuance. Our research design, however, addresses the market response during the stock issuance process. In particular, this study analyzes run-ups and crashes on free bonus issues of announcement date, ex-date, and pay-date.

Ⅲ. Data and Methodology

Our data come from several sources. We hand-collected the information on free-bonus issues from DART (Data Analysis, Retrieval and Transfer System), which is an electronic disclosure system. Under Korea securities laws, listed/unlisted firms are required to disclose important corporate information as it occurs without delay (same day disclosure) following the Securities and Exchange Act §186. The DART electronic data system allows firms to submit disclosure filings online. Also, we obtain stock returns, firms' information, and the trading volume from the FN Guide dataset.

Our initial sample contains all common stocks traded on the KOSPI and KOSDAQ from FBI daily file between January 1, 2000 and April 30, 2014. We identify 713 filings for only free bonus issues without SEO[4] to deter overlapping effect. We obtain our final sample of FBIs using the following process. First, we retain only ordinary stocks, that is, we discard preferred stocks. We further exclude stocks without information on June-end market capitalization, book-to-market at the end of year t-1, and 12 months of returns prior to May to calculate characteristic benchmark returns following Daniel, Grinblatt, Titman, and Wermers (DGTW)

4) In Korea, a few firms announce a bunch of SEO and FBI. During the sample period, there is 117 bunch of SEO and FBI.

(1997). After these exclusions, the final sample consist of 532 free-bonus issues events.

The measure of the degree of trading restrictions is the bonus ratio of FBI. It is similar to the split ratio considered by Greenwood (2009) as measure of trading constraints of stock splits. If investors seek free-bonus issues, they are willing to wait in line even though they could not obtain free-bonus shares during the event period. In that case, it is reasonable to expect investors to face the larger impact of trading restriction when the bonus ratio is higher. Under this line, we use bonus ratio as a measure of the trading restrictions directly.

Our main empirical methodology is to test for difference in stock returns following the FBI' announcement date, the ex-date, and the pay-date versus those of other benchmark firms. To establish the robustness of our results, we use two kinds of matching criteria: market adjusted returns and DGTW characteristic-adjusted returns. We calculate market adjusted returns by taking the difference between the raw return on a stock and market equally-weighted index as listed on KOSPI and KOSDAQ. DGTW characteristic-adjusted returns are the returns on stockless the return on their matching portfolio based on tercile grouping by size, book-to-market, and previous one year returns as described in DGTW (1997).

Ⅳ. Empirical Results

4.1 Summary Statistics

Panel A of <Table 1> presents summary statistics on the various measures for 532 FBI firm-year observations and 22,222 non-FBI firm-year observations. As the result, we find that the average market capitalization

with FBI is $157 million, and the average market capitalization with non-FBI is $481 million. Presplit price of FBI firms, however, is higher than for the non-FBI firms, $21 and $17 per share, respectively. Overall, Panel A of <Table 1> suggest that firms with higher stock price, but lower market capitalization tend to decide free-bonus issues.

Panel B of <Table 1> shows the length of the interim period of FBI. On the average, the number of trading days between the announcement date and ex-date is 16 days, and the number of days between ex-date and

<Table 1> Summary Statistics.

This table reports summary statistics of the sample from January 2000 to April 2014. The full sample contains 532 free bonus issues (FBIs). Panel A shows comparison between firms that execute a FBI and non-FBI firms. Panel B contains number of days between the announcement date and ex-date; the ex-date and the pay-date; and announcement date and pay date. Variables are shown separately for the full sample and for the subsample according to the bonus ratio (BR).

Panel A: Comparison between FBI and non-FBI firms

	Firms with FBI		Firms with non-FBI	
	Mean	Median	Mean	Median
Market Capitalization ($ million)	157.23	59.14	481.07	46.69
Book-to-market	1.17	0.93	1.02	1.10
Firm age (list)	9.54	5.80	12.22	9.00
Presplit price ($)	21.46	9.82	17.44	5.58
ROA	0.06	0.06	-0.01	0.03
Tobin Q	1.34	1.07	1.24	0.98
Sales Growth	1.25	1.10	1.27	1.07
Total Assets ($ million)	202.62	71.53	1090.0	92.60
Total Volatility	3.58	3.43	3.72	3.50
Number of firm years	532		22,222	

Panel B: Summary statistics of firms with free bonus issues

	Whole Sample	B1 (Low *BR*)	B2 (Medium)	B3 (High *BR*)
Bonus ratio	0.52	0.12	0.45	1.23
Days between Announcement and Ex-date	16.15	17.20	16.50	14.04
Days between Ex-date and Pay-date	17.04	16.72	17.17	17.34
Days between Announcement and Pay-date	33.18	33.93	33.67	31.38
Number of firm years	532	210	186	136

pay-date is 17 days. Thus the average length of time between the announcement date and the pay-date is approximately one and a half months. It should be noted that during the free-bonus issues period, the trading of FBI stocks is restricted for a considerable period of time.

Hereafter, for readability, 'ANN' stands for the announcement date, 'EX' stands the ex-date, and 'PAY' stands for the pay-date. The notation $[Date+t_1, Date+t_2]$ represents that variables are constructed from day $d+t_1$ through day $d+t_2$. For example, [ANN-2, EX+2] represents the period of 2 days before the announcement date until 2 days after ex-date.

4.2 Trading Pattern and Returns around FBI Events

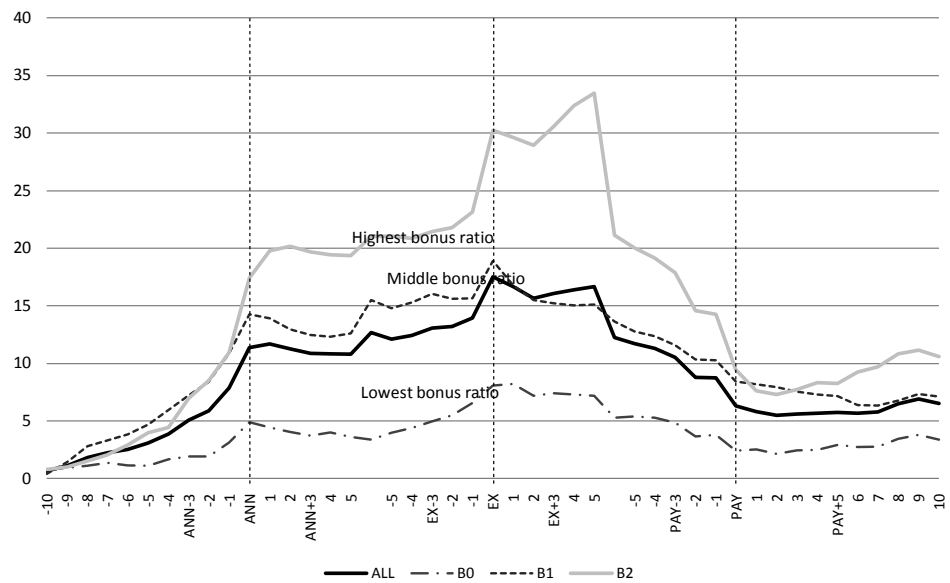
We start by analyzing the premium of free-bonus issues from January 2000 to April 2014 to depict a brief summary. Abnormal returns are calculated in excess of the equally weighted characteristic benchmark portfolio returns by using DGTW (1997) benchmark method. <Figure 2> shows buy-and-hold character-adjusted abnormal returns around FBI in the same classification as Greenwood's (2009). Because the length of interim period varies for each event, we assign abnormal returns in the [ANN+6, EX-6] and [EX+6, PAY-4] to 1 day. In <Figure 2>, it can be observed that buy-and-hold returns peak around ex-date, and then decline sharply before pay-date. The mean announcement abnormal returns and the ex-date abnormal returns for the full sample is positive, whereas the mean pay-date returns for the full sample is negative.

Specifically, for the full 532 events that did FBI, the announcement date has average characteristic-adjusted returns of 3.43% (t-stat = 10.96), the ex-date has characteristic-adjusted returns of 3.07% (t-stat = 11.74), and the pay-date has characteristic-adjusted returns of -2.11% (t-stat = -10.97). Similar results were obtained with market-adjusted returns and raw returns.

<Figure 2> also shows the buy-and-hold characteristic adjusted the abnormal returns according to bonus ratio. Partitioning FBI firms into three groups based on the bonus-ratio. In all three groups, there is a positive average abnormal return around the announcement and the ex-date, which turns negative just afterward. Note that the stocks with high ratio of bonus issues have higher abnormal return from the announcement date to the ex-date, and more likely to have negative returns as pay-date approaches. In other words, the stronger trading restrictions, the higher stock price drifts and reversals. The results are strongly consistent with our trading restriction hypothesis.

<Figure 2> Buy-and-Hold Abnormal Returns by Bonus Ratio

This figure plots the cross-sectional average of the buy-and-hold abnormal returns (BHAR) for various groups of 532 free bonus issues for [ANN-10, Pay10]. Abnormal returns are calculated in excess of the equally weighted characteristic benchmark portfolio return by using DGTW (1997) benchmark method. For all free bonus issue stocks, we sort stocks by bonus ratio. B0 = lowest bonus-ratio group, B1 = Middle bonus-ratio measure group, and B2 = highest bonus-ratio measure group. Because the length of interim period varies for each event, we assign abnormal returns in the [announcement +6, ex-date -6] and [ex-date +6, pay-date-4] to 1 day. 'ANN' stands for the announcement date, 'EX' stands the ex-date, and 'PAY' stands for the pay-date.



4.3 Event Returns and Proxies for the Degree of Trading Restrictions

We now turn to examining whether the abnormal returns generated by FBI events is related to the trading restrictions measured as by bonus ratio directly. We form tercile groups ranked based on bonus-ratio. Then, we calculate the means and medians of the adjusted returns of the terciles and the spread between the top tercile (LONG) and bottom tercile (SHORT) for various windows. <Table 2> reports the market-adjusted and DGTW characteristic-adjusted returns and the associated p-value from Newey-West t-test and Wilcox rank-sums test. The column labeled "L-S" represents the spread between the top tercile and the bottom tercile.

<Table 2> Bonus Ratio and Abnormal Returns (%) Around Free Bonus Issues

This table report the abnormal returns around free bonus issues. Table shows the average returns in each period: the announcement day, the Ex-date, interim period, after FBI. Market adjusted return is the stock return less market return. DGTW characteristic-adjusted return is the stock return less the returns of a portfolio matched on tercile of size, book-to-market, and momentum. Each year, free bonus issue stocks are sorted into three groups by bonus-issues ratio. We then compute the cross-sectional average (or median) adjusted returns in each period: the announcement day, the 1st interim period, the ex-day, the 2nd interim period, and the 40 days after the pay day. Portfolio "SHORT" presents the group with the lowest bonus ratio, and portfolio "LONG" presents the portfolio with the highest bonus ratio. Test for difference is the t-test for the difference in the means (in parentheses) or Wilcoxon rank-sums test for difference in the medians (in brackets) between liquid stocks and illiquid stocks. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

		Whole sample		MKT			Test for Difference	DGTW			Test for Difference
		MKT	DGTW	SHORT	LONG	L-S		SHORT	LONG	L-S	
[Ann Day]	Mean	3.46	3.38	1.76	6.15	4.39	(<.01)***	1.76	6.11	4.35	(<.01)***
	Median	2.47	2.05	0.96	7.00	6.04	[<.01]***	1.25	6.95	5.70	[<.01]***
[EX-date]	Mean	3.11	3.07	1.52	5.50	3.98	(<.01)***	1.46	5.50	4.04	(<.01)***
	Median	2.16	2.29	1.36	4.43	3.08	[<.01]***	1.17	4.54	3.38	[<.01]***
[PAY-1, PAY-2]	Mean	-1.61	-1.58	-0.96	-3.44	-2.48	(<.01)***	-0.84	-3.37	-2.53	(<.01)***
	Median	-1.31	-1.34	-0.98	-2.34	-1.36	[<.01]***	-0.93	-2.27	-1.34	[<.01]***
[PAY0, PAY40]	Mean	-2.57	-2.34	-1.37	-5.35	-3.98	(0.05)**	-1.03	-5.39	-4.36	(0.02)**
	Median	-3.82	-3.08	-2.82	-4.75	-1.93	[0.06]*	-1.66	-5.07	-3.42	[0.02]**
[PAY-date]	Mean	-2.14	-2.09	-1.38	-4.00	-2.62	(<.01)***	-1.31	-3.96	-2.65	(<.01)***
	Median	-2.00	-2.00	-1.29	-4.36	-3.07	[<.01]***	-1.21	-4.39	-3.19	[<.01]***

In <Table 2>, the average (median) DGTW characteristic-adjusted returns of the highest tercile FBI is 6.11% (6.95%), whereas the average (median) of the lowest tercile FBI is only 1.75% (1.25%) at announcement date. The average (median) spread between the highest and lowest tercile at announcement date is 4.35% (5.70%) and statistically significant at the 5% level. The ex-date has average (median) characteristic-adjusted returns of 5.50% (4.54%) for the highest tercile and 1.46% (1.17%) for the lowest tercile, the average (median) spread is 4.04% (3.38%) and significant at the 5% level. More interestingly, the returns change to the negative near the pay-date. The return of [PAY-1, PAY-2] is -3.37% (-2.27%) for the high group, and significantly smaller than -0.84% (-0.93%) for the low group at the 5% level. We also have similar results for market adjusted returns. These results suggest that trading restrictions are strongly associated with market reaction following FBI.

Our next step is to analyze the abnormal returns following each event dates in the regression framework, in which we controlled for other risk factors by using DGTW character-adjusted returns; size, book-to-market ratio, and momentum. The abnormal characteristic-adjusted returns are regressed onto explanatory variables. We estimate how the abnormal event returns are related to trading restrictions measured by bonus-issue ratio. We also include the interaction term with turnover, which is a proxy of willingness of investors to trade. It will examine whether the effect of trading restriction is larger in the FBI with higher trading intensity. Regressions run separately for [Announcement date], [Ex-date], [PAY-2, PAY-1], and [PAY0, PAY40].

In <Table 3>, the results indicate that high levels of bonus-issue ratio are associated with higher abnormal returns at the announcement date and the ex-date, as well as greater reversal around the pay-date. The co-

efficient on bonus-issue ratio is 0.089 (t-stat = 4.72) for announcement date in column 1, 0.022 (t-stat = 4.68) for ex-date in column 3, and -0.026 (t-stat = -5.70) for two days before the pay-date in column 4. All coefficients of our interest are statistically significant at a 5% level. The coefficients of interaction term of bonus ratio and turnover are also positive before ex-day in column 1～3, and statistically significant in ex-date of column 3 (0.038 with t-stat of 4.16). Before pay-date in column 4, the coefficient becomes negative, but not significant.

The regressions provide evidence for the statistically significant relation between positive abnormal returns and trading restrictions around the announcement and the ex-date. Moreover, the results also indicate more negative returns around the pay-date when the strong trading restrictions

<Table 3> Pooled Regression of FBI Event Returns on Bonus Ratio

We run a pooled ordinary least squares (OLS) regression of the event period returns for 532 free bonus-issues. Dependent variable is DGTW characteristic-adjusted returns, which is the stock return less the returns of a portfolio matched on tertile of size, book-to-market, and momentum. Turnover is the average ratio of the number of shared traded to the number of shares outstanding during the previous one year. ILLIQ is the average of Amihud (2002) ratio (the ratio of absolute returns to volume) over the previous one year. The table reports the time-series average of the cross-section coefficients, Newey-West (1987) adjusted t-statistics (in parentheses), and the adjusted R-squares. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Variable	[ANN-Day]	[ANN-1, EX1]	[EX-Date]	[Pay-2, Pay-1]	[Pay0, Pay40]
Bonus ratio	0.089***	0.077***	0.022***	-0.026***	-0.027**
	(4.718)	(4.441)	(4.679)	(-5.702)	(-1.962)
Bonus ratio×Turnover	0.004	0.016	0.038***	-0.003	0.009
	(0.112)	(0.474)	(4.159)	(-0.337)	(0.334)
Turnover	-0.010	-0.012	-0.001	0.000	-0.014
	(-0.615)	(-0.992)	(-0.317)	(0.103)	(-1.166)
ILLIQ	0.008	0.007	0.003	-0.002	-0.002
	(1.167)	(1.008)	(1.601)	(-1.162)	(-0.351)
Intercept	0.009	0.046***	0.011***	-0.002	-0.007
	(0.621)	(3.456)	(2.958)	(-0.437)	(-0.695)
Adj. R^2	0.046	0.041	0.116	0.068	0.010

are removed. These results are strongly consistent with the univariate evidence from <Table 2>. Overall, the evidences support the trading restriction hypothesis.

Ⅴ. Additional Test

5.1 Market Conditions

Because previous empirical literatures argue that the investors' behaviour is influenced by stock market conditions (as Chang, Cheng, and Khorana 2000; Tan, Chiang, Mason, and Nelling, 2008 suggest), it is worthwhile verifying whether our pervious results differ with stock market conditions. We measure stock market conditions using daily value-weighted market index over the 30-days leading up to the announcement day before, and we examine the effect of trading restrictions under the different market conditions by using the same methods of the previous sections.

We examine how trading restrictions and market condition interact with one another. We estimate the effect of 2×2 dimensional interaction term between trading restriction and market–condition, and it gives four potential cases: 1) lower trading restriction×UP market; 2) stronger trading restriction×UP market; 3) lower trading restriction×Down market; 4) Stronger trading restriction×Down market. We estimate Equation (1) for bonus issue ratio by using regression analysis:

$$r_{it} - r_{bt} = \beta_0 + \beta_{1U} LR_{it} UP_t + \beta_{2U} SR_{it} UP_t + \beta_{1D} LR_{it} Down_t + \beta_{2D} SR_{it} Down_t + \epsilon_{it} \quad (1)$$

where r_{it} is the returns on stock i; r_{bt} is the benchmark returns based

on DGTW method; UP_t = 1 if t is in the up-market condition, and UP_t = 0 otherwise; $Down_t$ = 1 if t is in the down-market condition, and $Down_t$ = 0 otherwise; LR_{it} = 1 for the lowest bonus-ratio tercile, and LR_{it} = 0 otherwise; SR_{it} = 1 for the highest bonus-ratio tercile, and SR_{it} = 0 otherwise.

<Table 4> shows that for bonus-issue ratio, not surprisingly, the effect of trading restriction on the abnormal returns and reversals exists in both up and down markets, which is in the agreement with previous results. First two rows show that for announcement date, β_{2U} and β_{2D} are significantly positive, and β_{1U} is significantly negative. We also find that [PAY-2, PAY-1] has negative β_{2U} and β_{2D}. Thus, the stronger trading restriction is, the higher stock price drift and steeper reversal are, no matter

<Table 4> Regression of Event Returns on Bonus Ratio Conditioning on up and Down Markets

Table shows the results of ordinary least squares (OLS) estimations for the following regressions:

$$r_{it} - r_{bit} = \beta_0 + \beta_{1U} LR_{it} UP_t + \beta_{2U} SR_{it} UP_t + \beta_{1D} LR_{it} Down_t + \beta_{2D} SR_{it} Down_t + \epsilon_{it}$$

where r_{it} is the returns for stock i; r_{bit} is the benchmark returns based on DGTW method; UP_t = 1 if t is in the up-market condition, and UP_t = 0 otherwise; $Down_t$ = 1 if t is in the down-market condition, and $Down_t$ = 0 otherwise; LR_{it} = 1 for the lowest bonus-ratio tercile, and LR_{it} = 0 otherwise; SR_{it} = 1 for the highest bonus-ratio tercile, and SR_{it} = 0 otherwise. The dependent variable $r_{it} - r_{bit}$ is the cumulative DGTW character-adjusted returns. The estimation uses Newey-West standard errors. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

		β_0	β_{1U}	β_{2U}	β_{1D}	β_{2D}	Adj. R^2
[Ann Day]	Estimate	0.034	-0.017**	0.020*	-0.014	0.040***	0.061
	t-stat	(5.94)	(-2.45)	(1.91)	(-1.46)	(3.60)	
[EX-date]	Estimate	0.025	-0.012**	0.029***	-0.006	0.033***	0.070
	t-stat	(5.30)	(-2.11)	(3.12)	(-0.84)	(2.81)	
[EX1, PAY-3]	Estimate	-0.049	0.014	-0.019	0.019	-0.031	0.010
	t-stat	(-4.37)	(0.85)	(-0.98)	(1.00)	(-0.99)	
[PAY-2, PAY-1]	Estimate	-0.012	0.006	-0.020**	-0.002	-0.024**	0.032
	t-stat	(-2.54)	(1.01)	(-2.11)	(-0.25)	(-2.03)	
[PAY0, PAY40]	Estimate	-0.013	0.022	-0.028	0.006	-0.063	0.012
	t-stat	(-0.82)	(0.82)	(-1.00)	(0.19)	(-1.41)	

what the market conditions. Overall, the results suggest that the market condition does not drive to change previous results.

5.2 Freshness and Staleness of the News of Free-Bonus Issues

The pronounced market reaction around FBI events and the relation between FBI return and trading restrictions might be attributable to freshness of FBI events of stocks. To investigate this possibility, we divided our samples into two groups: 388 FBI events with no prior history of FBI, and 144 FBI events that are paid at least one FBIs before. The analytical settings are similar to those tested previously section 5.1. We estimate the cumulative adjusted abnormal returns for first FBI and non-First FBI in a firm's history.

We estimate the effect of 2×2 dimensional interaction term between trading restriction and the number of FBI in history of firm, it gives four potential cases: 1) lower trading restriction×First FBI; 2) stronger trading restriction×First FBI; 3) lower trading restriction×Non-first FBI; 4) Stronger trading restriction×Non-first FBI. We estimate Equation (2) for bonus issue ratio by using the regression analysis:

$$r_{it} - r_{lit} = \beta_0 + \beta_{1U} LR_{i,t} First_t + \beta_{2U} SR_{i,t} First_t + \beta_{1D} LR_{i,t} Non_t + \beta_{2D} SR_{i,t} Non_t + \epsilon_{it} \quad (2)$$

where $First_t$ = 1 for first FBI, and $First_t$ = 0 otherwise; Non_t = 1 for FBIs of the firms that paid at least one FBIs before, and Non_t = 0 otherwise; LR_{it} = 1 for the lowest bonus-ratio tercile, and LR_{it} = 0 otherwise; SR_{it} = 1 for the highest bonus-ratio tercile, and SR_{it} = 0 otherwise.

The result in <Table 5> indicates that the effect of trading restriction on the abnormal returns and reversals exists in only first-time FBI. The results in the top part of the table show that for announcement date, B_{2F} is significantly positive at 5% level. Next part shows that for ex-date,

B_{2F} is significantly positive at 5% level. [PAY-2, PAY-1] has negative B_{2F} and statistically significant at 5% level. Thus, our result holds for only first-time FBI events. The results suggest that the impact of the trading restrictions is stronger for the first-time FBI.

<Table 5> Regression of Event Returns on Bonus Ratio Conditioning on the Number of FBI

Table shows the results of ordinary least squares (OLS) estimations for the following regressions:

$$r_{it} - r_{bit} = \beta_0 + \beta_{1F} LR_{it} First_t + \beta_2 FSR_{it} First_t + \beta_{1N} LR_{it} Non_t + \beta_{2N} SR_{it} Non_t + \epsilon_{it}$$

where $First_t$ = 1 for first FBI in history of firm, and $First_t$ = 0 otherwise; Non_t = 1 for FBIs of the firms that paid at least one FBIs before, and Non_t = 0 otherwise; LR_{it} = 1 for the lowest bonus-ratio tercile, and LR_{it} = 0otherwise; SR_{it} = 1 for the highest bonus-ratio tercile, and SR_{it} = 0 otherwise. The dependent variable $r_{it} - r_{bit}$ is the cumulative DGTW character-adjusted returns. The estimation uses Newey-West standard errors. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

		β_0	β_{1F}	β_{2F}	β_{1N}	β_{2N}	Adj. R^2
[Ann Day]	Estimate	0.034	-0.019**	0.031***	-0.013*	-0.024	0.067
	t-stat	(5.94)	(-2.43)	(3.71)	(-1.79)	(-0.77)	
[EX-date]	Estimate	0.025	-0.010	0.030***	-0.010*	0.030	0.069
	t-stat	(5.30)	(-1.57)	(3.87)	(-1.81)	(1.20)	
[PAY-2, PAY-1]	Estimate	-0.012	-0.001	-0.020**	0.009	-0.043	0.036
	t-stat	(-2.54)	(-0.18)	(-2.41)	(1.54)	(-1.43)	
[PAY0, PAY40]	Estimate	-0.020	0.020	0.020	-0.001	0.025	0.015
	t-stat	(-1.88)	(0.99)	(0.99)	(-0.09)	(0.33)	

5.3 Test for Stock Splits

In this section, the same analyses are performed using stock split samples. We hand-collect all the stock split files disclosed in the DART from January 2012 to December 2016. We then removed the stocks that are unable to obtain DGTW returns and liquidity measures. The final sample consists of 133 stock splits.

We analyze the abnormal returns around event dates by using the pooled regression like <Table 3>. Bonus ratio is replaced by split ratio. In <Table

6>, high levels of split ratio are associated with higher abnormal returns around the announcement date. The coefficient on split ratio is 0.005 (t-stat = 3.37) for announcement date in column 1. The coefficients of interaction term of split ratio and turnover are negative, but not statistically significant. Overall, the evidences from stock split is similar with FBIs' and support the trading restriction hypothesis.

<Table 6> Pooled Regressions of Event Returns for the Stock Splits on Split Ratio

We run a pooled ordinary least squares (OLS) regression of the event period returns for the 133 stock splits. Dependent variable is DGTW characteristic-adjusted returns, which is the stock return less the returns of a portfolio matched on tertile of size, book-to-market, and momentum. Turnover is the average ratio of the number of shared traded to the number of shares outstanding during the previous one year. ILLIQ is the average of Amihud (2002) ratio (the ratio of absolute returns to volume) over the previous one year. The table reports the time-series average of the cross-section coefficients, Newey and West (1987) adjusted t-statistics (in parentheses), and the adjusted R-squares. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

	[ANN-Day]	[ANN-1, ANN+1]	[ANN-Day]	[ANN-1, ANN+1]
Split ratio	0.005*** (3.373)	0.010*** (3.790)	0.007*** (3.461)	0.012*** (3.785)
Split ratio×Turnover			-0.174 (-1.167)	-0.271 (-1.126)
Turnover	-0.290 (-1.043)	-0.581 (-1.291)	0.521 (0.696)	0.684 (0.565)
ILLIQ	0.005 (0.693)	-0.001 (-0.079)	0.005 (0.796)	0.000 (0.022)
Intercept	-0.012 (-0.810)	-0.024 (-0.967)	-0.018 (-1.140)	-0.033 (-1.276)
Adj. R^2	0.090	0.118	0.093	0.120

5.4 Test for Short Sale Ban Period

Another key issue for testing trading restriction hypothesis in Korea is short-selling. If there exist short-selling constraints, the trading restrictions are easily binding. Therefore, it is worthwhile to examine the effect of short-selling for explaining the market reaction on FBI.

There is a difficulty in comparing the samples of FBI each other because the short sale itself is prohibited during the period of FBI, specifically between the ex-date and pay-date. To see the effect of short selling, we use the short sale ban period in Korea. In Korea, shot sale is banned for two periods from October 1, 2008 to May 31, 2009 (Global financial crisis period), and from August 10 to November 9, 2011 (European debt crisis period).

We performed the following simple analysis. We compared the sample of FBI during the period when short selling was banned throughout Korea and the FBI sample during the normal period. During the ban period,

<Table 7> Pooled Regression of FBI Event Returns on Bonus Ratio: Short Sales Ban Period

We run a pooled ordinary least squares (OLS) regression of the event period returns for 532 free bonus-issues. Dependent variable is DGTW characteristic-adjusted returns, which is the stock return less the returns of a portfolio matched on tertile of size, book-to-market, and momentum. Turnover is the average ratio of the number of shared traded to the number of shares outstanding during the previous one year. ILLIQ is the average of Amihud (2002) ratio (the ratio of absolute returns to volume) over the previous one year. Ban is a dummy variable that takes a value of one if the FBI is in the short sale ban period (2008. 10. 1~2009. 5. 31, 2011. 8. 10~2011. 11. 9), and zero otherwise. The table reports the time-series average of the cross-section coefficients, Newey-West (1987) adjusted t-statistics (in parentheses), and the adjusted R-squares. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Variable	[ANN-Day]	[ANN-1, EX1]	[EX-Day]	[Pay-2, Pay-1]	[Pay0, Pay40]
Bonus ratio	9.195***	7.992***	2.758***	-2.693***	-2.418***
	(5.238)	(4.873)	(6.349)	-(6.314)	-(1.917)
Bonus ratio×Ban	-9.073	0.397	5.686*	1.003	-2.781
	-(0.912)	(0.043)	(2.310)	(0.415)	-(0.389)
Ban	0.191	-2.764	-1.755	0.001	-0.543
	(0.032)	-(0.500)	-(1.199)	(0.001)	-(0.128)
Turnover	-0.947	-0.734	0.843*	-0.115	-1.178
	-(0.699)	-(0.580)	(2.514)	-(0.351)	-(1.211)
ILLIQ	0.799	0.647	0.269	-0.195	-0.187
	(1.139)	(0.988)	(1.550)	-(1.143)	-(0.372)
Intercept	1.056	4.777	1.016***	-0.168	-0.659
	(0.696)	(3.369)	(2.706)	-(0.454)	-(0.604)
Adj. R^2	0.047	0.040	0.095	0.066	0.002

short-selling around FBI is also prohibited, so that the effect of trading restrictions will be stronger as liquidity supply weakens.

The number of FBI samples corresponding to the prohibition period of short selling is only 36. The regression analysis is conducted using the dummy variable (Ban) for the period corresponding to the ban period. The results are shown in <Table 7>. Although the statistical significance is weak, the interaction terms of bonus ratio with ban dummy have a positive value as expected. These results show that short selling may plays a role in increasing the price pressure effect of trading restrictions.

Ⅵ. Conclusion

In this paper, we analyze the returns of free bonus issues in a unique setting with trading restrictions. We provide two principal empirical evidences. First, we find significantly positive abnormal returns around both the announcement date and the ex-date and reversals around pay-date. Second, these market reactions are stronger when investors face a high level of trading restrictions. These results make important contribution to solve the puzzle that could not be explained by prior explanations, such as the signaling hypothesis and liquidity hypothesis. Moreover, our paper tries to solve the puzzle by resorting on the institutional singularity existing in an emerging market, while most previous literature on event returns focuses on US stock market.

Further, we find that two main results hold for both up-market and down-market. We also suggest that two main results are confirmed on only first time FBI, not non-first time FBI. Overall, our results provide the evidence on highlighting the trading restrictions as a new explanation on the market reaction to corporate policies.

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