The Effect of the Refixing Option in Convertible Bond on Shareholders ' Wealth

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Abstract

In the Korean convertible bond market, there is a refix option that allows for the adjustment of the conversion price according to a fall in stock prices. This is a unique system in Korea. In this study, we look into how a refix clause of convertible bonds impacts the wealth of shareholders, and analyzed whether the aim of this clause, which is to protect investors, is valid. The refix option is a system where the conversion price of convertible bonds is pulled down when the stock price falls after the security's issuance. For investors, this could be beneficial, as the number of stocks one can receive increases despite a fall in stock prices. However, for shareholders, it can mean dangers of stock dilution, resulting from an increase in the number of issued stocks. This paper analyzes the impact of refix clauses on shareholders, by studying the existence or nonexistence of refix effect and the announcement effect of refix clauses.

Study results are as follows: First, a higher negative market response was observed after an announcement to issue a convertible bond with a refix clause. Second, the market also responded negatively even at the point in time that a refix in price actually occurs, which suggests that "refixing" of convertible bonds undermines wealth of actual shareholders. Third, it was found that the announcement effect less negative as the share of the majority shareholder goes higher, which points to a correlation between the share of the majority shareholder and the refix clause. Compared to the United States and other developed countries, the current refix clause in Korea seems to excessively focus on the protection of convertible bond investors, and there seems to be room for improvements in the future.

JEL Classification: G14, G30

Keywords: Convertible Bond; Cumulative Abnormal Returns; Refixing Option

1. Introduction

A convertible bond, or CB, is a hybrid security that exhibits both the features of a bond and a stock. In other words, it is like a bond in that you need to pay a fixed rate of interest and then repay the principal on the maturity date, while it is also similar to a stock in that the bond can be converted into a number of shares at the request of the buyer, after a certain period, in accordance with the conversion clause. The method of converting bonds into shares is determined in advance at the point of issuance, and, in general, the conversion price, which refers to the ratio of shares each convertible bond converts to, is also determined at this point in time.

CBs are bonds that come with an option where you can convert the bonds into a predetermined number of common stocks according to the conversion price. The conversion price is adjusted to protect the creditor when stock ownership changes, in situations such as a capital increase with or without consideration, stock dividends, stock splits, reverse stock splits, or mergers. However, in the Korean market, refixing is possible not only when such changes in stock ownership occur, but also simply even when there are concerns that investors will experience a loss due to a fall in stock prices below the conversion price. In such a case, it is possible to lower the conversion price so that investors can receive more shares. In short, the refix option is a clause designed to protect CB investors, and can be called either as a conversion price adjustment clause or a refix option that allows for the adjustment of conversion prices following market price fluctuations.

Nonetheless, the refix option in Korea can be seen advantageous only to the bond buyer, while presenting disadvantages to existing company shareholders. This is because a lower CB conversion price means an increase in the number of newly offering equity, which could harm stocks held by existing shareholders. Moreover, the financial authority recommends an annual refixing of no more than 4 times in 3-month intervals. Therefore, considering that the maturity for convertible bonds is usually 3 years, a maximum of 11 rounds of adjustments could be made until the maturity

date.[1] The refixing of CB to protect creditors from falling stock prices is a practice that is unique to the Korean domestic market and not seen in advanced nations, including the United States. Undoubtedly, this can protect creditors, but at the same time, it can be a source of various disadvantages from the standpoint of existing shareholders. According to Kim (2001), the negative effect of CB refixing to shareholders not only gives rise to a conflict in economic interests between the shareholder and creditor, but also becomes a contradiction to the principles of commercial law. Hence, there is a need to examine the current state of CB refixing and carry out an empirical verification on the validity of this system.

This paper aims to empirically examine the extent to which Korea's unique CB refix clause negatively affects the wealth of existing shareholders. Research on convertible bonds in Korea, up until now, broadly focused on the motive for issuing CBs, analysis on conversion rights, and long-term and short-term stock price changes following a public announcement to issue a CB.   A recent study by Bin, Chung, and Cho (2015) also tried to present a theoretical foundation on CB prices by using the actual contract price in the secondary market for convertible bonds. However, they made the presumption that the conversion price is a sort of strike price that is predetermined and does not change unless there is a special reason to do so, and also, did not take CB refixing into consideration.

CB refixing is a very common practice. This study can be said to be the first empirical paper on CB refixing. The data on convertible bonds used for analysis were obtained from the Korea Exchange (KRX) and the results of the empirical analysis are as follows:

First, a higher negative market response was observed in response to an announcement to issue a convertible bond with a refix clause. This shows that the market perceives CB refixing as something disadvantageous to the shareholders. Despite this, since its introduction in 2000, the

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[1] This is true for public offerings involving more than 50 people, while for private placement where the buyer is predetermined, possible refixing is reduced to a total of 8 rounds because adjustments could only be made once a year.

number of convertible bonds issued with a refix clause had constantly risen to reach 95 percent in 2015. This shows that the Korean primary market for convertible bonds is extremely distorted. Second, the market responded negatively at the time the refix in price actually occurs, suggesting that refixing of convertible bonds undermines the wealth of actual shareholders. Third, it was found that the announcement effect less negative as the share of the majority shareholder goes higher. It points to a correlation between the share of the majority shareholder and the refix clause. The biggest problem that CB causes is the share dilution of existing shareholders. Therefore, issuance of convertible bonds by the majority shareholder can moderate those held by existing shareholders.

This paper is organized as follows: Chapter 2 summarizes related literature and existing study results on convertible bonds in Korea and abroad and also gives a summary on the current state of CB refixing at home. Chapter 3 explains the sample composition used in this study and the variables. Chapter 4 outlines the result of the empirical analysis, and finally, Chapter 5 presents the conclusion and significance of this study.

2. Literature review and the Current State of Convertible Bond Refixing

2.1 Literature review on Convertible Bonds

Issuing convertible bonds is similar to issuing equity, as CBs can be converted into stocks. In traditional finance, issuing debt plays the role of informing investors that a company has good investment opportunities. According to Myers and Majluf (1984), debt issuance signals good investment opportunities because company executives have more information on the value of that company than potential investors. On the other hand, issuance of equity, such as seasoned equity offering(SEO), is a signal that the value of the company is currently overvalued because the decisions of executives are in the interest of current shareholders.

CBs possess features of a seasoned equity offering that investors do not prefer due to its

conversion option. It is said that, in the U.S. market, CB announcements bring about a negative (-) abnormal return. However, it is less negative than the stock price response to seasoned equity offering. Therefore, investors consider convertible bonds in terms of both its characteristics as a bond and its characteristics as a stock (Dan, Mikkelson, 1984; Mikkelson, Partch, 1986; Smith, 1986; Eckbo, 1986).

Abhyankar and Dunning (1999) studied the effect of issuing convertible bonds in the UK stock market. The result showed that the issuance of CBs has a significant negative (-) effect on the wealth of shareholders. Burlacu (2000) examined the same in the French stock market using 141 cases of convertible bond issuances, and found a significant negative market response.

On the other hand, Kand and Stulz (1996) analyzed the announcement effect of convertible bonds and warrant bonds in Japan's stock market, and found that it had a significant positive response. Such a result was interpreted as the Japanese market being inefficient, having a different market structure compared to that of the United States and the UK, and showing abnormal positive returns due to easing of regulations. The positive effect from the announcement was also seen in the German financial markets, but this did not carry statistical significance (Roon and Veld, 1998). The study explained that this result was due to the fact that German companies tend to make public announcements that draw out a friendly market evaluation regarding the purpose of convertible bond issuance.

Meanwhile, there are only a handful of studies on convertible bonds in the Korean market, and the results are mixed. Woo Chun-sik (1992) analyzed the issuance of convertible bonds, between the years 1987 to 1993, and reported that there was a -0.204 percent response during the announcement period (0, +1). In addition, Kwon Young-jun, Kim Ju-gwon, and Choi Hong-sik (1992) as well as Shim Dong-suk (1997)'s study showed a negative response but no statistical significance. However, the above mentioned studies date back to a long time ago and the sample size is small.

5

Moreover, these studies were conducted before the refix system was introduced. Therefore, the convertible bonds issued at that time may be different from recent convertible bond issuances. However, there are several study results that report on positive (+) responses that are of no significance. Go Bong-chan and Park Rae-soo (2000) studied 422 convertible bond issuance cases, between the years 1981 to 1995, and found an insignificant cumulative abnormal return of +0.146 percent before and after (-10, +10) the announcement. Furthermore, they analyzed the impact that convertible bonds have on shareholders and creditors, Jung & Cha (2009) reported on a positive response to convertible bond issuances between 2000 and 2008, which was of no significance. As such, preceding studies in Korea are outdated, with no new recent studies, and lacking consistency in the study results according to different research periods. This could be attributable to the fact that such preceding studies did not reflect the current situation of the stock market, where the refix clause has become ubiquitous ever since numbers started to increase after the year 2000. Thus, this study aims to analyze the response of the market, considering the refix option of convertible bonds. Therefore, this study is meaningful as the first study to investigate the effects of these options. Also, we can interpret the different results of the previous studies in depth by considering the refixing option.

2.2 Current State of Convertible Bond Refixing and Discussion on Illegality

As mentioned in the previous chapter, existing studies on convertible bonds do not touch upon the issue of the refix clause, which is the adjustment of conversion prices. This chapter will outline the current state of refix clauses in Korean CBs, and introduce the argument on the illegality of refixing that is being put forth by the legal circles.

For public offerings involving more than 50 people, refixing of convertible bonds is possible after 3 months, while for private placement where the buyer is already determined, this could be

done after a year. The conversion price refers to the price of one share, predetermined at the time of issuance, when converting CBs into stocks. The conversion price cannot be set below the base price at the time of issuance. The base price is determined as the highest among the following 3 prices: (1 month average + 1 week average + closing price of the date for the resolution of the board)/3, closing price of recent date (day before the date for the resolution of the board), or closing price of 3 business days before the stock subscription date. However, the conversion price finalized at the time of issuance can be lowered or "refixed."

In 2000, the Financial Supervisory Service released acceptance criteria for refix clauses as a screening standard for paid-in capital increase notifications:

> *"Price adjustments shall be made every 3 months after the prohibition period for conversion and use of subscription rights, in accordance with related rules, and the price shall be adjusted when the highest price among the closing prices of recent dates and the arithmetic mean price derived from the average closing price of 1 month and 1 week from the base date and the closing price of the recent date is lower than the previous strike price."*

This means that when the base price, determined on the adjustment date that comes around every 3 months, is lower than the previous conversion price, this lower price becomes the new conversion price. On the other hand, when the base price is higher than the previous conversion price, no price adjustments will be made. In other words, after the conversion price is adjusted to a lower price on the first adjustment date, the adjusted conversion price cannot be reverted or adjusted even when the base price increases on the second adjustment date. Therefore, the lowest price among fluctuating stock prices practically becomes the conversion price until the maturity date. Thus, the conversion price, predetermined at the time of issuance, becomes a mere formality.

Against this backdrop, academic research on convertible bonds, in relation to refix options,

have focused on conflicting interests with existing shareholders. Kim (2001) claimed that convertible bonds with refix options for conversion prices provide immense benefits for bond buyers, while the opposite is true for existing shareholders. Under the refix option, the lowest price among fluctuating stock prices becomes the de facto conversion price until the maturity of a CB. Therefore, the refix option actually counts as a discount issue. Furthermore, he pointed out the contradiction to the principles of commercial law, as the uncertainty in the conversion price leads to the uncertainty in the number of shares that one can buy. Also, Kim talks about the possibility that this can conflict with the authorized stock system. Due to such problems, there is a possibility for the expedient use of the refix option in CB issuance. there is the possibility for setting the conversion price at a ridiculously low price, and then buying it to gain unjust market profit margins. Kim emphasized that the refix option of CBs need to be sufficiently notified to existing shareholders prior to the issuance and be issued after receiving their consent (Kim, 2001).

Lee (2009) studied the determination and adjustment of conversion prices and pointed out the problem of conversion price adjustment. He claimed that dilution of conversion rights occur due to falling stock prices and if such a fall is the result of supply and demand principle of the securities market, then this is something that CB investors need to bear with because it is due to the speculative nature of convertible bonds. The Moving Strike Convertible Bond (轉換價格修正条項付轉換社債; MSCB)[2], which is issued in Japan, is a convertible security for which the adjustment of the conversion price, following a fall in market price, is generally accepted. The bond's conversion price adjustment is accepted in a limited manner in Korea. Through this example, Lee mentioned the pros and cons in the legal perspective. The refix option can lead to a substantial transfer of wealth from

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[2] The term MSCB, which is commonly used in Japan, was coined in the Japanese way, so in the United States, it is usually called a "death spiral convertible bond" or a "floating-priced convertible bond" to signify that it has no bottom limit, or a very low price limit, for the adjustment of the conversion price.

the existing shareholders to the buyers. Therefore, Lee also claimed that there is a need to carry out in-depth discussions on the extent to which there needs to be exceptions on the problem that existing shareholders face due to excessive conversion rights and the dilution of stock value and on the principle of risk for investors, which is an innate feature of bonds. In particular, if the buyer is a mega hedge fund, then it can pull down stock prices through large amounts of short sales and then lower the conversion price accordingly, thereby exercising conversion rights, which can possibly lead to greater dilution of stock value due to an increase in the number of stock issuances than expected when issuing bonds. Moreover, it can trigger the fall in stock prices because it means stocks are being issued at a low price, and also make it difficult for stock prices to go up again (Lee, 2009)

Yoon and Lim (2010) pointed out the problems and points for improvements of the current convertible bond system. They claimed that there is a possibility that it can lead to a loss for companies when there is low-price issuance, because there is no rules on the amount and number of CB conversion prices. Furthermore, convertible bonds issued at a low price can cause problems when combined with the problem of disposing convertible bonds, such as the dilution of not only the share value of existing shareholders but also dilution of economic value.

Despite such possibilities, it is hard to find an empirical study on the issuance of convertible bonds and the adjustment of conversion prices in the Korean market. First of all, <Table 1> illustrates the recent state of convertible bond issuance with refixing option. Data on the number of announcements to issue convertible bonds for each year and the ratio of convertible bonds with a refix option were obtained from the Korea Exchange electronic announcement webpage, and was organized into <Table 1>. The table shows that ever since the mid-2000s, the issuance rate of convertible bonds with a refix conversion option has risen by a large amount, and recently, most convertible bonds adjust conversion prices according to a fall in market price.

<Figure1> is a graph version of <Table 1>, showing the issuance rate per year of convertible

bonds with a conversion (refix) option for conversion prices following a fall in market price. As can be seen from the diagram, more than 85 percent of companies chose the refix adjustment option when issuing convertible bonds, after the year 2010. Now, most companies are issuing convertible bonds with these option.

[Insert Table 1 about here]

[Insert Figure 1 about here]

In addition, when looking at the ratio of converted bonds to the market cap the percentage is high during economic recession. This is probably because bonds are converted to stocks in greater amounts when there is prospects that repayment of the principal is likely to be difficult due to increased danger of bankruptcy for companies that issued convertible bonds. In particular, convertible bonds have a high growth potential, but there is a tendency for large SMEs to bear the costs for raising debt capital, due to information asymmetry (Jung & Cha, 2009). This means that convertible bonds play a significant role in SMEs, which have difficulty raising funds. Moreover, the conversion price is very important, as it determines the ratio for converting to shares. Thus, the recent trend, where the refix clause has become a standard, needs to be reflected into the research in order to properly analyze the impact of convertible bonds.

This study aims to examine the market response to the issuance of convertible bonds, taking into consideration the refix option, and to analyze the impact of the refix option on the wealth of shareholders, by examining the market response to actual announcements on conversion price adjustments. Accordingly the majority shareholders receive the biggest blow from stock dilution, resulting from a conversion price adjustment. This is because majority shareholders not only see an economic loss from stock dilution, but also experience weakening management rights. Therefore, we assumed that there will be an incentive to stop the loss of shareholder value, resulting from refixing,

when the majority shareholder has a high share. We aim to analyze such a relationship through an empirical study.

3. Design of research

3.1 Data and sample used

The subjects of this study were firms that publicly announced the issuance of convertible bonds (CB) between January 2000 to December 2015 at the Korea Exchange (KRX) KOSPI and KOSDAQ. Public announcement for the issuance of convertible bonds and data on the adjustment of issuance prices were obtained from the Korea Exchange announcement webpage (kind.krx.co.kr), and from this data, we confirmed whether it included conversion price adjustment options following a fall in market price. Data on overseas convertible bond issuances were excluded. Meanwhile, data on the stock market and financial statements needed to analyze the market response to the issuance of convertible bonds and to an adjustment in conversion price were obtained from FnGuide. We used the adjusted stock price, which takes into consideration the dividend, for calculation of the stock returns.

3.2 Model

The market response to the announcement of issuance and conversion price adjustment was analyzed by event study method. In this study, abnormal return (AR) and cumulative abnormal return (CAR) were obtained using both market model and market adjustment model. The KOSPI index for listed companies in the securities market and the KOSDAQ index for listed companies in the KOSDAQ market were used to estimate the beta to obtain abnormal returns. The estimation period is from 252 to 11 days before the announcement date.

Regression analysis was conducted to examine the relation between the cumulative abnormal return on the date of issue and share of the majority shareholder. The regression analysis model is as follows.

$$Dep.Var. = \beta_0 + \beta_1 Major + \beta_2 Size + \beta_3 MTB + \beta_4 Lever (or\ CBratio)$$

$$+Industry\ dummy + year\ dummy + \epsilon$$

4. Main Result

4.1 Market response to the issuance announcement of CB

We examine the cumulative abnormal return before and after the announcement date of convertible bonds issuance to check whether the market reaction varies depending on the refixing clause. The sample analyzed a total of 813 observations, which excluded firms that did not obtain stock returns between 11 and 250 days before the announcement between 2000 and 2015. The cumulative abnormal return (CAR) was calculated as follows: CAR (−1, +1) is the 3-day cumulative abnormal return based on event date, and (-3,+3) is the 7-day and (-5,+5) for 11-day.

Table 2 shows the abnormal returns during the announcement date. In the entire sample, CAR (-1, + 1) shows a value close to 0 with no statistical significance. However, CAR (-3, + 3) and CAR (-5, + 5) show consistently negative values. The results differ from the most recent Korean study, Jung & Cha (2009), which covered the expansion of refix options from 2000 to 2008, when the refixing option is extended. The present study, meanwhile, reflected changes in investors' perception covering a more recent time period.

The sample with the option shows significant negative abnormal returns on average over the entire study period. Conversely, the CAR of convertible bonds without refixing clauses was found to be statistically insignificant. This explains that investors are more negative about the issuance of convertible bonds with refixing provisions.

[Insert Table 2 about here.]

[Insert Table 3 about here]

4.2 Market response on refixing announcement

This section verifies the CARs on the day that the actual conversion price adjustment was announced. Generally, the conversion price is adjusted every three months, according to the clause, so if the stock price continues to fall, refixing events will be made several times a year. Therefore, to see the primary effect of refixing, only the first adjustment announcement is selected to obtain the CAR. Since the refixing date is determined upon the CB issuance, we expected that there will be no effect after the announcement date. Therefore, the estimation period was extended to previous years.

Table 3 reports CAR on the day the refixing was announced. Four CARs were calculated according to the estimated period. CAR(-10, + 1) were minus value and statistically significant at 1% level. In particular, CARs of the KOSDAQ group is lower than that of the KOSPI. Also, CAR (-5, + 1) and CAR (-10, + 1) of KOSDAQ were statistically significant. Because there are a lot of small-sized firms listed in the KOSDAQ, results suggest that the agency cost of debt due to information asymmetry is high (Titman and Wessels, 1988)

[Insert Table 3 about here]

4. 3. Market response by share of major shareholder

Regression analysis was conducted to examine the relationship between market response and the share of majority shareholders. If there is a majority shareholder, there will be incentives to prevent the loss of wealth since the entry of new investors will necessarily dilute their stock holdings. Therefore, we expected that there would be a negative correlation between the two variables examined in this section.

The dependent variable used CAR (-10,+1), which was statistically significant in the above

13

section. CAR obtained from market model, and CAR_m from the market adjustment model. Table 4 shows the summary statistics of the dependent and independent variables.

The firm size is defined as natural logarithm of total asset, while LEV is the total debt divided by the company's total assets. MTB is defined as the market-to-book ratio, which shows an average of about 2.6 in the sample that adjusted the conversion price of convertible bonds. We also used CB ratio to find out the share of convertible bonds in total debt for this study.

We anticipated that firm with many CB will be significantly affected by refixing. On average, companies issuing convertible bonds were using 5% of convertible bonds against their total assets. All variables, except the dependent ones, used winsorization value at 1% level.

[Insert Table 4 about here]

Table 5 shows the correlation between variables. The parentheses indicate the p-value of the coefficient. At face value, it can be seen that the coefficient between the variables is not high, and therefore can be considered to have been set well.

[Insert Table 5 about here]

Table 6 shows the regression results. The dependent variable of market response was obtained through the market and market adjustment model. The model is divided into three cases according to explanatory and dummy variables. The results show that the shareholder ownership ratio has a significant positive correlation with CAR, indicating that the higher share of the majority shareholder, the higher his or her CAR. This suggests that firms with high shareholding percentages have higher abnormal returns due to refixing, which tend to have a positive impact on shareholders' wealth. Both models posted stronger results in the market-adjusted model. Meanwhile, the debt ratio (LEV) showed a negative correlation with CAR, which means that firms with higher debt leverage

report lower CAR at the time of refixing. This implies that investors tend to evaluate for loss of the adjustment of the conversion price due to stock price falls.

[Insert Table 6 about here]

In the case of the sample in which the CARs show a positive response, it is expected that there will be other factor besides refixing. In addition, some convertible bonds may increase the conversion value. In order to remove these samples, only samples showing negative CARs are selected and regression analysis is performed. The results are shown in Table 7. As a result, the higher the share of the major shareholder, the higher the CAR, the market reaction is less negative. In addition, the market response and the size of the firm were found to be significant. In other words, the larger the size of the firm, the more favorable in the market due to the adjustment of the conversion price.

[Insert Table 7 about here]

In the previous t-test results, Kospi and Kosdaq responded differently. The results are shown in Table 8. The KOSPI has a long history of exchanges and companies with larger firms, while the KOSDAQ is mainly focused on small and medium enterprises. As a result, it shows that the majority shareholder ownership and statistically significant results show that the tendency is stronger in the KOSDAQ. In particular, the negative CAR of the KOSDAQ market decreased as the firm size increased.

[Insert Table 8 about here]

5. Conclusion

In the Korean convertible bond market, there is a refix option that allows for the adjustment of the conversion price according to a fall in stock prices. This is a unique system in Korea. In this

15

study, we look into how a refix clause of convertible bonds impacts the wealth of shareholders, and analyzed whether the aim of this clause, which is to protect investors, is valid. The refix option is a system where the conversion price of convertible bonds is pulled down when the stock price falls after the security's issuance. For investors, this could be beneficial, as the number of stocks one can receive increases despite a fall in stock prices. However, for shareholders, it can mean dangers of stock dilution, resulting from an increase in the number of issued stocks.

This paper aims to empirically examine the extent to which Korea's unique CB refix clause negatively affects the wealth of existing shareholders. And the results of the empirical analysis are as follows: First, a higher negative market response was observed in response to an announcement to issue a convertible bond with a refix clause. This shows that the market perceives CB refixing as something disadvantageous to the shareholders. Despite this, since its introduction in 2000, the number of convertible bonds issued with a refix clause had constantly risen to reach 95 percent in 2015. This shows that the Korean primary market for convertible bonds is extremely distorted. Second, the market responded negatively at the time the refix in price actually occurs, suggesting that refixing of convertible bonds undermines the wealth of actual shareholders. Third, it was found that the scale of refixing tends to be smaller and the announcement effect less negative as the share of the majority shareholder goes higher. It points to a correlation between the share of the majority shareholder and the refix clause. The biggest problem that CB causes is the share dilution of existing shareholders. Therefore, issuance of convertible bonds by the majority shareholder can negatively affect those held by existing shareholders.

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Table 1. The issuance rate per year of convertible bonds with a conversion (refix) option

year	without refix clauses	with refix clauses	Number of total samples	Rate of CB with refix option	New issuance of CB (face value, billion won)	Market cap. of CB (face value, billion won)	Conversion rate of CB
2015	7	225	232	96.98%	583	479	-
2014	7	135	142	95.07%	548	391	0.13%
2013	7	41	48	85.42%	353	638	75.48%
2012	3	48	51	94.12%	44	1,006	7.17%
2011	4	65	69	94.20%	170	1,075	13.63%
2010	2	75	77	97.40%	298	1,176	33.04%
2009	45	199	244	81.56%	491	1,215	64.59%
2008	33	116	149	77.85%	784	2,164	34.53%
2007	22	125	147	85.03%	1,070	2,634	51.58%
2006	18	149	167	89.22%	187	2,734	9.14%
2005	13	48	61	78.69%	445	3,082	23.36%
2004	15	17	32	53.13%	59	3,318	123.69%
2003	21	32	53	60.38%	2,685	7,315	7.96%
2002	37	36	73	49.32%	786	5,451	15.49%
2001	52	61	113	53.98%	3,958	5,589	23.86%

Figure 1. The issuance rate per year of CBs with a conversion (refix) option following a fall in
market price

Table 2. Mean difference of cumulative abnormal return on announcement date of CB issuance

	Total samples (N=813)		with refix clauses (N=650)		without refix clauses (N=163)		(with - without)	
	mean	t-value	mean	t-value	mean	t-value	Mean difference	t-value
CAR(-1,+1)	0.0000	-1.2599	0.0000	-0.7195	0.0000	-1.0406	0.0000	-1.3590
CAR(-3,+3)	-0.0105	-2.3232 **	-0.0107	-2.2684 **	-0.0098	-0.7820	-0.0105	0.0790
CAR(-5,+5)	-0.0231	-2.4090 **	-0.0277	-2.7475 ***	-0.0046	-0.1769	-0.0231	0.9678

***,**,and * denote significance at the 1%, 5% and 10% levels respectively.

Table 3. Cumulative abnormal returns by refixing effect (Market adjustment model)

	Total sample		Kospi		Kosdaq	
	mean	t-value	mean	t-value	mean	t-value
CAR(-1,+1)	-0.0018	-0.7537	0.0040	0.4061	-0.0023	-0.9780
CAR(-3,+1)	-0.0025	-0.7900	-0.0059	-0.4031	-0.0021	-0.6840
CAR(-5,+1)	-0.0083**	-2.1271	-0.0044	-0.2464	-0.0086**	-2.2165
CAR(-10,+1)	-0.0225***	-4.5139	0.0107	0.5340	-0.0257***	-5.0395

***, **, and * denote significance at the 1%, 5% and 10% levels respectively.

Table 4. Summary statistics

variables	Number of Observations	mean	median	min	max	Standard deviation
CAR	1406	-0.0155	-0.0194	-1.1460	1.5753	0.1926
CAR_m	1406	-0.0209	-0.0261	-1.0401	1.5361	0.1864
SIZE	1406	17.8566	17.7746	15.5537	21.0908	1.0413
Major	1406	0.2168	0.1962	0.0000	1.3931	0.1660
LEV	1406	0.6097	0.5872	0.0768	2.1296	0.3140
MTB	1406	2.6470	1.6023	-8.0097	30.2429	4.6382
CB_D	1406	0.1069	0.0055	0.0000	0.7795	0.1758

Table 5. Correlation analysis

The table reports the correlations among the variables used in this study.
Cumulative abnormal return (CAR) and CAR_10 as a dependent variable and Major as an independent variable.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CAR_m	1						
CAR	0.6824	1					
	0						
SIZE	0.0738	0.0519	1				
	-0.0057	-0.0519					
Major	0.0328	0.0506	0.2524	1			
	-0.2186	-0.058	0				
LEV	-0.0272	-0.0234	-0.0844	-0.0965	1		
	-0.3085	-0.3801	-0.0015	-0.0003			
MTB	-0.0452	-0.0102	-0.1844	-0.046	-0.0137	1	
	-0.0905	-0.7019	0	-0.0845	-0.609		
CB	0.0003	-0.0062	-0.1636	-0.0609	-0.1108	0.0724	1
	-0.9898	-0.8162	0	-0.0223	0	-0.0066	

Table 6. Regression results: Relationship between CAR and share of Major shareholders

$$Dep.Var. = \beta_0 + \beta_1 Major + \beta_2 Size + \beta_3 MTB + \beta_4 Lever\,(or\ CBratio) + Industry\ dummy + year\ dummy + \epsilon$$

VARIABLES	Market model			Market adjustment model		
	model 1	model 1-1	model 1-2	model 2	model 2-1	model 2-2
Major	0.0237	0.0700*	0.0926*	0.0152	0.0766**	0.0793**
	(0.0320)	(0.0359)	(0.0484)	(0.0310)	(0.0345)	(0.0345)
SIZE	0.00909*	0.00502	0.00707	0.0112**	0.00441	0.00418
	(0.00519)	(0.00580)	(0.00789)	(0.00502)	(0.00559)	(0.00563)
LEV	0.00723	0.00749		-0.0125	-0.0100	
	(0.0165)	(0.0168)		(0.0159)	(0.0162)	
MTB	-0.00187*	-0.00182	-0.000252	-0.00134	-0.00136	-0.00133
	(0.00113)	(0.00114)	(0.00155)	(0.00109)	(0.00110)	(0.00110)
CB_D			-0.0223			-0.0149
			(0.0419)			(0.0299)
Constant	-0.182*	-0.191	-0.318	-0.213**	-0.189	-0.189
	(0.0932)	(0.179)	(0.241)	(0.0902)	(0.172)	(0.172)
Observations	1,406	1,406	1,406	1,406	1,406	1,406
R-squared	0.006	0.038	0.032	0.007	0.047	0.047
Year dummy	no	yes	yes	no	yes	yes
Industry dummy	no	yes	yes	no	yes	yes

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 7. Regression analysis of samples with negative CAR values

$$Dep.Var. = \beta_0 + \beta_1 Major + \beta_2 Size + \beta_3 MTB + \beta_4 Lever(or\ CBratio) + Industry\ dummy + year\ dummy + \epsilon$$

VARIABLES	Market model			Market adjustment model			
	model 1	model 1-1	model 1-2	model 2	model 2-1	model 2-2	
Major	0.0829***	0.0808***	0.0427	0.0734***	0.0907***	0.0929***	
	(0.0280)	(0.0309)	(0.0536)	(0.0252)	(0.0275)	(0.0276)	
SIZE	0.0229***	0.0171***	0.0161*	0.0233***	0.0166***	0.0169***	
	(0.00462)	(0.00513)	(0.00894)	(0.00410)	(0.00455)	(0.00458)	
LEV	-0.00554	0.00319		-0.0197	-0.0135		Standard errors
	(0.0140)	(0.0142)		(0.0129)	(0.0131)		in parentheses,
MTB	6.42e-05	-0.000547	0.000716	0.000812	0.000299	0.000298	*** p<0.01,
	(0.000913)	(0.000924)	(0.00160)	(0.000822)	(0.000829)	(0.000831)	** p<0.05,
CB_D			-0.00260			0.00405	* p<0.1
			(0.0466)			(0.0249)	
Constant	-0.549***	-0.382***	-0.416*	-0.543***	-0.397***	-0.408***	
	(0.0832)	(0.136)	(0.234)	(0.0740)	(0.123)	(0.123)	
Observations	802	802	802	845	845	845	
R-squared	0.055	0.122	0.062	0.064	0.132	0.131	
Year dummy	no	yes	yes	no	yes	yes	
Industry dummy	no	yes	yes	no	yes	yes	

Table 8. Regression results by the stock exchanges with negative CAR

$Dep.Var. = \beta_0 + \beta_1 Major + \beta_2 Size + \beta_3 MTB + \beta_4 Lever (or\ CBratio) + Industry\ dummy + year\ dummy + \epsilon$

VARIABLES	Kospi			Kosdaq		
	model 1	model 1-1	model 1-2	model 1	model 1-1	model 1-2
Major	0.183**	0.307**	0.309**	0.0538**	0.0797***	0.0819***
	(0.0910)	(0.133)	(0.134)	(0.0266)	(0.0281)	(0.0282)
SIZE	0.0239	0.0353	0.0339*	0.0275***	0.0212***	0.0215***
	(0.0150)	(0.0219)	(0.0190)	(0.00452)	(0.00495)	(0.00494)
LEV	-0.0599	-0.00999		-0.0172	-0.0105	
	(0.0774)	(0.0964)		(0.0132)	(0.0133)	
MTB	0.00677*	0.00789*	0.00772*	0.000462	1.98e-05	5.27e-05
	(0.00389)	(0.00451)	(0.00402)	(0.000847)	(0.000847)	(0.000848)
CB_D			-0.00881			-0.00571
			(0.155)			(0.0253)
Constant	-0.585**	-0.891**	-0.871**	-0.612***	-0.398***	-0.412***
	(0.262)	(0.423)	(0.400)	(0.0813)	(0.147)	(0.146)
Observations	69	69	69	776	776	776
R-squared	0.095	0.223	0.223	0.072	0.157	0.156
year	no	yes	yes	no	yes	yes
industry	no	yes	yes	no	yes	yes

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1