What makes firms issue death spirals? A control enhancing story[†]

Woochan Kim[*], Woojin Kim[+], Hyung-Seok Kim[#]

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Abstract

In this paper, we study the motive of issuing floating-priced convertibles or warrants, known as *death spirals*, in a country setting where the private benefit of control is high. Using a total of 199 death spiral issuances by public firms listed in the Korea Stock Exchange during 1998-2006, we find a number of empirical evidences that are not consistent with the *last-resort financing hypothesis*, but rather consistent with the *control enhancing or control transferring hypothesis*. First, death spirals are not necessarily issued by firms with poor operating performances. Second, death spiral issuers with no changes in controlling shareholders do not experience a decrease in proportional ownership by the controlling party, while family members other than the controlling shareholder experience the most pronounced increases in the number of shares held. Third, this group of death spiral issuers tends to perform better than those in which family loses control.

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[*] Associate Professor of Finance, KDI School of Public Policy and Management, Chungrangri-Dong Dongdaemun-Ku, Seoul, 130-868, Korea, tel: +822-3299-1030 | fax: +822-968-5072 | E-mail: wc_kim@kdischool.ac.kr
[+] Assistant Professor of Finance, Korea University Business School, Anam-Dong, Seongbuk-Gu, Seoul, 136-701, Korea, tel: +822-3290-2834 | fax: +822-3290-1307 | E-mail: woojinkim@korea.ac.kr
[#] Korea University Business School, Anam-Dong, Seongbuk-Gu, Seoul, 136-701, E-mail: 9712010@korea.ac.kr

1. Introduction

Floating-priced convertibles, known as *death spirals*, are back. According to PlacementTracker, the amount of money raised by structured PIPEs - another name of death spirals - peaked in 2000 with the deal amount of USD 3.14 billion, dropped down to USD 0.28 billion in 2003, and then hit its new record at USD 14.20 billion in 2007.[1] Moreover, recent deals involving troubled US financial institutions closely resemble death spirals. For example, Merrill Lynch's deal with Temasek of Singapore in December 2007 includes a reset clause saying that should Merrill Lynch afterwards raise money at a lower price, Temasek would be compensated retroactively by having their initial investment priced at this lower price. The clause permits Merrill Lynch to compensate Temasek by issuing additional shares of common stock in lieu of cash. In July 2008, this reset clause was actually triggered when Merrill Lynch had to offer new shares at a lower price.

Death spirals are not confined to US firms either. In Japan, it is known as moving strike convertible bonds (MSCBs) and came under scrutiny when Lehman Brothers provided an JPY 80 billion MSCB for internet firm Livedoor's takeover battle against top broadcaster Fuji Television Network in 2005. In Korea, death spirals are known as convertible bonds or bonds with warrants with a re-fixing option clause, which became an important external financing vehicle for cash-strapped firms and others following the financial crisis of 1997.

According to the existing literature, firms issue death spirals when they have no other means of raising capital. Using US data during 1994 and 1998, Hillion and Vermaelen (2004) find

[1] PIPEs stand for private investment in public equity. Visit www.sagientresearch.com/pt for detailed statistics.

evidence that supports this story, which they named it as the *last resort financing hypothesis*.[2] Specifically, they show that (i) the issuance of floating-priced convertibles is followed by significant negative abnormal returns, (ii) the value of the underlying assets, i.e., common stock plus convertibles, fall significantly during the year after the issuance, (iii) operating performance declines significantly relative to comparable non-issuing firms during the years following the issuance, and (iv) poorly performing firms are more likely to issue a floating-priced convertible.

In this paper, we study the motive of issuing death spirals from a new angle. We investigate if death spirals are issued to enhance the controlling shareholder's influence over its business group in which the issuing firm is a member or to transfer the control over the issuing firm to the controlling shareholder's heir (*control enhancing or control transferring hypothesis*). For example, suppose there is a business group composed of two firms, A and B with equal size. Chairman Lee owns 50% of firm A shares and 30% of firm B shares. Firm A is fully controlled, but firm B is only partly controlled. To enhance his control over firm B, Chairman Lee can sell 20% of his shares in firm A to firm B and use the cash proceeds to purchase firm B shares from other shareholders. After these transactions, Chairman Lee would own only 30% of firm A shares, but through firm B, controls 20% of additional shares, which makes his control over firm A shares unchanged at 50%. In case of firm B, with the newly purchased shares, Chairman Lee would own and control 50% of its shares. So, both firms A and B are under Chairman Lee's full control.

Now, let's bring in a floating-priced convertible into the analyses. Suppose firm A privately issues a floating-priced convertible to firm B and just before the announcement of its issuance suppose Chairman Lee sells his 20% shares of firm A to other shareholders. Since conversion

[2] Hillion and Vermaelen (2004) also find evidence that supports the *faulty contract design hypothesis*. However, they acknowledge that it is not obvious under the *faulty contract design hypothesis* why managers would approve floating converts. One needs to introduce some frictions. For example, managers may not have fully understood the negative consequences. Or, they may have knowingly issued it since they can re-price their stock options. In the latter case, it is the effectiveness of the board of directors that is in question. In this paper, we propose *control enhancing or control transferring hypothesis* as an explanation why managers would approve floating converts despite their faulty design.

price will fall after the issuance, firm B would be able to acquire 20% of firm A shares at a much cheaper price compared to the case when firm B has to directly acquired the shares of firm A from Chairman Lee.[3] Chairman Lee, who sold his shares before the price fall would be able to secure enough cash to purchase 20% of firm B shares. As a result of these transactions, Chairman Lee controls 50% of firm A and 50% of firm B shares. These levels of control are same as those without death spirals. But, one difference is that firm B spent less money to acquire 20% of firm A shares. Thus, death spirals can be used as a cost-efficient way of enhancing control over a business group.

Another possibility is to transfer the control over the issuing firm to his heir. Suppose now Chairman Lee controls a stand-alone firm A in which he owns 50% of shares. To transfer his control over firm A to his son, Chairman Lee can sell all his shares in firm A to his son. The son who does not have any money will borrow the necessary cash from a bank, purchase the shares from his father, and let his father pay back the money. Now, let's bring in a death spiral. Suppose firm A privately issues a death spiral to the Chairman's son and just before the announcement of its issuance, suppose Chairman Lee sells his 50% of firm A shares to others and transfers the cash proceeds to his son. Since conversion price will fall after the issuance, Chairman's son would be able to acquire more than 50% of firm A shares if he chooses to use all the cash proceeds he received from his father. Since he only needs 50% of firm A shares, he may choose not to fully use the cash proceeds, which will give him a surplus to consume. Thus, death spirals can be used as a cost-efficient way of transferring control of a firm to one's heir.

The latter case actually took place in reality. In July 1999, Doosan Corporation issued a

[3] Stock price can decline upon issuance even when it is not overvalued. As will be explained later, any random move in share price can trigger a downward spiral. In the presence of a controlling shareholder, there is no need to rely on randomness. That is, the controlling shareholder can influence the share price in a way that triggers the downward death spiral.

bond with floating-priced warrants (USD 100 million).[4] It was an overseas public issuance, but it was prearranged so that warrants are detached immediately after the issuance and mostly sold to the members of the controlling family. Initially, the warrants were purchased both by the third and the fourth generation family members, but in September the third generation sold all of their warrants to the fourth generation family members. In October, the first downward adjustment took place for the warrants' exercise price. The debt was paid back one year after the issuance in July 2000.

In subsequent years share price dropped which lead the exercise price to fall from the original level of KRW 50,100 in July 1999 to KRW 9,460 in October 2002. If the fourth generation family members fully exercised their warrants in October 2002 they could have increased the family ownership of Doosan Corporation from 15.7% to 39.1%.[5] In October 2002, this scheme was uncovered by a local governance research institute, which lead Financial Supervisory Service (FSS) to investigate on the matter.[6] In February 2003, the controlling family announced that they would voluntarily void their entire holdings of Doosan Corp. warrants. The case of Doosan Corp. was not the only case uncovered during this period. People's Solidarity for Participatory Democracy (PSPD), a civil activist group in Korea, reported that at least 16 other companies have issued similar death spirals. Among these, there four cases where the controlling family later voluntarily redeemed all of their warrant holdings.[7]

To empirically test the *control enhancing or control transferring hypothesis*, we need to investigate the motive in a country setting where the level of private benefit of control is high. That is, we need a country setting where controlling shareholders make use of control enhancing

[4] This anecdote is from CGCG (2002) and CGCG (2003). Doosan Corporation is a member firm of Doosan group. At the time of the death spiral issuance, Doosan group was the 12th largest *chaebol* in Korea.
[5] Family control, including the shares owned by Doosan affiliates, could have increased from 59.72% to 70.9%.
[6] See CGCG (2003).
[7] See PSPD (2003).

mechanisms (CEM) to expand their control and where family succession is prevalent, which is why we study Korean firms in the paper. Using a total of 199 death spiral issuances by public firms listed in the Korea Stock Exchange during 1998-2006, we find a number of empirical evidences that are not consistent with the *last-resort financing hypothesis*, but rather consistent with the *control enhancing or control transferring hypothesis*. First, death spirals are not necessarily issued by firms with poor operating performances. Second, death spiral issuers, where there was no changes in controlling shareholders, do not experience a decrease in proportional ownership by the controlling party as a whole, while family members other than the controlling shareholder experience the most pronounced increases in the number of shares held. Third, this group of death spiral issuers tend to perform better than those in which family lose control.

The paper is organized as follows. Section 2 provides a brief overview of death spirals in Korea. Section 3 outlines our hypotheses and section 4 explains the data and the sample. Section 5 provides the empirical results and Section 6 concludes.

2. Death Spirals in Korea

Since the first convertible bond issuance by Samsung Electronics in 1985, hybrid securities – mostly convertible bonds (CB) and bonds with warrants (BW) – became one of the key external financing vehicles for Korean firms. In the beginning, firms issued hybrid securities with fixed conversion or exercise prices. But, since the financial crisis of 1997 firms started to issue hybrids with floating conversion or exercise prices. Table 1 reports that death spirals take up 28% of all hybrid securities issuances during 1998-2006, in terms of amount issued (30% in terms of number of issuances). In more recent years, however, death spirals are becoming the norm. During 2004-2006, death spirals dominate not only in numbers (83%) but also in terms of amount issued (60%).

Before we discuss our detailed hypotheses in the next section, we summarize here some of the unique features of the Korean death spirals. First, bonds with floating-priced warrants should be considered as a death spiral along with floating-priced convertibles. Unlike in the US, bonds with warrants have been one of the key hybrid securities next to convertible bonds. This is partly due to the fact that Korean commercial code does not allow firms to issue warrants separately from a bond issuance. Reflecting the prevalence of bonds with fixed-priced warrants in Korea, those with floating-priced warrants are also prevalent. Table 1 shows that, during 1998-2006, bonds with floating-priced warrants take up approximately 43% of total death spiral issuances in terms of numbers and 18% in terms of amount issued. Floating-priced convertible preferred stocks, another form of death spiral that exists in the US, however, do not seem to have been issued by Korean firms.

Second, unlike the death spirals in the US, Korean death spirals typically do not allow upward adjustments of conversion prices (exercise prices in case of bonds with floating-priced warrants). This means there can only be a "downward" spiral of conversion (or exercise) prices in Korea. A typical adjust rule would say that the conversion (or exercise) price is adjusted on the 15^{th} day of each month and it is adjusted to be equal to either (i) the previous month's conversion (or exercise) price or (ii) the arithmetic average of the closing prices during the past 5 trading days, whichever is "smaller." So, if share price initially falls after the death spiral issuance (pulling down the conversion price) and rises up afterwards (pushing up the market price, but not the conversion price), the conversion (or exercise) price will be below the market price. Related to this, it is also worth noting that this feature of the Korean death spiral effectively precludes the possibility for the *undervaluation hypothesis* to hold. According to this hypothesis, firms issue floating-priced convertibles instead of the fixed-priced convertibles when managers believe that the share price is undervalued at the time of issuance. If fixed-priced convertibles are issued,

conversion will take place below the share's fair value as it cannot be adjusted upward after the issuance. But if floating-priced convertibles are issued instead, conversion will take place at a higher price as it gets adjusted upward with the rising share price during the lock-up period. So, firms would choose to issue floating-priced convertibles. But, this argument relies on the fact that conversion (or exercise) prices can be adjusted upward, which is not the case in Korea.

Third, at the time of issuance, Korean death spirals do not allow any conversion (or exercise) discount. That is, the conversion (or exercise) price must be equal to the reference price. This is different from US death spirals that allow such a discount. According to Hillion and Vermaelen (2004), this conversion discount is on average 15.5% in the US. But, as explained above, Korean death spirals may eventually have a conversion (or exercise) discount subsequent to their issuances as swings in the share price will lower, but never raise, the conversion (or exercise) price (that is, upward price rigidity). Therefore, the typical investment strategy, found in the US among hedge funds, of purchasing a death spiral, selling short the shares dear, and later converting at a discount can also be a profitable strategy in Korea. Popular press reports that similar investment strategies did take place in Korea. In this regard, we do not preclude in this paper the possibility of *faculty contract design hypothesis*, which basically states that share price declines after the death spiral issuance because of its faculty contract design that triggers short selling, conversion, dilution, and so on. With upward price rigidity, any random move of share price can create a conversion (or exercise) discount, which would trigger a downward spiral. But, in the presence of a controlling shareholder, there is no need to rely on randomness. That is, the controlling shareholder can influence the initial share price drop and the subsequent price jump, which will create a conversion (or exercise) discount that triggers the downward death spiral.

In April 2002, the Financial Supervisory Service (FSS) introduced a number of regulatory changes regarding death spirals. First, it extended the minimum lock-up period for privately

placed death spirals from one month to a full year. For publically issued death spirals, the minimum lock-up period of one month was not extended. Second, it introduced a floor on conversion (or exercise) price to be at least 70% of the original at the time of issuance. So, if the original conversion (or exercise) price was KRW 10,000, any subsequent conversion (or exercise) price cannot drop below KRW 7,000. This does not mean that the maximum discount is 30%. If the share price moved up to KRW 12,000, the maximum discount would be 41.7%. FSS, however, allowed firms to opt out from this regulation by securing shareholders' approval.

Third, FSS required the issuance of death spirals and its detailed terms to be approved by the board. Fourth, in case of privately placed bonds with floating-priced warrants, it imposed a minimum period during which warrants cannot be detached from the bond. The minimum period is set to be one third of the bond's maturity. In case of those with a one-year maturity, the warrants cannot be detached until the bond matures.[8]

3. Hypotheses

The aim of this paper is to test the existence of control enhancing or control transferring motive when issuing death spirals. To this end, we develop a number of predictions that are consistent with the *control enhancing or transferring hypothesis*, but not with the *last resort financing hypothesis*. In this paper, we do not explicitly test the *faulty contract design hypothesis*. That is, we do not separately investigate whether some contractual features of the death spiral

[8] On December 2005, there was another regulatory change regarding death spirals. FSS changed the way reference prices can be set at the time of death spiral issuance. Previously, reference price had to be equal to the highest among the following three: (i) the arithmetic average of one-month closing price average, one-week closing price average, and last business day's closing price, (ii) last business day's closing price, and (iii) closing price on the day that is three business days prior to the subscription day. From January 2006, firms were allowed to set the reference price that is equal to the lowest, not the highest, among the three. This regulatory change applied only to publically issued death spirals.

security, such as lock-up period, discount, and others, exacerbate the stock price decline upon issuance. Rather, we propose our *control enhancing or transferring hypothesis* as one possible explanation why managers would approve the issuance of death spiral despite its faulty contract design. As explained earlier, there is no need to test the *undervaluation hypothesis* in the Korean context.

We begin with the test that investigates whether the issuance of death spirals are followed by significant negative abnormal returns. Note that this test is not intended to reject one hypothesis in favor of the other. This is because both hypotheses predict that share prices would decline following the issuance. Under the *last resort financing hypothesis*, firms issue floating-priced convertibles over fixed-priced alternatives when share prices are believed to be overvalued by outside investors at the time of issuance.[9] When floating-priced convertibles are offered, outside investors would willingly acquire them for its floating conversion price provides protection against the risk of overpayment. That is, conversion price would drop over time as initially overvalued stock price declines, which in effect protects them from overpayment. Fixed-priced convertibles, however, do not provide such protection. Thus, according to the *last resort financing hypothesis*, issuance of a death spiral would be a signal that shares are overvalued, which is why share prices drop following the issuance. Under the *control enhancing or control transferring hypothesis*, share prices drop not because shares are initially overvalued, but because the death spirals themselves are ill-designed. The difference from the *faulty contract design hypothesis* is that, it provides an explanation why a firm would issue a death spiral despite its faulty design. Under this hypothesis, the controlling shareholder allows the issuance of death spirals because they help the affiliated firms or the heir to convert bonds (or exercise warrants) at a cheaper price.

[9] This hypothesis obviously assumes two different types of investors. That is, current existing shareholders who believe the shares are fairly valued and outside potential investors who believe shares are overvalued.

Next, we investigate whether death-spiral issuers are firms with poor operating performance at the time of issuance. According to the *last resort financing hypothesis*, firms tend to issue death spirals when their poor accounting performance does not warrant them from issuing conventional securities. Even if shares are believed to be overvalued by outside investors at the time of issuance, as long as the level of operating performance is at a reasonable level, firms would still be able to issue straight debt. But firms under severe financial distress with extremely poor accounting performance have no choice but to issue death spirals. To the contrary, the *control enhancing or control transferring hypothesis* predicts that death spiral issuers are not necessarily poorly performing firms. The logic is simple. No controlling shareholder would want to enhance his/her control over a group where member firms are poorly performing. Likewise, no controlling shareholder would want to transfer to his/her heir the control of a firm that is poorly performing.

Related to this second test, we also investigate if the operating performance of death spiral issuers deteriorates over time. According to the *last resort financing hypothesis,* outside potential investors believe shares are overpriced, while current shareholders do not, because the former expects future operating performance to deteriorate over time while the latter does not. Thus, the issuance of a death spiral would be a signal that operating performance would deteriorate after the issuance. The *control enhancing or control transferring hypothesis*, on the other hand, has no prediction regarding ex-post operating performance.

Unlike our first test on ex-post share price movement, these two tests allow us to reject one hypothesis in favor of the other. If we find that death spiral issuers are not necessarily poorly performing firms at the time of issuance or do not experience deterioration in their operating performance after the issuance, it would be an indication that firms may issue death spirals for reasons other than last resort financing.

Our third test attempts to find direct evidence supporting the *control enhancing or control*

transferring hypothesis. We investigate a subset of firms that may have issued death spirals for control enhancing or control transferring motives. That is, we focus our analysis to death spiral issuers, where control is preserved within the family, even after the death spiral issuance. Specifically, we investigate whether these firms experience an increase of ownership either by affiliated firms or by other family members. If ownership by affiliated firms increases, this would support the control enhancing hypothesis. In our earlier example of a hypothetical group composed of firm A and B, an affiliate (firm B) increased its ownership in the death spiral issuer (firm A). If ownership by other family members increases, this would support the control transferring hypothesis. In our earlier example, Chairman Lee's son increased his ownership in the death spiral issuer (firm A).

Lastly, we investigate whether this group of firms, where control is preserved within the family even after the death spiral issuance, are different from another set of firms, where family loses control, in terms of operating performance at the time of death spiral issuance. If the former exhibits superior operating performance compared to the latter, it would strengthen our evidence that the former issued death spirals not as a last resort, but as a way to enhance control over a group or to transfer control to an heir.

4. Data

A. Sample Construction

We first extract a list of all publicly traded non-financial firms on Korea Stock Exchange (KSE) that issued hybrid securities (CBs or BWs) since 1998. This list is available from *TS2000*, a dataset compiled by the Korea Listed Companies Association (KLCA). The list contains the identity of the issuer as well as the detailed characteristics of the issue such as the type, amount,

conversion ratio, issue date, expiration date, etc. To identify the exact announcement date of the original disclosure of the issue, we manually searched Korea Stock Market Daily, a daily publication issued by KSE, where all of the public disclosures are officially announced.[10] In the process, we also double checked whether the information contained in *TS2000* is consistent with the original disclosure.[11] We set our sample period to start in 1998 and end in 2006, mainly since death spirals became popular in Korea after the financial crisis in 1997. During our sample period, we identified a total of 657 hybrid security issues by 288 distinct firms, of which 199 issues by 126 distinct firms were death spirals.

B. Other Data Sources

For accounting variables and year-end market variables, we use data provided in *TS2000.* For dividend and stock-split adjusted daily returns, we use data from Korea Securities Research Institute (KSRI). We obtain ownership data manually from the annual reports available through Data Analysis and Retrieval Transfer (DART) system which is an electronic disclosure system similar to EDGAR in US.[12]

5. Results

A. Summary Statistics

Panel A of table 1 reports the number of hybrid security issues over the sample period for

[10] The difference between the actual issue date and the original announcement date can be as short as one trading day up to two months.
[11] In case where there was discrepancy, we followed the original disclosure.
[12] There are a variety of data vendors that provide ownership data for Korean firms. But, there are certain limits regarding the accuracy of these datasets, especially the detailed relationship between each individual shareholder and the controlling shareholder. Hence, we reassembled the ownership dataset manually using the original disclosures by the reporting firms.

both death spirals and non-death spirals. Death spirals are floating-price convertible bonds (CBs) or bond with warrants (BWs) where the conversion price or the exercise price falls in case the stock price falls subsequent to the issue. We further classify death spirals and non-death spirals into three sub-categories; CBs vs. BWs, domestic vs. overseas issue, and public vs. private issue.

The numbers for all issues indicate that there was a clustering of issues in 1999. We conjecture that this is related with the efforts of the Korean firms to reorganize their capital structure in the aftermath of 1997 financial crisis. And most of the issues in 1999 were non-death spirals. Since 1999, the number of non-death spiral issues has been decreasing continuously. In contrast, we observe more issues of death spirals in the recent years. In fact, death spirals issued in 2005 and 2006 account for more than half of all death spiral issues. The composition of sub-categories indicates that the relative frequencies for BWs, overseas issues and public offers are higher in death spiral group than in the non-death spiral group.

In panel B of table 1, we report the total proceeds from hybrid securities. We observe a similar pattern as in panel A, except that there is another clustering in 2001 from both death spiral issues and non-death spiral issues.[13] On average, the total proceeds raised from hybrid securities accounts for roughly 2.7% of the total amount raised in the Korean capital market; both equity (primary issues only) and debt.

B. Stock Price Movement following the Death Spiral Issue Announcement

In table 2 and figure 1, we report the averages of the cumulative abnormal returns of the death spiral issuers surrounding the original disclosure announcement from day -10 through day +60. Event day is the original disclosure date of issue that identified from Korea Stock Market

[13] For death spirals, this clustering can be attributed to an extremely large issue of KRW 3,200 billion by a single firm, Hynix.

Daily. We use both market-adjusted model and market model to estimate abnormal returns where the market returns are value weighted index returns compiled by the Korea Securities Research Institute (KSRI). Market model residual returns are obtained using past 200 trading days from day -220 to -21 of the issue announcement.[14]

In table 2, we test the statistical significance based on two different procedures. First, we report the t-stats based on the cross-sectional standard errors from the event period. The second t-stat is based on the time-series standard deviations of portfolio returns during the estimation period (Brown and Warner, 1985).

The results from figure 1 and table 2 indicate that the death spiral issuers experience a significant drop in stock prices following the issue announcement. The average drop is -13.29% based on market model, and -8.47% based on market adjusted model over two month period.[15] This is consistent with Hillion and Vermaelen (2004), where they report abnormal returns between -30.1% to -54% over a 12 month period.[16] These results are consistent with either *last resort financing hypothesis* or reshuffling control structure hypothesis, but not with undervaluation hypothesis. As mentioned earlier, the undervaluation hypothesis is irrelevant in the Korean context. In unreported results, we examined whether there were any differences in abnormal returns between CBs and BWs, domestic and overseas issues, and public and private issues, but they were generally not statistically significantly different between these groups.

In the second column of table 2, we report the results only using the first death spiral issue

[14] In case where there were more than two issues by the same issuer on the same date, we excluded them from this analysis if one of them was death spiral but the other was not. If all of the issues made by the same issuer on the same date were death spirals, we treated them as one observation.

[15] We also tried various horizons, up to +30, +90, and +180 trading days other than our baseline horizon of +60 trading days and obtained similar results.

[16] Hillion and Vermaelen use monthly returns rather than daily returns since they cannot clearly identify the original announcement date. This is mainly because US disclosure rules allows firms to file *after* the actual issue so it is not clear when the issue decision was made public. Our dataset allows us to identify the exact date of the original disclosure from the Korea Stock Market Daily, so we use daily returns rather than monthly returns.

by each firm. And the results suggest that the magnitude of the price drop is smaller for the first issues, implying that the returns are more negative for the follow-up issues. This could be explained at least partially by investors becoming more aware of the consequences of the death spirals (Hillion and Vermaelen, 2004).

Overall, the results in this subsection show that death spiral issues are followed by significant negative abnormal returns. This suggests that death spiral issuers may be using this type of security either as a last resort of financing or a vehicle to reshuffle the control structure for the controlling shareholder's benefit.[17]

C. Operating Performance of the Death Spiral Issuers

In this sub-section, we attempt to distinguish between the *last resort financing hypothesis* and the reshuffling control structure hypothesis by analyzing the operating performance of death spiral issuers before and after the issue. Hillion and Vermaelen (2004) report negative operating performance for their sample of US death spiral issuers and conclude that the evidence is mostly supportive of the *last resort financing hypothesis*.[18] If *last resort financing hypothesis* also holds in our sample, we expect to see substantially negative operating performance for the death spiral issuers.

Table 3 reports the results of this analysis.[19] In panel A, we present the median values of

[17] To our knowledge, there is no paper, other than ours, that empirically studies death spirals issued by Korean firms. However, there are a number of papers that study hybrid securities in general issued by Korean firms. These papers use samples that may include death spirals, but do not provide any separate analyses focusing on death spirals. See Jung (2003), Park and Baek (2003), and Kang, Park, and Baek (2007).

[18] For example, they report median profit margin of -84.0% and median ROA of -47.1% for death spiral issuers as of one fiscal year end before the issue.

[19] In case where there were more than two issues by the same issuer within the same fiscal year, we excluded them from this analysis if one of them was death spiral but the other was not. If all of the issues made by the same issuer during a given fiscal year were death spirals, we treated them as one observation.

various measures of operating performance for the death spiral issuers.[20] In marked contrast with the Hillion and Vermaelen (2004) sample, the death spiral issuers in our sample do not exhibit poor operating performance at all. In fact, none of the point estimates of the performance measures are negative. And many of the variables exhibit an increasing trend over time. All of the variables, except for market to book and Tobin's Q, are significantly positive just prior to the issue of death spirals.[21] And these firms are spending significantly positive amount of capital expenditures, R&D, and advertisements throughout the whole sample period. In unreported results, we repeated the analysis using only the death spiral issuer that did not issue any non-death spirals during the whole sample period (exclusive death spiral issuers), and found similar results. This strongly suggests that death spiral issuers in the Korean market on average may be issuing them for reasons other than last source of financing.

In table 4, we explore this issue further by testing whether the decision to include death spiral characteristic conditional on issuing an hybrid security is affected by operating performance. Specifically, we run a logit model where the dependent variable equals one if the issues is a death spiral and zero if the issue is a conventional non-death spiral issue. Explanatory variables are measures of operating performance discussed in the univariate results in table 3 and interest coverage ratio defined as operating income divided by interest expense which is a typical measure of cash flow liquidity

We also include a number of control variables that have been recognized in the previous literature as potential factors behind the decision to issue death spirals. As discussed in Hillion and

[20] EBITDA is the sum of operating income and depreciation. Profit margin is net income divided by sales. ROA is net income divided by assets. CF (cash flow) ratio is operating income adjusted for non-operating income and expenses. INV is capital expenditures plus R&D. ADV is expenditures for advertisement. Market/Book is the ratio of the market value of equity to the book value of equity, where firms with negative book equity are excluded. Tobin's Q is the ratio of the sum of market value of common equity and the book value of debt to the book value of assets.

[21] The number of firms years used to calculate Market/Book and Tobin's Q are slightly smaller than reported in table 3 due to availability of market data.

Vermaelen (2004), the floating-priced convertibles offer lower costs of financial distress relative to convertible debt with a fixed conversion price. Thus, firms with higher leverage are likely to issue death spirals to reduce potential costs of financial distress.

Hillion and Vermaelen (2004) also find that floating-priced convertible issuers tend to be small, young and risky firms. Hence, we include the following additional control variables; 'Size' measured by log value of assets (in Korean Won thousands), 'Age' is the number of years from the IPO until -1 fiscal year before the announcement date, and 'Return Volatility' is measured by the standard deviation of daily stock returns during the previous 12 months before the announcement date. We also include industry and year fixed effect dummies in all of our specifications.

The results from table 4 show that death spiral issuers are indeed smaller than non death spiral issues. Leverage and age both are not statistically significant A somewhat puzzling result is that death spiral issuers exhibit less stock return volatility then non death spiral issuers.

One of the most striking results from table 4 is that none of the operating performance variables turn out to be a significant predictor of death spiral issues. The only explanatory variable that turns out to be significant is the interest coverage ratio, which proxies for liquidity of the firm indicating that firms that might have temporary liquidity issues might resort to death spirals.

Overall, the results from tables 3 and 4 strongly suggest that the death spiral issues in Korea are not consistent with the *last resort financing hypothesis* supported by Hillion and Vermaelen (2004) using US data.

D. Control Enhancing/Reshuffling as an Alternative Motivation behind Death Spiral Issues

In introduction, we suggested an alternative motivation behind death spiral issues in Korea; control enhancing and/or reshuffling. In this subsection, we explore this issue directly by examining the changes in ownership of the controlling shareholder as well as the related parties

since the death spiral issue for various horizons.

If the motivation behind the death spiral issue is last resort financing (from outside investors), then we should observe decreases in proportional ownership of the controlling party, as the death spiral holders exercise their conversion rights increasing the number of shares outstanding and hence diluting the proportional ownership of the existing shareholders.

In implementing this analysis, we made extreme care to only include those firms where the controlling shareholder remained in tact since the death spiral issue up until the expiration date or 4 years after the issue if the expiration date is not specified.[22] In cases where the firms were merged or acquired by other entities so that there was a change in the controlling party, we exclude them from this analysis.[23] It is very likely that this group of firms is quite different from those firms where the controlling shareholder remained the same, which we will get back to in the next subsection.

The results are reported in table 5. Beginning in year -1, Panel A presents the comparison up to year +1, Panel B up to year +3, and panel C up to the year of expiration date. The results indicate that there is a significant decrease in the ownership of the controlling shareholder him/herself throughout all panels. Other family members and the controlling party as a whole seem to experience a slight drop in proportional ownership immediately following the death spiral issue, but over longer horizons, other family members recover their proportional ownership (although not statistically significant) so that the overall control rights are unaffected. These results suggest that the controlling party may be utilizing the death spiral issues to change the control structure of their firms within the business group, while maintaining the same level of

[22] We chose 4 years since the average difference between the issue announcement and the expirations was around 3.6 years.

[23] We first identify the names of the controlling shareholders in *KISLINE*. Whenever there is a change in the name of the controlling shareholder, we manually search the shareholder distribution section in annual reports to identify the specific transaction that led to the changes in the controlling party.

overall control rights in the target firm.

To address this issue in more depth, we examine the changes in the number of shares held by the controlling party, after controlling for the mechanical changes in the number of shares.[24] The idea is that if the death spiral issue is mainly due to last resort financing, then the controlling party would not have enough resources to actively participate in subsequent rights offerings or purchase shares from other shareholders or exercise their conversion rights to recover and maintain their original proportional ownership.

We report the results of this analysis in table 6. In panel A, we report the increases in the number of shares for the controlling party as a whole, and in panel B we report the numbers separately for each shareholder group within the controlling party. In the first two columns of panel A, we include the increases in number of shares held due to mechanical changes in the total number of shares outstanding. In the last two columns of panel A and in panel B, we exclude such mechanical changes so that changes in holdings reflect only the following; subscription to rights offering, conversion exercise of hybrid securities (CBs and BWs), or purchase of stocks from other shareholders. We outline the detailed procedure of these calculations in the appendix.

The results indicate that controlling party as a whole increase their shareholdings substantially even after we exclude all mechanical changes in the total number of shares outstanding. This implies that the controlling party actively purchased shares from other shareholders or participated in rights offerings or exercised their conversion rights to recover and maintain their original shareholdings. Moreover, the results from panel B indicate that the increases in the number of shares is most pronounced for other family members. Overall, these

[24] Mechanical changes in the number of shares include the following: stock splits and reverse splits, stock dividends, and reduction in paid in capital.

results suggest that decision to issue death spirals may be directly related with preserving and/or transferring control of the business group to another family member.

E. Can there be Two Distinct Groups of Death Spiral Issuers?

In the previous subsection, we noted that some firms have experienced changes in controlling shareholders since the death spiral issue. It is quite likely that these firms might be different from the firms where the controlling shareholder remained the same. In this subsection, we explore this issue further by examining the operating performance of three groups of firms; death spiral issuers with no changes in controlling shareholder until the expiration date or 4 years after the issue if the expiration date is not specified (group A), death spiral issuers that experienced a changes in controlling shareholder before the expiration (group B), and non-death spiral issues (group C). Then, we compare groups A and B as well as A and C

Table 7 reports the results of this analysis. First, there is a clear difference within death spiral issuers between those that did not experience a change in controlling shareholder and those that did. Firms with no changes in controlling shareholder (group A) generally have much better operating performance than those with changes in controlling shareholders (group B). Group B's market to book or Tobin's q is higher than group A, but we conjecture that this may reflect either (cumulative) low book values following bad operating performance or simply overvaluation of these stocks. According to the *last resort financing hypothesis*, firms with poor operating performance with overvalued share price are the ones that issue death spirals. Group B in our sample fits these two characteristics.

Second, there is not much difference in operating performance between group A (death spiral issuers with no changes in controlling shareholder) and group C (non – death spiral issuers). The difference between group A and C is not significant for four variables; EBITDA/assets, EBITDA/sales, ADV/sales, and Market/Book. In fact, profit margin, ROA and CF/assets are

significantly higher for group A. This implies that group A firms are strongly inconsistent with *last resort financing hypothesis*, but group B firms might be consistent.

Overall, above results suggest that there could be two distinct types of death spiral issuers. One group that experienced a change in controlling shareholder could be consistent with *last resort financing hypothesis* supported by Hillion and Vermaelen (2004) using firms in US. The other group that did not experience a change in controlling shareholder seems to be issuing death spirals for reasons other than as a last source of financing. We conjecture that these firms may be issuing death spirals for control enhancing and/or control reshuffling purposes.

6. Conclusions

In this paper, we study the motive of issuing floating-priced convertibles or warrants, known as *death spirals*, in a country setting where the private benefit of control is high. Using a total of 199 death spiral issuances by public firms listed in the Korea Stock Exchange during 1998-2006, we find a number of empirical evidences that are not consistent with the *last-resort financing hypothesis*, but rather consistent with the *control enhancing or control transferring hypothesis*. First, we find that death spirals are not necessarily issued by firms with poor operating performances at the time of issuance or by firms with deteriorating operating performance after the issuance. In fact, we find that none of the point estimates of the performance measures are negative for death spiral issuers. In a multivariate regression, we also find that death spiral issuers do not differ from conventional non-death spiral issuers in term of their operating performance at the time of issuance.

Second, we find that in a subset of firms that may have issued death spirals for control enhancing or control transferring motives – the death spiral issuers where there was no change in

the controlling shareholder – proportional ownership by the controlling party as a whole is not affected by the death spiral issuance. Moreover, other family members exhibit the largest increases in the number of shares held after controlling for the mechanical changes in the number of total shares outstanding.

Third, we find that this group of firms, where control is preserved within the family even after the death spiral issuance, are different from another set of firms, where family loses control, in terms of operating performance at the time of death spiral issuance. For example, the former group recorded EBITDA/Assets of 4.476% at the time of issuance, while the latter recorded that of -1.063%. This finding strengthens our evidence that the former group of firms issued death spirals not as a last resort, but as a way to enhance control over a group or to transfer control to an heir.

Although our sample consists of death spirals issued by firms from a single country – Korea – we believe the findings we report can be generalized to other countries where the economy is dominated by family controlled business groups. As long as the controlling shareholder has a motive to enhance his/her control over the group or has a motive to transfer control over to his/her heir, there is a potential that death spirals can be used for such purposes.

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Appendix: Calculation of Increases in the Number of Shares Held by Controlling Party

This appendix outlines the detailed procedure used to calculate the changes in the number of shares held by the controlling party, which report in table 6. We first calculate the number of shares held by the controlling party *i* at time *t* by multiplying proportional ownership by the number of common shares outstanding at each fiscal year end as follows.

$$N^i_{-1} = OWN^i_{-1} \times Common_{-1}$$
$$N^i_{+1} = OWN_{+1} \times Common_{+1}$$
$$N^i_{+3} = OWN_{+3} \times Common_{+3}$$

Then, we calculate the changes in number of common shares held by the controlling party as follows.

$$Difference^i 1_{(-1,+1)} = (N^i_{+1} - N^i_{-1})$$
$$Difference^i 1_{(-1,+3)} = (N^i_{+3} - N^i_{-1})$$

However, above difference also includes mechanical changes in the number of shares outstading such as stock splits and reverse stock splits. To exclude these mechanical changes and focus on the controlling party's active decision to maintain or increase their shares (by participating in rights offering or exercising their conversion rights of hybrid securities – CBs or BWs - or purchasing existing shares from other shareholders), we obtain the increases in total number of shares due to mechanical changes as follows.

$$Common_{+1} - Common_{-1} = \Delta Common_{(-1,+1)}$$
$$\Delta Common_{(-1,+1)} = \Delta X_1 + \Delta X_2$$
ΔX_1 : numerical changes by stock splits, etc.

$$Difference^i 2_{(-1,+1)} = (N^i_{+1} - N^i_{-1}) - [\Delta X_1 \times OWN^*]$$

where OWN* corresponds to the proportional ownership as of the nearest fiscal year before mechanical changes in total outstanding shares takes place.

Table 1
Sample Summary Statistics

This table presents the summary statistics for the full sample. The sample includes all hybrid securities (convertible bonds or bonds with warrants) issued between January 1998 and December 2006 by non-financial firms listed on Korea Stock Exchange (KSE). Panel A reports the number of issues while panel B reports the total proceeds raised. The first column in each panel reports the numbers for all hybrid securities issued over the sample period. The next seven columns report the numbers for death spiral issues. Death spirals are floating-price convertible bonds (CBs) or bond with warrants (BWs) where the conversion ratio may increase in case the stock price falls subsequent to the issue. We further classify death spirals into three sub-categories; CBs vs. BWs, domestic vs overseas issue, and public vs. private issue. The next seven columns present the corresponding numbers for general, non-death spiral issues.

Panel A: Number of Hybrid Security Issues by Type

Year	All	Death Spirals							Non - Death Spirals						
		Total	CB	BW	Domestic	Overseas	Public	Private	Total	CB	BW	Domestic	Overseas	Public	Private
1998	70	2	2	0	0	2	2	0	68	66	2	57	11	32	36
1999	228	14	8	6	3	11	11	3	214	158	56	161	53	85	127
2000	77	5	1	4	1	4	5	0	72	59	13	64	8	17	52
2001	63	23	8	15	7	16	20	2	40	36	4	34	6	8	32
2002	42	18	12	6	12	6	8	10	24	23	1	23	1	3	19
2003	32	17	15	2	12	5	6	11	15	14	1	12	3	5	10
2004	28	18	7	11	11	7	7	11	10	9	1	8	2	1	9
2005	62	52	28	24	25	27	31	21	10	8	2	8	2	3	7
2006	55	50	33	17	21	29	35	15	5	4	1	5	0	2	3
Total	657	199	114	85	92	107	125	73	458	377	81	372	86	156	295

Table 1 - *continued*

Panel B: Total Proceeds Raised from Hybrid Security Issues by Type (Korean Won bil.)

Year	All	Death Spirals							Non - Death Spirals						
		Total	CB	BW	Domestic	Overseas	Public	Private	Total	CB	BW	Domestic	Overseas	Public	Private
1998	1,805	23	23	0	0	23	23	0	1,783	1,748	35	1,447	336	875	908
1999	8,184	680	315	365	262	418	643	37	7,504	5,751	1,753	5,360	2,144	3,396	4,043
2000	2,002	117	10	107	10	107	117	0	1,885	1,675	210	1,770	115	520	1,301
2001	8,242	4,308	4,024	284	4,011	297	3,547	11	3,934	3,168	766	3,131	803	1,529	2,405
2002	1,690	159	110	49	110	49	69	90	1,530	1,510	20	1,526	4	234	1,292
2003	1,536	372	362	10	272	100	105	267	1,164	1,127	37	827	337	472	692
2004	599	506	386	120	140	366	75	431	93	57	36	88	5	36	57
2005	1,453	603	387	216	277	326	332	271	850	841	9	102	748	828	22
2006	658	526	362	164	228	298	346	180	132	130	2	132	0	82	50
Total	26,169	7,294	5,979	1,315	5,310	1,984	5,257	1,287	18,875	16,007	2,868	14,383	4,492	7,972	10,770

Table 2

Cumulative Abnormal Returns (CARs) following the Death Spiral Issue Announcement

This table presents the averages of the cumulative abnormal returns of the death spiral issuers surrounding the original disclosure announcement from day -10 through day +60. We use both market-adjusted model and market model to estimate CARs where the market returns are value weighted index returns compiled by the Korea Securities Research Institute (KSRI). Market model residual returns are obtained using past 200 trading days from day -220 to -21 of the issue announcement. . For each model, we test the statistical significance based on two different procedures. First, we report the t-stats based on the cross-sectional standard errors from the event period. The second t-stat is based on the time-series standard deviations of portfolio returns during the estimation period (Brown and Warner, 1985). In the first column, we report the results for all issues. In the second column, we report the results only using the first issue by each firm. All returns represent CARs since day -10. The sample period is from January 1998 to December 2006.

		All issues included	Only first issues included
Market adjusted model	average CAR	-8.47%	-6.31%
	t -stat (crosssection)	-3.215	-1.912
	t -stat (portfolio)	-2.893	-1.751
	N	187	124
Market model	average CAR	-13.29%	-11.55%
	t -stat (crosssection)	-4.037	-2.792
	t -stat (portfolio)	-4.514	-3.225
	N	184	121

Table 3
Operating Performance of the Death Spiral Issuers

This table presents the median values of various measures of operating performance for the death spiral issuers from one fiscal year before the issue up to 3 fiscal years following the issue. Panel A reports the median values and panel B reports the p-values from testing that the median is zero. Year 0 corresponds to the fiscal year-end immediately following the issue. EBITDA is the sum of operating income and depreciation. Profit margin is net income divided by sales. ROA is net income divided by assets. CF (cash flow) ratio is operating income adjusted for non-operating income and expenses. INV is capital expenditures plus R&D. ADV is expenditures for advertisement. Market/Book is the ratio of the market value of equity to the book value of equity, where firms with negative book equity are excluded. Tobin's Q is the ratio of the sum of market value of common equity and the book value of debt to the book value of assets. The sample period is from January 1998 to December 2006.

Fiscal year	EBITDA/assets	EBITDA/sales	Profit Margin	ROA	CF /assets	INV/assets	ADV/sales	Market/Book	Tobin's Q	Firm-Years
Panel A: Death spiral issuers										
-1	2.898%	3.388%	0.785%	0.713%	1.390%	2.501%	0.148%	0.863	0.965	155
0	2.008%	2.327%	0.476%	0.478%	0.979%	2.556%	0.153%	1.081	1.041	157
1	1.055%	1.725%	0.193%	0.255%	0.438%	3.038%	0.142%	0.904	0.985	149
2	1.910%	2.284%	0.805%	0.535%	1.235%	2.506%	0.105%	0.805	0.999	105
3	4.733%	4.772%	1.400%	1.427%	2.597%	2.911%	0.129%	0.954	1.022	62
Panel B: p-values										
-1	<0.0001***	<0.0001***	0.0157**	0.0157**	0.0037***	<0.0001***	<0.0001***	0.3190	0.5124	155
0	0.0013***	0.0013***	0.6322	0.6322	0.3382	<0.0001***	<0.0001***	0.3256	0.1705	157
1	0.1401	0.1401	1.0000	1.0000	0.8699	<0.0001***	<0.0001***	0.4351	0.8496	149
2	0.0785*	0.0785*	0.3291	0.3291	0.3291	<0.0001***	<0.0001***	0.3581	1.0000	105
3	0.0013***	0.0013***	0.0980*	0.0980*	0.0559*	<0.0001***	<0.0001***	0.7552	0.8830	62

Table 4
Determinants of Death Spiral Issue Conditional on Issuing an Hybrid Security: Multivariate Analysis

This table presents the results from logit estimation where the dependent variable equals one if the issue is a death spiral (a total of 149 firm-years) and zero if it is conventional non-death spiral hybrid security (a total of 308 firm-years). Leverage is the ratio of debt to assets. Size is measured by log value of assets (n Korean Won thousands). Return volatility is measured by standard deviation of daily stock returns during the past 12 months before the announcement date. Age is the number of years since the IPO until -1 fiscal year before the announcement date. Tobin's Q is the ratio of the sum of market value of common equity and the book value of debt to the book value of assets. EBITDA is the sum of operating income and depreciation. Profit margin is net income divided by sales. ROA is net income divided by assets. INV is capital expenditures plus R&D. CF (cash flow) ratio is operating income adjusted for non-operating income and expenses. Interest Coverage is operating income divided by interest expense. All specifications include industry and year fixed effects. The sample period is from January 1998 to December 2006.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	7.3225	7.3554	7.3189	7.3261	7.2052	7.3257	7.3465	7.2819
(*p*-value)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0017)	(0.0014)	(0.0015)	(0.0021)
Leverage	-0.7087	-0.7070	-0.7226	-0.6987	-0.7895	-0.7000	-0.7771	-1.2062
(*p*-value)	(0.0824)	(0.0818)	(0.0799)	(0.0907)	(0.0636)	(0.0915)	(0.0796)	(0.0372)
Size	-0.2490	-0.2543	-0.2486	-0.2494	-0.2386	-0.2494	-0.2318	-0.2276
(*p*-value)	(0.0139)	(0.0141)	(0.0141)	(0.0138)	(0.0188)	(0.0138)	(0.0231)	(0.0332)
Return Volatility	-0.3272	-0.3190	-0.3269	-0.3265	-0.3248	-0.3267	-0.3752	-0.3041
(*p*-value)	(0.0079)	(0.0121)	(0.0079)	(0.0081)	(0.0083)	(0.0080)	(0.0030)	(0.0197)
Age	-0.0418	-0.0145	-0.0150	-0.0148	-0.0158	-0.0148	-0.0196	-0.0207
(*p*-value)	(0.3664)	(0.3785)	(0.3638)	(0.3670)	(0.3392)	(0.3668)	(0.2422)	(0.2276)
Tobin's Q	0.4874	0.5041	0.4923	0.4829	0.5456	0.4835	0.5370	0.6524
(*p*-value)	(0.1430)	(0.1367)	(0.1419)	(0.1489)	(0.1166)	(0.1486)	(0.1475)	(0.1204)
EBITDA/Asset	-	0.3617	-	-	-	-	-	0.8159
(*p*-value)		(0.8006)						(0.6353)
Profit Margin	-	-	-0.0048	-	-	-	-	-0.1838
(*p*-value)			(0.7310)					(0.1416)
ROA	-	-	-	0.0226	-	-	-	4.1893
(*p*-value)				(0.8926)				(0.3195)
INV/Asset	-	-	-	-	-2.2091	-	-	-2.6419
(*p*-value)					(0.3741)			(0.2984)
CF/Asset	-	-	-	-	-	0.0165	-	-3.1855
(*p*-value)						(0.9159)		(0.4643)
Interest Coverage	-	-	-	-	-	-	-0.0183	-0.0223
(*p*-value)							(0.0369)	(0.0223)
Pseudo R^2	0.3843	0.3844	0.3845	0.3844	0.3854	0.3843	0.3900	0.3975

Table 5
Average Changes in Proportional Ownership Following the Death Spiral Issue by Various Shareholder Types

This table presents the averages of ownership by various shareholder types before and after the death spiral issue. We only include those firms where the controlling shareholder remained in tact since the death spiral issue up until the expiration date or 4 years after the issue if the expiration date is not specified. Hence, firms that were merged or acquired are excluded from this analysis. Control rights indicate the ownership sum of controlling shareholder, families, affiliated firms and executives. Panel A presents the comparison between year -1 and year +1. Panel B compares year -1 and year +3 while panel C compares year -1 with the year of expiration date. p-values are based on pair-wise comparison. The sample period is from January 1998 to December 2006.

Panel A: from year -1 to +1

Year	Controllong Shareholder	Families	Affiliated Firms	Executives	Control Right	N
-1	11.89	8.05	10.91	0.71	31.56	110
+1	9.71	7.10	12.30	0.77	29.88	110
Difference	-2.179***	-0.953**	1.391	0.057	-1.684*	-
p -value	<0.0001	0.0231	0.1460	0.6731	0.0846	-

Panel B: from year -1 to +3

Year	Controllong Shareholder	Families	Affiliated Firms	Executives	Control Right	N
-1	10.76	7.04	10.91	0.71	29.42	48
+3	8.54	7.66	13.46	0.42	30.08	48
Difference	-2.222***	0.624	2.548	-0.288**	0.662	-
p -value	0.010	0.4837	0.1792	0.0483	0.7145	-

Panel C: from year -1 to expiration date

Year	Controllong Shareholder	Families	Affiliated Firms	Executives	Control Right	N
-1	9.82	6.95	12.79	0.83	30.39	38
expiration date	7.35	8.30	14.94	0.49	31.08	38
Difference	-2.468**	1.349	2.149	-0.339*	0.691	-
p -value	0.0226	0.2972	0.395	0.0598	0.7788	-

Table 6

Average Increases in the Number of Shares Held by the Controlling Party Following the Death Spiral Issue

This table presents the averages of increases in the number of shares held by the controlling party (in percentages) subsequent to the death spiral issue. In panel A, we report the increases in the number of shares for the controlling party as a whole, and in panel B we report the numbers separately for each shareholder group within the controlling party. In the first two columns of panel A, we include the increases in number of shares held due to mechanical changes in the total number of shares outstanding, such as stock splits, reverse splits, and stock dividends. In the last two columns of panel A and in panel B, we exclude such mechanical changes so that changes in holdings reflect only the following; subscription to rights offering, conversion exercise of hybrid securities (CBs and BWs), or purchase of stocks from other shareholders. In each panel, we track the increases in shareholdings up to the expiration date. p-values are based on pair-wise comparison. The sample period is from January 1998 to December 2006.

Panel A: Increases in number of common shares held by controlling party after issuing Death spiral

	Include all changes in number of common shares		Exclude mechanical changes in number of common shares		
Fiscal year	Mean	Median	Mean	Median	N
From year -1 to +1	+48.69% [0.0015]***	+9.69% [<0.0001]***	+51.21% [0.0008]***	+11.30% [<0.0001]***	109
From year -1 to +3	+166.19% [0.0021]***	+53.30% [<0.0001]***	+182.36% [0.0013]***	+53.30% [<0.0001]***	48
From year -1 to expiration date	+219.4% [0.0057]***	+48.51% [0.0076]***	+248.19% [0.0025]***	+57.41% [<0.0001]***	38

Panel B: Increases in number of common shares held by sub-groups within the controlling party

	Type of Controlling party							
Fiscal year	Controlling Shareholder		Families		Affiliated firms		Executives	
	Mean	N	Mean	N	Mean	N	Mean	N
From year -1 to +1	+34.05% [0.0521]*	108	+56.05% [0.0549]*	106	+63.72% [0.0002]***	105	+22.21% [0.1817]	98
From year -1 to +3	+109.45% [0.0377]**	48	+441.54% [0.0607]*	47	+185.41% [0.0297]**	45	+33.31% [0.3490]	46
From year -1 to expiration date	+137.23% [0.0428]***	38	+1000.1% [0.1673]	37	+219.25% [0.0391]***	35	+40.4% [0.2744]	37

Table 7
Operating Performance Before the Death Spiral Issuer: No change in Controlling Shareholder vs. Change in Controlling Shareholder

This table presents the median values of various measures of operating performance for the death spiral issuers as well as non-death spiral issuers as of one fiscal year before the issue. The first row presents the results for those death spiral issuers with no changes in controlling shareholder until the expiration date or 4 years after the issue if the expiration date is not specified (group A). The second row presents the corresponding numbers for those death spiral issuers that experienced a changes in controlling shareholder before the expiration date or 4 years after the issue if the expiration date is not specified (group B), while the third row presents the corresponding numbers for non-death spiral issues (group C). The fourth and fifth row reports the z-stats for testing the differences between groups A and B, and groups A and C, respectively based on Wilcoxon two sample median test. EBITDA is the sum of operating income and depreciation. Profit margin is net income divided by sales. ROA is net income divided by assets. CF (cash flow) ratio is operating income adjusted for non-operating income and expenses. INV is capital expenditures plus R&D. ADV is expenditures for advertisement. Market/Book is the ratio of the market value of equity to the book value of equity, where firms with negative book equity are excluded. Tobin's Q is the ratio of the sum of market value of common equity and the book value of debt to the book value of assets. The sample period is from January 1998 to December 2006.

		EBITDA/assets	EBITDA/sales	Profit Margin	ROA	CF/assets	INV/assets	ADV/sales	Market/Book	Tobin's Q	Firm-Years
Death Spiral Issuers	No change in controlling shareholder (A)	5.497%	6.167%	1.857%	1.181%	2.797%	3.111%	0.077%	0.565 (72)	0.865 (72)	73
	Change in controlling shareholder (B)	-0.298%	-0.207%	-10.546%	-8.005%	-10.206%	3.090%	0.268%	0.971 (38)	0.992 (38)	45
Non Death Spiral Issuers (C)		4.727%	6.167%	0.537%	0.346%	1.177%	2.557%	0.128%	0.655 (264)	0.913 (264)	313
z-statistics: difference	(A) - (B)	-5.1029***	-4.6708***	-4.3272***	-4.4325***	-4.6652***	-1.1857	-1.3076	1.8701**	1.5244*	-
	(A) - (C)	1.2482	0.8778	2.9514***	3.2625***	3.4023***	1.0141	-1.3822*	-0.9225	-1.9491**	-

Figure 1

Cumulative Abnormal Returns (CARs) following the Death Spiral Issue Announcement

This figure presents the averages of the cumulative abnormal returns of the death spiral issuers surrounding the original disclosure announcement from day -10 through day +60. We use both market-adjusted model and market model to estimate CARs where the market returns are value weighted index returns compiled by the Korea Securities Research Institute (KSRI). Market model residual returns are obtained using past 200 trading days from day -220 to -21 of the issue announcement. The thick line represents CARs based on market-adjusted model and the dashed line presents those based on market model. All returns represent CARs since day -10. The sample period is from January 1998 to December 2006.