

# Who's Leaving Money on the Table? Evidence from IPOs within Business Groups<sup>+</sup>

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August 2016

## Abstract

This paper examines how controlling shareholders of business groups may pass on the cost of IPO underpricing to minority shareholders. Based on a sample of IPOs made in Korea, we find that sale of secondary shares in general does not reduce underpricing as they do in U.S. However, we do find less underpricing or even overpricing when the offered shares are *directly* sold by the controlling shareholders. On the other hand, sale of secondary shares held by *affiliated firms* leads to negative market reaction for the selling firms, implying a direct wealth transfer from shareholders of affiliated firms to IPO subscribers. These findings suggest that minority shareholders in certain affiliated firms, or *scapegoats*, may bear the cost of underpricing while controlling shareholders of the business group remain effectively protected instead.

*JEL Classifications:* G32, G34

*Keywords:* IPO, Underpricing, Secondary Shares, Controlling Shareholders, Wealth Transfer, Korea

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## **1. Introduction**

Underpricing is a well-documented phenomenon in initial public offerings (IPO) all around the world (Ritter (2003)). One of the factors that have been suggested in the literature to affect the degree of underpricing is the relative proportion between primary or new shares and secondary or old shares being offered at the IPO. Primary shares are newly issued by the IPO firm and the proceeds contribute to increases in paid-in-capital, while secondary shares are already issued shares and thus simply changes hands from the existing shareholders (e.g. founders or venture capitalists) to IPO subscribers.

A few studies report less underpricing in IPOs where secondary or old shares held by the existing shareholders are being sold. (Barry (1989), Habib and Ljungqvist (2001), Ljungqvist and Wilhelm (2003)). These studies document that the offer price in IPOs with secondary shares is relatively higher, and the extent of underpricing is less pronounced than in IPOs that only offer primary shares.

These findings are consistent with the selling shareholders' interest to maximize their total proceeds by increasing the offer price. Pagano (1993) argues that IPO provides shareholders with the opportunity for diversified investment. Many subsequent studies also report the sale of secondary shares in IPOs as an exit strategy by entrepreneurs and venture capital (Black and Gilson (1998), Brau, Francis, and Kohers (2003), Ang and Brau (2003) and Brau, Li, and Shi (2007)). If selling shareholders have an influence on the offer price, more secondary shares offered in IPOs may lead to higher offer price and thus less underpricing.

Above logic is mostly applicable in U.S. where most firms are stand-alone style. That is, if each firm mostly remains independent from other firms, then the sale of secondary shares must be provided from insiders who has direct cash flow stake in the IPO firm, such as

founders or venture capitalists. Under this setting, any cost from underpricing must be borne by the selling insiders, and as such there is little room for ethical concerns

However, it is well documented by now that firms outside U.S. typically have controlling shareholders and at the same time belong to a business group. For firms that are members of business groups, there is another type of potential shareholder in IPO firms; a type that is generally not observed in U.S. Specifically, since there are multiple member firms in a business group which are mostly linked through inter-corporate equity ownership, an important class of shareholders in an IPO firm in a business group is *another member* firm, potentially publicly traded.

In a business group, important investment and financing decisions are typically coordinated at the group-level rather than at the firm-level. For example, in large acquisitions of a firm or an asset, member firms typically form a consortium and bid as a group.<sup>4</sup> Another example is the promotion of executives which is announced at the end of the year not at the firm-level but at the group level. In IPOs where secondary shares are sold, the selling shareholders may well be coordinated at the business group-level for the benefit of the controlling shareholders. The following anecdote highlights how controlling shareholders may avoid any cost from potential underpricing even when they have a large direct interest in IPO firms.

On August 25, 2014, Samsung, the largest business group in Korea announced the IPO of one of its member firms, Samsung SDS, an IT solution provider whose major clients are other member firms of the group. The offered shares were to be all secondary or old shares. According to previous studies based on U.S. data, we would expect relatively small

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<sup>4</sup> In September 2014, Hyundai Motor Group, the 2<sup>nd</sup> largest business group in Korea, made a bid for KEPCO (Korea Electric Power Corporation)'s urban real estate at a highly controversial price of KRW 10.5 trillion (roughly USD 8.75 billion). The bid was to be financed by 3 publicly traded member firms; namely, Hyundai Motor Corporation, Kia Motor Corporation, and Hyundai Mobis Corporation.

underpricing for this IPO since there are no primary shares and all offered shares are being sold by the existing shareholders or insiders.

In a strict contrast, the first day closing price of Samsung SDS was 72.4% above the offer price. The exact offer price was KRW 190,000, roughly USD 160, even though the shares traded in the over-the-counter market at almost double the offer price prior to the IPO. According to the local media, allowing such underpricing was somewhat expected considering the huge criticism on Samsung Life Insurance when it went public in 2010 at a relatively high offer price so that minority IPO subscribers experienced a subsequent loss.<sup>5</sup> However, such huge underpricing in all-secondary-share-IPO is difficult to reconcile with the existing literature based on U.S. data.

To explain this discrepancy, we propose that such underpricing is possible if controlling shareholders can find some *other* entity, which we refer to as ‘*scapegoat*’ from here on, who is willing (or influenced) to sell even if the offer price is relatively low. In Samsung SDS IPO, even though the controlling family members had large direct ownership in this firm, 19.07% to be exact, they did not sell any of their shares through the IPO but rather kept all of their holdings. Instead, the shares were offered by a publicly traded member firm, Samsung Electromechanics, in which the controlling family had zero direct ownership.<sup>6</sup>

On September 26, 2014, Samsung Electromechanics disclosed that its board decided to divest all of its existing holdings in Samsung SDS (7.88%) through the IPO. The next day’s stock price fell by 4.68% and 5-day cumulative return was -14%. This price decline largely reflects the market’s expectation that Samsung Electromechanics is the sole bearer of the cost of underpricing in this IPO.

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<sup>5</sup> For example, <http://www.businesspost.co.kr/news/articleView.html?idxno=4799> (in Korean).

<sup>6</sup> Even indirect cash flow rights held through Samsung Electronics, another member firm, was only 1.69%.

Since the controlling family members did not sell any of their direct holdings in SDS, however, they do not suffer at all from this underpricing. Nor do they suffer from any dilution since no new shares were issued. Rather, the shareholders of Samsung Electromechanics (indirectly) paid the cost through their stock price decline. This is effectively a wealth transfer from shareholders of Samsung Electromechanics to IPO subscribers of Samsung SDS. Even though the wealth transfer is made to the new IPO subscribers rather than to the controlling families, there is clearly an ethical issue, if not a legal issue, of potential breach of fiduciary duty by the board of Samsung Electromechanics who failed to prevent a loss in their shareholder value.

Above example highlights that underpricing may be severe even in all-secondary-IPOs, if controlling shareholders do not sell their shares. On the other end of the spectrum, if the controlling shareholders *themselves* sell a significant portion of their direct holdings in the IPO firm at the offer price, it may lead to *less* underpricing or even overpricing. For example, when Innocean, an advertising firm that belongs to Hyundai Motor Group, went public in July, 2015, the first trading day closing price actually ended up at 11% *below* the offer price, even though it was one of the hottest IPOs of the year. Specifically, the offer was oversubscribed by 204 to 1 for retail investors, and 273 to 1 for institutional investors. Such overpricing is closely related with the identity of the selling shareholders.

Two individuals, a daughter and the son of the controlling shareholder with 50% direct ownership in Innocean prior to the IPO, were the only shareholders selling secondary shares, who divested a third of their pre-IPO holdings at the offer price.<sup>7</sup> This case is consistent with the findings in U.S. precisely because the selling shareholders are not ‘scapegoats’ but genuine insiders whose incentive is to maximize the proceeds.

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<sup>7</sup> The offer also included primary shares newly issued by Innocean, which account for 10% of the post-IPO outstanding shares.

To summarize, when most firms are stand-alone style like in U.S., secondary shares offered in IPOs must come from insiders by construction and any cost of underpricing must be paid by them. As such, the more secondary shares in IPOs by itself would lead to less underpricing. In non-U.S. countries where firms are mostly members of business groups, however, secondary shares offered in IPOs may come from *other affiliated* firms where the controlling family has little cash flow rights. In these economies, the more secondary shares *per se* may not lead to less underpricing. Rather, *who* sells these secondary shares would be a key determinant of underpricing.

In this study, we test these predictions based on all IPOs in Korean stock market from June 2007 to August 2015. Korea provides an ideal setting for the following three reasons. First, Korea has an active IPO market where the total number of IPOs and total proceeds raised amounts up to 580 and over KRW 30 trillion, roughly USD 25 billion, during our sample period, respectively.<sup>8</sup> Second, many Korean firms, both private and public, typically belong to a business group controlled by families. Third, previous research often suggests that investor protection in Korea is less than adequate, which allows various forms of *tunneling* or expropriation of minority shareholders.<sup>9</sup> Such environment enables the controlling families to influence *other member* firms to divest their holdings in IPO firms at low offer price without directly hurting themselves.

Consistent with our hypothesis, we find that the IPO offer price is more influenced by *who* is selling the secondary shares, rather than the *existence* of secondary shares in itself. Specifically, the extent of underpricing decreases if controlling shareholders themselves divest a significant portion of their holdings through the IPO.

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<sup>8</sup> The total number of IPOs is largely similar to those made in U.S. during the same period, while the total proceeds account for roughly 1/7 of those in U.S.

<sup>9</sup> Bae, Kang, and Kim (2002), Choi, Kang, Kim, Lee, and Park (2015) among many others.

On the other hand, for the ‘scapegoat’ firms designated by the business group to divest their holdings in the IPO firm at the offer price, we find that disclosure of such decision negatively affects their announcement returns. Specifically, both the absolute amount and the relative proportion of shares sold by the scapegoat firms in IPOs are negatively correlated with their announcement returns.

While the effect of secondary shares on IPO offer price have been analyzed in past research, this study is the first to examine how offer prices are affected by the detailed identity of the selling shareholders. Although such underpricing does not imply direct tunneling or expropriation by the controlling shareholders, it clearly implies a wealth transfer from scapegoat firms’ (minority) shareholders to IPO subscribers, highlighting the complexity and severity of agency problems and potential ethical issues inherent in a business group.

In U.S., allocation of IPO shares is under complete discretion of the underwriters. However, IPO procedure in Korea follows a fixed price system where the offer price is fixed before the subscription and any oversubscribed shares are allocated on a pro rata basis. Since the rationing is done in proportion to the money deposited with the underwriters when applying for the subscription, our findings also raise a broader ethical issue related with general social welfare. Specifically, the largest benefit from underpricing accrues to those investors who were initially able to deposit a larger amount, who in turn are allocated with more shares. But, these investors are more likely to be relatively affluent investors.

The rest of this paper is organized as follows. Section 2 provides a literature review and develops our main hypotheses. Section 3 describes our data sources and sample construction process. Section 4 presents the overview of the Korean IPO market focusing on those including secondary shares and the main empirical results. Finally, section 5 concludes with a summary and directions for future research.



## **2. Literature Review and Hypotheses**

### **2.1. Previous Literature on Underpricing**

Most previous research on the relationship between corporate ownership structure and the degree of underpricing focused on the effect of insiders' holdings on offer price. For example, Leland and Pyle (1977) point out that insiders' holding may function as a sign of private information. This implies that a higher ownership by insiders reflects a more positive outlook for the company, leading to a higher offer price and less underpricing. Although this hypothesis has been extensively tested during the 80s and 90s, namely by Krinsky and Rotenberg (1989), Clarkson and Richardson (1991), How and Low (1993), and Kim, Krinsky, and Lee (1994), empirical evidence does not provide conclusive results.

Instead of examining the relationship between insiders' ownership and offer price through firm valuation, more recent studies have focused on the pecuniary incentives of insiders and CEOs to maximize their personal wealth and how such incentives may affect the offer price (Aggarwal, Krigman, and Womack (2002) and Ang and Brau (2003)). If insiders offer a significant portion of their shares through the IPO, it would be natural for them to set a high offer price to minimize their financial loss due to underpricing.

One way of increasing the offer price suggested in studies by Allen and Faulhaber (1989), Welch (1989), Booth and Smith (1986) is through the fees paid to the underwriters. According to these studies, the extent of underpricing can be reduced when the IPO firm pays higher fees to promote the company. To the extent that we also focus on the controlling shareholders' personal incentives to influence the offer price, our study extends this stream of

research. But unlike their findings, we do not find such substitution effect between underpricing and fees in our sample.

Perhaps the studies that are mostly closely related to ours are Barry (1989), Habib and Ljungqvist (2001), and Ljungqvist and Wilhelm (2003). These studies point out that more secondary shares offered in IPOs could imply less underpricing since these secondary shares must come from insiders who care about their personal wealth. However, they do not further distinguish between the *types* of insiders. This is precisely because in U.S., an IPO with secondary shares is typically considered as an exit strategy for the existing investors, regardless of who is selling the shares, so that there is no benefit of further identifying the seller.

In countries where firms typically belong to a business group, e.g. Korea, however, a single controlling shareholder has effective control over all member firms, while she has varying degrees of direct and indirect cash flow ownership in each member firm. Under such environment, the extent of underpricing may be different even in secondary-only-IPOs. Our key contribution is to highlight the importance of identifying the selling shareholders in predicting the degree of underpricing, which has not been explored in previous research as of yet.

## **2.2. Hypotheses**

We formally state our main hypotheses as follows.

*Hypothesis 1: The more controlling shareholder divests her cash flow interest, either directly or indirectly through an IPO, the higher the offer price and lower the underpricing.*

*Hypothesis 2: Disclosure of a publicly-traded affiliated firm's decision to sell its stake in the IPO of another privately-held affiliated firm would lead to a negative price impact for the publicly-traded affiliate.*

To test hypothesis 1, we resort to *FamilyRatio* defined as the number of secondary shares sold by the controlling family in the IPO scaled by the number of secondary shares held by the controlling family prior to the IPO, including all indirect holdings. This measure is designed to reflect how much cash flow interest a controlling shareholder sells from her original stake in the IPO firm. One potential issue with this measure is that the ratio may overstate or understate the impact of the sale on the controlling shareholder's wealth. For example, if the controlling shareholder has 0.1% cash flow stake in the IPO firm prior to the IPO and sells all of it, *FamilyRatio* would be one, the maximum possible value, even though it may account for only a small portion of her overall wealth. To address this issue, we also consider absolute dollar value of divested cash flow interest.

To test hypothesis 2, we resort to a 2-day return of the selling affiliate from day -1 to the announcement date as the main dependent variable. Note that the announcement is not about the IPO itself, but the selling affiliate's decision to divest its holdings in the IPO firm. Key explanatory variables are the absolute and relative amount of shares sold by the affiliate firm.

A confounding issue when an affiliated firm sells its stake in the IPO firm is that the controlling shareholders may also have direct and indirect cash flow interest in the selling affiliated firm. For example, if the selling affiliated firm is 100% owned by the controlling shareholder, then its sale is identical to a direct sale by the controlling shareholder in terms of pecuniary benefits or losses. If so, negative market reactions may be mitigated when the

controlling family's cash flow stake in the selling affiliate is large. We consider an interaction term between these two countervailing forces in our regression analysis to control for any potential mitigation effect.

### **3. Data and Sample Construction**

Our initial sample starts from all 526 IPOs of stocks completed between June 2007 and August 2015 in Korea collected from Korea Exchange (KRX) website. We set the beginning of our sample period as such because there was a major regulatory change with respect to pre-IPO book-building process and determination of final offer price at the time.

From the initial sample, we first add back 54 IPOs of delisted firms whose data are not provided by the KRX website. Next, we apply the following filters. First, we exclude 103 IPOs of special purpose acquisition company (SPAC), real estate investment trusts (REITs), and foreign companies. Second, we eliminate 26 relocations from KOSDAQ, the tech stock bourse analogous to NASDAQ, to KOSPI, the main bourse. Two firms which had concurrent cross-listing in the overseas market are also excluded. We additionally rule out 31 cases including privatization of SOEs (state-owned-enterprises), carve-outs, and companies whose largest shareholder is a foreign firm. Finally, we exclude 5 financial holding companies which are highly regulated. Our final sample includes 413 IPOs, 69 cases of which include offers of secondary shares.

Since Korean commercial databases provide accounting data only at annual frequency, we manually collect sample firms' accounting information from official prospectuses to enhance the reliability of the data. Further detailed information regarding offer price, number of new shares outstanding, number of secondary shares sold, and commissions are also

obtained from official prospectuses and stock issuance reports. We obtain financial information for other affiliated firms from Fnguide, a local data vendor. We also refer to the 38 communication ([www.38.co.kr](http://www.38.co.kr)), a commercial database specializing in Korean IPOs.

Table 1 presents summary statistics of the final 413 IPO observations included in our sample. *UP* refers to IPO underpricing, defined as the percentage difference between the closing price of the first trading day and the offer price. During our sample period, average IPO underpricing in Korea is 34%. This figure is almost twice as large as the average underpricing (18%) reported in U.S. from 1980 to 2010 (Ritter, 2011), but smaller than those reported for Korea (74.3%) during an earlier period from 1980 to 1996 (Ritter, 2003).

*FamilyRatio*, which is our key explanatory variable, identifies how much shares are sold by the controlling families relative to their original stake in the IPO firm. If there are no secondary shares offered in the IPO, this variable is zero by construction. This variable also includes any indirect cash flow interest held by the controlling family. For example, suppose family X has 30% direct ownership in IPO firm A, and another affiliated firm B has 20% direct ownership in A, and X has 50% direct ownership in B. Further suppose that X sells 5% interest in A, and B sells 10% interest in A through the IPO, respectively. Then, *FamilyRatio* would be 10% ( $=5\% + 10\%*50\%$ ) over 40% ( $=30\% + 20\%*50\%$ ), or 25%. Reported average *FamilyRatio* for the whole sample is 2%, which largely reflects that 83% of our sample IPOs consist of primary shares only in which case this variable would be zero.

*DilutionFactor* is computed as primary shares offered through the IPO divided by the total shares outstanding prior to the IPO. This variable captures the degree of dilution incurred to the original shareholders by issuing new shares. The reported average suggests that roughly a quarter of pre-IPO outstanding shares are newly issued.

*ConBeforeRatio* is the controlling shareholder family's ownership of the IPO firm prior to the IPO. This variable includes direct ownership, as well as indirect ownership held through affiliated firms.

*ABSValue* is the dollar value of secondary shares sold by the controlling family, in KRW billion. This variable also includes any indirect cash flow rights sold through affiliated firms. On average, a given controlling family sells KRW 2.95 billion, roughly USD 2.5 million, worth of secondary shares, either directly or through an affiliated firm.

*TotalProceeds* is the dollar value of total proceeds from an IPO, in KRW billion. Average proceeds per IPO is KRW 63.57 billion, roughly USD 53 million, which is about 1/5 of average proceeds in a U.S. IPO between 2001 and 2013 reported in Ritter's IPO statistics (<http://bear.warrington.ufl.edu/ritter>).

We also consider two market-level proxies for overall investor sentiment in the Korean IPO market. Specifically, we first obtain firm-level subscription rate for each IPO defined as requested number of shares (by investors) divided by offered number of shares. We then aggregate this firm-level measure by taking the averages of all IPOs for a specified period. *SCRQ* is the average during each calendar quarter to which a given IPO belongs, while *SCRH* is defined similarly where the averages are taken over half a year. Reported numbers indicate IPO market in Korea was extremely hot during our sample period. For example, average competition among investors was 433 to 1, implying that for every 433 requested shares (backed by deposited amount which equals offer price multiplied by the requested number of shares), an investor would receive only 1 share. Even minimum values are 91 to 1 for quarterly averages and 197 to 1 for semi-annual averages.

*Size* is the book value of a firm's total assets prior to the IPO, in KRW billion. Although the mean amounts up to KRW 1.3 trillion, roughly USD 1.1 billion, the distribution is quite

skewed with the median value at only KRW 39 billion, roughly USD 32.5 million. This indicates substantial heterogeneity in IPO firms' characteristics, which should be appropriately controlled for in a multivariate framework.

The remaining variables are as follows. *Leverage* is the total liabilities scaled by total assets prior to the IPO. *Old* is the age of the firm from the establishment up to the listing date in years. *KOSDAQ* is a dummy variable that equals one if a firm is listed in the KOSDAQ, and zero if a firm is listed in KOSPI. Lastly, *Secondary* is a dummy variable that equals one if any secondary shares are included in an IPO, and zero otherwise. *SecondaryCont* is the number of secondary shares sold normalized by the total number of original shares.

In Table 2, we separately report the summary statistics for KOSDAQ and KOSPI market. Summary statistics on Panel A of Table 2 reveal several interesting patterns about Korean IPOs. First, KOSDAQ IPOs are much smaller in terms of both total proceeds and asset size than KOSPI IPOs. They are also a lot younger and less levered. Reflecting this, firms listed in KOSDAQ tend to be slightly more underpriced to those listed in KOSPI. This is in line with the findings of prior studies in that offer prices of small, young, less profitable firms tend to be lower because such characteristics are unattractive to investors.

Second, IPOs in KOSPI include more secondary shares than IPOs in KOSDAQ. Out of 72 IPOs in KOSPI, 34 cases (47%) include secondary shares, whereas only 35 cases out of 341 IPOs (10%) in KOSDAQ sold secondary shares. This implies that it is difficult for young and smaller firms to include secondary shares in their IPOs. Reflecting this, *FamilyRatio* in KOSDAQ is also much smaller than in KOSPI.

In Panel B of Table 2, we compare characteristics of IPO firms without any secondary shares with those with secondary shares. The results first indicate that conditional on offering secondary shares, the controlling family sells 14% of their direct and indirect cash flow stake

in the IPO firm. In addition, firms whose existing shareholders are selling secondary shares in IPOs are much larger in size, more than 80 times as large as firms selling only primary shares on average. They are also much older and more levered. This is partly related with the fact that most of the firms that went public with secondary shares were listed in KOSPI.

In Panels C and D, we report separate summary statistics for 4 types of subsamples double sorted by the listed bourse and inclusion of secondary shares. We observe that in both KOSPI and KOSDAQ markets, IPOs with secondary shares are still older and larger in terms of both size and total proceeds on average.

## **4. Empirical Analysis**

### **4.1. Overview of IPOs with Secondary Shares in Korean Stock Market**

Previous studies based on U.S. report that the extent of underpricing is smaller in IPOs with secondary shares than in IPOs with only primary shares (Barry (1989), Habib and Ljungqvist (2001), Ljungqvist and Wilhelm (2003)). We first provide a brief univariate analysis of underpricing in Korean IPOs to verify whether such pattern also exists in Korea.

Table 3 presents the extent of underpricing for two groups sorted by whether secondary shares are included or not. This table shows not only the summary statistics for our sample period, but also presents the figures obtained from an extended period prior to our sample period to obtain higher reliability. Our extended period starts in July 2004, when the first IPO with secondary shares in Korea was ever introduced. We first note that IPOs with secondary shares account for 12.5% of all IPOs during the extended period. This largely reflects that the sale of secondary shares may provide negative signal especially for smaller, start-up firms, so



that ones that are able to include secondary shares in their IPOs are mostly large, old firms.

In terms of the degree of underpricing, IPOs with secondary shares exhibit smaller underpricing on average than primary-share-only IPOs as documented in U.S. However, the difference is not statistically significant. Moreover, during our main sample period, since June 2007, the differences in underpricing between the two types of IPOs have become less pronounced. This univariate analysis suggests that the mere existence of secondary shares in IPOs may not be sufficient to explain the degree of underpricing in Korea.

In Table 4, we implement multivariate analyses where the key explanatory variables are *Secondary* and *SecondaryCont*. *Secondary* is a dummy that takes value of one if an IPO includes at least some secondary shares sold by existing shareholders and zero otherwise. *SecondaryCont* is the number of secondary shares sold normalized by the total number of original shares.

To address the concern that univariate results of no difference in underpricing between the two groups reported in Table 3 may be driven by different firm characteristics, we control for several key variables known to have an influence on the extent of underpricing; namely, size, leverage, age, and IPO subscription rate. The results again suggest that the very existence of secondary shares in IPOs in itself is not related with the degree of underpricing. In all specifications, the coefficient on *Secondary* and *SecondaryCont* are statistically insignificant. This is highly inconsistent with the result of previous studies based on U.S. (Barry (1989), Habib and Ljungqvist (2001), Ljungqvist and Wilhelm (2003)), which all report less underpricing for IPOs with secondary shares.

#### **4.2. Correlation between Controlling Shareholders' Sale and IPO Underpricing**

Equation (1) is used to test hypothesis 1 which asserts that the extent of underpricing decreases if controlling shareholders themselves sell a significant portion of their holdings (*FamilyRatio*) and if the absolute value of the portion sold by the controlling shareholders (*ABSValue*) is large.

$$UP_i = \beta_1 FamilyRatio_i + \beta_2 ABSValue_i + \gamma OtherControlVariables_i + \varepsilon_i \quad (1)$$

Table 5 reports the results of the regression analysis. *t*-stats are all based on heteroskedasticity-consistent robust standard errors. As expected, we confirm that underpricing is substantially reduced when controlling shareholders sell a significant portion of their holdings through an IPO. The coefficients on *FamilyRatio* remain statistically significant at 1% level in most specifications, even after including year fixed effects in columns (6) through (9).

In terms of economic significance, a one-standard deviation increase in *FamilyRatio* (8% points) implies 9.3% points decrease in underpricing based on column (8). If we apply the 98th percentile *FamilyRatio* of 29.6%, then decreases in underpricing amounts up to 34.3% points. Considering that average underpricing for the full sample is 34%, this actually implies a mild overpricing.

In contrast to the effect of *FamilyRatio* on underpricing, the coefficient on *ABSValue* is not statistically significant in all specifications. In fact, the point estimates are all very close to zero. This suggests that a larger absolute value of cash flow interest divested by controlling shareholders does not necessarily lead to less underpricing.

The results so far strongly support the hypothesis that the extent of underpricing is reduced if the controlling shareholders sell more of their direct and indirect holdings through an IPO. Interestingly, this correlation between the selling portion of controlling shareholders

and the extent of underpricing is more prominent in firms listed in KOSPI than those listed in KOSDAQ. For example, if we include *KOSDAQ* dummy as well as its interaction term with the *FamilyRatio* in the analysis as in column (3), the magnitude of the coefficient on *FamilyRatio* becomes larger (coefficient: -1.16) compared to the original case without *KOSDAQ* dummy in column (1) (coefficient: -0.73).

The positive and marginally significant coefficient on the interaction term between *KOSDAQ* and *FamilyRatio* indicates that the relation between secondary shares sold by the controlling shareholders and underpricing is weaker in firms listed in KOSDAQ. One potential reason is that most IPOs in KOSDAQ are primary-only IPOs and that there are relatively few IPOs that include any secondary shares. Specifically, only 10% of the IPOs include secondary shares in KOSDAQ, while a half of the IPOs in KOSPI include secondary shares. One other possible reason is that in KOSDAQ retail investors play a major role and thus price movement in the first trading day can be very noisy.

We also implement a few additional robustness tests to further support the reliability of our analysis. First, we test whether our main results are driven by small firms with low offer prices. In unreported table, we exclude those 18 companies whose offering price was less than KRW 3,000 or roughly USD 2.5. We use KRW 3,000 as the exclusion threshold mostly because offering price of the lowest 5 percentile in our sample is KRW 3,000. The results indicate that the negative relationship between underpricing and controlling shareholders' sale remains statistically significant at 0.1% level (*t*-statistics: -3.29).

Second, we also deal with the potential concern that underpricing is not due to low offer price but stock price movement during the first trading day. That is, underpricing may be not be driven by low offer price (denominator effect), but more by higher closing price (numerator effect). To test for this possibility, we redefine underpricing as the difference

between the offering price and the opening price on the first day of trading scaled by offering price. We are not the first to use this definition and many previous studies have employed this approach, including Barry and Jennings (1993). Unreported results indicate that our results are robust even after we redefine underpricing as offering price to opening price.

#### **4.3. Announcement Return to Disclosure of Divesting Member Firm's Shares in an IPO**

Previous subsection documents that underpricing is less severe when controlling shareholders themselves divest their direct and indirect cash flow stake in the IPO firm at the offer price. On the opposite side, this implies that when controlling shareholders do *not* sell their cash flow stakes, underpricing may be large. This could happen when controlling shareholders locate a 'scapegoat' affiliate firm to divest its holdings potentially at a low offer price.

There are three conditions for such 'scapegoat' phenomenon to materialize. First, there should be other member firms that hold shares in the IPO firm. Second, these firms are willing to divest those shares in an IPO, regardless of the offer price. Third, the offer price should be substantially low to generate large underpricing.

First condition is easily met in Korea, since many firms belong to a business group and a typical private firm in a business group may well be funded through equity investment by other (public) member firms. Second condition can be met if the IPO decision, including who will divest shares, is made not at the firm-level but at the group-level. As previously mentioned, a single controlling shareholder typically has effective control over all member firms in Korean business groups, and major decisions are coordinated at the group-level

through central control towers.<sup>10</sup> IPO decisions are no exceptions so that the decision to go public is not made by the IPO firm itself, but carefully coordinated at the group level. Similarly, who is going to divest shares is also determined at the group-level rather than at the firm-level. It is widely believed that Samsung SDS's recent IPO was made in conjunction with the group's long-term succession plan to pass over the control from the current controlling shareholder to his only son. Since the controlling shareholder has effective control over group-level human resources, reflected at the end-of-year executive promotion announcements, managers of IPO firms, and selling affiliated firms, are expected to concede to group-level decisions.

Third condition, which implies a large underpricing and a value loss to selling shareholders, seems puzzling at first. We conjecture there is a potential trade-off between accepting underpricing and maintaining reputational capital. For example, Samsung went through a severe public criticism by the media when Samsung Life Insurance' stock price mostly remained at below the offer price subsequent to its IPO in 2010. Samsung, as a group, may allow underpricing in subsequent IPOs as a cost to prevent such loss in reputation. A critical ethical issue is that the cost of underpricing may not be distributed equally among the existing shareholders. As elaborated above, affiliated firms may be chosen at the group-level to bear the cost while the controlling shareholders may avoid it by not selling.

For this analysis, we start from 38 affiliates who divested their holdings in 31 IPOs during our sample period. Of these, we exclude 7 affiliates and 6 IPOs in which selling affiliates are not publicly traded. The number of selling affiliates and the number of IPOs may well be different, because multiple member firms with holdings in the IPO firm may offer secondary shares in a given IPO.

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<sup>10</sup> These control towers have many different names. For example, it used to be called 'Planning and Coordination Unit' in most business groups. Current name for Samsung's control tower is 'Future Strategy Unit'.

We classify the remaining 31 publicly traded affiliates and 25 IPOs into two groups using following criteria: 1) if controlling shareholder family's ownership in the selling affiliate is lower than 20%, and 2) the selling affiliate and the IPO firm are members of a large business group designated by the Korea Fair Trade Commission (KFTC) every year whose group-level total assets exceeds KRW 5 trillion (USD 4.2 billion, approximately). We classify a selling affiliate into *Scapegoat group* if it meets these two conditions. Based on this criteria, 14 affiliates offering shares in 8 IPOs are categorized into *Scapegoat group*.

We also consider an alternative definition of a scapegoat; those that are located within the circular-shareholding link or 'loop' of their business group structure (12 cases), and those who were the only shareholders divesting their shares even though the controlling shareholder has more than 30% of direct ownership in the IPO firm. We classify these 16 affiliates (12 IPOs) into *Scapegoat2 group* and the remaining 15 affiliates as *non-Scapegoat2 group*.

Table 6 presents the level of underpricing for both the *Scapegoat group* and *non-Scapegoat group*. The results suggest that the degree of underpricing is more severe for the *Scapegoat* firms than for *non-Scapegoat* firms. For example, the average level of underpricing is 32% for the *scapegoat* group while, the corresponding number for *non-Scapegoat* group is 17%. Analysis based on an alternative definition shows similar results. Although the *t*-tests are statistically insignificant presumably due to a small sample, non-parametric Wilcoxon rank-sum test indicates that the difference in underpricing between the two groups is statistically significant.

Such differences in underpricing, and thus differences in value loss to selling affiliates may be reflected in their stock prices when they announce the divestiture of their holdings in the IPO firm, which we have formally stated as hypothesis 2 in section 2. Specifically, the disclosure of an *affiliated* firm's decision to divests its holdings of another member firm at the

IPO offer price would be negative news to its shareholders. In order to test this, we estimate the following specification.

$$\begin{aligned}
Ab\_Ret_i = & \beta_1 AffAmount_i + \beta_2 AffProportion_i + \beta_3 (AffAmount_i * AffProportion_i) + \beta_4 WW_i \\
& + \beta_5 BigGroup_i + \beta_6 (AffAmount_i * BigGroup_i) + \beta_7 (AffProportion_i * BigGroup_i) \\
& + \beta_8 LowCSOwnership_i + \beta_9 (AffAmount_i * LowCSOwnership_i) \\
& + \beta_{10} (AffProportion_i * LowCSOwnership_i) + \beta_{11} Scapegoat_i + \beta_{12} (AffAmount_i \\
& * Scapegoat_i) + \beta_{13} (AffProportion_i * Scapegoat_i)
\end{aligned} \tag{2}$$

Equation (2) tests whether more secondary shares offered by an affiliate company, in both relative and absolute terms, lead to more negative market reaction. It also tests whether controlling family's interest in the selling affiliate mitigates such negative market impact.

We use a 2-day abnormal return as the dependent variable (*Ab\_Ret*). Abnormal returns for each selling affiliate are calculated by subtracting off market return during the event window from the return of each affiliated firm during the same window. Note that the unit of observation in this analysis is not an IPO firm but each *affiliated* firm which sells their existing holdings in the IPO firm. Consequently, the number of observations is different from the number of observations reported in Table 6.

Independent variables are as follows: the proportion of the shares held by the affiliated firm to be sold through the IPO relative to its total holdings prior to the IPO (*AffProportion*), the absolute amount of the shares divested by the affiliated firm (*AffAmount*), interaction term between these two variables (*AffProportion\*AffAmount*), and the degree of financial constraints of the selling affiliate measured by the Whited and Wu (2006) index (*WW*). We control for this index since some selling affiliates may face financial constraints so that proceeds from the sale could be viewed as positive news.

In addition, we consider how much cash flow rights of the selling affiliate are owned by the controlling family before the IPO. This is to control for the fact that even if affiliated firms

sell, negative impact may be reduced if the family has large cash flow interest in the selling affiliate. Specifically, we introduce *LowCSOwnership* variable, which is an indicator that equals 1 if controlling shareholder family's ownership of the selling affiliated is less than 20%. We interact *LowCSOwnership* with variables related to affiliated firms' sale of secondary shares and create the following two interaction terms; *AffProportion\*LowCSOwnership*, *AffAmount\*LowCSOwnership*.

Ownership structures of Korean firms included in large business group are usually quite complicated(La Porta et al. (1999)), which often leads to severe divergence between cash flow rights and voting rights. So, minority shareholders of those firms are usually vulnerable to tunneling(Johnson et al. (2000)), who be more sensitive to possible future loss. To incorporate this, we introduce *BigGroup* variable, which is a dummy that equals 1 if the selling affiliated firm belongs to large business group designated by the KFTC. As before we interact *BigGroup* with *AffAmount* and *AffProportion*.

Table 7 reports the results based on a 2-day event window. The results indicate that if the selling affiliate announces that it will divest a larger amount at the IPO offer price, announcement returns are more negative. Specifically the coefficient on *AffAmount* is statistically significantly negative in most specifications. In terms of economic magnitude, a KRW 100 billion (USD 82 million) increase in sale by an affiliated firm implies a 0.47% points decrease in abnormal return over a 2-day window on average.

On the other hand, coefficient on *AffProportion* is not statistically significantly correlated with the announcement returns. Similarly, cash flow interest held by the controlling family in the selling affiliate does not necessarily mitigate negative market reactions.

The results in columns 7 through 15 indicate that those from columns 1 through 5 are mostly driven by selling affiliates 1) which are members of a large business group or 2) with



low ownership of the controlling family. This result is consistent with those reported in Table 6. In fact, there are no significant relationships between *Ab\_Ret* and *AffAmount* (or *AffProportion*) if *BigGroup* (or *LowCSOwnership*) is zero. We next consider a joint effect of *BigGroup* and *LowCSOwnership*. Specifically, we include *Scapegoat*, which is effectively an interaction term between *BigGroup* and *LowCSOwnership*. The coefficients on interaction terms between *Scapegoat* and *AffAmount* (or *AffProportion*) are also statistically significantly negative. (t-statistics: -2.16 (-2.61))

In an unreported table, we also consider a 3-day return from day -1 to day +1 of the announcement. This is to incorporate the possibility that the announcement is made after the market is closed. The result is similar to those reported in Table 7. In addition, we use the Kaplan and Zingales (1997) index and SA index introduced by Hadlock and Pierce(2010) instead of *WW*. Similar to the results reported in Table 7, degree of financing constraints does not affect the relationship between *AffAmount* and *Ab\_Ret*.

As a final analysis, we further examine whether there is any potential substitution between allowing underpricing (indirect cost) and paying higher underwriting commission (direct cost). Previous studies based on U.S. document that insiders may decide to pay higher underwriting fees if they can obtain higher offer prices and face less underpricing. To test for this possibility, we regress underwriting fees (*Fee\_TotalProceeds*, the proportion of the underwriting fee to total proceeds from an IPO) on *Secondary* dummy, *SecondaryCont* and *FamilyRatio*.

The results, reported in Table 8, show that unlike in U.S. such substitution effect does not exist in Korea. Specifically, underwriting commission compared to the total amount of IPO *decreases*, rather than increases as in U.S., when the IPO includes secondary shares and

when controlling shareholders directly sell a larger stake in the IPO firm. These two effects are statistically significant in all of the specifications.

We interpret this result to be consistent with our previous findings. In U.S. both direct costs and indirect costs are paid by the selling insiders. In contrast, controlling shareholders in Korea are only responsible for direct costs, but they don't have to suffer from underpricing as long as they can find a 'scapegoat' affiliate. As such, there is no incentive for the controlling shareholders to pay higher fees to reduce underpricing. They can simply allow underpricing, but find a scapegoat affiliate that will bear the cost of underpricing.

## **5. Conclusion**

When firms exist as stand-alones as in U.S., secondary shares offered in IPOs must come from insiders – entrepreneurs and venture capitalists - and any cost from underpricing must be paid by them. Thus, insiders have incentives to reduce underpricing when they sell their own shares in the IPO. This has been well documented in the previous literature (Habib and Ljungqvist (2001)).

However, when firms exist as members of business groups as in vast majority of non-U.S. countries, secondary shares offered in IPOs need not come from controlling shareholders themselves even if they hold a substantial direct ownership interest in the IPO firm. Instead, they can locate an affiliated firm with the following characteristics; it should have holdings in the IPO firm, but at the same time the controlling family should have little cash flow interest in this affiliated firm. As long as the controlling family could influence this 'scapegoat' firm to sell their holdings in the IPO, the family is effectively insulated from any underpricing since the family retains their holdings in the IPO firm.

There are a few reasons why the controlling family may prefer IPOs to be underpriced. One potential explanation is the reputational risk they face when the IPO turns out to be overpriced. An example is the IPO of Samsung Life Insurance in 2010. The offer price was set at KRW 110,000 but the price as of January 2016 is still just around the offer price. Just after the IPO, there was a lot of controversy over the media and among the regulators about the potential overvalued offer. Allowing underpricing, but avoiding the cost from underpricing, could be an optimal solution to circumvent such reputational risk.

To the best of our knowledge, we are the first to suggest that it is not the existence of secondary shares *per se*, but *who* is selling these secondary shares that matters in determining the degree of underpricing in business group IPOs. As such, our key contribution to the literature is to highlight the importance of distinguishing the seller's identity in predicting the magnitude of underpricing in IPOs, especially those made within business groups.

From the perspective of minority shareholders of scapegoat firms, there is a clear wealth transfer. At the same time, this is also different from traditional tunneling since the direction of wealth transfer is not towards the controlling families, but to the IPO subscribers. At any rate, this raises a serious ethical issue, if not a legal issue.

An interesting follow-up research question is whether investors are aware of these potential conflicts of interest in IPOs with secondary shares. According to the results of this study, the offer is more likely to be less underpriced (or even overpriced) when controlling shareholders sell a significant portion of their cash flow interest. As elaborated in Innocean case in the introduction, however, investors do not seem to fully consider this possibility when applying for subscription. It would be interesting to further examine whether there is any learning effect in the market as more data become available over time.

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**Table 1. IPO Sample Characteristics**

This table shows summary statistics of final 413 IPOs in KOSPI and KOSDAQ since June 2007. We exclude IPOs of special purpose acquisition companies (SPAC), real estate investment trusts (REITs), privatized public companies, stocks delisted from the KOSDAQ to list on the KOSPI, carved out firms, companies having foreign companies as the largest shareholder, firms listed in the overseas market at the same time, financial holding companies established by stock transfer, and foreign companies listed in Korean market. *UP* is a degree of underpricing, computed as (Closing price of the first listing day – Offering Price) / Offering Price. *FamilyRatio* identifies how much shares controlling families sell out of families' original stake in a firm. *DilutionFactor* captures the dilution of original shareholders due to the IPOs, computed as new shares outstanding through IPO divided by the total shares outstanding. *ConBeforeRatio* is the controlling shareholder family's ownership of the IPO firm prior to IPO. *ABSValue* is the money value of secondary shares sold by controlling family, in KRW billion. *TotalProceeds* is the money value of total proceeds from an IPO, in KRW billion. *SCRQ* is an average subscription rate of the IPO firms listed in the same quarter, divided by hundred. *SCRH* is an average subscription rate of the IPO firms listed in the same half year, divided by hundred. *Size* is the book value of a firm prior to IPO, in KRW billion. *Leverage* is the debt-to-assets ratio of a firm prior to IPO. *Old* is the age of the firm from the establishment up to the listing date. *KOSDAQ* is a dummy variable that equals 1 if a firm is listed in the KOSDAQ, 0 if a firm is listed in the Korean Stock Exchange. *Secondary* is a dummy variable that equals 1 if secondary shares are included in an IPO, 0 otherwise. *SecondaryCont* is the number of secondary shares sold normalized by the total number of original shares.

VARIABLES	(1) N	(2) mean	(3) sd	(4) median	(5) P25	(6) P75	(7) skewness
<i>UP</i>	413	0.34	0.46	0.19	-0.03	0.62	0.91
<i>FamilyRatio</i>	413	0.02	0.08	0.00	0.00	0.00	4.58
<i>DilutionFactor</i>	413	0.27	0.11	0.26	0.19	0.34	-0.05
<i>ConBeforeRatio</i>	413	0.42	0.24	0.38	0.23	0.58	0.60
<i>ABSValue</i>	413	2.95	15.77	0.00	0.00	0.00	9.54
<i>TotalProceeds</i>	413	63.57	282.89	15.23	8.25	30.83	13.18
<i>SCRQ</i>	413	432.63	182.57	436.98	318.52	540.26	0.29
<i>SCRH</i>	413	433.09	133.17	381.87	332.94	525.89	0.66
<i>Size</i>	413	1,315.07	14,483.93	38.72	23.05	88.45	15.36
<i>Leverage</i>	413	0.44	0.19	0.45	0.31	0.58	0.12
<i>Old</i>	413	15.46	10.85	12.00	9.00	17.00	2.25
<i>KOSDAQ</i>	413	0.83	0.38	1.00	1.00	1.00	-1.72
<i>Secondary</i>	413	0.17	0.37	0.00	0.00	0.00	1.78
<i>SecondaryCont</i>	413	0.02	0.07	0.00	0.00	0.00	3.30

**Table 2. IPO Sample Characteristics - Subsamples**

This table shows summary statistics for each sub-sample. Panel A divides total sample of 413 IPOs by the stock exchange where the firm is listed. Panel B divides total sample by whether an IPO includes secondary shares sold. Panel C and Panel D shows the statistics of double sorting for KOSPI and KOSDAQ, respectively. *UP* is a degree of underpricing, computed as (Closing price of the first listing day – Offering Price) / Offering Price. *FamilyRatio* identifies how much shares controlling families sell out of families’ original stake in a firm. *DilutionFactor* captures the dilution of original shareholders due to the IPOs, computed as new shares outstanding through IPO divided by the total shares outstanding. *ConBeforeRatio* is the controlling shareholder family’s ownership of the IPO firm prior to IPO. *ABSValue* is the money value of secondary shares sold by controlling family, in KRW billion. *TotalProceeds* is the money value of total proceeds from an IPO, in KRW billion. *SCRQ* is an average subscription rate of the IPO firms listed in the same quarter, divided by hundred. *SCRH* is an average subscription rate of the IPO firms listed in the same half year, divided by hundred. *Size* is the book value of a firm prior to IPO, in KRW billion. *Leverage* is the debt-to-assets ratio of a firm prior to IPO. *Old* is the age of a firm from the establishment up to the listing date in years. *KOSDAQ* is a dummy variable that equals 1 if a firm is listed in the KOSDAQ, 0 if a firm is listed in the Korean Stock Exchange. *Secondary* is a dummy variable that equals 1 if secondary shares are included in an IPO, 0 otherwise. *SecondaryCont* is the number of secondary shares sold normalized by the total number of original shares.

	Panel A: Sorted by Stock Exchange						Panel B: Sorted by Secondary Share Inclusion					
	N	KOSPI		KOSDAQ		Without Secondary Shares			With Secondary Shares			
		mean	median	N	mean	median	N	mean	median	N	mean	median
<i>UP</i>	72	0.31	0.18	341	0.34	0.20	344	0.34	0.20	69	0.32	0.17
<i>FamilyRatio</i>	72	0.06	0.00	341	0.01	0.00	344	0.00	0.00	69	0.14	0.09
<i>DilutionFactor</i>	72	0.23	0.23	341	0.28	0.26	344	0.29	0.27	69	0.19	0.18
<i>ConBeforeRatio</i>	72	0.43	0.38	341	0.42	0.38	344	0.41	0.38	69	0.44	0.41
<i>ABSValue</i>	72	13.34	0.00	341	0.76	0.00	344	0.00	0.00	69	17.65	6.60
<i>TotalProceeds</i>	72	275.36	79.45	341	18.85	12.30	344	22.92	12.34	69	266.21	54.41
<i>SCRQ</i>	72	4.33	439.82	341	432.54	436.98	344	424.59	418.78	69	472.71	474.89
<i>SCRH</i>	72	4.39	381.87	341	431.75	381.87	344	426.43	381.87	69	466.33	510.50
<i>Size</i>	72	7,296.50	326.54	341	52.13	33.22	344	90.47	34.38	69	7,420.33	170.74
<i>Leverage</i>	72	0.55	0.56	341	0.42	0.43	344	0.43	0.44	69	0.50	0.50
<i>Old</i>	72	24.24	20.00	341	13.60	11.00	344	13.70	11.00	69	24.22	17.00
<i>KOSDAQ</i>	72	0.00	0.00	341	1.00	1.00	344	0.89	1.00	69	0.51	1.00
<i>Secondary</i>	72	0.47	0.00	341	0.10	0.00	344	0.00	0.00	69	1.00	1.00
<i>SecondaryCont</i>	72	0.09	0.00	341	0.01	0.00	344	0.00	0.00	69	0.15	0.13

**Table 2.** - continued

	Panel C: KOSPI						Panel D: KOSDAQ					
	Without Secondary Shares			With Secondary Shares			Without Secondary Shares			With Secondary Shares		
	N	mean	median	N	mean	median	N	mean	median	N	mean	median
<i>UP</i>	38	0.35	0.25	34	0.27	0.09	306	0.34	0.19	35	0.38	0.24
<i>FamilyRatio</i>	38	0.00	0.00	34	0.14	0.08	306	0.00	0.00	35	0.13	0.11
<i>DilutionFactor</i>	38	0.31	0.33	34	0.14	0.12	306	0.28	0.27	35	0.23	0.23
<i>ConBeforeRatio</i>	38	0.49	0.46	34	0.37	0.30	306	0.40	0.37	35	0.51	0.48
<i>ABSValue</i>	38	0.00	0.00	34	28.25	12.17	306	0.00	0.00	35	7.36	4.14
<i>TotalProceeds</i>	38	78.19	45.20	34	495.72	255.77	306	16.06	11.72	35	43.25	30.60
<i>SCRQ</i>	38	396.30	376.70	34	474.17	491.53	306	428.11	418.78	35	471.30	450.62
<i>SCRH</i>	38	414.59	375.21	34	467.23	510.50	306	427.90	381.87	35	465.46	510.50
<i>Size</i>	38	439.40	206.57	34	14,960.31	1,138.43	306	47.13	31.33	35	95.77	62.89
<i>Leverage</i>	38	0.52	0.53	34	0.59	0.60	306	0.42	0.43	35	0.41	0.44
<i>Old</i>	38	19.39	16.00	34	29.65	26.50	306	12.99	11.00	35	18.94	14.00



**Table 3. Secondary Shares Sold and IPO Underpricing: Univariate Analysis**

The table reports degree of underpricing sorted by whether secondary shares are sold. This table shows not only the summary statistics for our sample period, but also presents the figures obtained from longer period. We exclude IPOs of special purpose acquisition companies (SPAC), real estate investment trusts (REITs), privatized public companies, stocks delisted from the KOSDAQ to list on the KOSPI, carved out firms, companies having foreign companies as the largest shareholder, firms listed in the overseas market at the same time, financial holding companies established by stock transfer, and foreign companies listed in Korean market. *UP* is a degree of underpricing, computed as (Closing price of the first listing day – Offering Price) / Offering Price. We also sorted the result by which stock exchange IPOs take place. Furthermore, results for the period since June 2007, our main sample period, are also reported separately.

	IPOs with Secondary Shares		IPOs without Secondary Shares		<i>t</i> -statistics (H0 : $UP_N - UP_S = 0$ )
	N	$UP_S$	N	$UP_N$	
Our Sample Period	69	0.32	344	0.34	0.27
KOSPI	34	0.27	38	0.35	0.73
KOSDAQ	35	0.38	306	0.34	-0.49
After July 2004	74	0.34	520	0.40	0.98
KOSPI	39	0.30	57	0.34	0.39
KOSDAQ	35	0.38	463	0.40	0.29

**Table 4. Secondary Shares Sold and IPO Underpricing: Multivariate Analysis**

This table reports estimation results of the following regression specification;

$$UP_i = \beta_1 Secondary_i(\text{or } SecondaryCont_i) + \gamma OtherControlVariables_i + \varepsilon_i$$

The sample includes the 413 IPOs in KOSPI and KOSDAQ since June 2007, after excluding special purpose acquisition companies (SPAC), real estate investment trusts (REITs), privatized public companies, stocks delisted from the KOSDAQ to list on the KOSPI, carved out firms, companies having foreign companies as the largest shareholder, firms listed in the overseas market at the same time, financial holding companies established by stock transfer, and foreign companies listed in Korean market. *UP* is a degree of underpricing, computed as (Closing price of the first listing day – Offering Price) / Offering Price. *Secondary* is a dummy variable that equals 1 if secondary shares are included in an IPO, 0 otherwise. *SecondaryCont* is the number of secondary shares sold normalized by the total number of original shares. *SCRQ* is an average subscription rate of the IPO firms listed in the same quarter, divided by hundred. *LnSize* is a log value of the book value of a firm prior to IPO. *Leverage* is the debt-to-assets ratio of a firm prior to IPO. *Old* is the age of the firm from the establishment up to the listing date. *Old* is the age of the firm from the establishment up to the listing date. The numbers in parentheses are the heteroskedasticity-consistent *t*-statistics of White (1980). \*, \*\*, and \*\*\* indicates 10%, 5%, 1% statistical significance, respectively.

VARIABLES	(1) <i>UP</i>	(2) <i>UP</i>	(3) <i>UP</i>	(4) <i>UP</i>	(5) <i>UP</i>	(6) <i>UP</i>	(7) <i>UP</i>	(8) <i>UP</i>
<i>Secondary</i>	-0.02 (-0.27)		-0.07 (-1.08)		0.04 (0.49)		0.01 (0.15)	
<i>SecondaryCont</i>		-0.21 (-0.64)		-0.33 (-0.95)		0.03 (0.08)		0.09 (0.22)
<i>SCRQ*0.01</i>			0.10*** (8.81)	0.10*** (8.74)			0.10*** (9.09)	0.10*** (9.05)
<i>LnSize</i>					-0.05** (-2.12)	-0.04* (-1.96)	-0.06*** (-2.93)	-0.06*** (-3.01)
<i>Leverage</i>					0.08 (0.64)	0.08 (0.58)	0.09 (0.77)	0.09 (0.78)
<i>Old</i>					0.00 (1.24)	0.00 (1.32)	0.00 (1.55)	0.00 (1.55)
Constant	0.34*** (13.64)	0.34*** (14.13)	-0.09* (-1.74)	-0.09* (-1.73)	1.40*** (2.81)	1.30*** (2.65)	1.33*** (2.75)	1.34*** (2.84)
Observations	413	413	413	413	413	413	413	413
R-squared	0.00	0.00	0.16	0.16	0.01	0.01	0.18	0.18

**Table 5. Secondary Shares Sold by the Controlling Shareholders and IPO Underpricing: Multivariate Analysis**

This table reports regression results of the following specification;

$$UP_i = \beta_1 FamilyRatio_i + \beta_2 ABSValue_i + \gamma OtherControlVariables_i + \varepsilon_i$$

The sample includes the 413 IPOs in KOSPI and KOSDAQ since June 2007. *UP* is a degree of underpricing, computed as (Closing price of the first listing day – Offering Price) / Offering Price. *FamilyRatio* identifies how much shares controlling families sell out of families' original stake in a firm. *ABSValue* is the money value of secondary shares sold by controlling family, in KRW billion. *DilutionFactor* captures the dilution of original shareholders due to the IPOs, computed as new shares outstanding through IPO divided by the total shares outstanding. *ConBeforeRatio* is the controlling shareholder family's ownership of the IPO firm prior to IPO. *SCRQ* is an average subscription rate of the IPO firms listed in the same quarter, divided by hundred. *SCRH* is an average subscription rate of the IPO firms listed in the same half year, divided by hundred. *LnSize* is a log of book value of a firm prior to the IPO. *Leverage* is the debt-to-assets ratio of a firm prior to IPO. *Old* is the age of the firm from the establishment up to the listing date. *KOSDAQ* is a dummy variable that equals 1 if a firm is listed in the KOSDAQ, 0 if a firm is listed in the Korean Stock Exchange. The numbers in parentheses are the heteroskedasticity-consistent *t*-statistics of White (1980). \*, \*\*, and \*\*\* indicates 10%, 5%, 1% statistical significance, respectively.

VARIABLES	(1) <i>UP</i>	(2) <i>UP</i>	(3) <i>UP</i>	(4) <i>UP</i>	(5) <i>UP</i>	(6) <i>UP</i>	(7) <i>UP</i>	(8) <i>UP</i>	(9) <i>UP</i>
<i>FamilyRatio</i>	-0.73*** (-3.15)	-0.65*** (-2.78)	-1.16*** (-2.79)	-1.27*** (-2.81)	-1.22*** (-2.68)	-0.53** (-2.39)	-1.02*** (-2.64)	-1.16*** (-2.83)	-1.08*** (-2.63)
<i>ABSValue</i>	0.00 (0.54)	0.00 (1.10)	0.00 (0.88)	0.00 (1.47)	0.00 (1.48)	0.00 (0.45)	0.00 (0.25)	0.00 (0.81)	0.00 (0.88)
<i>DilutionFactor</i>	-0.02 (-0.10)	-0.12 (-0.60)	-0.02 (-0.09)	-0.13 (-0.64)	-0.09 (-0.40)	-0.11 (-0.50)	-0.02 (-0.09)	-0.12 (-0.58)	-0.12 (-0.53)
<i>ConBeforeRatio</i>	0.05 (0.49)	0.01 (0.14)	0.04 (0.41)	-0.01 (-0.06)	-0.04 (-0.46)	-0.03 (-0.29)	0.02 (0.19)	-0.05 (-0.50)	-0.07 (-0.67)
<i>SCRQ</i> *0.01	0.10*** (8.94)	0.11*** (9.23)	0.10*** (9.02)	0.11*** (9.54)		0.10*** (7.76)	0.10*** (7.64)	0.10*** (7.88)	
<i>SCRH</i> *0.01					0.13*** (8.07)				0.13*** (6.55)
<i>LnSize</i>		-0.06*** (-2.98)		-0.09*** (-3.53)	-0.09*** (-3.31)	-0.06*** (-3.06)		-0.10*** (-3.54)	-0.09*** (-3.27)
<i>Leverage</i>		0.10 (0.82)		0.14 (1.16)	0.09 (0.75)	0.07 (0.56)		0.11 (0.85)	0.08 (0.65)
<i>Old</i>		0.00* (1.69)		0.00* (1.66)	0.00* (1.76)	0.01** (2.32)		0.01** (2.31)	0.01** (2.47)
<i>KOSDAQ</i>			-0.01 (-0.17)	-0.18** (-1.98)	-0.16* (-1.76)		-0.01 (-0.11)	-0.18* (-1.81)	-0.14 (-1.51)
<i>KOSDAQ</i> *			0.72 (1.58)	0.98** (2.03)	1.00** (2.04)		0.70 (1.55)	1.01** (2.15)	1.03** (2.21)
FamilyRatio									
Constant	-0.11 (-1.34)	1.34*** (2.77)	-0.09 (-0.92)	2.26*** (3.29)	1.99*** (2.96)	1.90*** (3.50)	0.40* (1.94)	2.90*** (3.79)	2.46*** (3.25)
Observations	413	413	413	413	413	413	413	413	413
R-squared	0.17	0.19	0.17	0.20	0.17	0.25	0.23	0.27	0.23
Year FE	No	No	No	No	No	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	Yes	Yes	Yes	Yes

**Table 6. IPO Underpricing when affiliated firms sell their own shares**

This table reports degree of underpricing sorted by characters of selling affiliate firm. The analysis includes 25 IPOs in which a listed affiliated firm of a business group sells its holdings of another member firm through an IPO since June 2007. *UP* is a degree of underpricing, computed as (Closing price of the first listing day – Offering Price) / Offering Price. IPOs which meet following two conditions are classified as *Scapegoat*; 1) controlling shareholder family’s ownership of the selling affiliated is less than 20% and 2) a total sum of all member firms’ assets exceeds KRW 5 trillion. An IPO is classified into the *Scapegoat2* group when 1) selling affiliated involves in circular shareholding or 2) controlling shareholder family do not sell their own shares even though the family hold more than 30% ownership of an IPO firm. \*, \*\*, and \*\*\* indicates 10%, 5%, 1% statistical significance, respectively.

		<i>UP</i>	
	N	Mean	
			<i>z-statistics using Wilcoxon rank sum test</i> (H0 : $UP_{Scapegoat} - UP_{NonScapegoat} = 0$ )
			<i>t-statistics</i> (H0 : $UP_{Scapegoat} - UP_{NonScapegoat} = 0$ )
Total Subsample	25	0.22	
<i>Scapegoat</i>	8	0.32	1.89*
<i>Non-Scapegoat</i>	17	0.17	
<i>Scapegoat2</i>	12	0.31	
<i>Non-Scapegoat2</i>	13	0.14	2.06**

**Table 7. Announcement Effect on the Selling Affiliated Firm**

This table reports the result of the following regression specification;

$$Ab\_Ret_i =$$

$$\beta_1 AffAmount_i + \beta_2 AffProportion_i + \beta_3 (AffAmount_i * AffProportion_i) + \beta_4 WW_i + \beta_5 BigGroup_i + \beta_6 (AffAmount_i * BigGroup_i) + \beta_7 (AffProportion_i * BigGroup_i) + \beta_8 LowCSOwnership_i + \beta_9 (AffAmount_i * LowCSOwnership_i) + \beta_{10} (AffProportion_i * LowCSOwnership_i) + \beta_{11} Scapegoat_i + \beta_{12} (AffAmount_i * Scapegoat_i) + \beta_{13} (AffProportion_i * Scapegoat_i)$$

The analysis includes 31 observations in which a listed affiliated firm of a business group sells its holdings of another member firm through an IPO since June 2007. *Ab\_Ret*, dependent variable, is an affiliated firm's abnormal return from t-1 to the announcement date, as a percentage. Abnormal returns are calculated as follows: return of each affiliated firm from t-1 to the announcement date - market return for the same period. *AffAmount* is the money value of secondary shares sold originally owned by affiliated firms, in KRW 100 billion. *AffProportion* is the proportion that shows how much stake of a seller affiliated firm is sold through an IPO. *WW* is a Whited and Wu (2006) index of financial constraints. *BigGroup* is a dummy variable that equals 1 if selling affiliated firm belongs to large business group. *LowCSOwnership* is a dummy variable that equals 1 if controlling shareholder family's ownership of the selling affiliated is less than 20%. *Scapegoat* is a dummy variable that equals 1 if both the value of *BigGroup* and *LowCSOwnership* is 1. The numbers in parentheses are the heteroskedasticity-consistent *t*-statistics of White (1980). \*, \*\*, and \*\*\* indicates 10%, 5%, 1% statistical significance, respectively.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>	<i>Ab_Ret</i>
<i>AffAmount</i>	-0.47** (-2.21)			-0.48** (-2.27)		7.79** (2.07)		8.48*** (3.66)		6.92 (1.68)		8.25*** (3.15)		3.04 (1.70)	
<i>AffProportion</i>		-0.02 (-0.63)			-0.02 (-0.71)		0.10 (1.31)		0.07 (1.26)		0.08 (1.35)		0.06 (1.03)		0.08 (1.59)
<i>AffAmount*AffProportion</i>			-0.01*** (-3.61)												
<i>WW</i>				1.06 (0.24)	2.95 (0.73)					6.02 (0.84)	7.85 (1.27)	7.11 (1.26)	6.01 (1.08)	11.17** (2.37)	8.35* (1.81)
<i>BigGroup</i>						3.71* (1.78)	4.28 (1.56)			4.51* (1.78)	5.59* (1.86)				
<i>AffAmount*BigGroup</i>						-8.41** (-2.23)				-7.53* (-1.83)					
<i>AffProportion*BigGroup</i>							-0.13* (-1.71)				-0.13* (-1.90)				
<i>LowCSOwnership</i>								5.47*** (3.09)	5.13** (2.09)			6.32*** (3.16)	5.84** (2.32)		
<i>AffAmount*LowCSOwnership</i>								-9.31*** (-4.01)				-9.07*** (-3.47)			
<i>AffProportion*LowCSOwnership</i>									-0.13* (-1.97)				-0.12* (-1.98)		
<i>Scapegoat</i>														6.29*** (3.25)	7.68*** (3.56)
<i>Scapegoat*AffAmount</i>														-3.89** (-2.16)	
<i>Scapegoat*AffProportion</i>															-0.15** (-2.61)
Constant	0.44 (0.51)	0.38 (0.31)	0.32 (0.40)	0.79 (0.44)	1.56 (0.77)	-2.52 (-1.42)	-2.84 (-1.21)	-3.11** (-2.29)	-2.19 (-1.20)	-0.70 (-0.27)	-0.50 (-0.19)	-0.83 (-0.36)	0.06 (0.02)	1.51 (0.79)	-0.25 (-0.10)
Observations	31	31	31	30	30	31	31	31	31	30	30	30	30	30	30
R-squared	0.06	0.01	0.08	0.07	0.03	0.19	0.13	0.36	0.17	0.21	0.17	0.40	0.21	0.35	0.34

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret	Ab_Ret
<i>AffAmount</i>	-0.47** (-2.21)			-0.48** (-2.27)		7.79** (2.07)		8.48*** (3.66)		6.92 (1.68)		8.25*** (3.15)		3.04 (1.70)	
<i>AffProportion</i>		-0.02 (-0.63)			-0.02 (-0.71)		0.10 (1.31)		0.07 (1.26)		0.08 (1.35)		0.06 (1.03)		0.08 (1.59)
<i>AffAmount*AffProportion</i>			-0.01*** (-3.61)												
<i>WW</i>				1.06 (0.24)	2.95 (0.73)					6.02 (0.84)	7.85 (1.27)	7.11 (1.26)	6.01 (1.08)	11.17** (2.37)	8.35* (1.81)
<i>BigGroup</i>						3.71* (1.78)	4.28 (1.56)			4.51* (1.78)	5.59* (1.86)				
<i>AffAmount*BigGroup</i>						-8.41** (-2.23)				-7.53* (-1.83)					
<i>AffProportion*BigGroup</i>							-0.13* (-1.71)				-0.13* (-1.90)				
<i>LowCSOwnership</i>								5.47*** (3.09)	5.13** (2.09)			6.32*** (3.16)	5.84** (2.32)		
<i>AffAmount*LowCSOwnership</i>								-9.31*** (-4.01)				-9.07*** (-3.47)			
<i>AffProportion*LowCSOwnership</i>									-0.13* (-1.97)				-0.12* (-1.98)		
<i>Scapegoat</i>														6.29*** (3.25)	7.68*** (3.56)
<i>Scapegoat*AffAmount</i>														-3.89** (-2.16)	
<i>Scapegoat*AffProportion</i>															-0.15** (-2.61)
Constant	0.44 (0.51)	0.38 (0.31)	0.32 (0.40)	0.79 (0.44)	1.56 (0.77)	-2.52 (-1.42)	-2.84 (-1.21)	-3.11** (-2.29)	-2.19 (-1.20)	-0.70 (-0.27)	-0.50 (-0.19)	-0.83 (-0.36)	0.06 (0.02)	1.51 (0.79)	-0.25 (-0.10)
Observations	31	31	31	30	30	31	31	31	31	30	30	30	30	30	30
R-squared	0.06	0.01	0.08	0.07	0.03	0.19	0.13	0.36	0.17	0.21	0.17	0.40	0.21	0.35	0.34

**Table 8. Secondary Share Selling of Controlling Shareholders and Underwriting Fee**

This table reports the result of the following regression specification;

$$Fee\_TotalProceeds_i = \beta_1 Secondary_i + \beta_2 FamilyRatio_i + \beta_3 TotalProceeds_i + \beta_4 LnSize_i + \epsilon_i$$

The sample includes the whole IPOs in Korea since June 2007 after excluding special purpose acquisition companies (SPAC), real estate investment trusts (REITs), privatized public companies, stocks delisted from the KOSDAQ to list on the KOSPI, carved out firms, companies having foreign companies as the largest shareholder, firms listed in the overseas market at the same time, financial holding companies established by stock transfer, and foreign companies listed in Korean market. *Fee\_TotalProceeds* is the proportion of the underwriting fee to total proceeds from an IPO, as a percentage. *FamilyRatio* identifies how much shares controlling families sell out of families' original stake in a firm, and *Secondary*, a dummy variable that is 1 if secondary shares are sold in an IPO. *SecondaryCont* is the number of secondary shares sold normalized by the total number of original shares. *TotalProceeds* is the money value of total proceeds from an IPO, in KRW billion. *LnSize* is a log of the book value of a firm prior to the IPO. The numbers in parentheses are the heteroskedasticity-consistent *t*-statistics of White (1980). \*, \*\*, and \*\*\* indicates 10%, 5%, 1% statistical significance, respectively.

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12)

VARIABLES	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>	<i>Fee_Total Proceeds</i>
<i>Secondary</i>	-0.02*** (-10.77)			-0.02*** (-8.98)			-0.01*** (-4.47)			-0.01*** (-4.63)		
<i>SecondaryCont</i>		-0.10*** (-9.98)			-0.09*** (-8.59)			-0.04*** (-4.11)			-0.04*** (-4.33)	
<i>FamilyRatio</i>			-0.07*** (-7.25)			-0.06*** (-7.01)			-0.03*** (-3.43)			-0.02*** (-3.13)
<i>TotalProceeds</i>				-0.00* (-1.86)	-0.00* (-1.70)	-0.00** (-2.28)				0.00*** (4.09)	0.00*** (4.58)	0.00*** (3.26)
<i>LnSize</i>							-0.01*** (-9.14)	-0.01*** (-9.27)	-0.01*** (-10.49)	-0.01*** (-9.10)	-0.01*** (-9.28)	-0.01*** (-9.83)
Constant	0.04*** (31.61)	0.04*** (32.59)	0.04*** (32.32)	0.04*** (31.70)	0.04*** (32.54)	0.04*** (32.21)	0.21*** (11.15)	0.21*** (11.22)	0.22*** (12.45)	0.23*** (10.86)	0.23*** (11.01)	0.24*** (11.53)
Observations	413	413	413	413	413	413	413	413	413	413	413	413
R-squared	0.10	0.09	0.05	0.11	0.10	0.08	0.21	0.21	0.20	0.21	0.21	0.21