



Do Conflicts in the Interest of a Securities Firm Running Asset Management Businesses Effect an IPO Underpricing?

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Abstract

Purpose: This paper examines whether or not universal banking operating in the asset management business tend to IPO underpricing when they are hosting IPOs in favor of their private interests. Previous studies suggest evidence which indicates that the universal banking operating in the asset management business tend to underestimate offering prices. This paper compares and analyzes the data before and after June 2007 to examine the influence of put-back option on IPO underpricing. **Research design, data, and methodology:** This paper compares the underwritten prices of IPOs of universal banking with and without asset management business in Korea in order to test such tendency actually exists. **Result:** We can find that such tendency is not correlated with first-day stock returns but correlated with put-back options. Our paper concludes that the hypothesis that “the universal banking’s subsidiary asset management business influences the IPO underpricing” is found to be statistically insignificant. **Conclusion:** According to our analysis, it cannot be concluded that the interests of operating asset management do not conflict with the ones of underwriting business. However, it is so possible that the asset management companies try to harm the customers’ interests, for instances churning and stuffing, it is necessary to scrutinize their behaviors and review the related regulations.

Keywords: IPO Underpricing, Conflicts in the Interest of a Securities, IPO Puzzle

JEL Classification Code: C13, C50, G10

1. Introduction

In a broad sense, the term Initial Public Offering (IPO) refers to a stock company newly issuing and offering stocks to unspecified investors or offering old stocks that have already been issued in accordance with securities-related laws and regulations to change a closed structure of ownership that is formed around major shareholders, to an open one. In addition, IPO also indicates disbursing company stocks to investors for the purpose of being listed on the marketable securities market or the KOSDAQ market according to securities-related laws and regulations. IPO

and being listed have different meanings, but in Korea, they were used synonymously when the Public Corporation Inducement Law was legislated in 1972 and the initial public offering order system was adopted. Such an IPO has an important significance in that it establishes the means of financing, along with the significance of the company going public for the first time. Therefore, estimating a reasonable IPO price is a task that must be preceded to invigorate the securities market and the virtuous function of the financial market.

However, a majority of early stage IPO stocks have high excess returns, indicating that the issuing companies’

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confirmed offer prices were estimated lower than their reasonable value. In particular, the majority of IPO stocks close market trading with higher price than the confirmed offer price on the day of the listing, and this IPO underpricing phenomenon has been verified multiple times in previous studies. As to the causes for the repeated phenomenon of underpricing early stage IPOs in the market, the existing studies have explained them through information asymmetry, signal hypothesis, insurance hypothesis, and the pursuit of profit by the lead underwriters, among other explanations.

Meanwhile, insufficient studies have examined the conflicts of interest emerging from the universalization of securities firms as the cause of IPO underpricing compared with those that examined the subject of other causes of underpricing. Among them, Klein and Zoeller (2001) examined whether a securities firm's universalization influences IPO underpricing against 306 IPO stocks listed in Germany, finding that universalized securities firms intensify underpricing more than non-universalized securities firms. Park and Shin (2007) also analyzed IPO stocks' offer price in a domestic capacity in Korea and confirmed that the universalization of securities firms intensifies underpricing, mirroring the result of Klein and Zoeller (2001). According to their research, when securities firms also run asset management businesses, there is a greater degree of underpricing than those not running it. For these universalized securities firms, the degree of underpricing intensified and the market share of the asset management business run by each securities firm increased.

In contrast, Ber, Yafeh, and Yosha (2001) conducted an empirical analysis of the degree of low IPO price issue for the Israeli investment banks as a sample that also operating securities underwriting and asset management businesses. The study demonstrated a different result from the two aforementioned studies. According to this study, when comparing the one-year excess return of IPO stocks conducted by universalized investment banks with the return of IPO stocks conducted by non-universalized investment banks, the excess return earned by universalized investment banks was found to be markedly low. This demonstrates that when Israeli investment banks also operate underwriting and asset management businesses, they underwrite IPO stocks at a higher price than their reasonable value through their funds, thereby harming the profit of fund investors. The result of this study is an example of sacrificing the profit of asset management business and transferring it to securities underwriting services' profit.

This paper seems to examine, as did the study by Park and Shin (2007), whether conflicts of interest occurred due to securities firms' leading asset management businesses acting as the cause of IPO underpricing. The subject of this study is that the U.S. government, which strictly engaged in

specialized banking of the financial area in the past, implemented the Gramm-Leach-Bliley Financial Services Modernization Act in 1999 to reinforce competitiveness in the financial industry, which enabled U.S. securities firms to partially operate other functions aside from the inherent work of securities services. As the Capital Market Consolidation Act was implemented in Korea in 2009, the diversification of Korean financial businesses will be further expanded. As such, this shows that the subject of this paper has significant implications.

The aforementioned study by Park and Shin (2007) researched IPO underpricing from 1999 to 2006. However, Korean securities firms have experienced several major changes that impact the estimation of the IPO price since this research period. Among them, the stock market circumstances particularly showed an unprecedented boom, as the composite stock price index exceeded 2,000 points. The scale of the asset management business market influenced by this stock market also exhibited drastic growth. Furthermore, the abolition of the put-back option system in July 2007 significantly reduced the appeal of issuing underpriced IPO stocks for securities firms. Therefore, this paper conducted an empirical analysis of the stocks issued from January 2007 to July 2008 to assess whether securities firms' operation of asset management businesses continue to affect IPO underpricing, despite experiencing significant changes in the external environment.

The result of the empirical analysis conducted in this paper demonstrated that the hypothesis that "A universalized securities firm has a greater degree of issuing underpriced IPO than a non-universalized one" is not significant. This contradicts the research of Park and Shin (2007) and Klein and Zoeller (2001). Conversely, the analysis of the abolition of the put-back option system indicated that the degree of IPO underpricing reduced after this abolition, as expected.

This paper is organized as follows: Chapter 1 describes the motive and purpose of this paper and Chapter 2 summarizes previous research and hypotheses regarding IPO underpricing and Chapter 3 explains the hypothesis establishment and testing method used in this paper. Chapter 4 describes the results and regression analyses on the collected data according to each model, and lastly, Chapter 5 outlines the implications and conclusions of this study.

2. Literature Review

Underpricing in the early stage of IPO is a phenomenon generally observed across many countries in the world. However, academia has yet to identify a fundamental cause that can clearly explain IPO underpricing. Full-fledged research on such IPO underpricing began to be conducted after the mid-1980s. In particular, Rock (1986), Tinic (1989)

proposed several theories to explain IPO underpricing, which led to follow-up studies that are actively being conducted to date.

Compared with previous studies addressing other causes of underpricing, a limited number of studies examined the conflict of interest due to taking subsidiary business as the cause of underpricing. Among them, Klein and Zoeller (2001) investigated how securities firms' subsidiary business influenced the intensification of IPO underpricing with a sample of 306 German IPO stocks from 1997 to 1999. In the study, excess return on the first day of the listing was used as the proxy variable to measure the degree of underpricing, and the results indicated that securities firms with subsidiary business had a significantly higher degree of underpricing than those without subsidiary business. Moreover, the excess return on the first day of the listing was found to have high correlation with securities firms' subsidiary business, whereas the excess return of IPO stocks in the early listing period vanished or decreased in the long-term, demonstrating that the securities firms' subsidiary business has a low correlation with long-term excess return. In Korea, Park and Shin (2007) empirically analyzed the conflict of interest due to the lead underwriter's subsidiary business as the cause of IPO underpricing. This research argued that when securities firms conduct underwriting and asset management businesses, a conflict of interest arises between the two, and in particular, when the market share of the asset management business run by the securities firm is high, the firm may set a low offer price by prioritizing the profit of the asset management business over the profit gained from underwriting. They analyzed Korean IPO stocks listed from 1999 to 2006, confirming the hypothesis that underpricing intensifies for securities firms that also operate asset management business compared to securities firms that do not. In this paper, the market shares of the equity fund and the balanced fund that are operated as each securities firm's subsidiary business were used as the means to measure the proportion of subsidiary business in the asset management of securities firms. Additionally, the market shares of the fund operated by the securities firm and the market share of securities underwriting showed that they influence the degree of IPO underpricing in different directions. In other words, the outcome of this paper indicates that when the market shares of the asset business management operated subsidiaries by securities firms are the same, the degree of underpricing is relatively lower than the higher the market share of each securities firm in the securities underwriting market.

In contrast to the findings of the previous two papers, Ber, Yafeh, and Yosha (2001) showed that the degree of underpricing is actually lower for Israeli investment banks operating both underwriting and asset management businesses in the company. According to the verified results

of this study, "one-year stock returns of IPO stocks conducted by investment banks with subsidiary business were found to be drastically lower compared with IPO stocks conducted by investment banks without subsidiary business." This suggests that diversified Israeli investment banks running both underwriting and asset management businesses harmed fund investors' profits by underwriting IPO stocks that were underwritten through their funds at a higher price than the reasonable value.

3. Research Methods

3.1. Hypothesis Establishment

According to various domestic and overseas studies, IPO stocks were shown to have excess returns in the short-term. In particular, excess returns were shown to be higher in Korea compared with those overseas. In Korea, an average of 40% underpricing is indicated in existing studies. Conversely, it is indicated as 9.2% for France, 15.9% for Hong Kong, 26.4% for Japan, 17.5% for the U.K., and 18.4% for the U.S. according to Ritter (2002). Such excess returns indicate that early stage IPO stock offer prices were set lower than the reasonable price.

The characteristics of the IPO market must first be explored to examine IPO underpricing. Securities firms have a considerable influence on offer price in the IPO market because in an IPO market in which there is no set price for the stock, it must be determined through consultation between the issuing company and the securities firm. In this process, the securities firm generally has more knowledge and experience related to IPOs than the issuing company and also has superior negotiation skills, enabling them to have a greater influence on pricing. Thus, there is a high possibility of the offer price becoming distorted depending on the price the securities firm decides to estimate. However, in general, to continue underwriting in the future, securities firms must estimate a reasonable offer price to maximize profits on both sides of the issuing company and investors without disproportionately obtaining profits on a specific subject between those interests.

However, if the securities firm is operating an asset management business, in addition to securities underwriting, it can determine the offer price in the direction of maximizing its own profit by comparing the profit gained in underwriting (underwriting commission) with the profit of asset management business (fund commission). Particularly, if the asset management business market grows rapidly and the growth rate of the underwriting market is not high, the underwriter may distort the offer price by issuing underpriced IPO stocks for its own profit maximization. In short, securities firms may harm the issuing company's

profit (profit in underwriting) by prioritizing fund investors' profit (profit in asset management business). Hence, this paper aims to investigate the hypothesis below to determine how a securities firm's subsidiary operation of asset management business impacts offer price estimation.

H1: A securities firm's subsidiary operation of asset management business intensifies IPO underpricing.

The above hypothesis was shown to be significant by Park and Shin (2007). However, as noted since their study, changes have been made in important external environments that can affect IPO underpricing due to securities firms' conflicts of interest. Thus, this paper seeks to identify the potential effects of such changes on underpricing. The primary changes in external environments experienced by securities firms during this paper's research period are two-fold. First, as examined in the Korean asset management business market has rapidly increased. So, if a securities firm previously issued underpriced IPO stocks due to the conflict of interest of prioritizing the profit of asset management business, the degree of underpricing occurring from the influence of subsidiary business could intensify compared with prior research.

Moreover, as the put-back option system was abolished in July 2007, securities firms' burden in terms of the risk of a stock price fall in underwriting was relieved. Thus, the attractiveness of underpricing decreased for securities firms with a high market share in the underwriting market, whereas attraction to underpricing would not change greatly for securities firms with a high market share in asset management businesses. Consequently, as the influence of a securities firm's underwriting market share on underpricing decreased, the influence of the degree of underpricing according to asset management business's market share seems to have relatively expanded.

3.2. Data

This study empirically analyzed 99 companies with observed value for all variables among 104 companies listed through the marketable securities market and the KOSDAQ market from January 1, 2007 to July 30, 2008. Per period, 58 IPO stocks were issued in 2007, and 46 IPO stocks were issued in 2008.

3.3. Analysis Model

This paper used Equation (1) as the regression model to analyze whether securities firms operating both securities underwriting and asset management business issued underpriced IPO stocks due to conflicts of interest:

$$\begin{aligned} & \text{Underpricing} \\ & = b_0 + b_1M + b_2Mkt + b_3DM + b_4Operate \\ & + b_5Asset + b_6BS + b_7Deal + b_8Bid + b_9VF + b_{10}Ex \\ & + b_{11}PBR + b_{12}IB_{MS} + b_{13}IB_{BS} \\ & + b_{14}Fund \end{aligned} \quad (1)$$

M: Market return on the first day of listing

Mkt: Accumulated return of the KOSPI index from 140 days to 20 days compared to the offering date market circumstances prior to listing

DM: Dummy variable indicating the availability of the put option system (Put option 1)

Operate: Ordinary profit ratio = ordinary profit / sales figures

Asset: Market capitalization at the end of the year right before listing

BS: Debt-to-equity ratio of the issuing company (debt / asset)

Deal: Trade volume (Log offer price)

Bid: Log subscription competition rate

VF: Venture dummy variable (Venture 1)

Ex: Market division (Marketable Securities Exchange 1, KOSDAQ 0)

PBR: Log net asset value per share

IB_MS: Underwriting market share (offer price/total offer price)

IB_BS: Debt-to-equity ratio of the securities firm

Fund: Subsidiary business operated by the securities firm(1)

(1) Discount rate (Underpricing)

The degree of underpricing was calculated using Equation (2) with the discount rate as the dependent variable to estimate the degree of underpricing.

$$\text{Underpricing} = \frac{\text{Closing price on the day of listing}}{\text{Confirmed offer price}} - 1 \quad (2)$$

Equation (2) was also used as the dependent variable for measuring the degree of underpricing in Choi (1999), and

Kim and Lee (2006). According to Equation (2), when a securities firm sets a low confirmed offer price, the closing price on the first day of listing rises, indicating a high discount rate. However, it cannot be always interpreted that the confirmed offer price was measured low based on a high value gained from Equation (2) because the discount rate value may be calculated as high and the closing price increased due to other peripheral factors on the listing day.

(2) Market return on the day of listing (M)

The return of the relevant exchange (Marketable Securities Exchange, KOSDAQ) on the first day of listing was used as an explanatory variable for describing the market circumstances. Kim and Khil (2001) and Park (2017) used the market return on the first day of listing as an explanatory variable, and the result indicated a positive value.

(3) Market circumstances (Mkt)

As a variable indicating the market circumstances prior to IPO registration, this explains the influence that the market environment has on the IPO stock price at the time of offer price determination and registration. Regarding prior research, Lee and Choi (2014) and Won and Kim (2007) used this as a variable, indicating a positive value. A positive value is also expected in this study.

(4) System change dummy (DM)

As a variable explaining the influence system changes have on underpricing, this was used to analyze the impact of the put-back option on underpricing, as the put option system was abolished in July 2007. This was assigned 1 when the put-back option was applied to IPO was listed during the period until July 2007, and 0 was assigned for the opposite case. Regarding prior research, Won and Kim (2007) used this as an explanatory variable.

(5) Ordinary profit ratio (Operate)

The ordinary profit ratio is the value of dividing the ordinary profit figures of the year prior to listing by the sales figures and explains how the company's ability to obtain profit in the future influences underpricing. A company with a high ordinary profit ratio has lower uncertainty; thus, the attractiveness of underpricing decreases at the time of IPO.

(6) Asset

The asset variable was calculated by taking the log value of the market capitalization of the issuing company. Regarding prior research, Kang (1990), Kim and Khil (2001), Choi

(2005), and Park and Shin (2007) used this as an explanatory variable, and it was also used as a control variable in this paper. A company with a bigger asset indicates a higher likelihood of gaining information prior to listing for investors, and also suggests more advantage in negotiating with the underwriter.

(7) Debt-to-equity ratio (BS)

For the debt-to-equity ratio, the value of debt/asset was used as a variable based on the issuing company's fiscal year prior to listing. As a control variable indicating the issuing company's uncertainty, the lower value of the debt-to-equity ratio indicates less uncertainty. Therefore, it is expected to have a positive relationship with underpricing.

(8) Issuing volume (Deal)

Issuing volume is a variable calculated by taking the log value on the IPO issuing price, and explains the influence that the issuing volume has on the undervaluation of the stock.

(9) Subscription competition rate (Bid)

The subscription competition rate is a variable calculated by taking the log value on general subscription competition rate. The subscription competition rate is a variable to explain the influence of excess demand on underpricing.

(10) Venture dummy (VF)

For venture companies, "1" was assigned as the dummy variable, and "0" was assigned for other companies. The venture dummy variable explains whether being a venture company influences offer pricing. Regarding prior research, Choi (2018) and Won and Kim (2007) used this, and this paper also expects a positive value, as with previous studies.

(11) Market division (Ex)

As a variable explaining the influence of the type of market the issuing company is listing in has on underpricing, "1" was assigned to a securities market company and "0" was assigned to a KOSDAQ market company. Regarding prior research, Lee and Yi (2003) and Park and Shin (2007) used this variable. Companies listed in the KOSDAQ market have shorter business histories than those of the marketable securities market and thus have greater uncertainty.

(12) Net asset value per share (PBR)

Net asset value per share is a variable, explaining how

authentically the asset of the issuing company is reflected in the stock price. For prior research, Lee and Shin (2019) and Choi (2006) used this variable, and the result indicated a positive value.

(13) Underwriting market share (IB_MS)

As a variable indicating the share for taking part in the underwriting market, this was calculated based on the IPO price issued by the securities firm during the sample period.

(14) Securities firm debt-to-equity ratio (IB_BS)

The securities firm debt-to-equity ratio is a variable indicating its reputation or risk-taking capabilities. This was calculated by dividing the securities firm's debt by its assets.

It is expected that the lower a securities firm's debt-to-equity ratio, the bigger its risk-taking ability and avoidance of harming its reputation.

(15) Subsidiary operation of asset management business (Fund)

Among the independent variables, the subsidiary operation of asset management business is a key variable for assessing whether a conflict of interest exists for a securities firm. In short, the empirical value of the subsidiary operation of asset management business must be found significant to support the hypothesis. Regarding prior research, asset management was shown to be significant with a positive value by Park and Shin (2007). It is also expected to result in a positive value in this paper.

Table 1: Basic Statistics of the Variables

Name of the variable		Average	Number	Maximum value	Minimum value
Market return (%)	M	0.13	104	7.14	-3.37
Market circumstances (%)	Mkt	4.88	104	29.84	-22.1
System dummy	DM	0.29	104	1	0
Closing price discount rate (%)	Underpricing	27.52	104	130	-38.95
Opening price discount rate (%)	Underpricing	30.81	104	100	-14.29
Debt-to-equity ratio (%)	BS	37.10	99	70.25	7.22
Ordinary profit ratio (%)	Operate	17.75	104	52.23	0
Listing market capitalization (Log value)	Asset	24.77	104	29.54	21.90
Issuing volume (Log value)	Deal	23.42	104	28.15	21.79
Subscription competition rate (Log value)	Bid	4.58	104	7.34	-3.51
Underwriting market share (%)	IB_MS	10.17	104	41.05	0.18
Securities firm's debt-to-equity ratio (%)	IB_BS	79.33	104	91.35	57.23

4. Results

Prior to examining the results, the relationship between the major variables and the degree of underpricing. <Table 2> below indicates that the average degree of underpricing

for a securities firm with a subsidiary asset management business is 28%, and it is 16.81% for a securities firm without one, demonstrating a degree of underpricing for firms running subsidiary businesses that is approximately 7.19% higher. This is similar to the findings of Park and Shin (2007) in which the difference of 8.9% was shown.

However, in this study, there are only four IPO cases conducted by a full-time securities firm that does not operate funds. Therefore, it appears that it would be difficult to assume statistical significance based on these results.

Table 2: Degree of Underpricing According to a Securities Firm's Subsidiary Business

Classification	Total	Subsidiary business status		
		Subsidiary business (Fund=1)	Full-time (Fund=0)	Difference
Average discount rate (%)	27.50	28.00	16.81	7.19
Issuing number (case)	104	100	4	

<Table 3> presents data comparing the differences in the degree of underpricing according to the changes of the put-back option system, which is considered a major factor influencing underpricing. To this end, the effect of the put-

back option that was abolished in July 2007 is detailed in <Table 3>

Table 3: Degree of Underpricing According to the Implementation Status of the Put-back Option

Classification	Implementation of the put-back option (1)	No implementation (0)	Total
Average discount rate (%)	60.97	13.96	27.5
Issuing number (case)	30	74	104

As shown in <Table 3>, the average degree of underpricing of IPOs conducted prior to July 2007, when the put-back option system was being implemented, is 60.97%, and the average degree of underpricing after July 2007, when it was abolished, is approximately 13.96%, showing a marked difference. This mirrors the results demonstrated by Won and Kim (2007).

subsidary asset management business. The results differ from those confirmed by Park and Shin (2007). In particular, the result indicated that the average degree of underpricing for a securities firm operating asset management business is actually lower than the opposite case in the model assigned with the securities firm's subsidiary business dummy based on 1% market share of equity funds operated by the securities firm. Additionally, when assigning a dummy with 3% as a standard, no difference was found in the average degree of underpricing among each variable.

<Table 4> presents the differences in the degree of underpricing according to the market share of asset management business for securities firms that operate

Table 4: Degree of Underpricing According to the Market Share of Asset Management Business

Classification	MS ≥ 1	MS < 1	MS ≥ 3	MS < 3
Average discount rate (%)	23.10	33.79	27.52	27.52
Issuing number (case)	61	43	48	56
Difference	-10.69		0	

Note: MS is the market share of the asset management business.

Table 5: IPO Performance and Discount Rate Per Securities Firm

Securities firm	Average discount rate (%)	Market share of equity funds (%)	Number of IPOs (case)
Kyobo Securities	29.87	0.65	9

Good Morning Shinhan Securities	84.11	5.06	6
Daishin Securities	100	0.48	2
Daewoo Securities	76.95	0.52	8
Dongbu Securities	16.55	0.05	1
Dongyang Securities	26.72	0.62	10
Mirae Asset Securities	12.92	28.30	8
Samsung Securities	32.45	8.80	9
Eugene Investment & Securities	29.29	0.30	1
Shinyoung Securities	3.50	2.75	1
Shinhung Securities	35.00	0	2
Woori Investment & Securities	-8.05	2.85	5
Kiwoom Securities	-18.57	0	1
Hana Financial Investment	3.06	3.96	2
Korea Securities Finance	18.04	11.85	23
Hanwha Investment & Securities	19.17	0.52	6
Hyundai Securities	7.07	0.73	5
CJ Securities	-9.25	1.83	4
SK Securities	15.8	0	1
Total	27.52	69.26	104

<Table 5> presents a summary of the number of IPOs conducted, the average degree of underpricing, and the market shares of the equity funds operated per securities firm. As shown in <Table 5>, Kiwoom Securities and Woori Investment & Securities actually issued at a premium instead of underpricing during the research period, and Good Morning Shinhan Securities and Daishin Securities had relatively high degrees of underpricing despite market shares of equity funds that are lower than the average. In addition, Mirae Asset Securities indicated a belowaverage degree of underpricing, although the market shares of equity funds are significantly high compared to other securities firms. It can be intuitively assumed from this finding that the hypothesis of this paper may not be significant.

An important explanatory variable of this paper is the dummy variable of FUND, which indicates whether a securities firm operates an asset management business. However, as mentioned above, when this variable is simply

made a dummy variable depending on the securities firm's operation of asset management business, the result cannot be statistically trusted since there are only four IPO samples conducted by securities firms without subsidiary asset management business. Hence, this paper examined other proxy variables to explain the proportion of asset management business in the process of securities firms' decision-making, referencing Park and Shin (2007). This analysis was conducted by assigning the dummy variable to either 1% or 3%, based on the market share of the fund operated by the securities firm, and the market shares of equity funds and balanced funds were also used as explanatory variables. <Table 6> presents a summary of the proxy variables related to asset management that were used as per the model.

Table 6: Asset Management Business Variable Per Model

Model	Variable name	Details
Model 1	Fund	For FUND, 1 was assigned for operating subsidiary asset management business, and 0 was assigned otherwise.
Model 2	MS≥1	For MS≥1, 1 was assigned when the market share of subsidiary asset management business operated by the securities firm is 1% or more and 0 was assigned to the opposite case.
Model 3	MS≥3	For MS≥3, 1 was assigned when the market share of the subsidiary asset management business operated by the securities firm is 3% or more and 0 was assigned to the opposite case.
Model 4	MS	MS is the market share of the equity fund of subsidiary asset management business operated by the securities firm.
Model 5	MMS	MMS is the added market share of the equity fund and balanced fund of subsidiary asset management business operated by the securities firm.

<Table 7> presents the result of the regression analysis based on Equation (1). The control variables of market return (M), market circumstances (Mkt), asset, venture dummy (VF), market division (Ex), and price book value ratio (PBR) were found to be insignificant. In contrast, the ordinary profit ratio (Operate), subscription competition rate (Bid), and system change (DM) were found to be significant, presenting the same results as prior studies.

In particular, system change (DM), the variable concerning the end of the put-back option abolished in July 2007, indicated a positive value as expected, and was found to be significant at the level of 5% or 1%. This is identical with the results confirmed by Yon and Park (2005) and Won and Kim (2007), and the existing theory that “underwriters chose underpricing over a reasonable price for offer price to avoid risks when legal liabilities exist depending on price drops” was also verified in this study.

For the subscription competition rate, following Tinic’s (1988) hypothesis that investors who are not allocated offering stocks cause excess returns by manifesting fads based on speculative desire, identical results were also observed. That is, stocks with a higher competition rate at the time of subscription demonstrated higher excess returns (greater degree of underpricing) as the opening price and the closing price were set high on the first day of the listing.

As shown in <Table 7> the results of the variables related to the most significant dummy variable, FUND, indicated that not all variables are significant as expected in the model design. This differs from the findings of Park and Shin (2007) and Klein and Zoeller (2001). According

to the results of the regression analysis, it can be stated that “a securities firm’s operation of asset management business is not a factor for underpricing IPO stocks.” As confirmed in <Table 5> as well, this outcome was expected from the data on the degrees of underpricing offering stocks by Mirae Asset Securities and Korea Securities Finance with the biggest market shares in asset management business were lower than the overall average, whereas the degrees of underpricing by Daishin Securities, Daewoo Securities, and Shinhung Securities, with less than 1% market shares, were strikingly high.

As previously noted, the method of determining the opening price of stock offering was altered from simply using the confirmed offer price to being determined by the simultaneous bids and offers system in June 2000, the opening price of the offering stock does not differ from the closing price on the listing day as a proxy variable indicating underpricing, as it also “reflects the evaluation in the market.” Rather, while the closing price on the listing day may vary considerably depending on the influence of investors’ sentiments, the opening price does not include speculative effect. Thus, unlike previous studies, this paper used opening price as the basis for measuring the degree of underpricing rather than the closing price on the listing day. The calculation method for the dependent variable changes from Equation (2) to Equation (3) when using the opening price as the basis for a reasonable offer price.

$$\text{Underpricing} = \frac{\text{Opening price on the day of listing}}{\text{Confirmed offer price}} - 1 \quad (3)$$

Although the degree of underpricing was used as a dependent variable in Equation (3), the result indicated, as shown in <Table 7>, that the hypothesis that a securities firm operating asset management underpriced IPOs is not significant.

Furthermore, despite the uniquely high market share of Mirae Asset Securities, its degree of underpricing is far below the average. Therefore, since Mirae Asset Securities' data may work as a singular value, the empirical analysis was conducted after removing the relevant data. As a result, the hypotheses were found to be insignificant, further confirming the results of previous models, as seen in <Table 8>. Furthermore, when the closing price on the first day of the IPO stock hit the upper limit price, the discount rate was considered to have increased from the excess return that was caused by excess demand, acting as the primary reason, rather than securities firms' underpricing; thus, regression analysis was conducted after removing this data, and the results are shown in <Table 8>. As shown in <Table 8>, the results of the regression analysis remained insignificant.

Finally, instead of using equity funds' market share as the indicator for securities firms' interest in asset management business, the rate of increase of the equity fund volume operated per securities firm between 2004 and 2007 was used as the variable. However, the resulting

values were also found to be insignificant, except the model that assigned a dummy for the equity fund's 100% rate of increase, as shown in <Table 8>.

The reason these outcomes differ from prior research is as follows: Park and Shin's (2007) research revealed a significant difference between the resulting values when including IPO data from 1999 as the sample of the regression analysis. In summary, the result of the empirical analysis with the research period from 1999 to 2006 indicated that IPO undervaluation due to subsidiary business was significant at a 5% level, whereas the result of the regression analysis with the research period from 2000 to 2006, excluding the 1999 data, indicated significance at a 10% level, demonstrating a drastic drop in the level of significance. It can be inferred that although Park and Shin's (2007) outcomes were not significant overall, the value of the analysis result may have been significant due to the influence of the 1999 data.

Almost securities firms operating asset management businesses rapidly increased the size of most funds they were previously operating during the research period. This indicates a high probability that most securities firms' interest in asset management business elevated considerably; thus, it is likely that the market shares of present funds did not act as a differentiating factor causing conflicts of interest.

Table 7: Regression Analysis on the Securities Firm's Subsidiary Asset Management Business and IPO Underpricing - based on the Closing Price on the First Listing Day

Classification	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	21.90 (0.14)	27.10 (0.17)	-8.10 (-0.05)	14.30 (0.09)	14.10 (0.09)
Market return (M)	-0.96 (-0.43)	-0.63 (-0.29)	-0.71 (-0.32)	-0.85 (-0.37)	-0.84 (-0.37)
Market circumstance (Mkt)	0.09 (0.23)	0.049 (0.12)	0.02 (0.05)	0.06 (0.15)	0.06 (0.15)
System change (DM)	29.61 (2.52)**	34.20 (2.79)***	34.91 (2.75)***	30.76 (2.30)**	30.93 (2.29)**
Ordinary profit ratio (Operate)	-0.97 (-2.02)**	-1.025 (-2.18)**	-0.92 (-1.95)*	-0.97 (-2.03)**	-0.97 (-2.03)**
Asset	13.54 (1.25)	13.09 (1.22)	13.44 (1.25)	13.65 (1.26)	13.64 (1.26)
Debt-to-equity ratio (BS)	-0.57 (-1.93)*	-0.63 (-2.10)**	-0.60 (-2.04)**	-0.58 (-1.97)*	-0.58 (-1.97)*
Issuing volume (Deal)	-14.72 (-1.27)	-14.21 (-1.24)	-14.12 (-1.23)	-14.64 (-1.26)	-14.62 (-1.26)
Subscription competition rate (Bid)	6.66 (3.11)***	6.68 (3.15)***	6.59 (3.10)***	6.62 (3.11)***	6.66 (3.11)***
Venture dummy (VF)	-7.54 (-0.65)	-8.20 (-0.71)	-7.74 (-0.67)	-7.35 (-0.63)	-7.35 (-0.63)
Market division (Ex)	23.06 (1.33)	22.78 (1.33)	23.72 (1.38)	23.78 (1.37)	23.83 (1.37)

Price book value ratio (PBR)	3.97 (0.99)	2.80 (0.71)	3.54 (0.89)	3.90 (0.97)	3.89 (0.97)
Underwriting market share (IB_MS)	0.68 (2.02)**	0.63 (1.90)*	0.57 (1.63)	0.67 (1.97)*	0.66 (1.95)*
Securities firm's debt-to-equity ratio (IB_Bs)	-0.26 (-0.32)	-0.30 (-0.38)	-0.08 (-0.09)	-0.27 (-0.33)	-0.27 (-0.33)
Subsidiary (Fund)	-3.50 (-0.10)				
MS \geq 1		9.90(1.19)			
MS \geq 3			9.09(1.08)		
MS				0.10(0.19)	
MMS					0.13(0.20)
F-value	5.11***	5.30***	5.26***	5.12***	5.12***
R-sq	46.0%	46.9%	46.7%	46.0%	46.0%
Adj R-sq	37.0%	38.30%	37.9%	37.0%	37.0%
Obs	99	99	99	99	99

Note: *, **, *** indicate 10%, 5%, and 1% significance levels, respectively, the t value is in parentheses, MS is the equity fund's market share, MMS is the market share including balanced funds.

Table 8: Regression Analysis on the Securities Firm's Subsidiary Asset Management Business and IPO Underpricing- based on Opening Trading Price

Classification	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	56.9 (0.46)	29.7 (0.24)	28.3 (0.23)	32.6 (0.26)	33.0 (0.27)
Market return(M)	-0.81 (-0.46)	-0.686 (0.39)	-0.70 (-0.40)	-0.88 (-0.49)	-0.89 (-0.50)
Market circumstance (Mkt)	-0.01 (-0.04)	-0.03 (-0.10)	-0.03 (-0.10)	0.02 (0.08)	0.02 (0.04)
System change (DM)	26.43 (2.89)***	26.49 (2.73)***	26.35 (2.64)***	23.67 (2.26)**	23.41 (2.22)**
Ordinary profit ratio (Operate)	-0.42 (-1.12)	-0.49 (-1.32)	-0.49 (-1.31)	-0.52 (-1.39)	-0.52 (-1.39)
Asset	8.16 (0.96)	9.09 (1.07)	9.13 (1.08)	9.33 (1.10)	9.36 (1.11)
Debt-to-equity ratio (BS)	-0.18 (-0.78)	-0.22 (-0.95)	-0.22 (-0.95)	-0.22 (-0.97)	-0.22 (-0.96)
Issuing volume (Deal)	-9.13 (-1.01)	-9.15 (-1.01)	-9.17 (-1.01)	-9.38 (-1.04)	-9.42 (-1.04)
Subscription competition rate (Bid)	8.15 (4.89)***	8.07 (4.81)***	8.06 (4.81)***	8.03 (4.79)***	8.02 (4.79)***
Venture dummy (VF)	-9.41 (-1.04)	-8.63 (-0.95)	-8.58 (-0.94)	-8.61 (-0.95)	-8.61 (0.95)
Market division (Ex)	10.72 (0.80)	12.11 (0.90)	12.16 (0.90)	11.24 (0.83)	11.19 (0.82)

Price book value ratio (PBR)	4.7 (1.51)	4.64 (1.44)	4.70 (1.49)	4.87 (1.55)	4.89 (1.56)
Underwriting market share (IB_MS)	0.60 (2.26)**	0.55 (2.10)**	0.55 (2.01)**	0.570 (2.17)**	0.58 (2.18)**
Securities firm's debt-to-equity ratio (IB_Bs)	-0.87 (-1.37)	-0.98 (-1.54)	-0.97 (-1.49)	-1.00 (-1.58)	-1.01 (-1.58)
Subsidiary (Fund)	-16.75(-1.07)				
MS≥1		0.62(0.09)			
MS≥3			0.26(0.04)		
MS				-0.22(-0.50)	
MMS					-0.27(-0.54)
F-value	7.95***	7.76***	7.76***	7.80***	7.80**
R-sq	57.0%	56.4%	56.4%	56.5%	56.5%
Adj R-sq	49.8%	49.1%	49.1%	49.3%	49.3%
Obs	99	99	99	99	99

Note: *, **, *** indicate 10%, 5%, and 1% significance levels, respectively, and the t value is in parentheses.

5. Conclusion

This paper analyzed the influence of securities firms' conflicts of interest on underpricing, examining 104 IPO stocks listed from January 2007 to July 2008, in contrast to the period used in Park and Shin (2007). As a result of the analysis, the hypothesis that "the securities firm's subsidiary asset management business influences the underpricing of IPO stocks" was found to be insignificant. In short, statistical grounds supporting the conflicts of interest arising from securities firms' subsidiary operation of asset management business intensifying IPO underpricing could not be identified. Additionally, to examine the influence of the put-back option system, an analysis was conducted distinguishing the data until June 2007 when the system existed and the degree of IPO underpricing implemented after July 2007. As a result, the degree of underpricing for IPO stocks was demonstrated as slowing down after the system was abolished. Based on the findings of this research, it can be assumed that the number of securities firms operating asset management business increased as the Capital Market Consolidation Act was implemented in 2009, and that the likelihood of the conflicts of interest occurring due to the subsidiary operation of asset management business is not high, even if the securities firm's degree of universalization intensifies as it became possible to also run

an in-house asset management business that was previously undertaken through a subsidiary.

Based on the results of this paper, it cannot be concluded simply that conflicts of interest do not occur due to the operation of both asset management and underwriting business. Simply put, there remains a possibility that conflicts of interest may occur in another form due to subsidiary operation. In particular, considering the occurrence of harming the profit of the asset management business's clients, such as churning and stuffing, it is necessary to focus on researching and implementing the related restrictions. This is because the size of the Korean underwriting market is relatively small in comparison to the number of securities firms presently operating underwriting, and this increases the possibility of each securities firm's prioritization of the profit of the issuing company to attract IPOs amid intense competition.

Finally, the statistical reliability of the results can be elevated by increasing the number of observed values through adding data from IPO stocks conducted after asset management business was vitalized. In addition, as mentioned above, various conflicts of interest may arise between securities firms' subsidiary operation and the IPO offer price. Hence, future research will verify other cases of conflicts of interest that harm the profit of asset management business, unlike the conflicts of interest that prioritize the profit of asset management business that have been examined in this paper.

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