CONFLICTING INTERESTS: GOING PUBLIC IN DETERIORATING MARKET CONDITIONS

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Abstract

The purpose of this paper is to analyze whether the conflicting interest between issuing firms and CEOs (venture capitalists) affect the going-public decision. Going public in deteriorating market conditions is costly for issuing firms in terms of low offering price and high probability of withdrawal. If agency costs exist, agents pursuing their own interests may bring firms public even in poor market conditions, which has been largely ignored in the previous literature.

To examine our hypotheses, we collect 1246 Japanese firms going public from 2001 to 2016 and conduct logit regressions, propensity score matching (PSM) as well as a probit model with sample selection. Consistent with our conjecture, we find a positive relation between the going-public decision and secondary shares offered by CEOs. Additionally, we also find an inverse U-shaped relationship between CEOs' retained ownership and the going-public decision, indicating that in addition to liquidity needs, private benefits of control is another potential source of conflicting interests. Furthermore, secondary shares offered by VCs are also positively associated with the going-public decision, suggesting that when VCs attempt to exit as rapidly as possible, they are more likely to bring firms public even in deteriorating markets. These findings suggest that conflicting interests among parties affect the timing and costs of IPOs.

Keywords: Agency Cost, Deteriorating Market Conditions, IPOs

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1. INTRODUCTION

The conflict of interest among parties with heterogeneous objectives has been at the core of finance, business, and management literature. Given that the process of an IPO (initial public offering) typically creates a situation of conflicting interest, the purpose of this paper is to analyze whether the conflicting interest between issuing firms and CEOs (venture capitalists) affect the going-public decision.

Going public in deteriorating market conditions is risky and costly for issuing firms in that they are likely to sell at a discounted offering price, raise a smaller amount of proceeds and face a higher probability of withdrawal when investors become pessimistic (Çolak & Günay, 2011). If the interests of insiders (e.g., CEOs, venture capitalists) are in line with those of issuing firms, they should delay the IPO and wait for the recovery of market conditions. Indeed, IPOs tend to cluster in improving market conditions (Lowry & Schwert, 2002; Helwege & Liang, 2004; Pástor & Veronesi, 2005; Banerjee et al., 2016). If agency costs exist, insiders pursuing their own benefits may go public regardless of market conditions. This could happen since the conflicting interests among parties are salient at the time of IPOs. One strand of literature based on traditional agency theory (Jensen & Meckling, 1976) argues that

an IPO is a typical event that increases the agency cost between manager and shareholders due to the diversification of CEOs' ownership. Another strand of literature based on multiple agency theory also argues that conflicting voices among various groups substantially affect the performance of IPO firms (Arthurs et al., 2008; Bruton et al., 2010).

Specifically, CEOs can realize liquidity needs and non-pecuniary benefits (private benefits of control) through the IPO. If CEOs attempt to sell their stakes at the IPO, probably due to a less-diversified portfolio, they may be willing to sell even at a discounted price (Busaba et al., 2001; Bodnaruk et al., 2007). Importantly, agency costs between issuing firms and self-serving CEOs increase due to the diversification of CEOs' ownership.

As regard to VCs (venture capitalists), they provide both capital and advice prior to going public but usually use IPOs as a vehicle to exit from investee firms. As argued by Arthurs et al. (2008), VCs have dual identities: principal as a shareholder of issuing firms, and agent to their own investors. Due to their short-term investment horizon, VCs may need to timely exit from IPO firms to serve their own investors even in deteriorating market conditions.

Consequently, we conjecture that agent costs between CEOs (VCs) and issuing firms will influence the timing of IPO firms. We use Japanese IPOs from 2001 to 2016 to test our conjectures. Japanese data provide two main advantages: first, conflicting interests might be more severe in civil law countries where legal protection of shareholders is weak compared to common law countries (Bruton et al., 2010). Second, it is more common to sell some portion of insiders' stakes at the IPO in Japan than for their US counterparts. Approximately 91 percent of the IPOs are with secondary shares. This setting enables us to analyze the conflicting interests among parties in weak market conditions.

To define bear market IPOs, our primary measure is the averaged underpricing three months prior to the filing date. Those in the bottom quantile of the averaged underpricing are defined as bear IPOs and all the other firms are considered as non-bear IPOs.

The main findings can be summarized as follows. First, we find that firms going public in bearish markets sell at a much lower offering price, raise a smaller amount of proceeds, and face a higher probability of withdrawal, highlighting the costs associated with weak market conditions. Second, we find a positive relation between the going-public decision and secondary shares offered by CEOs. This implies that when CEOs have strong liquidity needs, they care less about the costs associated with weak investor sentiment. Third, secondary shares offered by VCs are also positively associated with the going-public decision, suggesting that when VCs attempt to exit as rapidly as possible, they are more likely to serve the interests of their own investors at the expense of issuing firms. These findings are based on robust control of parameters such as the endogeneity problem, selection bias, and alternative story.

Next, we turn to examine the premises of our hypothesis. This hypothesis assumes that while poor market conditions incur significant costs in terms of equity issuance for both issuing firms and CEOs, CEOs can also realize liquidity needs and enjoy private benefits of control. Consistent with our assumption, we find that on average, CEOs only sell 5% of their pre-IPO stakes and retain most of their equity stakes. Importantly, secondary shares offered by CEOs increase in CEOs' pre-IPO ownership. In addition, we examine whether CEOs who are more capable of pursing private benefits of control care less about market conditions. As argued by Paeglis and Veeren (2013), intermediate levels of CEOs ownership will be high enough to ensure control and yet too low to ensure CEOs' interests are aligned with other shareholders. Consistent with their argument, we do find an inverse U-shaped relationship between CEOs' retained ownership and the probability of conducting an IPO in cold markets, suggesting that both liquidity needs and private benefits of control are potential sources of conflicting interests between CEOs and issuing firms.

We finally turn to explore why VCs prefer fast exit even in deteriorating market conditions. One potential explanation is that VCs' exit will be most detrimental for firms with intermediate levels of founder ownership; therefore, fast exits are more attractive for VCs (Paeglis & Veeren, 2013). Our finding reveals an inverse U-shaped relationship between CEOs' retained ownership and shares sold by VCs at the IPO, suggesting that agency cost between self-serving CEOs and issuing firms is one of the potential driving forces of VCs' fast exit, which in turn affects the timing of IPO.

This paper makes significant contributions to the literature. To the best of our knowledge, this is the first research to focus on how the conflicting interests among parties affect the timing and costs of IPOs. Our finding that secondary shares offered by CEOs links to the going-public decision suggests that, in addition to the innovation (Bernstein, 2015) and investment behavior (Asker et al., 2011), agent costs between CEOs and issuing firms also influence the timing of IPO firms. Our second finding that secondary shares offered by VCs affects the going-public decision also contributes to a burgeoning literature on conflicting voices among parties with different investment objectives and horizons. Arthurs et al. (2008) examine the effect of conflicting voices between managers and VCs on the performance of IPO firms. Similarly, they find that VCs tend to serve the interests of their own investors at the expense of issuing firms. In contrast, they argue that managers with high retained ownership have concerns regarding the long-term performance of issuing firms. Complementing that work, findings in this study suggest that self-serving CEOs are less likely to monitor against VCs. Furthermore, the paper also adds to the literature on the topic of exit decisions by venture capitalists (Gompers, 1996; Lin & Smith, 1998; Paeglis & Veeren, 2013). Gompers (1996) shows that VCs often seek to take private firms public earlier than may be optimal. We extend this study by showing evidence that VCs have an incentive to bring firms public even in weak market conditions if they prefer a fast exit at the IPO. Finally, the present study also contributes to another strand of literature on hot and cold IPO markets by focusing on the motivation to go public in cold

markets, which has been largely ignored by previous literature.

The remainder of the paper is organized as follows. Section 2 presents the literature review and hypotheses. Section 3 describes the sample selection and data and defines bear market IPOs. Section 4 presents the empirical results. Section 5 offers additional analyses. Section 6 is the conclusion of this research.

2. LITERATURE REVIEW AND HYPOTHESIS

2.1. Hot IPO markets

It is well documented that initial public offerings tend to concentrate on bullish conditions (Lowry & Schwert, 2002; Helwege & Liang, 2004; Pástor & Veronesi, 2005; Banerjee et al., 2016). Conventional wisdom is that going public in improving markets is advantageous for issuing firms in terms of equity issuance. Çolak and Günay (2011), Ljungqvist et al. (2006) and others argue that the success of IPOs depends not only on qualities but also on investor sentiments. When the sentiment of investors turns down, it is difficult for firms to entice them to participate, no matter how they discount the offering price. In addition, the reduced sentiment will also lead to low liquidity in the post-IPO period (Pham et al., 2003), which is also detrimental for issuing firms. Therefore, such firms have an incentive to avoid going public in deteriorating market conditions. However, some firms actually do not choose to wait for the recovery of market conditions. One potential reason is the conflicting interests between issuing firms and insiders, who ultimately make the going-public decision.

2.2. Liquidity need for an insider as a motive of IPO

Another strand of literature that is closely related to our paper focuses on the liquidity (diversification) need as a motive of IPO (Pagano et al., 1998; Busaba et al., 2001; Brau & Fawcett, 2006; Bodnaruk et al., 2007; Mantecon & Poon, 2009). Prior to an IPO, CEOs are arguably highly under-diversified in that their wealth is closely tied to their equity stakes. Based on traditional portfolio theory, this situation not only reduces their utility but also leads them to act sub-optimally. Meanwhile, Pagano et al. (1998), Brau and Fawcett (2006) argue that one of the main motivations for IPOs is to remove insiders' excessive risk exposure. Moreover, if a firm goes public for diversification reasons, insiders are more likely to part with their shares at the IPO and to accept a low offering price. The rationale is that all else being equal, a less diversified investor values the same assets less than a more diversified one. This conjecture is supported by the following studies. First, Bodnaruk et al. (2007) document that less-diversified insiders are more likely to bring firms public, and importantly, the degree of diversification is negatively (positively) related to the secondary shares offered by insiders at the IPO (offering price). In addition, they also suggest that while more diversified insiders tend to time their IPO and wait for a longer period, those less diversified insiders tend to bring firms public sooner. But they do not directly examine this issue, which is exactly what is being explored in the current paper. Next, prospect theory can also explain the going-public decision (Ritter & Welch, 2002), since the reference point for under-diversified insiders is lower than those evaluated by well-diversified outsiders, even though a discounted offering price might be acceptable for them.

2.3. Hypothesis development

Jensen and Meckling (1976) argue that principle-agent cost increases are due to the decline of ownership by CEOs. Recent literature shows that firms tend to exhibit a decline in investment intensity and innovation after going public, which has been interpreted as evidence of agency costs (Asker et al., 2011; Bernstein, 2015). In addition to the primary shares, secondary shares offered by CEOs further dilute their ownership, which might lead to conflicting interests between CEOs and issuing firms. As argued previously, if CEOs attempt to diversify their wealth by selling shares at the IPO, they are more likely to agree to a large discount. However, the low offering price is detrimental for issuing firms (other shareholders), who could have obtained a more favorable offering price had they delayed the IPO. These discussions give rise to our first hypothesis:

H1: The probability of going public in deteriorating market conditions increases as the secondary share offered by CEOs increases.

VCs are further important existing insiders performing monitoring and advising roles before going public and certifying the true value of issuing firms to uninformed outsiders at the IPO (Lee & Wahal, 2004). Due to their certification roles, most VCs do not sell during the IPO since selling by VCs sends a bad signal to outsiders, which might weaken investor sentiment (Lin & Smith, 1998). However, VCs might need to timely exit from IPO firms for the following reasons. First, IPOs substantially reduce the information asymmetry problem of issuing firms, which in turn lowers the competitive advantages of VC monitoring (Paeglis & Veeren, 2013). The reduced marginal benefits of continuous involvement in issuing firms suggest that VCs would be better off if they can exit and redeploy resources to new ventures where the marginal benefits of monitoring are relatively high. Second, generally structured as limited partnerships with a finite life span, VCs might need to reap their profits as soon as possible. For example, Gompers (1996), Megginson and Weiss (1991) argue that less-reputable venture capitalists have an incentive to bring young firms public earlier than what would be optimal timing. In deciding whether to sell at the IPO, we premise that VCs trade off the costs and benefits of continuous involvement. If VCs intend to sell more at the IPO, they are less likely to be concerned about the best interests of the issuing firms. This is possible as a result of their dual identities. As argued by Arthurs et al. (2008), in the transition to public-listed firms, VCs are more likely to serve their own investors. These discussions give rise to our second hypothesis:

H2: The probability of going public in deteriorating market conditions increases as the secondary shares offered by VCs increases.

3. SAMPLE SELECTION AND DATA

3.1. Completed IPOs

We collect information (e.g., secondary shares offered by CEOs and VCs) for firms that have successfully completed their IPOs (hereafter denoted as completed IPOs) in the Japanese stock market from 2001 to 2016 from prospectuses and IPO White papers. We start our sample period from 2001 because prospectuses became available after 2001 from the ELO service. The IPO data are merged with financial data, which are available from Nikkei NEEDS Financial Quest. Financial institutions and utilities are removed from the sample. As a result, our sample consists of 1,211 completed IPOs.

3.2. Withdrawn IPOs

We collect data for firms that withdrew before the scheduled IPO dates (hereafter, withdrawn IPOs) from 2001 to 2016 (35 companies). Including withdrawn IPOs enables us to examine whether it is riskier to go public in bad market conditions. Since there is a lack of comprehensive databases covering withdrawn IPO, we have to manually collect information from various sources as with Fan and Yamada (2017). Financial information is taken from Nikkei NEEDS Financial Quest. Our results are qualitatively unchanged when we only focus on completed IPOs.

3.3. Definition of BEAR IPOs

Given that underpricing has been commonly used to define hot IPO markets (Ritter, 1984; Lowry & Schwert, 2002; Helwege & Liang, 2004), we identify firms that decided to go public in deteriorating market conditions based on *UNDERPRICING* (the averaged underpricing three months prior to the filing date). Previous studies commonly identify hot market IPOs by using market condition during several months before the listing date. However, this method may not accurately capture IPO decisions because an approximately one-month interval in Japan exists between the submission date of the first prospectus, which is also the date of the shareholder meeting for IPO approval, and the first trading date. We do not include data during the one month preceding the first trading date for *UNDERPRICING* calculation in order to prevent unpredictable market condition changes in the one-month interval from contaminating the identification. Since *UNDERPRICING* captures the overall market conditions approximately three months before the release of the firm's prospectus, we contend that it provides insiders with important information for their decision to issue an IPO prospectus. We divide *UNDERPRICING* into four groups and the lowest group is defined as bear IPOs, all other groups are defined as non-bear IPOs.

To check the assumption that hot IPO markets tend to arise during bullish markets, we also calculate the buy-and-hold RNMSCI (Russell Nomura Mid-Small Cap Index return)[34], which is the weighted-average return index of the small- and medium-size firms in Japan, during the three months prior to the filing date for each of the sample companies and defined as BHR -4 to -1 Month.

Panel A in Table 1 indicates the yearly distribution of our sample IPOs, broken down by the eventual outcome. The number of IPOs filing in Column 1 significantly declines in the second half of our sample period due to the global financial crisis in 2008. Column 2 and Column 3 report the number of completed IPOs (firms that successfully completed their IPOs) and withdrawn IPOs (firms that withdrew before the scheduled IPO dates). Column 4 and Column 5 present the number of bear and non-bear IPOs. It shows that approximately 30% of bear IPOs and 50% of withdrawn IPOs clustered in 2001, during which time the stock market collapsed due to the burst of the internet bubble, indicating that firms going public in deteriorating market conditions are more likely to withdraw the IPO. Note that bear IPOs dominate non-bear IPOs in frequency for years 2001, 2008, 2009, and 2010 when stock prices declined. We find no bear IPOs from 2013 and afterwards when the stock market goes up.

Panel B and Panel C show the summary statistics of market conditions for bear and non-bear IPOs. The median *UNDERPRICING* is 21% for bear IPOs, while that of non-bear IPOs is 85% (p=0.000). Similarly, the median BHR -4 to -1 Month is -6.8% for bear IPOs, while that of non-bear IPOs is 2.7% (p=0.000). These results confirm that our identification of bear market IPOs is consistent with the conventional wisdom that hot (cold) IPO markets tend to follow improving (deteriorating) market conditions.

To test our hypotheses, we calculate the percentage of secondary shares offered by CEOs (VCs), divided by shares owned by CEOs (VCs) prior to the IPO. In addition, we include Primary Share (primary shares deflated by outstanding shares in Year -1, where Year 0 indicates IPO year). Firms brought by more reputable underwriters are more likely to conduct IPOs in deteriorating market conditions due to the effect of certification by underwriters (Dong et al., 2011)[35].

To examine the premise of our hypotheses that it is costly to go public in weak market conditions, we compare *Offering Price* (offering price to sales per share), *Primary Proceeds* (primary proceeds deflated by total assets in Year -1) and *WITHDRAWD* (a dummy variable that takes on a value of one for withdrawn IPOs and zero otherwise) between subsamples[36]. We winsorize all continuous variables at the top and bottom one percent values.

[34] Russell Nomura Mid-Small Cap Index is taken from Astra Manager.

[35] We regard the Top 3 security companies (i.e., Nomura, Daiwa, and Nikko) as reputable underwriters. These three companies have a long history in the Japanese underwriting market and have large shares.

[36] We divide UNDERPRICING (Averaged underpricing three month prior to the filing date) into four groups and the lowest group is defined as bear IPOs, all other groups are defined as non-bear IPOs.

Table 1. Sample year distribution

Panel A. Sample year distribution					
	IPO filing	***Completed IPOs***	***Withdrawn IPOs***	***Bear IPOs***	***Non-Bear IPOs***
2001	160	145	15	97	63
2002	108	102	6	50	58
2003	109	106	3	45	64
2004	155	154	1	0	155
2005	137	136	1	0	137
2006	170	169	1	38	132
2007	69	68	1	28	41
2008	22	21	1	11	11
2009	4	4	0	4	0
2010	19	19	0	19	0
2011	35	33	2	13	22
2012	44	44	0	19	25
2013	52	52	0	0	52
2014	62	62	0	0	62
2015	64	61	3	0	64
2016	36	35	1	0	36
Total	1,246	1,211	35	324	922

Panel B. UNDERPRICING (averaged underpricing three months prior to the filing date)								
	Mean	***Median***	***SD***	***Min***	***P25***	***P75***	***Max***	***N***
Bear IPOs	24%	21%	7%	19%	19%	29%	37%	324
Non-Bear IPOs	84%	85%	26%	39%	55%	110%	110%	922
P-value	0.000***	0.000***						

Panel C. Three-month buy and hold Russell Nomura Mid-Small Cap Index return prior to the filing date								
	Mean	***Median***	***SD***	***Min***	***P25***	***P75***	***Max***	***N***
Bear IPOs	-4.97%	-6.80%	8.33%	-19.71%	-10.70%	0.25%	16.95%	324
Non-Bear IPOs	3.89%	2.70%	9.51%	-19.71%	-2.60%	10.97%	23.86%	922
P-value	0.000***	0.000***						

*Note: Panel A indicates the yearly distribution of our sample IPOs, broken down by the eventual outcome. IPO filing is the sum of completed IPOs (firms that successfully completed their IPOs) and withdrawn IPOs (firms that withdrew before the scheduled IPO dates). We divide UNDERPRICING (Averaged underpricing three months prior to the filing date) into four groups and the lowest group is defined as bear IPOs, all other groups are defined as non-bear IPOs. Panel B shows the summary statistics of UNDERPRICING for bear IPOs and non-bear IPOs. Panel C shows the summary statistics of BHR -4 to -1 Month (Three-month buy and hold Russell Nomura Mid-Small Cap Index return prior to the filing date) for bear IPOs and non-bear IPOs. P-values are for mean (median) difference test between. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively.*

Panel A in Table 2 explores the cost of going public in weak market conditions. Not surprisingly, both the offering price and primary proceeds are significantly lower for bear IPOs. Moreover, the probability of withdrawal is 6.5% for bear IPOs while it is only 1.5% for non-bear IPOs. Panel B presents summary statistics separately for bear and non-bear IPOs. CEOs sell 9.38% of their shares for bear IPOs, which is significantly higher than that of non-bear IPOs (7.99%). As regard to VCs, we find that firms with large amounts of secondary shares offered by VCs are more likely to go public in deteriorating market conditions. Of course, these results do not control for other firm-specific characteristics.

With respect to other variables, we find that large firms are more likely to go public in poor market conditions. The mean that sales growth ratio for bear IPOs is 69%, which is significantly higher than that of non-bear IPOs (46%). Firms taken public by more reputable underwriters are less likely to delay their IPO plans. We formally test our hypotheses in the following section.

Table 2. Summary statistics (Part 1)

Panel A. Costs of going public in deteriorating market conditions			
	Bear IPOs	***Non-Bear IPOs***	***P-Values***
	Mean [Median]	Mean [Median]	Mean [Median]
Offering Price	2.98 [0.84]	5.65 [1.23]	0.000***
	N=324	N=922	[0.000***]
Primary Proceeds	24.56% [13.23%]	42.18% [18.31%]	0.000***
	N=324	N=922	[0.000***]
WITHDRAWD	6.48% [0.00%]	1.52% [0.00%]	0.000***
	N=324	N=922	[0.000***]
Panel B. Summary statistics			
Share sold by CEOs	9.38% [6.41%]	7.99% [5.03%]	0.039**
	N=324	N=922	[0.057*]
Share sold by VCs	8.76% [0.00%]	5.65% [0.00%]	0.001***
	N=324	N=922	[0.048**]
Primary Shares	13.29% [12.41%]	13.47% [12.52%]	0.706
	N=324	N=922	[0.958]
CEOs Stake	38.24% [39.66%]	39.39% [41.98%]	0.503
	N=324	N=922	[0.593]
lnAssets	8.491 [8.322]	8.286 [8.137]	0.026**
	N=324	N=922	[0.050**]
Firm Age	21 [16]	19 [13]	0.128
	N=324	N=922	[0.234]

Table 2. Summary statistics (Part 2)

Panel B. Summary statistics			
Leverage	57.38% [60.81%]	58.43% [61.39%]	0.455
	N=324	N=922	[0.557]
ROA	12.97% [11.25%]	12.97% [10.94%]	0.994
	N=324	N=922	[0.634]
Sales Growth Ratio	69.44% [21.22%]	46.12% [20.64%]	0.004***
	N=324	N=922	[0.178]
Reputable Underwriter Dummy	61.11% [100.00%]	49.78% [100.00%]	0.000***
	N=324	N=922	[0.000***]

*Note: Panel A preliminarily investigates costs of going public in deteriorating market conditions. Panel B reports summary statistics for bear IPOs and non-bear IPOs. The entire sample consists of 1246 IPO filings in Japan from 2001 to 2016. Data in Year -1 are presented, where Year 0 indicates IPO year. All continuous variables are winsorized at the top and bottom one percent values. P-values are for mean (median) difference test between. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*

4. EMPIRICAL RESULTS

4.1. Costs of going public in deteriorating market conditions

In this section, we conduct both regression and propensity score matching analyses to demonstrate how costly it is to conduct an IPO in cold markets. First, we conduct regression analyses. Panel A in Table 3 shows OLS (Model 1 and Model 2) and Logit (Model 3) regression results. The dependent variables for Model 1 and Model 2 are *Offering Price* and *Primary Proceeds*, respectively. The dependent variable in Model 3 takes on a value of one for withdrawn IPOs and zero for completed IPOs (*WITHDRAWD*). *BEARIPOD* (A dummy variable that takes on a value of one for bear IPOs and zero for non-bear IPOs) is our main interest. We do not include year dummies due to the inherent high correlation between *BEARIPOD* and year dummy. Recall that in 2004, 2005, and 2012–2016, there are no bear IPOs, and year dummy itself can explain a large proportion of the variation. Instead, we add *Real GDP Growth* (percentage GDP growth ratio from the previous year) to capture macro-economic conditions at the year of the IPO. In addition, we further include the buy-and-hold Russell-Nomura Small and Medium-Size Index return during the one month preceding the first trading date (a market condition during the book-building period), defined as *BHR -1 to 0 Month*.

Consistent with our prediction, *BEARIPOD* engenders negatively and highly significant signs in Model 1 and Model 2. The estimated coefficients suggest that on average, the offering price for bear IPOs is -3.376 lower than that of non-bear IPOs, with the difference in primary proceeds amounting to 17% of pre-IPO total assets. These figures are economically significant given that the mean *Offering Price (Primary Proceeds)* is 4.97 (37.6%). Model (3) engenders a positive and significant sign and the estimated marginal effect suggests that on average, the probability of withdrawal is 2.2% higher for bear IPOs. This is economically significant given that the unconditional probability of withdrawal is only 3%.

Panel B compares *Offering Price, Primary Proceeds* and *WITHDRAWD* between bear IPOs and their matching non-bear IPOs. Model 1 in Table 4 is used to identify the matching non-bear IPOs of each bear IPOs. Offering price to sales per share is 2.98 for bear IPOs, which is significantly lower than that of non-bear IPOs (5.71). *Primary Proceeds* is 24.55% for bear IPOs, which is significantly lower than that of non-bear IPOs (36.63%). The probability of withdrawal is 6.5% for bear IPOs while it is 1.9% for non-bear IPOs. Taken together, these results support our premise that it is risky and costly for issuing firms to go public in deteriorating market conditions.

Table 3. Costs of going public in deteriorating market conditions (Part 1)

Panel A. OLS (Logit) regression results			
	Model 1	***Model 2***	***Model 3***
	OLS	OLS	Logit
Dependent variables:	*Offering Price*	*Primary Proceeds*	*WITHDRAWD*
BEARIPOD	-3.376***(-7.31)	-0.168***(-3.71)	1.187***(3.57)
Control variables:			
lnAssets	-1.157**(-2.44)	-0.148***(-5.56)	0.091 (0.25)
Firm Age	-0.036 (-0.99)	-0.002***(-3.36)	0.015 (0.41)
Leverage	-11.919***(-4.70)	-0.267***(-4.71)	-1.264 (-1.03)
ROA	-18.082 (-1.19)	0.100 (0.27)	1.036 (0.72)
Sales Growth Ratio	2.870***(3.89)	0.096***(8.71)	0.223**(1.96)
Reputable Underwriter Dummy	2.217***(3.71)	0.130***(4.87)	-0.693 (-1.40)
BHR -1 to 0 Month	-14.069*(-1.78)	-0.054 (-0.34)	-3.628**(-2.07)
Real GDP Growth	80.572***(2.80)	3.271**(2.66)	-27.067***(-4.01)
Constant	20.687***(3.37)	1.662***(6.97)	-18.306***(-10.69)
Industry Dummy	YES	YES	YES
N	993	993	836
R2	0.12	0.329	
Pseudo R2			0.267

Table 3. Costs of going public in deteriorating market conditions (Part 2)

Panel B. Propensity score matching results			
	Bear IPOs	***Non- Bear IPOs***	***t-statistics***
Offering Price	2.98	5.71	-2.49**
	N=313	N=313	
Primary Proceeds	24.55%	36.63%	-3.24***
	N=313	N=313	
WITHDRAWD	6.50%	1.86%	2.96***
	N=313	N=313	

*Note: Panel A shows OLS (Model 1 and Model 2) and Logit (Model 3) regression results. The dependent for Model 1 and Model 2 is Offering Price (offering price deflated by sales per share) and Primary Proceeds (primary proceeds deflated by total assets in Year -1) respectively. The dependent in Model 3 takes on a value of one for withdrawn IPOs and zero for completed IPOs (WITHDRAWD). All regressions include industry dummies (not reported). Heteroskedasticity-consistent standard errors (adjusted for clustering at the industry-level) are shown in parentheses. Panel B compares Offering Price, Primary Proceeds and WITHDRAWD between bear IPOs and their matching non-bear IPOs. Model 1 in Table 4 is used to identify the matching non-bear IPOs of each bear IPOs. t-statistics are for difference test between bear IPOs and their matching non-bear IPOs. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*

4.2. Logit regression: which firms go public in deteriorating market conditions?

This section implements logit regressions, in which the dependent variable takes a value of one for bear IPOs and zero for non-bear IPOs (*BEARIPOD*), in order to test our hypotheses with controls for various factors. As with the univariate analysis, data before the IPO are employed for financial variables. Results are shown in Table 4. Model 1 and Model 2 report the results based on the entire sample. *Shares Sold by CEOs* in Model 1 has a positive and significant coefficient, suggesting that issuing firms are more likely to go public in deteriorating market conditions when CEOs attempt to sell more stakes at the IPO. Holding other variables at mean values, a 10 percent increase in *Shares Sold by CEOs* from mean value increases the probability of IPO by 2.4 percent, which is economically significant given that the unconditional probability of going public in deteriorating market conditions is only 25 percent. *Shares Sold by VCs* in Model 2 also carries a positive and significant coefficient, indicating that when VCs prefer fast exit through the IPO, they care less about the offering price. Holding other variables at mean values, a 10 percent increase in *Shares Sold by VCs* from mean value also increases the probability of IPO by 2.4 percent. Qualitatively similar results are obtained when we limit our sample to IPO in which shareholding of CEOs (VCs) is larger than 0% prior to IPO (Model 3 and Model 4).

Because the characteristics of bear IPOs may differ from non-bear IPOs, one way to test the effect of conflicting interests on the going-public decision is to compare the selling intentions by CEOs (VCs) of bear IPOs with that of matching non-bear IPOs. To this end, we use the matched sample based on the propensity score matching method. Specifically, control variables in Table 4 are used in a logit model to identify the matching IPOs for each bear IPO (without replacement). Model 5 and Model 6 demonstrate the Logit regression results based on the matched subsamples. For the matched sample, we find no significant coefficients for control variables, while both *Shares Sold by CEOs* and *Shares Sold VCs* carry positive and significant signs. Importantly, holding other variables at mean values, a 10 percent increase in *Shares Sold by CEOs (VCs)* from mean value increases the probability of IPO by 3.8 (3.5) percent, which is even larger than that in the unmatched sample.

As regard to other control variables, sales growth ratio is positively associated with going-public decisions. Underwriter reputation (*Reputable Underwriter Dummy*) also positively affects the going-public decision likely because information asymmetries are lower for firms underwritten by reputable underwriters. *Real GDP Growth* is negatively related to the bear market IPO, simply because bear markets tend to take place when macro-economic conditions turn down.

4.3. Probit model with Heckman sample selection

One can also criticize that our estimations suffer from sample selection biases because firm characteristics affecting the going-public decisions may be associated with IPO timing. To address this concern, we estimate the Probit model with Heckman sample selection. Specifically, we collect financial data of private companies during 2001 and 2016 from Nikkei NEEDS Financial Quest, which contains data from the pre-IPO period of sample IPOs and non-IPO firms that did not go public during our sample period[37]. The first-step regression estimates a Probit model of a dummy variable that takes on a value of one for the year before IPO of sample IPOs (year t data of sample IPOs that went public in year t + 1). Zero is assigned to the first step dependent variable for all other observations (year t – 1 and before of sample IPOs that went public in year t + 1, and all years of non-IPO firms). In addition to *lnAssets, Firm Age, Leverage, ROA, Sales Growth Ratio, Industry,* and *Year dummies, INTANGIBLE* (intangible assets deflated by total assets) and *CAEXP* (capital expenditures deflated by lagged total assets) are employed in the first step for model identification. Results are presented in Panel A, Table 5. The first step regressions show that smaller and younger firms are more likely to go public. Highly leveraged firms are more likely to rebalance their capital structure through IPOs (Pagano et al., 1998). *CAEXP* has a positive and significant sign, which is consistent with the conventional view that firms go public to finance their growth opportunities (Chemmanur & Fulghieri, 1999; Lowry, 2003). In addition, the correlation between the error terms in the first and second stage (ρ) is significant at the 1% level, confirming the necessity to control for the selection bias. As with previous results, we find that shares sold by CEOs and VCs have significant bearings on the timing of IPO.

[37] Takahashi and Yamada (2015) also use this database to compare firm growth between private and IPO firms.

Table 4. Logit regression: Determinates of going public in deteriorating market conditions

	Full Sample		***CEOs (VCs)' Pre-IPO stake >0% Sample***		***Matched Sample***	
	Model 1	***Model 2***	***Model 3***	***Model 4***	***Model 5***	***Model 6***
Dependent variables:	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*
Share sold by CEOs	1.286***(3.80)		1.276***(3.72)		1.518***(2.61)	
Share sold by VCs		1.280***(4.12)		1.128***(3.73)		1.381*** (5.36)
Control variables:						
Primary Shares	0.293 (0.23)	0.436 (0.33)	-0.144 (-0.11)	1.624 (0.97)	-1.138 (-0.64)	-1.124 (-0.58)
CEOs Stake	0.263 (0.86)	0.329 (1.06)	0.237 (0.71)	0.450 (1.17)	-0.546 (-1.22)	-0.419 (-0.93)
VCs Stake	0.465 (1.41)	-0.074 (-0.19)	0.435 (1.56)	-0.472 (-1.22)	-0.177 (-0.54)	-0.782**(-2.19)
lnAssets	0.136 (1.29)	0.149 (1.37)	0.169 (1.51)	0.168*(1.68)	-0.026 (-0.19)	-0.007 (-0.05)
Firm Age	0.004 (0.81)	0.003 (0.70)	0.001 (0.34)	-0.004 (-0.59)	-0.003 (-0.76)	-0.004 (-1.01)
Leverage	-0.362 (-1.17)	-0.429 (-1.29)	-0.417 (-1.36)	-0.194 (-0.85)	0.178 (0.40)	0.107 (0.22)
ROA	0.047 (0.09)	-0.050 (-0.09)	0.110 (0.21)	0.094 (0.19)	0.310 (0.87)	0.118 (0.32)
Sales Growth Ratio	0.138**(2.45)	0.135**(2.33)	0.141**(2.45)	0.165**(2.38)	0.043 (0.91)	0.038 (0.80)
Reputable Underwriter Dummy	0.369***(7.55)	0.367***(7.17)	0.360***(6.81)	0.081 (1.23)	-0.080 (-0.63)	-0.052 (-0.39)
Real GDP Growth	-46.152***(-9.21)	-45.834***(-8.97)	-46.071***(-8.98)	-46.095***(-13.56)	-1.526 (-0.32)	-1.033 (-0.22)
Constant	-2.772***(-2.60)	-2.711**(-2.45)	-3.081***(-2.78)	-2.459**(-2.30)	1.113 (0.97)	1.067 (0.92)
Industry Dummy	YES	YES	YES	YES	YES	YES
N	1225	1228	1199	806	633	635
Pseudo R2	0.083	0.087	0.085	0.089	0.014	0.018

*Note: This table shows Logit regression results. The dependent variable takes on a value of one for bear IPOs and zero for non-bear IPOs (BEARIPOD). Model 1 and Model 2 report the results based on the entire sample. Model 3 and Model 4 limit our sample to IPO in which shareholding of CEOs (VCs) is larger than 0% prior to IPO. Model 5 and Model 6 further demonstrate the results based on matched subsamples. Control variables in Table 4 are used to identify the matching non-bear IPOs of each bear IPOs. All continuous variables are winsorized at the top and bottom one percent values. All regressions include industry dummies (not reported). Heteroskedasticity-consistent standard errors (adjusted for clustering at the industry-level) are shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*

Table 5. Probit model with sample selection (Part 1)

Panel A. Probit model with sample selection for the going-public decision				
	First-Stage	***Second-Stage***	***First-Stage***	***Second-Stage***
Dependent variables:	*IPOD*	*BEARIPOD*	*IPOD*	*BEARIPOD*
Share sold by CEOs		*0.779****		
		(5.77)		
Share sold by VCs				0.489***
				(2.65)
Primary Shares		-0.110		-0.044
		(-0.32)		(-0.11)
CEOs Stake		0.188		0.250
		(1.25)		(1.61)
VCs Stake		-0.082		-0.308*
		(-0.59)		(-1.73)
lnAssets	-0.188***	-0.082***	-0.188***	-0.073**
	(-9.11)	(-2.97)	(-9.07)	(-2.36)
Firm Age	-0.024***	-0.016***	-0.024***	-0.016***
	(-9.77)	(-6.07)	(-9.78)	(-6.26)
Leverage	0.900***	0.577***	0.901***	0.522**
	(6.53)	(3.05)	(6.54)	(2.53)
ROA	5.142***	2.954***	5.151***	2.850***
	(13.00)	(8.17)	(12.88)	(7.42)

Table 5. Probit model with sample selection (Part 2)

Panel A. Probit model with sample selection for the going-public decision				
	First-Stage	***Second-Stage***	***First-Stage***	***Second-Stage***
Sales Growth Ratio	0.102***	0.107***	0.101***	0.107***
	(5.60)	(4.99)	(5.75)	(4.67)
Reputable Underwriter Dummy		0.062**		0.066**
		(2.20)		(2.41)
Real GDP Growth		-11.182***		-11.362**
		(-2.63)		(-2.56)
INTANGIBLE	-0.233		-0.219	
	(-0.72)		(-0.66)	
CAEXP	0.651***		0.660***	
	(3.83)		(3.87)	
ρ		1.722***		1.661***
		(5.79)		(5.74)
Constant	12.584***	-1.366***	12.581***	-1.305***
	(4.41)	(-5.35)	(3.77)	(-4.66)
Industry Dummy	YES	YES	YES	YES
Year Dummy	YES	NO	YES	NO
N	13895	1073	13895	1073
Log pseudolikelihood		-2883		-2883

Panel B. Probit model with sample selection for receiving venture backing		
	First-Stage	***Second-Stage***
Dependent variables:	*Venture backing prior to IPO*	*BEARIPOD*
Share sold by VCs		0.571***(4.66)
Primary Shares		0.669 (1.13)
CEOs Stake		0.191 (1.25)
VCs Stake		-0.219*(-1.96)
lnAssets	-0.218***(-6.79)	-0.008 (-0.15)
Firm Age	0.004 (1.05)	-0.000 (-0.12)
Leverage	-0.551***(-5.07)	-0.158 (-1.38)
ROA	-1.840***(-5.42)	-0.419 (-0.94)
Sales Growth Ratio	0.051*(1.83)	0.123**(2.20)
Reputable Underwriter Dummy		0.033 (0.94)
Real GDP Growth		-22.084***(-11.75)
TENURE	0.013***(2.84)	
Working Experience	0.314 (1.52)	
INTANGIBLE	1.942**(2.38)	
ρ		12.244***(1012.84)
Constant	2.631***(8.86)	-0.748 (-1.48)
Year Dummy	YES	NO
Industry Dummy	YES	YES
N	1112	798
Log pseudolikelihood		-1023

*Note: Panel A shows a probit model with sample selection for the going-public decision. We estimate the probability of going public as the first step and the probability of going public in deteriorating market conditions in the second step. INTANGIBLE (intangible assets deflated by total assets) and CAEXP (capital expenditures deflated by lagged total assets) are employed in the first step for model identification. Panel B shows a probit model with sample selection for venture backing prior to IPO. We estimate the probability of receiving venture backing prior to the IPO as the first step. TENURE (CEOs' tenure at the time of IPO), Working Experience (a dummy variable that indicates CEOs' working experience in financial institutions) and INTANGIBLE are employed in the first step for model identification. All continuous variables are winsorized at the top and bottom one percent values. Heteroskedasticity-consistent standard errors (adjusted for clustering at the industry-level) are shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*

One could also argue that the logit regression results presented above require that venture backing prior to IPO is observed[38]. Panel B shows the probit model with sample selection for venture backing prior to IPO. We estimate the probability of receiving venture backing prior to the IPO as the first step. *TENURE* (CEOs' tenure at the time of IPO), Working Experience (a dummy variable that indicates CEOs' working experience in financial institutions) and *INTANGIBLE* are added in the first step as instrument variables. In the first stage, firms with more intangible assets are more likely to receive venture backing. CEOs' tenure is also positively associated with the probability of receiving venture backing. In the second stage, we still find a positive and significant coefficient for *Share Sold by VCs.*

5. FURTHER ANALYSES

5.1. CEOs' ownership around IPO

Although our results in the previous sections support our hypotheses, several issues remain unexamined. First, *H1* stands on the premise that under-diversified CEOs tend to sell their shares at the time of IPO and thus are more likely to accept a discounted offering price (Busaba et al., 2001; Bodnaruk et al., 2007). To examine this issue, we conduct OLS regression, where the dependent variable is *Share Sold by CEOs*. Since we do not have data regarding CEOs' compensation and their personal investment portfolios, we can only rely on their pre-IPO ownership (*CEOs Stake*). Model 1 in Table 6 engenders a positive coefficient on *CEOs Stake* (CEOs' ownership prior to the IPO), indicating that CEOs' selling intention increases in their pre-IPO ownership. In addition, while not reported, we find that on average, CEOs only sell 5% of their pre-IPO stakes and retain most of their equity stakes. We interpret these results as evidence that IPOs provide a vital opportunity for CEOs to diversify their wealth associated with issuing firms' idiosyncratic risks.

Table 6. Determinants of share sold by CEOs at the time of IPO

	Model 1
Dependent variables:	*Share sold by CEOs*
CEOs Stake	0.063***(6.05)
Control variables:	
lnAssets	0.005*(1.86)
Firm Age	0.001***(4.05)
Leverage	0.010 (0.66)
ROA	0.007 (0.32)
Sales Growth Ratio	-0.003*** (-3.75)
Constant	0.022 (0.59)
Industry Dummy	YES
Year Dummy	YES
N	1319
R2	0.060

*Note: This table conducts OLS regression, where the dependent variable is Share sold by CEOs. All continuous variables are winsorized at the top and bottom one percent values. All regressions include industry and year dummies (not reported). Heteroskedasticity-consistent standard errors (adjusted for clustering at the industry-level) are shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*

5.2. Private benefits of control and the going-public decision

In addition to the diversification need, are there any other benefits that go to the pockets of CEOs but not to the issuing firms? Here, we premise that CEOs more capable of pursuing private benefits of control are also more likely to go public in deteriorating market conditions. The rationale is, as argued by Paeglis and Veeren (2013), that intermediate levels of CEOs ownership will be high enough to ensure control and yet too low to ensure CEOs' interests are aligned with other shareholders. In addition, the exit by VCs, who have played vital roles of monitoring up to the IPO, further leaves them with more freedom for entrenchment. In contrast, for firms with low levels of ownership, the market for corporate control is likely to discipline entrenched CEOs. Meanwhile, for firms with high levels of CEOs ownership, they are less likely to pursue private benefits since large a fraction of those costs is eventually borne by themselves. Therefore, an inverse U-shaped relationship is expected. Following Bruton et al. (2010) and Paeglis and Veeren (2013), we include *CEOs' Retained Ownership* and its squared term (*CEOs' Retained Ownership*^{2}) in Table 7. We find that the coefficient estimate for (*CEOs' Retained Ownership*^{2}) is negative (-4.533) while the coefficient estimate for CEOs' Retained Ownership is positive (3.332), both of which are statistically significant at the 1% level. The inverse U-shaped relationship with an inflection point at 36.8% *CEOs' Retained Ownership* suggests that firms with intermediate *CEOs' Retained Ownership* are more likely to go public in deteriorating market conditions.

Because of the non-linearity, it is difficult to interpret the results of the interaction term in logit estimation, so we also employ the OLS estimation in Model 2 and similar results are obtained. In order to further test the robustness of our results, Model 3 shows the piecewise logit regression result. *CEOs' Retained Ownership_35* equals *CEOs' Retained Ownership* if *CEOs' Retained Ownership* is lower than 35%. *CEOs' Retained Ownership_Above35* equals the difference between CEOs' Retained Ownership and 35% if *CEOs' Retained Ownership* is equal to or higher than 35%. *Constant_Above35* equals one if CEOs' Retained Ownership is equal to or higher than 35% and zero otherwise. Consistent with previous results, *CEOs' Retained Ownership_35* carries a positive sign while *CEOs' Retained Ownership_Above35* engenders a negative sign, suggesting that while selling in deteriorating market conditions incurs costs in terms of equity issuance for both issuing firms and CEOs, CEOs can also enjoy some private benefits of control.

[38] Since approximately 98% of CEOs have an equity stake prior to the IPO, we thereby focus on the selection bias of venture backing.

Table 7. Private benefits of control and the going-public decision

	Model 1	***Model 2***	***Model 3***
	Logit	*OLS*	*Logit*
Dependent variables:	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*
CEOs' Retained Ownership²	-4.533***	-0.753***	
	(-4.07)	(-3.90)	
CEOs' Retained Ownership	3.332***	0.560***	
	(3.26)	(3.12)	
CEOs' Retained Ownership_35			1.896**
			(2.05)
CEOs' Retained Ownership_Above35			-1.492***
			(-2.69)
Primary Shares	0.167	0.026	0.205
	(0.13)	(0.12)	(0.16)
VCs Stake	0.141	0.035	0.157
	(0.41)	(0.56)	(0.44)
lnAssets	0.177	0.031	0.170
	(1.57)	(1.55)	(1.46)
Firm Age	0.003	0.001	0.003
	(0.61)	(0.71)	(0.64)
Leverage	-0.361	-0.063	-0.362
	(-1.20)	(-1.14)	(-1.17)
ROA	0.247	0.044	0.211
	(0.46)	(0.48)	(0.40)
Sales Growth Ratio	0.137**	0.027**	0.137**
	(2.58)	(2.53)	(2.52)
Reputable Underwriter Dummy	0.377***	0.067***	0.377***
	(7.90)	(7.93)	(8.07)
Real GDP Growth	-45.873***	-9.075***	-45.991***
	(-9.46)	(-9.16)	(-9.54)
Constant_Above35			-0.037
			(-0.18)
Constant	-3.245***	-0.100	-2.465**
	(-2.81)	(-0.50)	(-2.41)
Industry Dummy	YES	YES	YES
N	1224	1245	1224
Pseudo R2	0.086	0.078	0.085

*Note: Model 1 and Model 3 show the Logit regression results while Model 2 presents the OLS regression result. The dependent variable takes on a value of one for bear IPOs and zero for non-bear IPOs (BEARIPOD). Here, we replace Share sold by CEOs with CEOs' Retained Ownership (share owned by CEOs right after the IPO) and its squared term CEOs' Retained Ownership². Model 3 shows the piecewise logit regression result. CEOs' Retained Ownership_35 equals CEOs' Retained Ownership if CEOs' Retained Ownership is lower than 35%. CEOs' Retained Ownership_Above35 equals the difference between CEOs' Retained Ownership and 35% if CEOs' Retained Ownership is equal to or higher than 35%. Constant_Above35 equals one if CEOs' Retained Ownership is equal to or higher than 35% and zero otherwise. All continuous variables are winsorized at the top and bottom one percent values. All regressions include industry dummies (not reported). Heteroskedasticity-consistent standard errors (adjusted for clustering at the industry-level) are shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*

5.3. Why do VCs prefer fast exit even in deteriorating market conditions?

We finally turn to explore some potential explanation regarding why VCs prefer fast exit even in deteriorating market conditions. Limited life-span, costs of continuous involvement in issuing firms and reputation concern are potential activators. But we cannot directly examine these ideas due to lack of data availability. Instead, we focus on the determinants of the speed at which venture capitalists exit from issuing firms. The above discussion implies that VC exit will be most detrimental for firms with intermediate levels of founder ownership; therefore, fast exits are more attractive for VCs. Put differently, if the costs associated with potential agency costs during the post-IPO period outweigh the costs associated with low investor sentiment at the IPO, VCs will prefer fast exits at the IPO. The evidence supporting our conjecture is provided by Paeglis and Veeren (2013). Specifically, they document that firms with intermediate levels of founder ownership have the fastest speed of VC exit. To examine this possibility, we conduct OLS (Model 1), piecewise (Model 2) and fractional logit (Model 3) regression, where the dependent variable is shares sold by VCs, with results being presented in Table 8. Consistent with our premise, an inverse U-shaped relationship between *CEOs' Retained Ownership and Share Sold by VCs* is observed, suggesting that agency cost between self-serving CEOs and issuing firms is one of the potential driving forces of VCs' fast exit, which in turn affect the timing of IPOs[39].

[39] Qualitatively similar results are obtained when we replace CEOs' retained ownership by CEOs' ownership prior to IPO.

Table 8. Determinants of share sold by VCs at the time of IPO

	Model 1	***Model 2***	***Model 3***
	OLS	Piecewise Linear	Fractional Logit
Dependent variables:	*Share sold by VCs*	*Share sold by VCs*	*Share sold by VCs*
CEOs' Retained Ownership²	-0.253***		-6.523***
	(-3.90)		(-3.32)
CEOs' Retained Ownership	0.199***		5.041***
	(3.67)		(3.60)
CEOs' Retained Ownership_35		0.116***	
		(3.24)	
CEOs' Retained Ownership_Above35		-0.070**	
		(-2.39)	
VCs Stake	0.302***	0.304***	3.700***
	(9.79)	(9.69)	(9.33)
lnAssets	0.001	0.001	-0.020
	(0.48)	(0.30)	(-0.29)
Firm Age	0.001**	0.001***	0.014**
	(2.72)	(2.80)	(2.36)
Leverage	0.046***	0.046***	0.724**
	(4.13)	(4.14)	(1.96)
ROA	0.088**	0.085**	1.234*
	(2.58)	(2.49)	(1.87)
Sales Growth Ratio	0.000	0.000	0.023
	(0.13)	(0.09)	(0.36)
Reputable Underwriter Dummy		-0.002	
		(-0.38)	
Constant	-0.117***	-0.067*	-19.812***
	(-3.08)	(-1.84)	(-24.74)
Industry Dummy	YES	YES	YES
Year Dummy	YES	YES	YES
N	1286	1286	1286
Pseudo R2	0.125	0.123	

*Note: This table explores determinants of share sold by VCs at the time of IPO. Model 1, Model 2 and Model 3 show the OLS, Piecewise Liner and Fractional Logit regression results respectively. The dependent is Share sold by VCs. CEOs' Retained Ownership is share owned by CEOs right after the IPO and CEOs' Retained Ownership² is its squared term. CEOs' Retained Ownership_35 equals CEOs' Retained Ownership if CEOs' Retained Ownership is lower than 35%. CEOs' Retained Ownership_Above35 equals the difference between CEOs' Retained Ownership and 35% if CEOs' Retained Ownership is equal to or higher than 35%. Constant_Above35 equals one if CEOs' Retained Ownership is equal to or higher than 35% and zero otherwise. All continuous variables are winsorized at the top and bottom one percent values. All regressions include industry and year dummies (not reported). Heteroskedasticity-consistent standard errors (adjusted for clustering at the industry-level) are shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*

5.4. Robustness checks

In this section, we conducted additional analyses to check the robustness of our hypotheses. First, we redefine CEOs' stakes as the shares offered only by CEOs (excluding other directors), with results being reported in Appendix B. In addition, we also use the averaged underpricing one month prior to the filing date to identify Bear IPOs (Appendix C). Next, we limit our sample to completed IPOs (excluding withdrawn IPOs). Qualitatively similar results are obtained.

5.5. Alternative story

Premti and Madura (2013) argue that firms go public in deteriorating market conditions because they can hardly afford to wait for the recovery of stock markets and they do find that firms going public in deteriorating market conditions show worse post-IPO performance. To examine this alternative story, we compare ROA between bear IPOs and their matching non-bear IPOs. We do not find a significant difference between the two groups from Year 1 to Year 3 (Year 0 indicates IPO year), which is inconsistent with their proposal.

6. CONCLUSION

The process of IPO typically creates a situation of conflicting interests among parties. On the one hand, both CEOs and VCs are principles in the IPO firms in that they hold significant stakes of equity prior to IPO. On the other hand, CEOs are agents for issuing firms in light of their employment and VCs are agents to their investors. Given that IPO provides an important opportunity for insiders to cash out, insiders might switch to pursue their own interests, which are likely to be detrimental to the interests of issuing firms. The present study investigates whether conflicting interests among parties affect the going-public decision in deteriorating market conditions by using Japanese IPOs from 2001 to 2016.

We find that when CEOs and VCs intend to sell more stakes at the IPO, they are more likely to accept a discounted offering price, and thus are less likely to delay their IPO even in a low-investor-sentiment period. In addition, we also find evidence that firms with intermediate CEOs' retained ownership are more likely to go public, probably to pursue private benefits of control. These results clearly suggest that conflicting interests among parties.

Overall, our findings clearly suggest that the process of an IPO typically creates a situation of conflicting interest among CEOs (VCs) and issuing firms. However, we must mention that we need further research to conclude whether the liquidity needs by the CEOs have a positive impact on the going-public decisions in bear markets. In most analyses, we use the secondary shares offered by

CEOs as the proxy variable for the liquidity needs, it is recommended for the future research that, CEOs' personal net wealth can be used to directly examine whether the liquidity needs of CEOs will affect the going-public decisions in bear markets.

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Appendix A

Variable definition

BEARIPOD	A Dummy variable that takes on a value of one for bear IPOs and zero for non-bear IPOs
BHR -4 to -1 Month	Three-month buy and hold Russell Nomura Mid-Small Cap Index return prior to the filing date
BHR -1 to 0 Month	One-month buy and hold Russell Nomura Mid-Small Cap Index return prior to the first trading date (book-building period)
Offering Price	Offering price deflated by sales per share
Primary Proceeds	(Primary share x Offering price) / Total assets in Year -1, where Year 0 indicates IPO year
WITHDARWD	A Dummy variable that takes on a value of one for withdrawn IPOs and zero for completed IPOs
Share sold by CEOs	Secondary share sold by CEOs (including directors) overshare owned by CEOs in Year -1, where Year 0 indicates IPO year
Share sold by VCs	Secondary share sold by VCs over share owned by VCs in Year -1, where Year 0 indicates IPO year
CEOs Stake	Share owned by CEOs (including directors) before the IPO
VCs Stake	Share owned by VCs before the IPO
Primary Shares	Primary shares over outstanding shares in Year -1, where Year 0 indicates IPO year
lnAssets	Natural logarithm of total assets
Firm Age	Firm age at the time of IPO
Leverage	Total liabilities over total assets
ROA	Operating income divided by total assets
Sales Growth Ratio	Percentage sales growth ratio from the previous year
Reputable Underwriter Dummy	A dummy variable that takes on a value of one for firms with Top 3 underwriter and zero otherwise
Real GDP Growth	Percentage GDP growth ratio from the previous year
INTANGIBLE	*Intangible assets deflated by total assets*
CAEXP	*Capital expenditures deflated by lagged total assets*
TENURE	*CEOs' tenure at the time of IPO*
Working Experience	*A dummy variable that indicates CEOs' working experience in financial institutions (e.g., banks, security houses, mutual funds)*

Note: This appendix presents the definition of the variables used in this study.

Appendix B

Logit regression: Determinates of going public in deteriorating market conditions

	Full Sample	***CEOs' Pre-IPO stake >0% Sample***	***Matched Sample***
	Model 1	***Model 2***	***Model 3***
Dependent variables:	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*
Share sold by CEOs	6.369***	6.605***	7.873***
	(4.88)	(5.19)	(3.53)
Primary Shares	0.306	-0.117	-1.051
	(0.26)	(-0.09)	(-0.59)
CEOs Stake	-0.203	-0.269	-0.737
	(-0.67)	(-0.83)	(-1.61)
VCs Stake	0.360	0.316	-0.406
	(1.17)	(1.32)	(-1.27)
lnAssets	0.133	0.170	-0.021
	(1.24)	(1.49)	(-0.16)
Firm Age	0.003	-0.001	0.001
	(0.57)	(-0.11)	(0.24)
Leverage	-0.313	-0.354	0.090
	(-1.06)	(-1.13)	(0.23)
ROA	0.137	0.128	-0.083
	(0.24)	(0.26)	(-0.17)
Sales Growth Ratio	0.143**	0.149**	0.066
	(2.47)	(2.42)	(1.47)
Reputable Underwriter Dummy	0.369***	0.359***	-0.156*
	(7.17)	(6.48)	(-1.81)
Real GDP Growth	-46.727***	-48.715***	-4.966
	(-8.62)	(-10.16)	(-1.05)
Constant	-2.600**	-2.901**	0.290
	(-2.43)	(-2.55)	(0.23)
Industry Dummy	YES	YES	YES
N	1227	1192	631
Pseudo R2	0.086	0.092	0.020

*Note: This table replicates the Logit regression in Table 4 while using the alternative definition for Share sold by CEOs. Here, Share sold by CEOs is defined as secondary share offered only by CEOs (excluding other directors) deflated by outstanding shares prior to the IPO. The dependent variable takes on a value of one for bear IPOs and zero for non-bear IPOs (BEARIPOD). Model 1 reports the results based on the entire sample. Model 2 limits our sample to firms in which shareholding of CEOs (VCs) is larger than 0% prior to IPO. Model 3 further demonstrates the result based on matched subsamples. Control variables in Table 4 are used to identify the matching non-bear IPOs of each bear IPOs. All continuous variables are winsorized at the top and bottom one percent values. All regressions include industry dummies (not reported). Heteroskedasticity-consistent standard errors (adjusted for clustering at the industry-level) are shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*

Appendix C

Logit regression: Determinates of going public in deteriorating market conditions

	Full Sample		*CEOs (VCs)' Pre-IPO stake >0% Sample*		*Matched Sample*	
	Model 1	***Model 2***	***Model 3***	***Model 4***	***Model 5***	***Model 6***
Dependent variables:	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*	*BEARIPOD*
Share sold by CEOs	1.566***(2.95)		1.529***(3.01)		1.510*(1.83)	
Share sold by VCs		1.155***(5.07)		1.106***(2.73)		0.872**(2.52)
Primary Shares	1.821***(2.67)	2.007***(2.99)	1.807***(3.24)	2.705***(3.81)	0.538 (0.65)	0.560 (0.61)
CEOs Stake	0.425 (0.99)	0.503 (1.19)	0.409 (0.94)	0.341 (0.70)	-0.307 (-0.76)	-0.217 (-0.52)
VCs Stake	1.274***(4.75)	0.770***(2.83)	1.400***(5.23)	0.670 (1.30)	-0.011 (-0.04)	-0.436 (-1.60)
lnAssets	0.190**(1.98)	0.203**(2.11)	0.228**(2.27)	0.094 (1.11)	0.000 (0.00)	0.015 (0.15)
Firm Age	-0.003 (-0.51)	-0.003 (-0.53)	-0.006 (-1.05)	-0.004 (-0.66)	-0.001 (-0.20)	-0.002 (-0.25)
Leverage	-0.407 (-1.36)	-0.475 (-1.57)	-0.341 (-1.08)	-0.032 (-0.10)	-0.307 (-1.09)	-0.349 (-1.12)
ROA	-0.806*(-1.93)	-0.904**(-2.22)	-0.636 (-1.43)	-0.814 (-1.21)	-0.237 (-0.29)	-0.396 (-0.47)
Sales Growth Ratio	0.202***(5.04)	0.202***(4.68)	0.217***(5.45)	0.204***(3.27)	0.074*(1.89)	0.070*(1.70)
Reputable Underwriter Dummy	0.197*(1.87)	0.201*(1.83)	0.178 (1.60)	-0.026 (-0.27)	-0.278 (-1.38)	-0.267 (-1.34)
Real GDP Growth	-63.660***(-11.62)	-62.983***(-11.73)	-63.050***(-11.13)	-64.854***(-9.44)	-11.832**(-2.47)	-11.199**(-2.35)
Constant	-3.377***(-4.28)	-3.313***(-3.99)	-3.588***(-4.47)	-2.812***(-3.46)	-0.290 (-0.35)	-0.211 (-0.25)
Industry Dummy	YES	YES	YES	YES	YES	YES
N	1240	1243	1213	810	624	624
Pseudo R2	0.133	0.134	0.134	0.132	0.020	0.020

*Note: This table replicates the Logit regression in Table 4 while using the alternative definition for bear and non-bear IPOs. Here, we define UNDERPRICING as averaged underpricing one month prior to the filing date and divide it into four groups and the lowest group is defined as bear IPOs, all other groups are defined as non-bear IPOs. The dependent variable takes on a value of one for bear IPOs and zero for non-bear IPOs (BEARIPOD). Model 1 reports the results based on the entire sample. Model 2 limits our sample to firms in which shareholding of CEOs (VCs) is larger than 0% prior to IPO. Model 3 further demonstrates the result based on matched subsamples. Control variables in Table 4 are used to identify the matching non-bear IPOs of each bear IPOs. Heteroskedasticity-consistent standard errors (adjusted for clustering at the industry-level) are shown in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% respectively. See Appendix A for the definition of variables.*