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TUNNELING THROUGH PRIVATE EQUITY PLACEMENTS: EVIDENCE FROM JAPAN

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Abstract:

This paper examines the tunneling issue of controlling shareholders, and in particular, this empirical study is conducted to determine whether controlling shareholders are tunneling the wealth of companies by using private equity placements (hereafter, PEPs), which have been frequently used as a means of equity financing in the Japanese market in recent years. We find that the discount rate is higher for PEPs issued to the controlling shareholders compared with PEPs issued to others. This empirical result is robust considering several methods of calculating the discount rate of PEPs. Furthermore, we find that discounts of PEPs are more likely to take place in the ex-ante controlling shareholder case than in the ex-post controlling shareholder case. The findings of this paper mainly make three contributions. Firstly, this paper contributes to prior studies and adds to the empirical evidence on the detailed path of tunneling by controlling shareholders. Secondly, this paper contributes to prior studies related to determinants of the price discount of PEPs. Thirdly, this paper contributes to institutional design in practice.

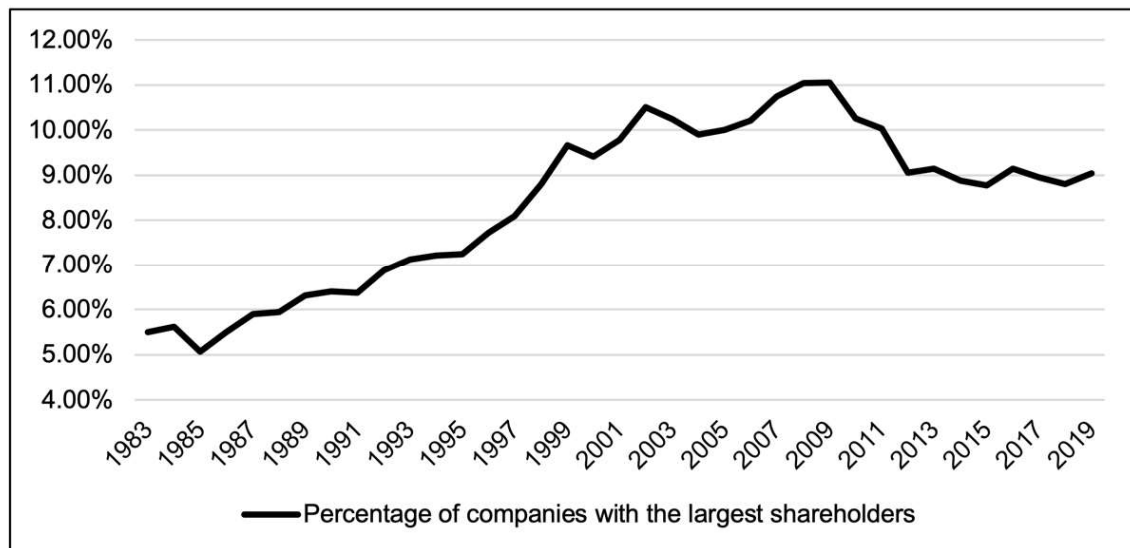
Key words: *Private equity placements; ; Discount rate; Tunneling; Controlling shareholders*

1. Introduction

The purpose of this paper is to examine the tunneling problem around the issue price of private equity placements (hereafter, PEPs) sold to controlling shareholders of Japanese listed companies. When PEPs are offered to controlling shareholders, there may be a conflict of interests between controlling shareholders and other non-controlling shareholders, which concerns the issue of shares being sold at a discount. Because controlling shareholders can enjoy benefits from the discount, conversely, other non-controlling shareholders cannot. Tunneling refers to the expropriation of non-controlling shareholders and describes the transfer of assets and profits out of firms for the benefit of those who control them (Johnson et al., 2000). And the issue of selling shares at a discount to controlling shareholders may be considered as a specific form of tunneling that is practiced in the Japanese market. In this paper, controlling shareholders are defined as, (a) a parent company or (b) a person who holds, directly or indirectly, the majority of the voting rights in a company, which is in accordance with Rules for Securities Listing Regulations of the Tokyo Stock Exchange (hereafter, Rules of TSE). More specifically, in

Japan, conflicts of interests between controlling shareholders and non-controlling shareholders are likely to occur mainly for two reasons.

Firstly, there is as high presence of controlling shareholders in the Japanese market. Figure 1 shows the number of firms with the largest shareholders in the Japanese market who controlled more than 50% of companies' outstanding shares from 1983 to 2019. As shown in Figure 1, the number of companies with the largest shareholders whose shareholdings are more than 50% increased from 1983 to 2009, and the percentage decreased slightly from 11% to 9% between 2009 and 2012. Since then, the percentage has remained at around 9%. In addition, according to the results of the "TSE-Listed Companies White Paper on Corporate Governance" from 2009 to 2019, approximately one in five listed companies have had controlling shareholders in the TSE over the past 10 years. Furthermore, based on the "Practical Guidelines for Group Governance Systems" (hereafter, Group Guidelines), companies have some advantages in having listed subsidiaries with controlling shareholders, specifically, in keeping and improving employee motivation, recruiting the best and brightest, securing trust from business partners, and maintaining their brand and status as listed companies, etc. On the other hand, from the point of view of the market, there is a concern that the existence of controlling shareholders in listed companies could give rise to a new governance problem of conflicts of interests among shareholders.



Data source: NEEDS FinancialQUEST

Figure 1 Presence of the largest shareholders in the Japanese market

Secondly, the issue of conflicts of interests between controlling and non-controlling shareholders has been highlighted in the development of systems in Japanese markets, which is due to the rapid development of the globalization of securities markets in recent years. Foreign investors and other activist shareholders have entered the Japanese securities market recently, and while they are less likely to become blockholders, it is common for them to become non-controlling shareholders, which is likely to increase the focus on concerns about conflicts of interests among shareholders. Then, the Group

Guidelines which raise corporate governance issues regarding listed subsidiaries, where conflicts of interests between controlling shareholders and non-controlling shareholders may be a problem. The METI emphasized that this issue exists not only in listed subsidiaries but also in listed companies which have controlling shareholders, and should be taken seriously. In addition, the Advisory Group on Improvements to TSE Listing System, in April 2009, also raised doubts about the soundness of PEPs issued to controlling shareholders, including over the possibility of unjustified profit sharing through transactions, which may infringe upon the interests of non-controlling shareholders. Therefore, the conflicts of interests between controlling and non-controlling shareholders, especially the issuance of PEPs to controlling shareholders, has drawn considerable institutional attention recently.

Based on the above background, this paper examines the tunneling problem caused by the existence of controlling shareholders, and focuses on the increasing use of PEPs in recent years. The remainder of the paper is organised as follows. Section 2 summarizes the relevant current literature and develops the hypothesis. Section 3 describes the methodology and data used in this study. Section 4 presents the empirical results. The robustness checks are reported in Section 5, while Section 6 concludes.

2. Literature review and hypothesis development

2.1. Literature review

It has been observed in previous studies that the issue price of PEPs is lower than the market price. The determinants of the discount rate are interpreted in previous studies from four main perspectives: the information hypothesis, the monitoring hypothesis, the entrenchment hypothesis, and the rescue hypothesis (Fukuda, 2010; Hoda, 2011; Suzuki, 2017).

The first is the information hypothesis. Because PEPs allow only certain shareholders to subscribe for new shares, investors who subscribe for many shares have an incentive to investigate the prospects and investment opportunities of the issuing company in advance. While costly information gathering can mitigate information asymmetry with the issuing company, investors who are assigned new shares through PEPs may demand the discount as compensation for the cost of information gathering. In other words, the discount rate of PEPs is compensation for the information gathering costs of the investors. The representative study examining this hypothesis is Hertz and Smith (1993).

The second is the monitoring hypothesis. Monitoring by large shareholders may work as a means to mitigate the moral hazard problem of management. Large shareholders have a greater incentive to monitor than investors with smaller shareholdings because the benefits of monitoring are greater (Shleifer and Vishny, 1986). Investors who are assigned more shares become large shareholders, then they have to monitor that firm. The monitoring hypothesis allows us to consider the discount rate as a compensation for monitoring. The representative study examining this hypothesis is Wruck and Wu (2009),

which further found that these investors are more likely to subscribe for shares in order to participate in the management of the firm.

The third is the entrenchment hypothesis. Entrenchment refers to that managers create a stable position in which they will not be penalized by dismissal or other penalties for their lazy management or mismanagement. Entrenchment may lead to managerial moral hazard. Management may use PEPs to strengthen entrenchment. By assigning new shares to specific investors who are not actively involved in the management of the company, management can stabilize their own position. These investors will not invest in the company unless they are guaranteed a reward for the decrease in enterprise value caused by the entrenchment. Therefore, under the entrenchment hypothesis, the discount rate can be considered as a compensation for the decrease in enterprise value. The representative study examining this hypothesis is Barclay et al. (2007).

The fourth is the rescue hypothesis. There is high risk for investors if they are assigned new shares from financially distressed firms, therefore, the discount rate of PEPs can be considered as a compensation for the risk. The representative study examining this hypothesis is Krishnamurthy et al. (2005).

Of these hypotheses, only the entrenchment hypothesis is assumed to be an opportunistic act of management, while the other three hypotheses assume discounting as an economically rational act after comparing and balancing costs and benefits. However, in these previous studies, when examining the determinants of the discount rate for PEPs, factors related to conflicts of interests among shareholders have not been considered. The information hypothesis and monitoring hypothesis interpret discount rates as an agency problem between management and shareholders. From the perspective of the information hypothesis, when PEPs are offered to controlling shareholders, the controlling shareholder is already considered as an insider because they already have controlling rights of the company, therefore it is considered that the cost of collecting information before PEPs may not be incurred compared with others. In other words, the information hypothesis is unlikely to occur in the case of issuance of PEPs to controlling shareholders. Also, the monitoring hypothesis is unlikely to occur in the case of issuance of PEPs to controlling shareholders because the controlling shareholder has already been involved in the management and taken the monitoring role previously, therefore the incentive for further management involvement and monitoring is lower than for others. On the other hand, although the concentration of ownership is expected to reduce monitoring costs, the existence of controlling shareholders may also enhance conflicts of interests between controlling and non-controlling shareholders (Morck et al., 2005). In addition, the entrenchment hypothesis is limited to the allocation of new shares to investors who are not actively involved in the management of the company, but controlling shareholders taking part in management is usual, so the entrenchment hypothesis does not always work for companies with controlling shareholders. The rescue hypothesis does not consider factors related to ownership structure. Above all, existing hypotheses are based on prior research that may not capture the existence of controlling shareholders, which may affect the discount rates of PEPs.

Unlike studies that focus on the information asymmetry between management and shareholders, such as those concerning the information hypothesis and the monitoring

hypothesis, this study focuses on the problem of tunneling by the controlling shareholders and the conflicts of interests between controlling and non-controlling shareholders. While previous studies have focussed on the opportunistic behaviour of managers from the perspective of the entrenchment hypothesis, this study focuses on the opportunistic behaviour of controlling shareholders. Based on these points, it is considered that there are important differences between this study and previous studies in examining determinants of the discount rates of PEPs. In addition, the viewpoint of this research is important because almost 20% of listed companies in the Japanese market have had controlling shareholders for the past ten years.

On the other hand, Miyajima (2011) examined discount rates of PEPs and focused on listed parent companies as controlling shareholders, but did not identify tunneling problems with PEPs used by parent companies. Although Miyajima (2011) presents some useful findings, there are still some inadequacies in the analysis methods and samples. In Miyajima (2011), examination was performed using univariate analysis, but just using univariate analysis may not eliminate other influential factors. In particular, there are many determinants that affect the discount rates of PEPs, so it is important to control other factors by using multivariate analysis. In addition, Miyajima (2011) only examined listed parent companies as controlling shareholders, but conflicts of interests among shareholders do not only exist in firms with a parent company, but also in firms with controlling shareholders. Compared with firms with a parent company, firms with controlling shareholders are more usual and important in the Japanese market. In this sense, the issue of conflicts of interests between controlling and non-controlling shareholders includes the issue of conflicts of interests between parent companies and non-controlling shareholders of subsidiaries, and therefore, the characteristics of the Japanese market cannot be fully captured by only examining the parent companies as controlling shareholders.

Based on the above discussion, this study focuses on the controlling shareholders and examines whether there are conflicts of interests among shareholders due to the concentration of ownership in the Japanese market from the aspect of PEPs.

2.2. Hypothesis development

While the existence of controlling shareholders mitigates agency problems between shareholders and management through more efficient monitoring of the firm's management, there are aspects of controlling shareholders that make it easier for them to take advantage of their control rights to pursue private interests (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). The discussion of agency issues is based primarily on the separation of ownership and management advocated by Berle and Means (1932). Under the traditional agency problem, it is often practically unfeasible from an economic point of view for individual shareholders to monitor management's actions, since ownership is widely dispersed, and individual shareholders receive only a small profit instead of incurring significant monitoring costs. In contrast, due to the concentration of ownership, large or controlling shareholders emerge, and it may be more efficient and effective for them to monitor management's behaviour (Jensen and

Meckling, 1976). Thus, under the traditional agency problem, concentration of ownership is expected to reduce monitoring costs.

On the other hand, the emergence of large or controlling shareholders may raise conflicts of interests between controlling and non-controlling shareholders (Morck et al. 2005). Even for shareholders of the same company, controlling and other non-controlling shareholders perhaps do not have the same interests, and controlling shareholders may sacrifice the interests of non-controlling shareholders in order to extract private benefits for themselves. Shleifer and Vishny (1997) suggest that in countries where ownership of shares is not well protected by the legal system, the private benefits extracted from the firm by controlling shareholders are relatively large. La Porta et al. (1998) and La Porta et al. (1999) also find an association between institutional weaknesses and the degree of ownership concentration. Therefore, conflicts of interests among shareholders are likely to be prompted mainly by two factors: concentration of ownership and institutional weaknesses in the protection of non-controlling shareholder rights (Young et al., 2008). Above all, this paper develops its hypothesis based on these two factors.

The first is the concentration of ownership. As discussed in section 1, ownership concentration in Japanese listed firms cannot be ignored. In this sense, the conflicts of interests between controlling and non-controlling shareholders may be significant. Additionally, we find that the issue price of PEPs is generally discounted in the Japanese market during the 2000s. Based on the above, overall, there may be a potential tendency in the Japanese market to use PEPs to transfer wealth to certain shareholders.

The second is the legal system of protection of non-controlling shareholders. Kato (2016) argues that in the United States, there is well-established case law that the controlling shareholder owes a fiduciary duty to subordinate companies and non-controlling shareholders, whereas in the Japanese legal system, there are no provisions in the Companies Act that stipulate that the controlling shareholder has any obligations to the subordinate companies and non-controlling shareholders. It should be noted that although the disclosure rules of the Companies Act and the listing rules of the TSE play a role in restraining the behaviour of controlling shareholders to some extent, such regulations, unlike the fiduciary duty in U.S. law, do not directly regulate the behaviour of controlling shareholders. Moreover, since the establishment of Japanese law is deeply influenced by German and French law, which are civil law systems, the protection of non-controlling shareholders may be weak to some extent, because of the weakness of the legal system. Based on the discussion above, we consider that conflicts of interests among shareholders may arise in the Japanese market.

Furthermore, under the current institutional setting, because it is allowed to set the issue price of PEPs at a discount, which may be disadvantageous to existing shareholders who are not assigned new shares, it cannot be denied that issuing PEPs to controlling shareholders may be detrimental to the interests of existing shareholders (Shishido et al., 2010). Specifically, since PEPs allow the issuing firm to issue new shares to certain shareholders as a discount, this issue may transfer the firm's wealth

from the existing shareholders who were not assigned new shares to certain shareholders. As a result, existing shareholders who are not allocated new shares through PEPs will be disadvantaged.

In particular, in a company where there are controlling shareholders, the controlling shareholders can decide subscribers and the issue price of PEPs, so controlling shareholders can pursue private benefits through opportunistic behaviour, and then take advantage of control rights to implement the PEPs at further discounted rates in their favour. In other words, there may be conflicts of interests between the controlling shareholder, who is the investor of the PEPs, and the existing shareholders who are not allocated new shares. Based on the above discussion, the hypothesis is as follows:

Hypothesis: The discount rate is higher for PEPs issued to the controlling shareholder compared with PEPs issued to others.

3. Research design

3.1. Model

In order to examine the hypothesis, we estimate the following regression model based on Suzuki (2017).

$$\text{Discount}\%_i = \alpha + \beta_1 \text{PEP_for_ctl}_i + \beta_2 \text{PEP_for_Nonctl}_i + \beta_3 \text{Control} + \text{Industries} + \text{Year} + \varepsilon_i$$

The dependent variable $\text{Discount}\%_i$ means the discount rate of the issue price of the PEPs. Based on prior studies, we calculate the discount rate of the PEPs by calculating the difference between the pre-announcement exchange price and the per share price of the PEPs' announcement, then dividing by the pre-announcement exchange price.

The main independent variable is PEP_for_ctl_i . PEP_for_ctl_i is a dummy variable that takes the value of 1 if the controlling shareholder existed prior to the PEPs in the firm, meanwhile PEPs are assigned to the controlling shareholder, and 0 otherwise. Moreover, PEP_for_Nonctl_i is a dummy variable that takes 1 if the controlling shareholder existed prior to the PEPs in the firm, but PEPs are not assigned to the controlling shareholder, and 0 otherwise. Based on the hypothesis, we predict that there is a positive relationship between PEP_for_ctl_i and $\text{Discount}\%_i$.

In estimating, we include control variables for controlling other factors which may affect the discount rate of the PEPs. First, we control the issue size (Iss_size_i) that may affect the discount rate of the PEPs. Hertz and Smith (1993) argue that if the firm value is difficult to assess and uncertain, investors involved in PEPs need to spend more resources to determine the value of their investment and will seek greater discount. Also, they argue that if investment opportunities are more difficult to value than existing assets, the larger the issue size, the greater the discount. Moreover, it is also possible that a larger issue

size gives the investor a greater incentive to monitor the management and then a greater discount is needed. Therefore, we predict the coefficient for lss_size_i is positive.

The number of investors in the PEPs (Num_alloc_i) may also affect the discount rate. Suzuki (2017) states that a larger number of investors means smaller sums each investor will allocate to new shares. Because these investors have little advantages in information and monitoring, some discount is necessary to encourage them to buy new shares. Therefore, we predict the coefficient for Num_alloc_i is positive.

Next, the number of days, from the date of board meeting to the issuance date ($Days_i$), also needs to be controlled. Because the issue price of the PEPs has already been decided at the board meeting, the longer the duration, the greater the liquidity risk assumed by investors. As a result, the investors seek more discount on the PEPs. Therefore, we predict the coefficient for $Days_i$ is positive.

Prior research shows that firm size ($Firm_size_i$) may be associated with the issue price of PEPs (Hertzel and Smith, 1993; Wu and Wang, 2005; Barclay et al., 2007; Liang and Jang, 2013). In large firms, investors have easier access to firm information and the cost of information collection by investors is lower. In contrast, for small and medium-sized firms, the information gap between investors and firms is larger and the cost of information collection by investors is higher. Therefore, we predict the coefficient for $Firm_size_i$ is positive.

In addition, previous studies have also controlled for the book-to-market ratio of the firm (BTM_i). Low book-to-market ratios imply fewer growth opportunities for the firm, and it is more difficult for investors to predict, thus they may require higher discounts on the PEPs (Krishnaswami et al., 1999; Folta and Janney, 2004; Cronqvist and Nilsson, 2005). On the other hand, a low book-to-market ratio also means that the intangibles make up a large proportion of firm value, and more intangibles in a firm means a larger information gap between investors and firms, which makes it more difficult for investors to predict, thus they may also require a larger discount on the PEPs (Hertzel and Smith, 1993; Tan et al., 2002). Therefore, a negative correlation is expected between the book-to-market ratio and the discount rate.

Furthermore, because financial distress is also expected to affect the discount rate of PEPs, the financial distress of the firm also needs to be controlled. In this study, we use the leverage (Lev_i) and Z-score (Z_score_i) (Altman, 1968) as proxies for the firm's financial distress. Krishnamurthy et al. (2005) use financial distress as a measure of whether a public offering is a feasible choice for a firm; if a company is financially distressed, it is difficult to carry out a public offering and therefore PEPs are the only a feasible choice for raising capital. Meanwhile, if a company is financially distressed, the risk is also higher for the investors, and as a result, more discount on PEPs is required. Specifically, higher leverage and lower Z-scores are associated with more severe financial distress of the firm, which may suggest higher discount rates. Therefore, we predict the coefficient for Lev_i is positive, and Z_score_i is negative.

Finally, we control the business complexity and the governance of the firm, which could affect the discount rate of PEPs. The more complex the business, the more difficult it is for investors to access company information and the more costly it is to collect information. Firms that are older and have more segments are more likely to have a

complex business and the discount rate of PEPs in these firms is likely to be higher. Here, we control firms' business complexity by using the age (Age_i) and the number of segments ($Segment_i$) of the firm. The coefficient for Age_i and $Segment_i$ is expected to be positive. In addition, we use dispatched executive ($Director_i$) and the Big4 ($Big4_i$) as variables of corporate governance. If the board members are dispatched by controlling shareholders, they may already have access to internal information about the company in advance, meanwhile, it is expected to improve the governance of the firm, which will both lead to a lower discount rate. Then, if the audit firm is one of the Big 4, the issue price of PEPs may be more appropriate, and the discount rate will be lower. Therefore, we predict the coefficient for $Director_i$ and $Big4_i$ is negative.

In order to control fixed effects of industry and year, industry and year dummies are also included in the regression model.

3.2. Samples

Firstly, this study obtains data of PEPs, financial data, and stock data, from the NEEDS FinancialQUEST database, using a sample of publicly listed Japanese firms on the TSE (delisted companies included) that meet the following criteria from FY2009 to FY2019:

- a. PEPs between FY2009 and FY2019
(2,256 case-year)
- b. Excludes the samples of discontinued PEPs after the announcement of the PEPs
(-95 case-year)
- c. Excludes the samples that are accompanied by public offering and the initial public offering at the same time
(-514 case-year)
- d. Excludes samples of non-transferable share acquisition rights and stock awards from contribution in kind
(-299 case-year)
- e. Final sample size of PEPs
(1,348 case-year)

Among these, this study first excludes the samples with issuances discontinued after the announcement of PEPs. In addition, due to the impact of the public offering and the initial public offering, cases of PEPs accompanied by them are excluded from the data. Moreover, because non-transferable share acquisition rights and stock awards from contribution in kind are excluded from the definition of PEPs by the Financial Instruments and Exchange Act, these samples are also excluded.

Then, in order to examine the hypothesis, it is necessary to identify companies that already had controlling shareholders prior to the PEPs. From 2009, because listed companies which have controlling shareholders are required to disclose the details of controlling shareholders by the TSE, this study can obtain the data of controlling shareholders if listed companies have them. Therefore, this study focuses on the period

from 2009 to 2019. Then, this study obtained these disclosure files from the eol database, and hand collected the detailed data of controlling shareholders of these firms, such as characteristics, and ownership ratios. As a result, the sample satisfying the criteria that companies already had controlling shareholders prior to the PEPs have a case-year of 218, of which 50 case-year are PEPs to controlling shareholders. Figure 4 shows the detail of the samples that this study uses.

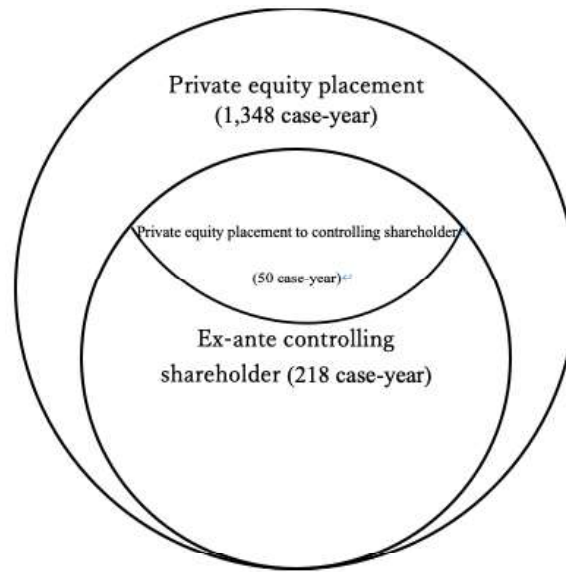


Figure 2 Detail of the samples

3.3. Summary Statistics

The following is the descriptive statistics of each variable used for analysis and the correlations between each variable.

Table 1 reports the descriptive statistics. The mean values of Discount%_i, PEP_for_ctl_i, PEP_for_Nonctl_i, lss_size_i, Num_alloc_i, Firm_size_i, BTM_i, Z_score_i, Days_i, and Director_i are 0.0901, 0.0371, 0.1246, 0.2004, 1.8212, 9.0565, 0.6984, 3.0799, 31.1402, and 0.2337, respectively, whereas their median values are 0.0867, 0.0000, 0.0000, 0.0543, 1.0000, 8.9172, 0.5019, 1.9343, 23.0000, and 0.0000, respectively, suggesting that the distributions of these five variables are right-skewed. By contrast, the mean value of Lev_i, Age_i, Segment_i, and Big4_i is 0.6562, 9.1921, 4.2352, and 0.5616, whereas their median value is 0.6579, 9.2582, 5.0000, and 1.0000, suggesting that the distribution of this variable is left-skewed. However, the distribution of these variables is skewed just slightly, and the difference between the mean and the median is not very large. Furthermore, all variables are winsorized at 1% and 99% levels.

Table 1 Descriptive statistics

	N	Mean	St.Dev.	Min	Q1	Median	Q3	Max
Discount% _i	1348	0.0901	0.1458	-0.3423	0.0000	0.0867	0.1561	0.6491
PEP_for_ctl _i	1348	0.0371	0.1891	0.0000	0.0000	0.0000	0.0000	1.0000
PEP_for_Nonctl _i	1348	0.1246	0.3304	0.0000	0.0000	0.0000	0.0000	1.0000
Iss_size _i	1348	0.2004	0.3623	0.0029	0.0186	0.0543	0.2053	2.1047
Num_alloc _i	1348	1.8212	2.3013	1.0000	1.0000	1.0000	1.0000	16.0000
Firm_size _i	1348	9.0565	1.9762	5.3609	7.6560	8.9172	10.2468	14.3921
BTM _i	1348	0.6984	0.8681	-1.3350	0.1826	0.5019	0.9822	4.7273
Lev _i	1348	0.6562	0.2930	0.0496	0.4679	0.6579	0.8188	1.7668
Z_score _i	1348	3.0799	8.5772	-22.9016	0.6465	1.9343	3.4409	55.5530
Days _i	1348	31.1402	21.8587	16.0000	18.0000	23.0000	39.0000	170.0000
Age _i	1348	9.1921	0.8454	6.6720	8.5415	9.2587	9.9841	10.5689
Segment _i	1348	4.2352	2.5789	1.0000	1.0000	5.0000	6.0000	10.0000
Director _i	1348	0.2337	0.4233	0.0000	0.0000	0.0000	0.0000	1.0000
Big4 _i	1348	0.5616	0.4964	0.0000	0.0000	1.0000	1.0000	1.0000

Note: Industry dummy and year dummy are omitted.

Table 2 shows the correlations among the testing variables. The correlations between Discount%_i and PEP_for_ctl_i are positive and significant at the 1% level, so the hypothesis is supported. But this just indicates the relationship between the discount rate of PEPs and the PEPs issued to the controlling shareholder on a univariate basis. Multivariate analysis is conducted in the next section.

The correlation coefficients of Lev_i and Z_score_i are marginally higher, so the issue of multicollinearity may arise. In order to check the multicollinearity among independent variables, calculations suggest that the variance inflation factor (VIF) is 2.10 for Lev_i, and the VIFs are less than 2 but more than 1 for other estimates. Therefore, it appears that the issue of multicollinearity may not arise.

Table 2 Correlation matrix

	Discount%	PEP_for_ctl	PEP_for_Nonctl	Iss_size	Num_alloc	Firm_size	BTM	Lev	Z_score	Days	Age	Segment	Director	Big4
Discount%														
PEP_for_ctl	0.1005*													
PEP_for_Nonctl	0.0106	-0.0741*												
Iss_size	0.2117*	-0.0623*	0.0727*											
Num_alloc	0.0469*	-0.017	0.0117	0.1800*										
Firm_size	0.2090*	-0.0168	-0.0202	-0.3436*	-0.2015*									
BTM	-0.0791*	-0.0028	0.0609*	0.0748*	0.0009	-0.0217								
Lev	0.0828*	-0.007	0.0453*	0.2959*	0.1217*	-0.1772*	-0.2189*							
Z_score	-0.033	0.0211	-0.0526*	-0.1978*	-0.0379	0.2098*	-0.0649*	-0.5645*						
Days	0.2252*	-0.0113	-0.0329	0.1539*	-0.0914*	0.3230*	0.0452*	0.001	-0.0088					
Age	0.0915*	-0.043	0.0427	-0.0535*	-0.0385	0.2244*	0.1286*	0.0453*	-0.1147*	0.1183*				
Segment	0.0584*	-0.0582*	0.0510*	0.0378	0.0026	0.0201	-0.0053	0.0493*	-0.0424	0.0128	0.1209*			
Director	-0.0218	-0.2719*	-0.3595*	0.1079*	-0.0501*	-0.0019	-0.0513*	0.0153	0.003	0.0570*	-0.0106	-0.0177		
Big4	0.0586*	0.0164	0.0061	-0.2182*	-0.1733*	0.5115*	0.0843*	-0.1920*	0.1568*	0.2187*	0.0991*	-0.1647*	0.0004	

Note:

a. Pearson's correlations appear below the diagonal; Spearman's correlations appear above the diagonal.

b. Industry dummy and year dummy are omitted.

c. *Indicates significance at the 1% level.

4. Empirical findings

Table 3 shows the multivariate analysis results. In each table, model 2 shows the results that control monitoring costs of companies. Model 3 shows the results that

control information costs, model 4 controls financial distress, model 5 controls liquidity risk, model 6 controls business complexity, and model 7 controls corporate governance of companies. Furthermore, model 8 shows the results when all control variables are included.

Table 3 Multivariate analysis results

	model1	model2	model3	model4	model5	model6	model7	model8
PEP for cti _i	0.0777 [3.41]***	0.083 [3.58]***	0.0972 [4.29]***	0.0775 [3.39]***	0.0788 [3.32]***	0.0802 [3.52]***	0.0823 [3.34]***	0.0971 [4.21]***
PEP for Noncti _i	0.0087 [0.78]	0.0005 [0.04]	-0.0009 [-0.07]	0.0079 [0.71]	0.0116 [1.09]	0.0067 [0.61]	0.0118 [0.90]	0.0019 [0.16]
lss_size _i		0.0959 [4.71]***	0.13 [6.44]***					0.1209 [5.61]***
Num_alloc _i		0.0009 [0.52]	0.003 [1.72]*					0.0034 [2.02]**
Director _i		-0.0063 [-0.59]	-0.0088 [-0.84]				0.0064 [0.53]	-0.0079 [-0.76]
Firm_size _i			0.0232 [10.25]***					0.0214 [7.72]***
BTM _i			-0.021 [-3.73]***					-0.0254 [-4.37]***
Age _i			0.0087 [1.78]*			0.0124 [2.28]**		0.0089 [1.73]*
Segment _i			0.0005 [0.33]			0.0023 [1.37]		0.0003 [0.21]
Lev _i				0.0227 [1.18]				-0.0399 [-0.70]
Z_score _i				0 [-0.03]				-0.0011 [-2.09]**
Days _i					0.0015 [5.04]***			0.0007 [2.40]**
Big4 _i							0.0121 [1.44]	-0.0096 [-1.08]
Constant	0.0937 [4.02]***	0.0562 [2.37]**	-0.2066 [-3.82]***	0.0783 [2.94]***	0.0583 [2.51]**	-0.0329 [-0.59]	0.0868 [3.57]***	-0.1664 [-3.02]***
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.0665	0.1177	0.2029	0.0683	0.111	0.0724	0.0683	0.2149
Adj-R-squared	0.0343	0.0851	0.1709	0.0346	0.0796	0.0388	0.0346	0.1808
N	1348	1348	1348	1348	1348	1348	1348	1348

Note:

a. ***, **, * indicates statistical significance at the 1% , 5%, and 10% levels.

b. All t-tests are based on White (1980) standard errors.

From the results of model 8, when controlling monitoring costs, information costs, financial distress, and liquidity risk of new shares, in addition, business complexity and corporate governance of companies, the coefficient of the key independent variable PEP_for_cti_i is positive and significant at the 1% level, which is consistent with the expected results in section 3.1. The hypothesis was supported by these results, suggesting that the discount rate is higher for PEPs issued to the controlling shareholders compared with PEPs issued to others, which could originate from the opportunistic behaviour of pursuing private benefit for themselves (controlling shareholders).

However, the coefficient of Firm_size_i is opposite to the expectation, which is positive and significant at the 1% level. Hertzell and Smith (1993) state that large firms

need to be monitored more closely, thus larger discount rates compensate for higher monitoring cost. Additionally, this result is consistent with Liang and Jang (2013). Moreover, although the coefficient of Lev_i is opposite to the expectation, significant statistical correlation was not observed. We also found no statistically significant results for the control variables of business complexity and governance. Except that, the coefficients of other control variables were statistically significant, and as expected.

5. Robustness tests

In the main analysis, this paper calculates the discount rates of PEPs based on pre-announcement exchange price and the empirical result is consistent with the hypothesis. However, in prior studies and in practice, there are several methods for calculating the discount rate of PEPs. There are concerns that the discount rates calculated based on pre-announcement exchange price are not always appropriate. In addition, the control variables in the main analysis may not be able to totally control the effect of the information hypothesis and monitoring hypothesis on the discount rate, which may have affected the empirical results of the main analysis. In other words, there are concerns about whether the higher discount rate of PEPs issued to controlling shareholders can be said to be negatively influenced by controlling shareholders' tunneling behaviour, rather than the information hypothesis or monitoring hypothesis. Therefore, in this section, we conduct two major analyses to evaluate the robustness of our empirical results.

Firstly, in order to control the effect of the method of calculating the discount rate of PEPs on the main analysis results, we use the discount rates calculated in several ways used by prior studies or in practice. Although a number of previous studies have calculated the discount rate using the pre-announcement exchange price (Wruck, 1989; Kato and Schallheim, 1993; Wruck and Wu, 2009; Chen et al., 2010; Aman, 2003; Fukuda, 2010; Yasuda, 2011; Suzuki, 2017), Barclay et al. (2007) argued that it is unclear whether the PEP's announcement affects stock trading on the announcement day, so they used the first available closing price after the day of the initial announcement of PEPs to calculate the discount rates. We calculate the discount rate as in Barclay et al. (2007). We re-calculate the discount rate using the first available closing price after the day of the initial announcement of PEPs and replace the dependent variable of the main analysis with this calculated discount rate to see if we can obtain the same empirical results as in the main analysis. Table 4 shows the empirical results. The coefficient of the key independent variable $PEP_for_ctl_i$ is positive and significant at the 1% level, which is consistent with the results observed in the main analysis. This indicates that regardless of the method for calculating the discount rate of PEPs, the discount rate is higher for PEPs issued to the controlling shareholder compared to PEPs issued to others, and in this sense, the evidence is consistent with the hypothesis of this paper. However, unlike the main analysis, the coefficient of Num_alloc_i is not statistically significant. Thus, the effect of the number of investors in the PEP on the discount rate of the PEP is not confirmed. Then, the coefficients of Lev_i and Z_score_i are also not statistically significant, so we could not

observe the effect of the financial distress of the firms on the discount rate of the PEP. In addition, Table 4 shows that the explanatory power of the regression model is somewhat lower than the main analysis when the discount rate is calculated based on the first available closing price after the day of the initial announcement of the PEP which is used as the dependent variable.

Table 4 Results of robustness test 1

	model1	model2	model3	model4	model5	model6	model7	model8
PEP for cti _i	0.08 [3.31]***	0.0933 [3.90]***	0.107 [4.59]***	0.0797 [3.28]***	0.0812 [3.29]***	0.0825 [3.41]***	0.0927 [3.57]***	0.1069 [4.54]***
PEP for Noncti _i	0.016 [1.42]	0.0117 [0.97]	0.0104 [0.89]	0.0155 [1.37]	0.0189 [1.74]*	0.0142 [1.24]	0.0251 [1.90]*	0.0135 [1.16]
Iss size _i		0.1107 [5.64]***	0.1436 [7.43]***					0.1348 [6.57]***
Num alloc _i		0.0004 [0.22]	0.0024 [1.30]					0.0026 [1.46]
Director _i		0.0036 [0.34]	0.0013 [0.12]				0.0188 [1.56]	0.0024 [0.23]
Firm size _i			0.0223 [9.63]***					0.0211 [7.49]***
BTM _i			-0.0192 [-3.16]***					-0.0228 [-3.69]***
Age _i			0.0086 [1.73]*			0.0119 [2.15]**		0.0094 [1.78]*
Segment _i			0.0006 [0.35]			0.0021 [1.27]		0.0001 [0.08]
Levi _i				0.0307 [1.54]				-0.0348 [-1.77]*
Z score _i				0.0005 [0.87]				-0.0005 [-0.95]
Days _i					0.0015 [5.31]***			0.0007 [2.45]**
Big4 _i							0.0041 [0.47]	-0.0168 [-1.85]*
Constant	0.1095 [4.55]***	0.0663 [2.84]***	-0.1904 [-3.49]***	0.0877 [3.24]***	0.0741 [3.08]***	-0.0124 [-0.22]	0.1053 [4.20]***	-0.1607 [-2.90]***
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.0575	0.1227	0.1964	0.0597	0.0996	0.0626	0.0597	0.2069
Adj-R-squared	0.0249	0.0903	0.1641	0.0257	0.0678	0.0287	0.0258	0.1725
N	1348	1348	1348	1348	1348	1348	1348	1348

Note:

a. ***, **, * indicates statistical significance at the 1% , 5%, and 10% levels.

b. All t-tests are based on White (1980) standard errors.

Secondly, in order to control the effect of the information hypothesis and monitoring hypothesis on the empirical results of the main analysis (hereinafter referred to as the ex-ante controlling shareholder case), we use the case where the controlling shareholders did not exist before the PEP, but the controlling shareholders emerged after the PEP (hereinafter referred to as the ex-post controlling shareholder case), for comparison. Both in the ex-ante controlling shareholder case and the ex-post controlling shareholder case, the discount rate can be affected by the information hypothesis and the monitoring hypothesis, but in the ex-post controlling shareholder

case, controlling shareholders did not exist before the PEP, so tunneling behaviours of controlling shareholders are impossible to carry out. Therefore, apart from the effects of the information hypothesis and monitoring hypothesis, we expect that if the problem of tunneling by the controlling shareholder arises, discounts of the issue price would be more likely to take place in the ex-ante controlling shareholder case than in the ex-post controlling shareholder case. Based on the results of the tests in Table 5, the coefficients of the dummy variable Aft_Ctl_i, which represents the ex-post controlling shareholder case, Lev_i and Z_score_i were not statistically significant. Therefore, it can be said that the reason for the higher discount rate of PEPs to controlling shareholders may not be due to the negative effect of the information hypothesis and monitoring hypothesis, but rather due to the tunneling behaviour of controlling shareholders.

Table 5 Results of robustness test 2

	model1	model2	model3	model4	model5	model6	model7	model8
Aft Ctl _i	-0.0125 [-0.93]	-0.0079 [-0.54]	-0.0152 [-1.07]	-0.0112 [-0.84]	-0.0133 [-1.00]	-0.0137 [-1.02]	-0.0269 [-1.70]*	-0.0192 [-1.37]
Iss size _i		0.0939 [4.61]***	0.1262 [6.24]***					0.1159 [5.41]***
Num_alloc _i		0.0008 [0.45]	0.0028 [1.63]					0.0034 [1.95]*
Director _i		-0.0202 [-1.73]*	-0.0275 [-2.45]**				-0.02 [-1.69]*	-0.0293 [-2.61]***
Firm size _i			0.0228 [9.92]***					0.0208 [7.44]***
BTM _i			-0.021 [-3.73]***					-0.0253 [-4.38]***
Age _i			0.0079 [1.59]			0.0119 [2.17]**		0.0081 [1.56]
Segment _i			0.0002 [0.16]			0.0022 [1.32]		0.0001 [0.06]
Lev _i				0.0222 [1.15]				-0.0348 [-0.61]
Z_score _i				0 [-0.02]				-0.001 [-2.05]**
Days _i					0.0015 [4.90]***			0.0007 [2.51]**
Big4 _i							0.0131 [1.56]	-0.0091 [-1.02]
Constant	0.0916 [3.88]***	0.057 [2.39]**	-0.193 [-3.53]***	0.0766 [2.85]***	0.0563 [2.40]**	-0.0307 [-0.54]	0.086 [3.53]***	-0.1536 [-2.76]***
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.0577	0.1076	0.1897	0.0594	0.1018	0.0631	0.0613	0.2024
Adj-R-squared	0.0259	0.0754	0.1578	0.0261	0.0708	0.03	0.0281	0.1685
N	1348	1348	1348	1348	1348	1348	1348	1348

Note:

a. ***, **, * indicates statistical significance at the 1% , 5%, and 10% levels.

b. All t-tests are based on White (1980) standard errors.

6. Conclusions and limitations

This paper examines the tunneling issue of controlling shareholders, and in particular, this empirical study is conducted to determine whether controlling shareholders are tunneling the wealth of companies by using PEPs, which have been frequently used as a means of equity financing in the Japanese market in recent years. We find that the discount rate is higher for PEPs issued to the controlling shareholders compared with PEPs issued to others. This empirical result is robust considering several methods of calculating the discount rate of PEPs. Furthermore, we find that discounts of PEPs are more likely to take place in the ex-ante controlling shareholder case than in the ex-post controlling shareholder case.

The findings of this paper mainly make three contributions. Firstly, this paper contributes to prior studies and adds to the empirical evidence on the detailed path of tunneling by controlling shareholders. Although there are many prior studies examining tunneling issues around controlling shareholders, it is difficult to identify the specific channels by which the controlling shareholders extract private profits from the firm, because these channels are usually well-concealed. Therefore, these studies have indirectly examined the existence of tunneling, but have not provided a detailed analysis of how they are implemented by controlling shareholders (Zingales, 1994; Bae et al., 2002; Bertrand et al., 2002; Nenova, 2003; Dyck and Zingales, 2004; Atanasov, 2005; Baek et al., 2006). This paper examines the tunneling behaviour of controlling shareholders from the perspective of PEPs, and provides empirical evidence from the Japanese market that controlling shareholders can use PEPs to extract private profits from companies.

Secondly, this paper contributes to prior studies related to determinants of the price discount of PEPs. Prior studies have interpreted the determinants of the discount rate from four main perspectives: the information hypothesis, the monitoring hypothesis, the entrenchment hypothesis, and the rescue hypothesis. However, the factors related to the issue of conflicts of interests among shareholders have rarely been taken into consideration. The emergence of the controlling shareholder may raise conflicts of interests between controlling shareholders and non-controlling shareholders, and the empirical results of this study suggest the effect of the controlling shareholder on the discount rate of PEPs. In particular, this study indicates that the controlling shareholders affect the discount rate of PEPs when they are assigned new shares from PEPs.

Thirdly, this paper contributes to institutional design in practice. With the globalization of securities markets, the issue of conflicts of interests between controlling and non-controlling shareholders has been highlighted in the Japanese market. This paper provides important implications for the improvement of the market environment and corporate governance systems from the perspective of PEPs.

However, there are some limitations to this study. This paper used several measures, such as the price-to-book ratio (PBR), price-to-earnings ratio (P/E ratio), and dividend payout ratio, to analyse the specific incentive of controlling

shareholders using PEPs to implement tunneling. We have attempted to create intersection terms with `PEP_for_ctli` and conducted multivariate analysis, however, no statistically significant results have been observed. In other words, it is not yet clear what incentives the controlling shareholders have to carry out tunneling via PEPs. This may be due to an insufficient number of samples. These issues need to be further examined in the future after expanding the sample size.

7. References

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