

Research about the Impact of Institutional Investors and Major Shareholders on the Discount Rate of Private Placement

Yanping Liu*, Mengmeng Yu, Sisi Wang, and Rong Wang

Abstract—Since the promulgation of the *Measures for the Administration of Securities Issuance by Listed Companies* in May 2006, private placement has become the favorite of equity refinancing in China's capital market, and the number and scale of private issuance have increased by doubled. In the implementation process of the private placement plan, the most significant feature is that the pricing of the additional placement shares has a certain discount rate. The discount rate is an important performance of whether the pricing of the private placement is fair, whether the distribution of the interests of new and old shareholders is reasonable, and whether the equity refinancing of listed companies is efficient. This paper takes listed companies from 2006 to 2014 as samples, combines the research of many scholars at home and abroad on placement discount rate, and uses empirical analysis to study the influence of major shareholders on placement discount rate, the influence of institutional investors on the placement discount rate, and the combined influence of major shareholders and institutional investors on the discount rate of private placement. Through empirical analysis, this paper drew the following conclusions: the participation of major shareholders in placement subscription can increase the discount rate of private placement price; the participation of institutional investors can reduce the discount rate; and when the major shareholders and institutional investors participate in private placement at the same time, the participation of institutional investors will restrain the increase of discount rate of private placement.

Index Terms—Discount rate of private placement, institutional investors, major shareholders.

I. INTRODUCTION

When enterprises choose equity financing, they can choose the way of public offering or non-public offering. From the development process of China's capital market, the way of public offering of shares has always occupied a dominant position. With the reform of the securities market and the growth of market investors, private placement, as a way of private offering, has become the choice of more and more listed companies.

The discount of equity placement is common in capital markets. Wu found that although the US capital market is mature, there is still a discount rate of 9% to 20% [1]; Carpentier, L'Her, and Suret found that private placement discount problem in Canada, and a higher price discount rate [2]. Jia, Li, and Zhang found that the discount rate of private

placement with the participation of major shareholders is higher [3]. At the same time, many theoretical hypotheses explain this phenomenon, and one of the important areas is the relationship between major shareholders and the discount rate of private placement.

There have been a large number of empirical studies showing that institutional investors have obvious professional advantages over the general investors Gibson, Safieddine, and Sonti, have all confirmed that institutional investors are able to tap potential investment opportunities [4-6]. Tong, Xie, and Li found that when an enterprise has good growth, institutional investors' participation in subscription will significantly reduce the discount rate of the issue, and the higher the subscription rate, the lower the discount rate [7].

In order to study the behavior of institutional investors and major shareholders in the process of private placement, this paper uses the combination of theoretical analysis and empirical analysis to study the private placement data in China's capital market from 2006 to 2014, and empirically tests the impact of two important types of private placement participants on the discount rate, which will improve the efficiency of equity financing.

II. RELATED THEORIES AND RESEARCH HYPOTHESES ABOUT THE DISCOUNT RATE OF PRIVATE PLACEMENT

The concept of private placement is divided between broad and narrow sense. Broad directional placement includes directional issuance and directional placement, and private placement in foreign capital markets belongs to this category. In the narrow sense of private placement only means the targeted issuance of shares to qualified investors, and the private placement in China's capital market falls into this category.

A. Related Theories about the Discount Rate of Private Placement

1) *Controlling shareholder self-interest hypothesis*: The actual decision-maker of the company is the controlling shareholder, so the decision-making will inevitably be affected by its pursuit of control for personal interests. There are self-interest behavior in the process of major shareholders in the capital market of many countries. For example, Baek, Kang, and Lee found that the controlling major shareholders generally carried out interest transfer in the process of private placement of Korean enterprises [8]. The controlling shareholder can make their profits by affecting the price of private placement, whether issued at a premium or at a discount.

2) *The supervision cost hypothesis*: Regarding the agency

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problem between shareholders and management, Wruck proposed a "regulatory hypothesis", believing that the private placement process is also the process of introducing active supervisors of the company [9]. Because the stock shares subscribed in the private placement are generally large and all have a lock-up period of one to three years, the subscription participants have a strong regulatory incentive for the company they have invested in, and even participate in the internal governance and management of the company to ensure that they can make a maximum profit. Therefore, the discount of the private placement price is a compensation for the future cost of supervision of the subscription participants.

3) *Liquidity compensation hypothesis*: In addition to having price discounts, another significant feature is having a limited sale period. As in the domestic situation, foreign listed companies directed additional issuance of shares have 1-3 years of sale. It is precisely because of the existence of the restricted sale period that seriously affects the liquidity of private placement stocks. Some scholars believe that the liquidity restriction is an important reason for the discount rate of private issuance. Silber studied private equity cases of 69 listed companies in the U. S. capital markets and found that stocks with lock-up periods had a discount rate of up to 34%. She believed that it is a liquidity compensation for investors not to buy or sell stocks immediately [10].

B. Research Hypothesis

In the equity structure of listed companies in China, the phenomenon of "one share is dominant" has existed for a long time, which provides convenience for major shareholders to seek personal gain.

When issuing a discount, if the original shareholders want to make a profit through subscription, the subscription ratio must exceed the original holding ratio. The economic meaning behind this behavior is: if the proportion of major shareholders owning the equity of the listed company before the private placement is α , the subscription ratio of the majority shareholders in the private placement is β . As a new shareholder participating in the private placement, the major shareholder will receive $1*\beta$ yuan, but at the same time serve as the old shareholder, its loss is $1*\alpha$ yuan. If $\beta > \alpha$ exists, then the net profit ($\beta - \alpha$) is positive. It can be seen that whether major shareholders can profit from private placement is determined by two factors: the price of private placement and the proportion of major shareholders' subscription. Accordingly, the paper presents the first hypothesis:

H1: The discount rate for private placement is negatively related to the difference between the shareholding ratio of major shareholders before private placement and the subscription ratio in private placement.

From the perspective of view of signal theory, the participation of institutional investors sends a positive signal to the market, because other investors believe in the professionalism of institutional investors, prompting them to have more optimistic expectations for listed companies, and thus they can also accept relatively high pricing. A second hypothesis is proposed from this paper:

H2: The higher the proportion of institutional investors who subscribe for shares in the private placement, the lower the discount rate of the issue price.

Due to institutional investors' stronger supervision ability, their participation has released positive information, which makes other investors more optimistic about the quality of the company and the future prospects, and enhances their confidence. This introduces multi-party competition in the pricing link and boosts the final issue price. Accordingly, this paper proposes a third hypothesis:

H3: The impact of major shareholders on the additional issue price discount rate will be weakened by the participation of institutional investors.

III. RESEARCH DESIGN

A. Sample Selection and Data Source

The data of this paper are mainly derived from the wind database, and the private placement of listed companies in Shanghai and Shenzhen from January 1, 2006 to December 31, 2014 was selected as the research sample. To ensure the rationality of the study results, the data were removed as follows:

Excluding the first-class sample of the financial industry in the industry classification of the CSRC (China Securities Regulatory Commission). Excluding the sample of shareholders after refinancing additional placement. Excluding the samples being ST during additional placement.

After the above screening, the sample size of studies meeting the criteria was 1577.

B. Variable Definition

The measurement and symbolic representation of the explained variables, explanatory variables and control variables are shown in Table I.

C. Model Setting

Based on the previous analysis, the following three models are constructed.

Eq. (1) is used to verify the impact of major shareholders on the discount rate of private placement:

$$Discount = \beta_0 + \beta_1 Tunnel + \beta_2 Liquidity + \beta_3 Size + \beta_4 Fraction + \beta_5 Lev + \sum \beta_i Industry_i + \sum \beta_j Year_j + \varepsilon \quad (1)$$

Eq. (2) is used to verify the impact of institutional investors on the discount rate of private placement:

$$Discount = \beta_0 + \beta_1 INS + \beta_2 Liquidity + \beta_3 Size + \beta_4 Fraction + \beta_5 Lev + \sum \beta_i Industry_i + \sum \beta_j Year_j + \varepsilon \quad (2)$$

Eq. (3) is used to verify whether the participation of institutional investors in the process of private placement plays a restraining role in the tunneling effect of major shareholders:

$$Discount = \beta_0 + \beta_1 Tunnel + \beta_2 INS_1 + \beta_3 Tunnel \times INS_1 + \beta_4 Liquidity + \beta_5 Size + \beta_6 Fraction + \beta_7 Lev + \sum \beta_i Industry_i + \sum \beta_j Year_j + \varepsilon \quad (3)$$

Under this model, the partial effect of major shareholder tunnel effect on private placement discount rate is (keep all other quantities unchanged):

$$\frac{\Delta Discount}{\Delta Tunnel} = \beta_1 + \beta_3 \times INS_1 \quad (4)$$

When the institutional investor does not participate in the subscription, namely $INS_1=0$, the impact on the discount rate is β_1 ; when the institutional investor participates in the subscription, namely $INS_1=1$, the impact on the discount rate is $\beta_1 + \beta_3$.

TABLE I: VARIABLE'S DEFINITION

Type of variable	Variable	Symbol	Variable interpretation
explained variable	rate discount	<i>Discount</i>	The difference between the closing price on the announcement date and the private placement price divided by the closing price on the date of announcement
	tunnel effect	<i>Tunnel</i>	The difference between the original shareholding ratio of major shareholders in the company minus the proportion subscribed in participating in private placement
explanatory variable	Participation of institutional investors	<i>INS</i> <i>INS_1</i>	The subscription ratio of institutional investors in the private placement Whether institutional investors participate in the private placement activities
	flowability	<i>Liquidity</i>	Three times the subscription ratio of private placement by major shareholders plus the subscription ratio of other specific investors
controlled variable	company size	<i>Size</i>	Natural log of the total company assets
	Issue scale	<i>Fraction</i>	The natural log of the amount of this additional issue
	financial leverage	<i>Lev</i>	Asset-liability ratio after excluding advance income
	Industry dummy variable	<i>Industry</i>	According to the industry classification standards of the CSRC, 15 industry dummy variables are set
	Year dummy variable	<i>Year</i>	From 2006 to 2014, 8 year dummy variables were set

IV. EMPIRICAL ANALYSIS AND CONCLUSIONS

A. Descriptive Statistical Analysis

Descriptive statistical analysis of the variables is shown in Table II.

As can be seen from Table II, Column (1) describes the various properties of the discount rate of private placement. Line (2) of Column (1) indicates that the average level of the discount rate is 22%, indicating that our private placement price is basically about 80% of the closing price of the announcement day, and there is an obvious deviation of 10% compared with the stipulation that “the stock offering price of listed companies should not be lower than the average stock

price of 20 trading days before the pricing base date”.

The numbers in Lines (1) (4) and (5) indicate that the minimum of the discount rate is -14% and the maximum is 90%. The negative discount rate indicates the existence of premium issuance, but in the absolute value, the premium degree is far less than the discount degree.

B. Correlation Test

To initially verify the correlation between variables and also to prevent multiple collinearity between variables, we first Spearman tested the variables with the results shown in Table III.

TABLE II: DESCRIPTIVE STATISTICS OF VARIABLES

Variables	<i>Discount</i> (1)	<i>Tunnel</i> (2)	<i>INS</i> (3)	<i>INS_1</i> (4)	<i>Liquidity</i> (6)	<i>Size</i> (7)	<i>Fraction</i> (8)	<i>Lev</i> (9)
(1) N	1577	1577	1577	1577	1577	1577	1577	1577
(2) Mean	0.22	0.13	0.56	0.75	1.45	21.88	2.06	0.53
(3) Media	0.21	0.24	0.69	1.00	1.00	21.70	1.96	0.49
(4) Min	-0.14	-0.91	0.00	0.00	1.00	18.74	-1.02	0.00
(5) Max	0.90	0.89	1.00	1.00	3.00	26.38	6.12	12.38
(6) 25%per	0.09	0.00	0.01	0.00	1.00	21.06	1.37	0.34
(7) 50%per	0.21	0.24	0.69	1.00	1.00	21.69	1.96	0.50
(8) 75%per	0.36	0.41	1.00	1.00	1.63	22.57	2.74	0.65
(9) Std	0.27	0.39	0.41	0.43	0.73	1.20	1.04	0.54

TABLE III: SPEARMAN CORRELATIONS ANALYSIS OF VARIABLES

Variables	<i>Discount</i> (1)	<i>Tunnel</i> (2)	<i>INS</i> (3)	<i>INS_1</i> (4)	<i>Size</i> (5)	<i>Fraction</i> (6)	<i>Lev</i> (7)	<i>Liquidity</i> (8)
(1) <i>Discount</i>	1							
(2) <i>Tunnel</i>	-0.360*	1						
(3) <i>INS</i>	-1.370***	0.516***	1					
(4) <i>INS_1</i>	-0.091***	0.451***	0.758***	1				
(5) <i>Size</i>	-0.176***	-0.089***	0.001	-0.041*	1			
(6) <i>Fraction</i>	0.001	-0.076***	-0.017	-0.005	0.611***	1		
(7) <i>Lev</i>	-0.090***	-0.084***	0.069**	0.036*	0.426***	0.228***	1	
(8) <i>Liquidity</i>	-0.006	-0.769***	-0.570***	-0.494***	0.235***	0.169***	0.135***	1

Note: ***, **, * indicate significant at the 1%, 5%, and 10% levels.

The numbers in Line (2) of Column (1) indicates that the correlation between the tunnel effect of major shareholders and discount rate is significant at the level of 10%, the number in Line (3) of Column (1) indicates that the correlation between the institutional investors' subscription ratio and discount ratio is significant at the level of 1%, and the number in Line (4) of Column (1) indicates that the correlation between the institutional investors participation and discount rate is significant at the level of 1%. All three are negatively correlated with the discount rate, which is in line with the research hypothesis.

C. Regression Analysis

The results are shown in Table IV. Among them, Columns (1) and (3) have no control variables, while Columns (2) and (4) have control variables.

As can be seen from Model 1 in Table IV, regardless of whether control variables are added to the regression equation, the tunneling effect of major shareholders is significantly negatively correlated with the discount rate of private placement. Hypothesis 1 is verified.

Although the liquidity of the private placement and the private placement discount rate are negatively related, it is not significant. This article believes that this is because the major shareholders were originally the “insiders” of private placement companies, and their participation in private placement subscriptions is based on the judgment of all external information and internal information they have learned.

It can be seen from Model 2 that regardless of whether the control variable is added to the regression equation, the main explanatory variable of institutional investor subscription

ratio is negatively correlated with the private placement discount rate, and the results are significant at the 1% level. This shows that when institutional investors participate in the process of private issuance, they have indeed given full play to their own advantages in information collection, professional ability, scale investment and corporate governance, effectively inhibiting the too high discount rate and improving the issuance price to a certain extent. Hypothesis 2 is verified.

To sum up, institutional investors are "outsiders", and their investment decisions rely more on the public information that can be collected in the market. Major shareholders belong to "insiders", and can more fully understand the information of all aspects of the private placement company itself, and about the company collected in the market.

In Model 3, the tunneling effect of major shareholders is negatively correlated with the discount rate of private placement, and the result is significant at the 1% level, indicating that major shareholders have benefit transmission behavior in the process of private placement. The regression coefficients of the cross-variables are positive and are significantly correlated at the 10% level. According to (4), when institutional investors participate in the private placement process, INS_1 takes a value of 1. At this time, the degree of influence of the tunnel effect of the majority shareholder on the discount effect of private placement is $=-0.210+0.07=-0.140$, which is still a negative impact, but to a lesser extent than when only major shareholders participated in the private placement process. It can be seen that the participation of institutional investors has indeed restrained the influence of major shareholders on the price of private placement. Hypothesis 3 has been verified.

TABLE IV: THE REGRESSION ANALYSIS

Variables	Model 1		Model 2		Model 3
	(1)	(2)	(3)	(4)	(5)
Constant	36.576*** (13.399)	156.585*** (10.925)	38.940*** (14.064)	152.516*** (10.672)	161.822*** (11.231)
Tunnel	-0.39* (-1.649)	-0.188** (-1.994)			-0.210*** (-2.721)
INS			-0.106*** (-4.544)	-0.138*** (-4.711)	
INS_1					-0.081*** (-2.721)
Tunnel*INS_1					0.070* (1.832)
Liquidity		-0.075 (-1.237)		-0.053* (-0.079)	-1.70** (-2.469)
Size		-0.265 (-8.321)***		-0.254*** (-8.012)	-0.261*** (-8.193)
Fraction		0.222 (7.246)***		0.0212*** (6.952)	0.230*** (7.490)
Lev		0.043 (1.844) *		0.052** (2.281)	0.042* (1.797)
Industry	-	-	-	-	-
Year	-	-	-	-	-
F	13.931	15.516	14.860	16.229	14.843
Adj-R ²	0.165	0.205	0.174	0.213	0.209
DW	1.713	1.729	1.734	1.745	1.743

Note: t-values in parentheses, ***, **, * indicate significant at the 1%, 5%, and 10% levels.

D. Test of Robustness

This paper replaces the variables that measure major

shareholder behavior and institutional investor behavior, respectively, with the following robustness tests:

Replace the tunneling effect (Tunnel) with the major shareholder Subscription ratio (Share), the regression to Model 1. Replacing the subscription proportion of institutional investors (INS) with the institutional investor participation ratio (Number), the return to Model 2, and the results are shown in Table V.

As can be seen from Table V, in Model 1, the subscription proportion of major shareholders is significantly and positively related to the discount rate of private issuance at the level of 10%, indicating that the higher the subscription proportion of major shareholders, the higher the discount rate, and the lower the price of private placement. In Model 2, the proportion of institutional investors participating is inversely related to the discount rate of private placement, and the results were significant at the 1% level.

In Model 3, the subscription proportion of major shareholders is positively related to the discount rate of private issuance, and the results are significant at the 5% level. The correlation coefficient of the variable of whether institutional investors participate (INS_1) and the discount rate of private placement is significantly not zero. The regression coefficients for the cross-variables were negative and significantly correlated at the 1% level. According to (4), when institutional investors participate in the process of private placement, INS_1 is 1. At this time, the influence of the tunnel effect of the major shareholder on the discount effect of private placement is $=0.152-0.071=0.081$, still positive, but less influential. Thus, the participation of institutional investors has suppressed the impact of major shareholders on the price of private placement.

TABLE V: THE REGRESSION ANALYSIS

	Model 1	Model 2	Model 3
Constant	156.103*** (10.824)	151.733*** (10.670)	154.355*** (10.722)
Share	0.036* (1.518)		0.152** (2.131)
Number		-0.143*** (-4.987)	
INS_1			-0.079** (-2.711)
Share*INS_1			-0.071*** (-3.002)
Liquidity		-0.054* (-1.827)	
Size	-0.276*** (-8.741)	-0.252*** (-7.951)	-0.272*** (-8.641)
Fraction	0.222*** (7.250)	0.0218*** (7.173)	0.229*** (7.487)
Lev	0.046** (2.012)	0.051** (2.223)	0.045** (1.968)
Industry	-	-	-
Year	-	-	-
F	15.913	16.469	15.751
Adj-R ²	0.204	0.216	0.208
DW	1.730	1.749	1.741

Note: t-values in parentheses, ***, **, * indicate significant at the 1%, 5%, and 10% levels.

V. EMPIRICAL CONCLUSIONS AND POLICY RECOMMENDATIONS

In this paper, the following conclusions are obtained by a

regression analysis of the sample data: The participation of major shareholders will increase the discount rate of private placement, and major shareholders will tend to lower the stock price of private placement.

Institutional investors participating in the process of private placement can reduce the discount rate of private placement and increase the price of private placement.

When institutional investors and major shareholders simultaneously participate in the process of private placement, the two will have an impact on each other.

Based on the above conclusions, the paper puts forward the following policy recommendations: When a listed company chooses private placement as a means of equity refinancing, the regulatory authorities should pay special attention to the behavior and decisions of the major shareholders, prevent them from manipulating the pricing, and infringe on the interests of the listed companies and the minority shareholders in the name of private placement.

Encourage more institutional investors to participate in the process of private placement of listed companies, form checks and balances with the control of major shareholders, improve the fairness of private placement with the professionalism of institutional investors, ensure the interests of listed companies and minority shareholders, so as to make the price of private placement more reasonable and the process more market-oriented.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Yanping Liu determined the research theme and grasped the overall situation. Mengmeng Yu collected data, downloaded data and conducted data analysis. Sisi Wang revises and translates papers. Rong Wang corrects the detail error and adjusts the format.

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