

The impact of private placement on the business performance of listed companies -- an empirical study based on factor analysis

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Abstract: After the reform of non-tradable shares, private placement, as a way of equity refinancing, has gradually become an important way for listed companies to obtain working capital. Its issuance is more convenient and flexible, and the funds obtained by the company can also be used to optimize the allocation of corporate resources, so as to improve business performance and sustainable development ability. Therefore, compared with other financing methods, the private placement has unique advantages, and also occupies a considerable proportion in equity refinancing. Many scholars at home and abroad have discussed and studied it, but there are few studies on the impact of private placement on the business performance of listed companies, and the conclusions of the studies are difficult to reach a consensus. The impact of private placement on business performance is the main research content of this paper, through the quantitative processing of enterprise performance, to study the impact of private placement on the business performance of listed companies. This paper first makes a theoretical analysis on how the private placement affects the business performance, that is, how the private placement affects the business performance; On this basis, the paper constructs the index system of the company's business performance, and analyzes the changes of the company's business performance before and after the private placement with the method of factor analysis. Finally, according to the results of empirical research, the possible causes of this result are analyzed, and then the corresponding policy suggestions are put forward.

1. Introduction

Private placement refers to the behavior of equity refinancing by a listed company to no more than 10 qualified investors in the form of non-public development. After the promulgation of the new Securities Law in 2006, the formal implementation of the law and the reform of non-tradable shares, the private placement in China gradually developed and became mature. Now, the financing amount of private placement has accounted for the majority of the total equity refinancing, and has become the main method of equity refinancing in China.

The financing method of private placement has its irreplaceable advantages. First, the issue is aimed at major shareholders and institutional investors, which can avoid the idea of "circling money" to medium and small investors and restore market confidence. Second, the existence of the lock-up period can avoid the impact of spot expansion on the secondary market; Third, if the private placement is used to inject high-quality assets into the company and increase the company's earnings, it will be beneficial to the development of the company and even the national economy, and at the same time achieve a "win-win situation" between large and small shareholders. However, private placement, problems, such as low price issue, such as injection of bad assets, the indemnification, academia on the purchase of relevant research also is relatively abundant, but most of these studies focused on the private placement and big shareholders transport problems, the discount effect of directional issuance, earnings management and corporate governance, There are few researches on the relationship between private placement and business performance. On this basis, this paper studies the impact of private placement on business performance, so as to infer whether the private placement will bring positive or negative effects to the company.

2. Literature Review

This study is considering the impact on the operating performance, involved in the research of this field in China and abroad generally focused on the three point of view, the first is to mainly explore the problems caused by the purchase and the impact on the operating performance, such as Linck scholar (2002) observed the U.S. after implementation of the purchase, the company's share price performance and business performance, Found that the company's performance was not improving; Lee(2006) and other scholars found that the private placement actually reduced the performance of the company, and concluded that the reason might be that the major shareholders took advantage of the private placement to seek personal gains. Xu Xiaoxiao et al. (2015) showed in their research that the private placement would increase the company's business performance in the short term, while the business performance in the long term would decline to before the private placement. Such a result would result in the suspected hollowed out of the company by major shareholders.

Second perspective is mainly to explore the issue type, that is, to large shareholders or actual controllers, to institutional investors, or other eligible investors to raise a different impact on company performance, such as Wang Lijie scholar (2014) study found that major shareholders holdings and significantly positively related to institutional investors subscribe to financial performance, Mainly because of ownership concentration increase that big shareholders can better play a role of supervision, perfect the corporate governance, make up the company's financial performance is strong, institutional investors play a supervision function also has a positive influence on performance, but different scholars on the issue of the results are not consistent, the scholar li ju (2009) study, A private placement to institutional investors will not improve the company's performance.

The third perspective is an in-depth analysis of the mechanism of private placement affecting corporate operating performance. For example, Zhang Bo et al. (2019) opened the "black box" from private placement to corporate performance and proposed two intermediary variables, "corporate governance" and "operational risk", to explore the mechanism of private placement acting on business performance.

3. The main problems existing in private placement

3.1 Transmission of interests of controlling shareholders

New securities laws recommend that the listed company purchase price cannot under 90% of pricing benchmark of 20 trading days ago on average, but for price setting, distribution, release amount of objects made no clear rules, major shareholders have larger selection control over for these uncertainties, the controlling shareholder can take means to manipulate stock price, low price issue, In order to achieve from the listed company to its interests.

Taking the case study of Yunnan Chihong Zinc and Germanium Co., Ltd by Zhu Hongjun et al. (2008) as an example, the controlling shareholder suffered stock price setbacks through a series of trading suspension and earnings management behaviors before the issuance of the private placement plan, thus saving a huge amount of acquisition funds for the major shareholder as the target of the private placement. By calculating the earnings per share of the company before and after the private placement, it is found that the private placement dilutes the equity, reduces the earnings per share, dilutes the value of other shareholders and damages the interests of small and medium shareholders.

3.2 Inadequate regulations and regulations allow companies to change the use of capital at will

Private placement in China's development time is shorter, the regulatory measures and regulations also has many imperfect as well as the need to improve place, some listed companies because of regulatory loopholes and the information asymmetry between the companies and investors, will consider to raise money for any other purpose, the original announcement for the production of construction funds for other purposes, affect the company, To some extent, it damages the interests of investors. Institutional and regulatory issues make it possible for major shareholders of listed companies to seek their own interests by changing their capital orientation.

3.3 Liquidity risk caused by information asymmetry and the lockup period

The objects of private placement are mostly concentrated in institutional investors and specific investors, but information asymmetry still exists, and the equity held by private placement has a certain lockup period. During the lockup period, the subscription funds cannot flow, and once the stock price continues to fall, investors will suffer heavy losses.

4. Empirical analysis of private placement of listed companies

4.1 Selection of sample data

This paper mainly explores the changes in the business performance of listed companies before and after the private placement. It selects the listed companies that implemented the private placement in China in 2016 as samples to analyze the changes in the business performance of the year before the private placement (T-1), the year after the private placement (T), the first year after the private placement (T +1), and the second year after the private placement (T +2), that is, from 2015 to 2018. The sample selection process is as follows: Based on the concept of private placement, select no more than 10 institutional investors, major shareholders or other qualified investors who will be issued by way of non-public placement in 2016; Exclude listed companies with continuous loss of ST and *ST during sample selection to reduce the impact of extreme conditions on the experimental results; If the same listed company has issued additional shares several times in 2016, only one private placement will be taken; Excluded listed companies with abnormal changes in operating data and incomplete operating performance data; Eliminate delisted private placement listed companies.

4.2 Model construction

1) Index selection

From the perspective of financial indicators, this paper selects four representative categories of first-level indicators, including profitability, debt paying ability, growth ability and operation ability, as well as eight second-level indicators, as shown in Table 1.

Table.1. Financial index system

Level indicators	Secondary indicators	Variables
profitability	EPS	X1
	ROE	X2
debt paying ability	Current ratio	X3
	Asset-liability ratio	X8
Growth ability	Growth rate of revenue	X4
	Growth rate of net profit	X5
Operation ability	Inventory turnover	X6
	Total asset turnover	X7

2) Suitability test

Before using factor analysis method to process the original data, statistical software SPSS25.0 was used to conduct KMO sampling fitness and Bartlett sphericity test for the partial correlation matrix among 8 variables in each year from 2015 to 2018. The results are shown in Table 3, 4, 5 and 6. It can be seen from the data that Kaiser-Meyer-Olkin values are 0.643 >0.6, 0.630>0.6, 0.658>0.6, and 0.675>0.6 respectively. Meanwhile, the significance Sig of Bartlett's spherical degree test is 0 < 0.01, thus rejecting the original hypothesis. The correlation coefficient matrix is significantly different from the identity matrix. Therefore, the sample data are suitable for factor analysis.

Table.2. KMO and Bartlett test (2015)

KMO Measure of Sampling Adequacy		0.643
Bartlett's Test of Sphericity	The approximate chi-square	236.773
	Degrees of freedom	28
	Significance	0

Table.3. KMO and Bartlett test (2016)

KMO Measure of Sampling Adequacy		0.630
Bartlett's Test of Sphericity	The approximate chi-square	184.679
	Degrees of freedom	28
	Significance	0

Table.4. KMO and Bartlett test (2017)

KMO Measure of Sampling Adequacy		0.658
Bartlett's Test of Sphericity	The approximate chi-square	202.688
	Degrees of freedom	28
	Significance	0

Table.5. KMO and Bartlett test (2018)

KMO Measure of Sampling Adequacy		0.675
Bartlett's Test of Sphericity	The approximate chi-square	197.491
	Degrees of freedom	28
	Significance	0

3) Extraction of common factors

This paper takes 2018 as an example to explain the analysis process and steps in detail. The other three years will not be described in detail. Common factors were extracted according to principal component analysis, and the results were shown in Table 7. From the initial total eigenvalues corresponding to the factors, there are 4 eigenvalues greater than 1, and the percentage of the total variance explained by the rotated factors is 29.12%, 21.67%, 14.57% and 13.10% respectively. The 4 factors explain 78.45% of the total variance of the original variables in total. Therefore, the four principal components extracted basically contain the main information of all variables and can be used as common factors.

Table.6. Variable eigenvalue and variance contribution value

Initial eigenvalue			Sum of the squares of the rotating loads		
Total	Percentage of variance	accum%	Total	Percentage of variance	accum%
2.549	31.867	31.867	2.329	29.117	29.117
1.583	19.784	51.65	1.733	21.665	50.783
1.116	13.945	65.596	1.166	14.572	65.355
1.028	12.855	78.451	1.048	13.096	78.451

4) Rotate and interpret the common factor

The load matrix after orthogonal rotation was obtained by the maximum variance method for common factors, as shown in Table 8. The first common factor has a higher load value in earnings per share and return on equity, which reflects the profitability of the enterprise and is regarded as the profit factor. The second common factor has a higher load value on the current ratio, which reflects the solvency of the enterprise and is recorded as the debt paying factor. The third factor has a higher load value on the growth rate of net profit, which reflects the profitability of the enterprise and is recorded as the profit factor. The fourth factor has a higher load value on the total asset turnover, which reflects the operating capacity of the enterprise and is recorded as the operating factor.

Table.7. Rotation component matrix

Variables	Component			
	1	2	3	4
VAR00001	0.811	0.151	-0.159	-0.027
VAR00002	0.895	0.128	-0.066	0.039
VAR00003	0.101	0.913	0.016	-0.131
VAR00004	0.12	-0.089	0.094	0.092
VAR00005	0.809	0.001	0.864	0.044
VAR00006	0.027	0.024	-0.012	0.169
VAR00007	0.36	-0.152	-0.617	0.982
VAR00008	-0.11	-0.911	0.003	-0.159

Extraction method: principal component analysis
Rotation method: Kaiser normalized maximum variance

5) Factor score

The final result of identifying factors by component matrix will be shown in the factor scoring coefficient matrix, as shown in Table 9. The four common factors are represented as linear combinations of eight variables. The scores of the four extracted common factors were recorded as F1, F2, F3 and F4, and the observed values of the eight indicator variables (each indicator variable was the average of 91 companies) were multiplied by their load amounts and summed, and four linear equations were established to obtain the factor scores:

Table.8. Component score coefficient matrix

Variables	Component			
	1	2	3	4
VAR00001	0.344	0.015	-0.072	-0.078
VAR00002	0.388	-0.008	0.018	-0.019
VAR00003	-0.031	0.534	0.006	-0.129
VAR00004	0.132	-0.078	0.769	0.094
VAR00005	0.389	-0.081	0.156	-0.008
VAR00006	-0.052	0.016	0.006	0.945
VAR00007	0.115	-0.114	-0.504	0.13
VAR00008	0.047	-0.534	0.006	-0.15

$$F_1=0.344X_1+0.388X_2-0.031X_3+0.132X_4+0.389X_5-0.052X_6+0.115X_7+0.047X_8$$

$$F_2=0.015X_1-0.008X_2+0.534X_3-0.078X_4-0.081X_5+0.016X_6-0.114X_7-0.534X_8$$

$$F_3=-0.072X_1+0.018X_2+0.006X_3+0.769X_4+0.156X_5+0.006X_6-0.504X_7+0.006X_8$$

$$F_4=-0.078X_1-0.019X_2-0.129X_3+0.094X_4-0.008X_5+0.945X_6+0.13X_7-0.15X_8$$

6) Integrate score

$$F_j=\alpha_1F_1+\alpha_2F_2+\alpha_3F_3+\alpha_4F_4$$

F_j ($j=2015, 2016, 2017, 2018$) represents the comprehensive score of the company in each year; F_i ($i=1, 2, 3, 4$) represents the common factor; α_i is the variance contribution rate of each common factor; the variance contribution rate of each factor is equal to the variance of this common factor divided by the sum of the variances of all common factors. Taking 2018 as an example, the mean values of the 8 indicators were substituted into the linear equation in 3.3.4, and the following results were obtained: $F_1=-7.02$, $F_2=-25.17$, $F_3=48.36$, and $F_4=6.54$

F_1 variance contribution rate $=(29.11\%)/(78.45\%)=0.37$; The variance contribution rate of F_2 $=(21.66\%)/(78.45\%)=0.28$; The variance contribution rate of F_3 $=(14.57\%)/(78.45\%)=0.19$; The variance contribution rate of F_4 $=(13.09\%)/(78.45\%)=0.16$

$$\text{Overall score in 2018 } F=0.37F_1+0.28F_2+0.19F_3+0.16F_4=0.5898$$

7) Results of Empirical Analysis

After analyzing the original operating performance data of the listed companies in the four years before and after the private placement, we can determine the comprehensive score function of each

observation factor according to the score results of the factors. According to the existing research data in this paper, the comprehensive score of each year is calculated as follows:

Table.9. Integrate scores

Year	F ₁	F ₂	F ₃	F ₄	Integrate score
2015	-0.8468	-20.7967	-12.5937	-1.3124	-8.0573
2016	13.1654	25.6244	11.5390	18.3369	20.5388
2017	13.7639	26.6433	9.2587	8.8961	14.7659
2018	-7.0230	-25.1706	48.3575	6.5372	0.3813

Table.10. Scores Comparison

F	$F^0 - F^{-1}$	$F^1 - F^0$	$F^2 - F^1$
	28.596	-5.7729	-14.3846
F	$F^0 - F^{-1}$	$F^1 - F^{-1}$	$F^2 - F^{-1}$
	28.596	22.82318	8.438578

Through the comparison of the comprehensive scores in the table above, it can be seen that private placement can bring some improvement to the business performance of enterprises, but as time goes by, this positive effect gradually weakens. From the perspective of year by year, the operating performance of the year of the private placement is significantly improved compared with that of the previous year, and the comprehensive score of the year after the private placement is decreased compared with that of the year before the private placement, but it is still significantly higher than that of the year before the private placement. The comprehensive score and performance of the second year after the private placement also declined compared with the first year after the private placement, but it was still higher than the level of the year before the private placement.

5. Conclusions and recommendations

5.1 Research conclusions

The implementation of private placement has a significant improvement effect on the business performance of listed companies, but this improvement effect will be weakened with the passage of time. Through the analysis of financial indicators, it is found that in the year of additional issuance, the profitability reflected by earnings per share and return on equity, and the growth ability reflected by return on equity and growth rate of operating income have significantly improved. However, the solvency reflected by the current ratio and the asset-liability ratio only increased significantly one year after the additional issuance, indicating that the impact of additional issuance on the solvency of enterprises has a delayed effect to a certain extent. Private placement has a negative impact on inventory turnover and total asset turnover, and these two indicators show a general trend of decline on the whole.

5.2 Analysis of causes

It can be seen from the results of this article, consider the company's overall business performance improved, this is in conformity with the objective knowledge, consider to increase the efficiency of the use of idle funds, funds in the form of capital into the company, to a certain extent, help enterprises to achieve economies of scale, expand production, optimize the industrial structure, so as to improve the management level of enterprises. When the issuing object is the major shareholders, the private placement can increase the ownership concentration degree, so that the major shareholders can better play the supervisory role to reduce the agency cost and improve the operating conditions of the company.

It is worth noting that the company's debt paying ability did not significantly increase in the year of the private placement, but increased significantly in the second year after the private placement. The possible reasons are as follows: First, it takes a certain time for the fund to be raised, and after the fund

is raised, the company must analyze the current operating situation to gradually decide the use of the fund, which process also has a certain time lag. Second, the issue cost can not be ignored, the current ratio and asset-liability ratio to a certain extent also reflect the cash liquidity of the enterprise, when the fund has not been raised in place, the company will have a large amount of fundraising expenses, the existence of this situation will worsen the cash flow of the enterprise.

Some research conclusions on the condition of private placement influence company roughly divided into three categories, the first is its had no obvious effect on the company's operating performance, due to the existence of information asymmetry, the listed company may not be released according to its issuance plans to use funds of funds, but changed the money purpose, not for the company's production and operation; The second is the existence of negative influence, because there are shareholders to use the control of the company to carry out the problem of interest transmission; Third, it has an impact, but it can be divided into long-term impact and short-term impact. In the short term, the business performance will be significantly improved, but in the long term, the business performance of the company will be worse than before the additional issuance, that is, there will be a negative impact. The research conclusion of this paper is that the private placement has significantly improved the company's operation, and the reasons are as follows: Consider the surviving time is not long in our country, in the process of practice, the corresponding regulation and system are also constantly improve, with the strengthening of the supervision and auditing issues by directional, before the problems arising from the purchase a certain improvement, the purpose of the funds need to experience greater scrutiny, capital quality has been improved, Reflected in the company level is the overall operating conditions of the company has been improved, private placement in the company's business performance on the improvement of the effect is also more significant.

5.3 Suggestions

Considering the purpose of the system settings is that regulators want companies can profit oriented secondary unique advantages to strengthen the company's financing ability, for immediate available funds, in order to improve the company's overall level, promote the economic development, but due to system construction and regulatory system is not perfect, cause the loopholes of listed companies, causing the occurrence of a series of problems, Therefore, in order to strengthen the positive impact of private placement on the capital market, we should improve the system construction and strengthen supervision.

The influence of private placement on the company's business performance is related to the company's internal governance level. Orderly and efficient governance structure can strengthen the positive impact of private placement on the company, so optimize the governance structure, enhance the management ability, and then improve the company's ability to use and integrate resources; Improve the construction of relevant systems of the company, reasonably regulate and limit the rights of shareholders, and effectively use the private placement to improve the company's operating performance.

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