The Empirical Research on Monthly Effect of IPO Underpricing in The Chinese A-Share Market

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Abstract: Chinese A-share market has established for many years, the IPO underpricing calendar effect as abnormal phenomena still exist. To study the IPO underpricing phenomenon further, this paper combined these two abnormal phenomena to research the calendar effect of the IPO underpricing in the Chinese A-share market. The results show that the information asymmetry and investor behavior paid important roles to the IPO underpricing of the Chinese A-share market. Compared with January, IPO underpricing has the calendar effect: February had a negative monthly effect, and April, June, August, November and December had the positive monthly effect.

1. Introduction

In China, the stock market was established relatively late. In the 30-40 years, Chinese capital markets become mature, more and more companies raised funds through initial public offerings (IPO). IPO underpricing is that the first-day closing price of initial public offerings is generally higher than the issue price, and is widely regarded as one of the anomalies in the capital market. It's commonly known that; the calendar effect is also abnormal in the share market. In Chinese market, there are many researches about IPO underpricing and calendar effect, but studied respectively: some research believes that the greater the degree of information asymmetry [1,2,3], the more serious IPO underpricing level and investor sentiment has a significant impact on IPO underpricing [4,5]). What's more, others have studied the calendar effect based on the specific stock market, and have drawn a conclusion that the week effect and the month effect exist in Stock Market [6,7,8]. But few studies have combined the two [9].

The causes of IPO underpricing are most from information asymmetry, investor behavior, system, and so on. However, the reasons for the calendar effect vary from market to market. Chinese A-share market has its own characteristic. This paper holds the view that the Chinese A-share market may have whitewash effect, information effect and festival effect. Whitewash effect is the phenomenon of rising stock prices in special trading periods, such as the end of the quarter and the end of the year. Information effect explains that information disclosure in the stock market will affect the price of shares, such as disclosing quarterly report, semi-annual report [10]. Holiday effect demonstrates that the average stock return rate during the holidays is a significant difference in other time. For example, during the Spring Festival (usually in February of the Solar calendar), people are in a good mood [11], and it can have an influence on the IPO underpricing rate. This paper had a research of the monthly effect of IPO underpricing in the Chinese A-share market. Based on the above statement, the following three assumptions were put forward: (1) IPO underpricing may have a month effect in the fourth quarter due to a whitewash effect. (2) Because of the information effect, IPO underpricing may have the same monthly effect on the month of financial statements disclosure. (3) Based on the holiday effect, IPO underpricing may have the February effect caused by the Spring Festival.

2. Data and Variables

2.1 Data

This paper selected the IPO information in the A-share market, from 1995 to 2017(total of 3,272 data), some data were removed from this paper which might lead to inaccurate results, and finally 2,670 samples were left. In addition, this paper selected the Shanghai composite index (000001) as A-share market indices [12].

2.2 Explained variable

This paper used adjusted underpricing rate as the explained variable to measure the IPO underpricing, expressed by IR [9]. The adjusted underpricing rate is defined as the relative underpricing rate after excluding the influence of changes in the broad market index on IPO underpricing, based on the simple premium rate:

$$IR = \frac{P_{i1}-P_{i0}}{P_{i0}} - \frac{I_{i1}-I_{i0}}{I_{i0}} \quad (1)$$

Where, P_{i1} is the closing price on the first day of listing, P_{i0} is the issue price, I_{i1} is the closing price of the market index on the first day of listing, and I_{i0} is the closing price of the market index on the day of issue.

2.3 Explaining variables

The variables selected in this paper include two aspects: one is dummy variables representing months and another is variables influencing factors of IPO underpricing.

The January effect is universal in the share market, so this paper took January as the benchmark group. Used Y_j j=2, 3……12) represented the month, when Y_j= 0, it meant January; when Y_2 is 1, Y_j (j≠ 2) =0, it meant February, and so on.

The other variables influencing factors of IPO underpricing respectively can be represented by the following parameters: waiting time to market(X_1), total fund raised (X_2), issue costs(X_3), lot winning rate (X_4), and turnover on the first day of trading (X_5) [13]. The following assumptions about the relationship between variables and IPO underpricing can be put forward: (1) long waiting time will enhance the IPO underpricing; (2) IPO underpricing will follow the total amount to change; (3) if the offering fee rises, the IPO underpricing will decrease; (4) the low Lot winning rate will aggravate the IPO underpricing level; (5) turnover rate and IPO underpricing will change in the same direction.

3. Empirical test

3.1 Empirical method

To find the relationship between IPO underpricing and dummy variables and other explanatory variables, the following model was adopted in this paper [9]:

$$IR = A_0 + \sum_{i=1}^{5} A_i X_i + \sum_{j=2}^{12} B_j Y_j + \varepsilon_1 \quad (2)$$

Where, A_0 is the intercept of the formula. A_i and B_j are the coefficients of X_i and Y_j, respectively. ε_1 is the error term.

3.2 Empirical test

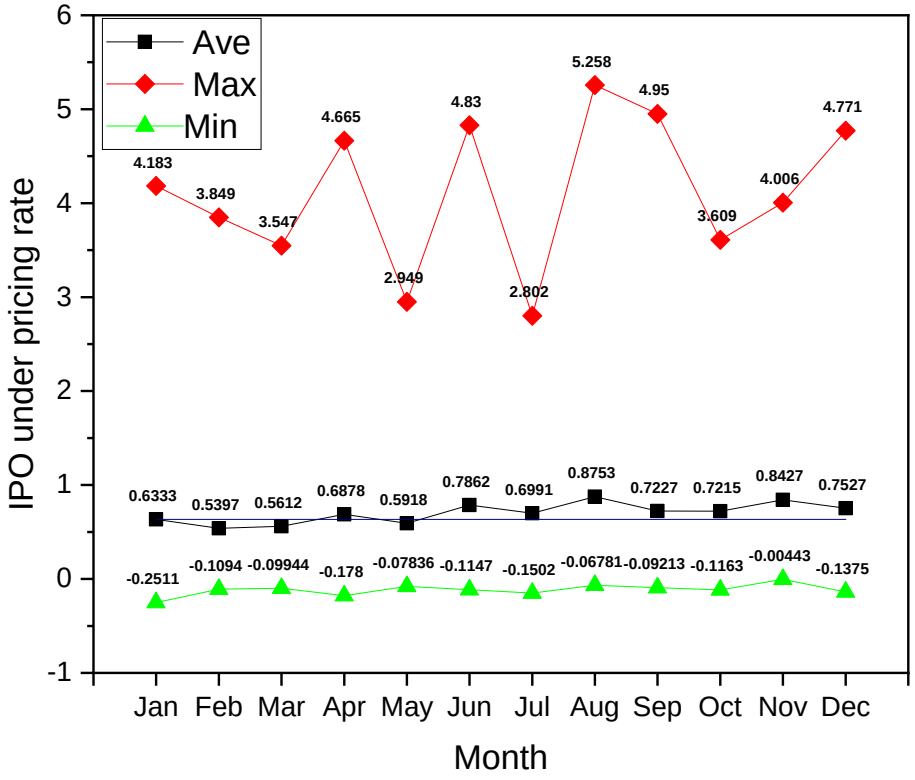

Fig.1 Descriptive Statistics

Fig.1shows that the average IPO underpricing rate was the lowest in February and the highest in August after removing January. With the highest 100 companies IPO underpricing rate, 21 companies accounted for more than 20% in August, and only one company was listed in August with the lowest 100 IPO underpricing rate. This result demonstrates that IPO underpricing is more likely to occur in August.

Table 1 OLS Regression results

Variable	Coefficient	Std. Error
C	0.5328***	0.0481
X1	0.0057***	0.0007
X2	8.24E-11***	7.43E-12
X3	6.26E-09***	4.36E-10
X4	-2.498***	0.313
X5	0.5369***	0.0355
Y2	-0.1128*	0.0616
Y3	-0.012	0.0572
Y4	0.104*	0.0586
Y5	-0.0091	0.0567
Y6	0.1168**	0.0542
Y7	-0.0026	0.0591
Y8	0.1678***	0.0567
Y9	0.028718	0.0588
Y10	-0.0111	0.0626
Y11	0.1418**	0.0585
Y12	0.1071**	0.0545

Note: *** indicates the coefficient passed the significance test at the 1% significance level, ** means passed the 5% significance level, and * means passed the 10% significance level (same explanation to the all coefficient).

Next, the data were analyzed using the ordinary least squares regression. Table 1 shows that all the coefficients of influence factors and coefficients in some months passed the significance test, which indicates the factors have influenced the IPO price, and it has month effect of IPO underpricing in Chinese A-share market. To ensure the accuracy of the results, the multicollinearity and heteroscedasticity of the results were tested. The regression analysis shows that the regression had no multicollinearity problem but heteroscedasticity.

Table 2 White test results

Heteroskedasticity Test: White			
F-statistic	5.469027	Prob. F (86,2583)	0.0000
Obs*R-squared	411.2872	Prob. Chi-Square (86)	0.0000
Scaled explained SS	1940.324	Prob. Chi-Square (86)	0.0000

Then, OLS+ robust standard error method was used to correct heteroscedasticity. Finally, take the first day trading volume as the tool variable of generalized method of moments (GMM) to verify the viability of the model. Table 3 shows that two models have similar results, which demonstrates the conclusions are reliable.

Table 3 Two Models Comparing

OLS+ robust standard			GMM	
Variable	Coefficient	Std. Error	Coefficient	Std. Error
C	0.5328***	0.0641	0.5123***	0.06117
X1	0.0057***	0.0014	0.006033***	0.0014
X2	8.24E-11***	1.66E-11	8.00E-11***	1.64E-11
X3	-6.26E-09***	1.09E-09	-5.86E-09***	1.02E-09
X4	-2.498***	0.5728	-2.523***	0.5813
X5	0.5369***	0.0328	0.538***	0.0325
Y2	-0.1128**	0.055	-0.1142**	0.0552
Y3	-0.012	0.0517	-0.01437	0.05189
Y4	0.104*	0.0577	0.1016*	0.05789
Y5	-0.0091	0.0519	-0.009273	0.05198
Y6	0.1168**	0.05861	0.1175**	0.05874
Y7	-0.0026	0.05209	-0.01132	0.05187
Y8	0.1678**	0.06658	0.1699**	0.06674
Y9	0.0287	0.058522	0.02555	0.05855
Y10	-0.0111	0.05937	-0.009397	0.05934
Y11	0.1418**	0.06017	0.1404**	0.06038
Y12	0.1071**	0.05452	0.1187**	0.05432

3.3 Analyses

The empirical results show that the effect of influencing factors is consistent with hypothesis. The coefficients of X1, X2, X5 are positive, which means waiting time to market, total fund raised and turnover on the first day of trading aggravate IPO underpricing. The coefficients of X3、X4 are negative, which means issue costs and lot winning rate can relieve it. The calendar effect was significant and February, April, June, August, November, and December all passed the significance test. The coefficient of February is significantly negative, which verifies that the Spring Festival effect has existed and can reduces the IPO underpricing. November and December have a positive coefficient that means companies may whitewash their annual reports with IPO at the end of the year,

leading to higher IPO underpricing. IPO underpricing increased significantly in April, June and August. In China, these months will publish a quarter and annual report. Therefore, the release of financial statements will strengthen IPO underpricing.

4. Conclusion

In this paper, based on the existing IPO underpricing theory and calendar effect theory, the significance of the influence factors of IPO underpricing and the IPO underpricing calendar effect have been verified. And all results of influence factors indicate that information asymmetry and investor irrationality have a significant influence on Chinese A-share market. It shows that the behavior of investors still pays an important role in affecting the stock price. The empirical results show that IPO underpricing in the Chinese A-share market has a month effect in February, April, August, November and December, which proves that IPO underpricing is related to the stock market system and Chinese stock market. These conclusions may contribute to improve the Chinese a-share market. There are many reasons for this phenomenon and the three hypotheses mentioned in this paper may be some of them. This phenomenon can be further investigated.

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