

Analysis on the Influencing Factors of IPO Under-pricing on Sci-tech Innovation Board in China

Guojun Li^a

Department of Economics, Binhai College of Foreign Affairs of TJFSU, Tianjin, China

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Abstract: The IPO system innovation on the Sci-tech innovation Board has changed from the "approval system" to the "registration system", which is expected to reduce the degree of IPO under-pricing. This article uses multiple linear regression analysis to conduct an empirical analysis of the under-pricing of 70 Sci-tech innovation Board companies listed in 2019. The results show that the under-pricing rate of the Sci-tech innovation Board is significantly lower than that of the main board and the growth enterprise board. At the same time, factors such as the scale of fundraising, the listing time, the first-day turnover rate, the reputation of the sponsor, the issuance PE ratio, and the debt-to-asset ratio have an effect on IPO. Prices have varying degrees of impact. Finally, based on the results of the empirical analysis, relevant countermeasures such as insisting on and improving system innovation, normalization of new stock issuance, increasing the rate of successful online subscription and multi-dimensional improvement of the pricing power of sponsors, etc., are proposed, hoping to help my country improve the efficiency of the IPO market and reduce speculation so as to promoting the healthy development of capital market in China.

1 INTRODUCTION

1.1 The Objective of the Work

This paper uses a multiple linear regression model for empirical analysis, analyzing the scale of financing (FA), time to market (TTM), first-day turnover ratio (TR), sponsor reputation (GOS), issuance price-to-earnings ratio (PE), asset-liability ratio (ALR) on the impact of IPO under-pricing. The objective of the work is to find some factors influencing the high under-pricing of the Sci-tech innovation Board.


1.2 The Importance of the Objective of This Thesis

The Sci-tech innovation Board appeared relatively late, and there are relatively few analyses on the factors affecting the IPO under-pricing on the Sci-tech innovation Board, so this article has certain theoretical and practical significance. According to the research result, we hope this thesis can provide some useful references for the pricing of shares

issued on the Sci-tech innovation Board under the registration system of our country in order to facilitate the long-term development of the Sci-tech innovation Board market under the registration system of our country.

1.3 Background

The establishment of the Sci-tech innovation Board is short and the number of listed stocks is small, so there are relatively few researches on the IPO under-pricing of the Sci-tech innovation Board. The professors in Guizhou University proposed that factors such as the stock turnover rate on the first day of IPO listing, issuance scale, winning rate, and the time interval between the issuance date and the listing date will have an impact on the under-pricing of the GEM IPO (Liu 2013, Chen 2013). The professor of the School of Accounting, Zhongnan University of Economics and Law pointed out that the issuance price-earnings ratio, issuance scale, circulation ratio, issuance price, turnover ratio, and first-day price-to-book ratio are all positively correlated with the excess return on the first day of IPO (Cheng 2014). Professor

^a <https://orcid.org/0000-0003-0055-1825>

of Suzhou University believes that indicators such as the price-earnings ratio at the time of issuance, the winning rate, and the reputation of the lead underwriter have all had varying degrees of impact on my country's IPO under-pricing (Yu 2015). Through empirical analysis people believe that the issuer's timing factors, stock issuance price-earnings ratio, stock issuance scale, etc. affect the level of under-pricing of new stocks (Zhao 2007). Wang Yixia verified the influence of investor sentiment on IPO under-pricing (Wang 2009). Based on the relevant research of other scholars, this paper uses regression analysis to establish a model to analyze the impact of relevant factors on the first-day premium rate of IPO on the Sci-tech innovation Board, draws corresponding conclusions, and puts forward relevant suggestions.

2 RELATED CONCEPTS

2.1 IPO

IPO (Initial Public Offering), an initial public offering, refers to a company's initial public offering of stocks to investors on a stock exchange to raise funds.

2.2 IPO Under-pricing

IPO under-pricing means that the issue price of new shares is lower than the market price after listing. There are usually two expressions of "under-price" and "premium" for this phenomenon. Under-pricing belongs to the concept of the primary market. From the perspective of the issuer, they sell stocks at a price lower than the intrinsic value of the stock, so it is called "under-pricing." The "premium" is a secondary market concept. From the perspective of the purchaser, the market price of new shares after listing is usually higher than the subscription price (the issue price), resulting in additional income, so it is called "premium." This article uses the first method of expression.

IPO under-pricing rate, used to measure the degree of IPO under-pricing, the formula is:

$$UPR_i = (P_{i1} - P_{i0}) / P_{i0} * 100\% \quad (1)$$

Among them, UPR_i : IPO absolute under-pricing ratio (UPR, namely Under-Pricing Ratio) of stock i ; P_{i0} : issue price of stock i ; P_{i1} : stock's first-day closing price.

3 CURRENT SITUATION ANALYSIS

On July 22, 2019, the first batch of 25 companies on the Sci-tech innovation Board went public. As of the close, the stock prices of 25 companies have risen across the board, with an average under-pricing ratio of 139.55%. In 2019, a total of 70 companies were listed on the Sci-tech innovation Board. Among them, JLWN(688357) broke the issue, becoming the first SSE STAR company to break the issue on the day of listing. In addition, there are 35 companies with an under-pricing rate of 0-100%, and 34 companies with an under-pricing rate greater than 100%. The average under-pricing rate is 115.05%, which is lower than the under-pricing of the main board and Growth Enterprise Market during the same period. At the same time, with the increase in the number of listed companies, the under-pricing rate of the Sci-tech innovation Board has a gradual downward trend.

IPO under-pricing exists all over the world, and my country's performance is particularly prominent. According to statistics, the average under-pricing rate for IPO in the United States from 2001 to 2009 was 12.1%, the average under-pricing rate in the UK was 16.35%, the average under-pricing rate in France was less than 5%, and the under-pricing rate in Malaysia was relatively high, about 80%. The average under-pricing rate of new stocks in my country from 1990 to 2010 was as high as 137.4% (Gao 2017). The launch of the Sci-tech innovation Board is expected to reduce the IPO under-pricing rate of Chinese companies (Chen 2020). The high rate of under-pricing of new stocks allows subscribers to obtain excess returns, enhances the speculative nature of the stock market, and causes many adverse effects. Finding the influencing factors of the IPO under-pricing rate and taking corresponding countermeasures has very important theoretical and practical significance.

4 METHODS AND MATERIALS

4.1 Research Method

This article uses SPSS software and EXCEL software for data statistics, and adopts multiple linear regression model for empirical analysis.

4.2 Research Materials

This article analysis 70 companies from the establishment of the Sci-tech innovation Board to the listing on December 31st, 2019.

4.3 Index Composition and Research Hypothesis

4.3.1 Dependent Variable

This article selects the IPO under-pricing rate as the dependent variable. Adopt the first calculation formula of IPO absolute under-pricing rate, namely

$$UPR_i = (P_i - P_0) / P_0 * 100\% \quad (2)$$

4.3.2 Independent Variables and Research Hypotheses

(1) Funding scale

The financing scale (FA), is expressed by the natural logarithm of the total amount of funds raised. Since my country's securities market is still in a weakly effective market, it is relatively speculative (Zhu 2018). Generally, the smaller the scale of listed companies, the more popular they are with investors. Therefore, the higher the IPO under-pricing rate.

Hypothesis 1: IPO under-pricing rate is negatively correlated with the size of fundraising (FA).

(2) Circulation Proportion

Circulation Proportion (CP), the calculation formula is Circulation Proportion = Number of Circulation Shares / Total Share Capital * 100%. According to the supply theorem, supply is inversely proportional to price. When the proportion of outstanding shares is too small, stock prices are more likely to rise, and the IPO under-pricing rate will be higher.

Hypothesis 2: The IPO under-pricing rate is negatively correlated with the circulation ratio (CP).

(3) Time to Market

Time to Market (TTM), is calculated based on the time distance between the listing year and month and the establishment of the Sci-tech innovation Board (July 2019). For example, if listed in July 2019, the value is 1, and listed in August 2019, then The value is 2, and so on. The Sci-tech innovation Board is a newly established board, and the IPO under-pricing rate of the first batch of 25 listed companies is significantly higher than that of other listed companies. However, with the increase in the number of listed companies, the IPO under-pricing rate is showing signs of gradual decline.

Hypothesis 3: IPO under-pricing rate is negatively correlated with time to market (TTM).

(4) Turnover Rate on the first day of listing

Turnover Rate on the first day of listing (TR), which is the turnover within a certain period of time / total number of shares issued * 100%, which is used to measure the liquidity of new shares and reflect the degree of speculative sentiment of investors. The higher the turnover rate, the more attractive to investors and the higher the IPO under-pricing rate.

Hypothesis 4: The IPO under-pricing rate is positively correlated with the first-day turnover rate (TR).

(5) The sponsor's reputation

The sponsor's reputation ,GOS (Goodwill of Sponsor). Investors usually refer to the reputation of the sponsor when participating in the subscription of new shares. Practice has proved that the company sponsored by China International Capital Corporation Limited (CICC) has a higher meeting rate. In 2019, 6 of the 70 Sci-tech innovation Board listed companies have CICC as the sponsor, accounting for 8.57% of all listed companies. Here, the reputation of the sponsor is used as a dummy variable, with CICC being 1 and other sponsors being 0.

Hypothesis 5: The IPO under-pricing rate is positively correlated with the sponsor's reputation (GOS).

(6) Issue price-earnings ratio

Issue price-earnings ratio (PE), issue price-earnings ratio = issue price / net income per share * 100%. The Sci-tech innovation Board issue price has cancelled the administrative guidance of 23 times the price-earnings ratio ceiling and changed to market pricing. Except for the price-earnings ratio of the 70 listed companies on the Sci-tech innovation Board (688009), which is 18.80 times, the other 69 listed companies are all higher than 23 times. Investors generally believe that a higher price-to-earnings ratio means better development prospects.

Hypothesis 6: The IPO under-pricing ratio is positively correlated with the issuance price-earnings ratio (PE).

(7) Asset Liability Ratio

Asset Liability Ratio (ALR), asset-liability ratio = total assets / total liabilities * 100%, usually used to measure the long-term solvency of an enterprise. The higher the asset-liability ratio, the greater the financial risk of the enterprise. According to the risk-return principle, high risks require high returns to compensate. Therefore, we believe that a listed

company with a higher asset-liability ratio will have a higher IPO under-pricing rate.

Hypothesis 7: The IPO under-pricing rate is positively correlated with the asset-liability ratio (ALR).

4.4 Building a Regression Model

$$UPR = \alpha + \beta_1 * FA + \beta_2 * CP + \beta_3 * TTM + \beta_4 * TR + \beta_5 * GOS + \beta_6 * PE + \beta_7 * ALR + \epsilon \tag{3}$$

5 EMPIRICAL RESEARCH

5.1 Descriptive Statistics

We use SPSS software in order to calculate the minimum, maximum, mean and standard deviation of UPR, FA, CP, TTM, TR, GOS, PE, ALR and other variables, as shown in Table 1. The data comes from 70 listed companies listed on the Sci-tech innovation Board

Table 1: Variable descriptive statistics.

	N	Min.	Max.	mean	Std.
UPR	70	-2.15	400.15	115.05	83.41
FA	70	10.33	13.88	11.26	0.64
CP	70	6.58	23.55	18.37	5.93
TTM	70	1	6	3.40	2.05
GOS	70	0	1	0.09	0.28
PE	70	18.80	467.51	59.01	52.93
ALR	70	0.20	80.53	26.27	17.88

It can be seen from Table 1 that, the average IPO under-pricing rate (UPR) is 115.05%, the maximum is 400.15%, and the minimum is -2.15%. The average value of the circulating ratio (CP) is 18.37%, the maximum value is 23.55%, and the minimum value is 6.58%, which accounts for a relatively small proportion of the total equity. The average time to market (TTM) is 3.40, the maximum is 6, and the minimum is 1, indicating that the number of new shares issued in each month tends to be the same. The average turnover rate (TR) on the first day of listing is 75.93%, the maximum is 86.19%, and the minimum is 57.57%, which is much higher than the normal turnover rate, reflecting the abnormally high speculative sentiment of investors and excessive speculative atmosphere in the secondary market concentrated. The average issuance price-earnings ratio (PE) is 59.01 times, the maximum is 467.51 times, and the minimum is 18.80 times. The issuance price-earnings ratio of the Sci-tech innovation Board

is generally high. The average asset-liability ratio (ALR) is 26.27%, the maximum is 80.53%, and the minimum is 0.20%. The overall asset-liability ratio is relatively low, reflecting the better long-term solvency of listed companies on the Sci-tech innovation Board and reducing company operations Financial risks.

5.2 Regression Analysis of the Model

Based on the above data, we conduct col-linearity test and regression analysis, and the results are shown in Table 2.

Table 2: Col-linearity test and regression analysis.

	Unstandardized Coefficient		T	Sig.	Col-linearity statistics	
	B	Std. Error			Tolerance	VIF
	308.7	264.9	1.16	0.25		
FA	-31.39	15.59	-2.01	0.04	0.58	1.72
CP	-2.05	1.65	-1.24	0.22	0.60	1.65
TTM	-17.82	4.14	-4.30	0.00	0.80	1.23
TR	3.31	1.58	2.09	0.04	0.72	1.37
GOS	60.24	29.90	2.02	0.05	0.81	1.22
PE	0.45	0.15	3.05	0.00	0.94	1.06
ALR	-0.96	0.45	-2.16	0.03	0.91	1.09

It can be seen from the col-linearity analysis that the tolerance (tolerance value) is greater than 0, and the VIF value is less than 10, and there is no col-linearity problem.

In the non-standardized period, the scale of fundraising (FA), time to market (TTM), first-day turnover rate (TR), sponsorship reputation (GOS), issuance price-to-earnings ratio (PE), and asset-liability ratio (ALR) have all passed significant Test of sex, the circulation ratio (CP) did not pass the test of significance.

6 CONCLUSIONS

6.1 The Main Points

Based on the data obtained from the above inspection and analysis, it can be seen that this article uses the data of the listed companies on the Sci-tech innovation Board in 2019 as a sample, with the scale of fundraising (FA), time to market (TTM), and turnover rate on the first day of listing (TR), Sponsor's reputation (GOS), issuance price-earnings ratio (PE), asset-liability ratio (ALR) as independent

variables, the equation established with IPO under-pricing ratio (UPR) as the dependent variable passed the test, and the equation is as follows:

$$\text{UPR}=308.743-31.397*\text{FA}-2.050*\text{TTM}+3.312*\text{TR}+60.243*\text{GOS}+0.453*\text{PE}-0.966*\text{ALR}+\varepsilon \quad (4)$$

Firstly, the scale of fundraising (FA) is inversely proportional to the listing under-pricing rate (UPR), which is consistent with Hypothesis 1, which verifies that investors in my country's securities market tend to speculate on small-cap stocks.

Secondly, time to market (TTM) is inversely proportional to the market under-pricing rate (UPR), which is consistent with Hypothesis 3. The premium rate of the first batch of Sci-tech innovation Board companies listed on July 22 was significantly higher than the average. As the number of listed companies increased, the premium rate gradually declined, reflecting the relatively high speculative nature of the Sci-tech innovation Board.

Thirdly, the turnover rate (TR) on the first day of listing is directly proportional to the listing under-pricing rate (UPR), which is consistent with Hypothesis 4. The higher the turnover rate on the first day of listing indicates that IPO applicants do not use long-term holding as the purpose of subscription, but obtain short-term income as the motivation, which fully reflects the characteristics of limited rationality of individual investors in my country's securities market (Fang 2016).

Fourthly, the sponsor's reputation (GOS) is directly proportional to the listing under-pricing rate (UPR), which is consistent with Hypothesis 5. When investors apply for new shares, they often refer to the reputation of their sponsors instead of on the comprehensive pricing power of the sponsors. This is also a manifestation of the lack of rationality in the market.

Fifthly, issuance price-to-earnings ratio (PE) is directly proportional to the listing under-pricing ratio (AIR), which is consistent with Hypothesis 6. The Sci-tech innovation Board was changed to market pricing, and the 44% limit on the first day of listing of new shares was removed. The purpose is to reduce administrative intervention in the IPO, but to a certain extent, it also caused excessive speculation of new shares on the Sci-tech innovation Board by investors. , Enhancing the speculative nature of new shares subscription on the Sci-tech innovation Board.

Finally, the asset-liability ratio (ALR) is inversely proportional to the listing under-pricing ratio (UPR), which is contrary to Hypothesis 7. Facts have proved

that the higher the asset-liability ratio, the lower the listing under-pricing rate, which violates the principle of risk return, indicating that IPO applicants have a low risk appetite and tend to choose listed companies with lower risks. It also reflects a certain degree of my country's securities market. Irrational.

6.2 The Significance of the Work

Based on the empirical results and conclusions of this article, the following four suggestions are given:

First of all, persist in and improve the innovation of the Sci-tech innovation Board system. The supervisory authorities should adhere to the "initial intention" of the policy, and cannot be swayed by temporary market anomalies, let alone change the course easily. Perform cold treatment on the problems in the Sci-tech innovation Board, find the cause, and prescribe the right remedy.

Secondly, increase the number of new shares to be issued, normalize the issuance of new shares, and reduce the IPO under-pricing rate of new shares. In the early days of the establishment of the Sci-tech innovation Board, due to its scarcity, the IPO under-pricing rate was relatively high. As the number of listings continues to increase, the under-pricing rate has a downward trend. Therefore, we have reason to believe that as the Sci-tech innovation Board cools down, investors will become more rational.

Thirdly, increase the proportion of online purchases and restrict the online purchase behavior of institutional investors. According to the statistics of new stock subscription data on the Sci-tech innovation Board in 2019, the number of online issuance accounted for only 33.96% of the total number of issuance. Except for one company with a winning rate of 0.23%, the winning rate of the rest is 0.04%-0.06%, which is obviously low . Only by increasing the proportion of small and medium-sized investors winning the lottery can the IPO under-pricing rate be effectively reduced.

Finally, multi-dimensional evaluation of the sponsor's pricing ability. There are a total of 28 sponsors behind the 70 listed companies. The top three investment banks in the number of sponsors are CITIC Construction Investment, CITIC Securities, CICC, and GuoXin Securities. And the sponsor concentration is relatively high. According to the results of empirical analysis, the IPO under-pricing rate of listed companies sponsored by CICC is significantly higher than that of listed companies sponsored by other investment banks. Investors are advised to check the capabilities of sponsors from multiple dimensions such as issuance experience, net

capital, and Sci-tech innovation Board investment and research when applying for new shares, rather than just referring to a single indicator such as their market share or net profit.

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