Research on Under-pricing of Initial Public Offerings in Our Country's Growth Enterprise Market

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Abstract. Our country's Growth Enterprise Market (GEM) is oriented to the venture enterprises which are still in the growth period, and stresses on supporting independent innovation enterprises, thus the different batches of companies which have been going on public in GEM should have some characteristics which different with other markets in Under-pricing of initial public offerings (IPO) and their influence factors and so on. This paper has firstly summarized the present research situation and explanation theory of the under-pricing of IPO; Secondly, it collected many index of GEM IPO companies and did some correlated analysis with data analyzing soft tools. Thirdly, it selected some index such as earnings per share, lot winning rate, turnover rate on the first day, interval time between issuing and transacting day, funds raised actually from IPO and so on, built regression model and did linear regression analysis, then analyzed on under-pricing of IPO and it's influence factor in our country's GEM from the theory and empirical point. Finally, it put forward to some correlated suggestions on how to perfect our country's GEM.

Keywords: Growth Enterprise Market (GEM) ;Initial Public Offerings (IPO);Under-pricing rate;Lot winning rate;Turnover rate on the first day

1. Introduction

Initial public offering, (IPO) is referred to the process of firms "going on public" by offering shares to the public and raising some equity fund, then the shares are transacted in the security exchange market. Successfully IPO is benefit for the company to expand its financing scale, and is also helpful to improve company's capital structure and government structure. While how to price rationally in the IPO process is a core procedure which decides the IPO success or failure. New stock pricing usually has two stages: Firstly, the publisher coordinating the main underwriter estimates the reference price which reflects company's interior value according to certain estimating model, which is the decision basis for investor purchasing; Secondly, after estimating value, the main underwriter selects appropriate new stocks issuing method according to the special details in order to make the ultimately determined issuing price full reflecting market demanding situation.

The phenomenon of IPO under-pricing usually is referred to the new stock 's issued price in primary market is much lower than the transacted price in secondary market, especially the stock's market price on the first day going on public rises hugely. Its manifestation is that the new stock 's issued price obviously lower than it's closing price on the first day when new stock go on public, The new stock-holders can obtain obviously great returns on this day. Because of the existence of high IPO under-pricing, it creates great prices differences between the primary stock market and the secondary market, causes massive funds to be detained in the primary market. The frozen capital in domestic primary market during the period of IPO has greatly surpassed the financing scale, the lot winning rate of applying for new stock is more and more low, and much production domain fund and bank deposit entered the primary stock market. This phenomenon has intensified the gap of stock supplying and demanding, and harmed the capital disposing efficiency in the

entire social scope. So the high IPO under-pricing has become one of significant difficult problems which disturb our country's stock market.

2．Present research situation and explanation theory of IPO under-pricing

2.1. Present research situation of IPO under-pricing

In 1963, The American securities exchange committee (SEC) proposed the IPO under-pricing problem for the first time in a research report, after that many American scholars carried research on the aspect of IPO under-pricing, Logue(1973) and Ibboston(1975) has respectively conducted empirical research using 1960's US stock market's data, they discovered that the new stock's issued price is lower than the closing price of the first day going on public, because at that time they didn't know it's reason so called it "the riddle"[1]. Miller and Reilly(1987), Carte etc. further confirmed successively that the new stock's issued price is lower 9%-15.3% than the closing price of the first day going on public. Besides US, other countries also has universally existed the phenomenon of varying degree of IPO under-pricing, and the average scope of IPO under-pricing is 4.2%-388%. In general, the degree of developed country's IPO under-pricing is obviously lower, for example, France's IPO under-pricing rate is 4.2% during the period of 1983–1986, but the IPO under-pricing rate in new emerging stock market is higher; For example, Malaysia's average scope of IPO under-pricing is 80.3% during the period of 1980–1991.

In Chinese stock market, It also exists IPO under-pricing problem, some researches indicate that IPO under-pricing phenomenon is more serious in short-term, but the long-term returns of the new stocks are not good in our country. In 2005, our country had experienced non-tradable share reform, before this reform, because of the circulation stock and non-circulation stock separating, it twists the IPO pricing mechanism and issued price determination lacked efficiency, which was one of the important reasons for causing higher IPO under-pricing phenomenon. After the non-tradable share reform, the phenomenon of stockholder's rights separating is already was not existed. With this system perfecting it urged our country's stock market to enter into a raising bull market wave, and the increasing scope was huge, during these periods the degree of IPO under-pricing had also enhanced compare to the recently past years.

2.2. Explanation theory for IPO under-pricing

IPO under-pricing problem being existed for a longer-time, and it is difficult to explain with traditional financial theory. In view of IPO under-pricing phenomenon, foreign scholars proposed different kind of theory supposition, among which most suppositions are correlated theories mainly based on the information economics, and it specifically includes: Asymmetric information theory, principal-agent theory, symmetric information theory, signal demonstrated theory and the comparable new theory of placement of shares and so on[2]. Besides the above common theory hypothesis, explanation for IPO under-pricing also has "the dynamic collection of information hypothesis", "the conformity hypothesis" and "the market atmosphere hypothesis", "the underwriters supported the IPO price hypothesis" and so on [3]. The above explanation theory generally from different point of the IPO publisher, investor and underwriter and so on, they possibly affect in IPO pricing simultaneously, and also possibly mainly affects on some aspects.

3．Summarize research on our country's IPO under-pricing problem

Research on IPO under-pricing began in western countries, the overwhelming majority correlated classical theory suppositions are proposed by the western scholars, Nearly all the Chinese scholar's research just carried on confirmation to the western classical theory hypothesis utilizing Chinese stock market's data. WangJun combining the characteristic of our country's small-medium enterprise board market, selected 9 factors from secondary market which affected IPO under-pricing such as lot winning rate , turnover rate of the first day, raised funds amount, issuing price-earnings ratio, issued price and so on. She carried empirical research, and discovered that it also existed relatively seriously phenomenon of IPO under-pricing in our country's small-medium enterprise board market [4]. Among the research, she found that the returns of equity of one year before offering and lot winning rate had positive correlation with the IPO under-pricing in our country's small-medium enterprise board market, and the influence was also remarkable; The funds which collected from IPO had negative correlation with the IPO under-pricing and the influence was obvious,

presenting a small company phenomenon. ZhuoXian carried on a confirmation to the relevance between the issuing price-earnings ratio with IPO under-pricing of the first day going on public, the result indicated that relevance between the two items was small, and she thought that control on the issuing price-earnings ratio was not the primary reason causing IPO excess earnings on the first day[5].

The above scholars had carried analysis on the IPO under-pricing situation of our country's new stock, but the sample selecting and the origin analysis of the research on IPO under-pricing were various, therefore their viewpoint were also different. Most scholars considered that the asymmetric information theory can be used to explaining our country's IPO under-pricing phenomenon. For example, from the point of views of the stock issuing examination and approval system, authorized system, implementation stage channel system as well as the higher phase of recommending person system, discovered that the more serious of information asymmetric, the higher of IPO under-pricing [6]. Western classical theory supposition have strong explanation ability to the IPO under-pricing phenomenon of western developed country's market, but all these theory supposition need the prerequisite that the secondary market is effective and the primary market is saturated. China now still does not meet these two requirements, thus Chinese stock market's IPO under-pricing phenomenon can not apply the western theory mechanically and simply.

On October 30, 2009, the first batch of 28 growth enterprise market (GEM) stocks started to be transacted officially, and the GEM which had been prepared for ten years finally landed the Shenzhen stock exchange successfully, up to May 9, 2010, the GEM altogether had 78 companies completed new stocks issued with the method of legal person placement not online and pricing online under the part circulation environment. Statistics indicated that the first batch 28 companies 's new shares average turnover rate reached 88.88%, when closing the average dynamic price-earnings ratio achieved 111.03 times, the total market value on the first day going on public amounted to 139,967 million yuan. The average increasing scope of closing price compares to the issued price is 106.23%. In a other word, the average rate of IPO under-pricing is 106.23%, among which the highest rate is 209.73%, the lowest rate is 75.84%, presenting a higher IPO under-pricing rate. Although the main board, the small-medium enterprise board and the growth enterprise board are all important constituents of our country's multi-level capital market, their service objects are different, various levels market have differences in the aspect of stock issuing standard, system designing, risk characteristic, value estimating level and so on. The GEM is mainly oriented to the venture enterprises which are still in the growth period, and stresses on supporting independent innovation enterprises, thus the different batches of companies which have been going on public in GEM should have some characteristics which are different with other markets. This paper will make discussing and exploration on the related problem of this aspect.

4. Empirical research on the influence factor of under-pricing of IPO in our country's GEM

4.1. Sample selecting

This paper has collected all basic data of all the 78 listed companies which had completed IPO in Shenzhen stock exchange's GEM during the period from October 30,2009 to May 9,2010. The basic data includes each stock's total stock capital, proportion that total circulation stock accounts for total stock capital, earnings per share, issued price, closing price on the first day going on public, lot winning rate , turnover rate on the first day, IPO price-earnings rate, funds raised from IPO, interval time between issuing and transacting day, IPO stock amount, stock transacted quantity on the first day, net assets per share after issued, funds raised actually from IPO and so on. Among them, all the data this paper doing empirical analysis using mainly origins from JvLing information terminal database (http://terminal.gti.cn/), the analysis software which this paper uses is EViews 5.0.

4.2. 4.2 Dependent variable definition and research supposition

This paper supposes IPO under-pricing rate namely the new stock's returns on the first day as the dependent variable. Because utilizing the market model is not suit for analyzing new issued stock, and also there is not a reliable standard and basis for market risk adjustment, therefore this paper gives the formula definition of the IPO under-pricing rate as follows: $IRi=(Pi_1-Pi_0)/Pi_0 \times 100\%$. Among them, IRi represents the

IPO under-pricing rate on the first day of the ith new stock, P_{i1} represents the closing price on the first day going on public of the ith new stock, P_{i0} represents the issued price of the ith new stock. On the condition of not rejecting the influence of overall market factor, the IPO under-pricing rate on the first day can be collected directly with the rising the declining range of the new stock on the first day going on public to reflect the degree of the IPO under-pricing.

4.3. 4.3 Independent variable definition and research supposition

Before carrying on the regression analysis on the influence factor and the IPO under-pricing rate in our country's GEM, it carried on relevant analysis on all the above selected factors, then carried on the relevance examination among the dependent variable and each independent variables, trying to know initially each variable's influence to the IPO under-pricing rate. Finally, utilizing the EVIEWS software obtained the following result as follows: Each stock's total stock capital, the proportion that total circulation stock accounts for total stock capital, turnover rate on the first day, interval time between issuing and transacting day, IPO stock amount, stock transacted quantity on the first day going public all have positive correlation with the IPO under-pricing rate; While earnings per share, issued price, lot winning rate, IPO price-earnings rate, funds raised from IPO, net assets per share after issued, funds raised actually from IPO all have negative correlation with the IPO under-pricing rate. Among them, the positive correlated degree with IPO price-earnings rate of turnover rate on the first day, interval time between issuing and transacting day, stock transacted quantity on the first day going public are comparable remarkable; while the negative correlated degree of issued price, IPO price-earnings rate, net assets per share after issued are comparable remarkable.

It find that some indexes including the total stock capital, proportion that total circulation stock accounts for total stock capital, funds raised from IPO, IPO stock amount all have a comparative weaker relevance with IPO price-earnings rate; combining with the theoretical analysis, this paper picks out all the above index, and not integrating them into the regression model. Although some index including earnings per share, lot winning rate and funds raised actually from IPO have a comparative weaker relevance with IPO price-earnings rate, in view of the fact that these indexes' importance to the new stock going on public, we still included them in the regression model. Combining with the requirement of empirical research, it selects the following five factors including earnings per share, lot winning rate, turnover rate on the first day, interval time between issuing and transacting day, funds raised actually from IPO as the research independent variables.

4.4. 4.4 Establishing the regression model and the result of it

Through the above analysis, now establish the regression model of IPO under-pricing degree in our country's GEM as follows: $IRI = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + a_5 X_5$. Among them: a_0 is constant term, a_1、 a_2、 a_3、 a_4、 a_5 are their respective coefficient of earnings per share, lot winning rate, turnover rate on the first day, interval time between issuing and transacting day, funds raised actually from IPO. The followed Tab.1 is the result of regression analysis of IPO under-pricing and its influence factors in GEM.

TAB.1 RESULT OF REGRESSION ANALYSIS OF IPO UNDER-PRICING AND ITS INFLUENCE FACTORS IN GEM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
constant term	-142.8231	18.87400	-7.567187	0.0000
earnings per share	-22.52560	24.14710	-0.932849	0.3540
lot winning rate	-53.52499	12.66959	-4.224683	0.0001
turnover rate on the first day	2.940090	0.263823	11.14418	0.0000
interval time between issuing and transacting day	0.797405	0.381094	2.092410	0.0399
funds raised actually from IPO	0.000175	7.93E-05	2.200990	0.0309
R-squared	0.728648	Mean dependent var		62.88667
Adjusted R-squared	0.709804	S.D. dependent var		43.21832
S.E. of regression	23.28164	Akaike info criterion		9.207010
Sum squared resid	39026.49	Schwarz criterion		9.388296
Log likelihood	-353.0734	F-statistic		38.66761
Durbin-Watson stat	1.853651	Prob(F-statistic)		0.000000

4.5. Analysis of model result

From the regression result of Tab.1, we know the coefficient $R^2 = 0.728648$, it means the model fitting degree is high and the error is small; After adjusted the $R^2 = 0.709804$, indicates that majority of the

independent variable's change is caused by the dependent variable's change. The significance examination of the regression equation is: F=38.66761, F statistics is bigger: Prob (F-statistic)=0.000000 which is very small, therefore the equation significance examination passes.

In the regression model, a_0 is an constant term and it has non-economical significance, its associated probability (Prob=0.000000) is very small, the significance level is high, statistics examination passes; a_1 =-22.52560，it means that earnings per share has negative correlation with the IPO under-pricing degree, but its associated probability (Prob=0.3540) is high, the significance level is high, statistics examination can't pass; In a other word, the fitting degree of the influence to the under-pricing rate is not good, but because earnings per share is a important index for IPO, so we still keep it in the regression model; a_2=-53.52499，it means that lot winning rate has negative correlation with the IPO under-pricing degree, and its negative correlation degree is very remarkable. Lot winning rate being high, it means the investor who applying for new issued stocks are relatively fewer in some degree, cause the under-pricing degree correspondingly lower; On the contrary, lot winning rate being low, it means the investor who applying for new issued stocks are relatively more, cause the under-pricing degree correspondingly higher. Its associated probability (Prob=0.0001) has 99% significance, statistics examination passes; a_3=2.940090，it means that turnover rate on the first day has positive correlation with the IPO under-pricing degree. Its associated probability (Prob=0.0000) has 99% significance, statistics examination passes. Just as the supposition, the excessively high turnover rate reflected the market speculating atmosphere is very strong, and indicated that there existed more serious behavior in GEM's IPO, and resulting in price bubble. Being affected by the speculating atmosphere, new stock's price rose irrationally on the day going on public, therefore the higher of turnover rate on the first day also facilitated higher IPO under-pricing degree; a_4=0.797405, it means that interval time between issuing and transacting day has positive correlation with the IPO under-pricing degree. Its associated probability close to 0.1, and its significance close to 90%. Because the longer of the interval time between issuing and transacting day, the higher of risk of the fund in application for new shares, thus has higher under-pricing returns rate as compensation. In a other word, the two items have presented positive correlated relationship, which is consistent with our theory supposition; a_5=0.000175，the fund raised actually from IPO has positive correlation with the IPO under-pricing degree. Its associated probability close to 0.1, and its significance close to 90%.

5．Conclusions and suggestions

From the above empirical analysis we know that there existed certain degree phenomenon of IPO under-pricing in our country's GEM. The higher IPO under-pricing level in our country's GEM, on the one hand, it is not benefit for pricing GEM's new stock reasonably, easy to form market speculating bubble; On the other hand, it will result much fund detained for a longer time in the primary market, create fund distributing irrationally between the primary and secondary market, and do not favor our country's stock market developing healthfully. Maintaining the rationality of IPO under-pricing level in our country's GEM is a important topic to promote healthy development of our country's stock market. Therefore, this paper suggests that it should take the following measures to promote GEM's IPO under-pricing to maintain reasonable level:

Firstly, properly develop stock index future's balancer function to stable our country's stock market. The characteristic of our country GEM's IPO under-pricing fluctuating fiercely has close correlation with the characteristic of our country overall stock market rising and falling greatly. The rising of overall stock market will push our country GEM's IPO under-pricing level and the falling of overall stock market will pull down GEM's IPO under-pricing level. The stock index future can change the shortcomings of our country's stock market as unilateral market, favoring the market's long-term stability. Consummating the related system of our country's stock index future, can from the point of improving stock market's overall environment stable, suppress our country GEM's IPO under-pricing fluctuating fiercely. Secondly, control well the rhythm of enterprise's IPO and going on public on the GEM, suppressing producing speculating bubble. Generally speaking, the circulation capital stock on the first day going on public of our country GEM's listed company is very small, the stock price is easily controlling and speculating, thus causes enterprise's IPO under-pricing phenomenon quite serious. Therefore, we should control well the rhythm of

enterprise's IPO and going on public on the GEM, try to use batch going on public as far as possible, reduces GEM's gap between stock supplying and demanding in specific time, suppresses producing bubble. Thirdly, simplifying the issuing procedure of IPO in GEM, enhancing the marketability degree of going on public's underwriting and recommending, reducing the expenses of enterprise going on public. The procedure of our country's enterprise going on public is extremely complex, the marketability of security going on public's underwriting and recommending is insufficient, this causes the cost of our country's enterprise going on public generally quite high. The enterprises which have been gone on public in GEM, most are small and medium-sized enterprises which are scarce of fund, so simplifying the procedure of small and medium-sized enterprise's going on public, enhancing the marketability degree of going on public's underwriting and recommending, is benefit for enterprise's IPO fund distributing rationally, supporting healthy development of the GEM.

In brief, the time is still short since our country's GEM opened up, companies sample quantity is also few, the data and the model persuasive power also waits for textual research. Higher IPO under-pricing is accompanied with some non-rationalities and low efficiency factor, and it also has higher risk. So we should solve these problems gradually, thus motivate our country's under-pricing return rationally and impel developing and perfecting our country's GEM gradually.

6．Reference

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