

Study on Determinants of the Abnormal Returns of A-shares on the First Listed Day

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Abstract *On the background of the reform of split share structure, applying weighted least squares method of multiple linear regression model, 206 A-shares issued and listed from January 1st, 2004 to December 31st, 2007 is empirically studied, and it is found that turnover rate on the first listed day, size of money raised, and market index, have significant impact on the abnormal returns of A-shares on the first listed day, whereas, the influence of issuing price, issuing P/E ratio, net asset per share before issuance, real negotiable share ratio after issuance, method of issuance and the reform of split share structure, is not significant.*

Keywords *Abnormal returns IPO underpricing Reform of split share structure*

1. Introduction

In the stock markets throughout the world there is an obvious phenomenon of the IPO underpricing, that is, shares after an initial public offering will have high abnormal rate of returns on the first listed day^[1]. In spite of the complexity of China's capital market^[2], the regulators have carried out drastic reform and the market-oriented objective is approaching step by step. The method of issuance and the mode of pricing are changing, meanwhile the split share structure reform are putting forward and the regime of new stock issues is about to change. On the background of the great institutional innovation, the study of the determinants of the abnormal returns of A-shares on the first listed day will help understand the determinants of stock prices and the mechanism of changes in the prices, promote China's reform of the regime of the issue and the pricing of the new stocks, and is of practical significance to China's stock market to play the reasonable and adequate role.

2. Research Method

2.1 Research Assumptions

In view of the big going-up margin in the prices of China's stocks during their initial public offering, the paper made the following assumptions:

First, the subscription costs of new shares are ignored. The subscription costs include the opportunity costs of the funds used for subscription and the subscription expenses incurred. Due to the inaccuracy of the measurement of the opportunity costs, and the very small ratio of the subscription expenses to the funds used for subscription, they are all ignored here.

Second, transaction costs are not included. The transaction cost of stock mainly comprises the commission charged by stock brokers and the stamp duty. Though the rate of stamp duty was increased to 3 ‰ on May 30th, 2007, the transaction costs accounted for the amount of the investment funds only about one percent.

Third, the won rate of the issuance is not considered. The won rate is often closely linked with the method of issuance. Because of the seriously low won rates under each of the methods of issuance, they are not considered hereby.

2.2 Sample Selected

This paper examined the A-shares listed during the period from January 1st, 2004 to

December 31st, 2007 in Shenzhen Stock Exchange and Shanghai Stock Exchange. All the data came from the "CCER capital market research database". The shares with incomplete data or not enough observations are excluded. In the sample period, there are 300 stocks newly listed in Shenzhen and Shanghai. 206 stocks in the 300 stocks meet the above requirement, of which 59 are in Shanghai and 147 are in Shenzhen. This study used a relatively large sample carefully selected, experienced the important process of the market-oriented evolution of China's securities market, and can more comprehensively and accurately reflect actual level of the IPO abnormal returns of the China's A-share market and the changes in the process. EXCEL and SPSS 11.5 are applied to conduct the statistical analysis^[3,4].

2.3 The Measurement of the IPO Abnormal Returns

To measure it, the following formula is used:

$$R_j = (\ln P_{1j} - \ln P_{0j}) - (\ln M_{1j} - \ln M_{0j}) \quad (1)$$

where, R_j stands for the IPO abnormal return of the j -th stock adjusted by the market return, P_{1j} stands for the closing price of the j -th stock on the first listed day, P_{0j} stands for the issuing price of the j -th stock, and M_{1j} and M_{0j} are the closing market indices on the first listed day of the j -th stock and on the issuing day of this stock respectively.

2.4 The Hypotheses to Be Examined

Through analysis, there are 8 hypotheses to be examined:

Hypothesis 1: The methods of issuance influence the abnormal returns on the first listed day. The methods of issuance of the sampled stocks are categorized as following: issuance through the trading network with fixed price, issuance off the trading network by inquiry, the secondary market placement, corporate placement (including the strategic placement, placement off the trading network and private placement). Hereby, issuance through the trading network with fixed price and issuance off the trading network by inquiry are classified by the methods of pricing; the secondary market placement and corporate placement are classified by the types of investors. These methods of issuance are often combined. Different method of issuance may affect the IPO abnormal returns differently.

Hypothesis 2: The issuing price is negatively related to the abnormal returns on the first listed day. For the stocks with lower issuing price, the rising intervals of their prices are larger and the magnitudes of the rise are larger.

Hypothesis 3: The issuing P/E ratio is related to the abnormal returns on the first listed day.

Hypothesis 4: The negotiable share ratio positively correlates with the abnormal returns on the first listed day^[5,6]. For firms with lower negotiable share ratio, their risks of corporate governance tend to be larger, and the probability of mergers and acquisitions is bigger after the issuance. This may lead to the smaller magnitude of the rise of the price of the stock on the first listed day.

Hypothesis 5: The turnover rate on the first listed day and net asset per share before issuance positively correlates with the abnormal returns on the first listed day. The larger the turnover rate and the more the net asset per share of the newly issued stock, the more investors are in the secondary market for this stock. That too many investors rush for the stock will push the price upward.

Hypothesis 6: The size of money raised negatively correlates with the abnormal returns on the first listed day. The smaller size of money raised, the more speculators buy the stock and the higher of the abnormal returns on the first listed day.

Hypothesis 7: The market index positively correlates with the abnormal returns on the first listed day. The higher market index shows that the market is in better condition and investors are more confident. This will heighten the trading price and lead to higher abnormal returns on the first listed day.

Hypothesis 8: Listed before or after the reform of split share structure is related to the

abnormal returns on the first listed day. The reform of split share structure will change the expectations of the investors and cause the fluctuations of stock prices. So it is thought that listed before or after the reform of split share structure is related to the abnormal returns on the first listed day.

3. Empirical Studies

3.1 Multivariate Linear Regression Model I

3.1.1 Variables

According to the above-mentioned hypotheses, this model includes following variables, R (Abnormal returns), T (Turnover rates), P (Issuing price), N (net asset per share before issuance), E (P/E ratio), L (Logarithm of the size of money raised), I (Market index, the sum of the comprehensive index of Shanghai Stock Exchange and the composite index of Shenzhen Stock Exchange is adopted hereby), C (Change of policy, a dummy variable, its value is 1 for the stock issued before the implementation of the reform of split share structure, otherwise 0), r (Negotiable share ratio), M (Methods of issuance, dummy variables. Three kinds of them, M_1 , M_2 and M_3 are involved hereby, where M_1 is the combination of issuance through the trading network with fixed price and issuance off the trading network by inquiry; M_2 is the combination of issuance off the trading network by inquiry and the secondary market placement; M_3 is the secondary market placement).

3.1.2 Model I

$$R = \alpha + \beta_1 P + \beta_2 T + \beta_3 N + \beta_4 E + \beta_5 r + \beta_6 L + \beta_7 I + \beta_8 C + \sum_{j=1}^3 \beta_{9j} M_j + \varepsilon \quad (2)$$

where, R is dependent variable, P , T , N , E , r , L , I , M_j ($j=1,2,3$), C are independent variables, β_i ($i=1,2,\dots,8$) and β_{9j} ($j=1,2,3$) are coefficients, α is constant, ε is stochastic error.

3.1.3 Empirical analysis process

First, exclude multicollinearity. This can be done in two ways. One way is to examine tolerance and variance inflating factor. When the tolerance is not bigger than or near 0.1 and variance inflating factor is bigger than 10, multicollinearity may exist. The variable correlated more with other variables should be deleted. The other way is to examine the condition index and variance ratio. When the condition index of some row in the collinearity diagnose table is bigger than 15 and at least two variables have variance ratios bigger than 0.90, multicollinearity may exist. The variable correlated more with other variables should be deleted. Second, exclude abnormal points. Abnormal points are points with extremely large or extremely small values. These points should be removed in order to keep robust. Third, examine the goodness-of-fit. If the regression equation passes the F-test, the equation established. The more the determinable coefficient R^2 is, the better the goodness-of-fit is. The determinable coefficient used hereby is the adjusted determinable coefficient, Adjusted R^2 . Fourth, Carry out T-test of the regression coefficients. *** stands for having passed T-test at the 1% significant level, ** stands for having passed T-test at the 5% significant level, and * stands for having passed T-test at the 10% significant level. Fifth, select appropriate regression method. Weighted least squares method with total shares is adopted.

3.1.4 Analysis of the regression results

The regression results are listed in Table 1 and Table 2. M_1 should be removed due to its tolerance less than 0.0001. α , T , r , L , I are significant at the 1% level, but N , P , E , M_2 , M_3 , C are not significant at the 10% level. The condition index in the 11th row in Table 2 is 17.020, bigger than 15, and the variance ratios of C and M_3 are both larger than 0.90. This shows

that multicollinearity may exist and the model should be modified.

Table 1 Regression result of model I

Coefficients								
Model		Non-normalized Coefficients		Normalized Coefficients	t	Significance	Statistics of Collinearity	
		B	Std. Error	Beta			Tolerance	Variance Inflation Factor
I	α	4.001	0.404		9.907	0.000***		
	T	0.270	0.115	0.123	2.339	0.020***	0.615	1.625
	N	0.005	0.026	0.010	0.187	0.852	0.644	1.552
	P	-0.007	0.005	-0.077	-1.401	0.163	0.559	1.789
	E	0.002	0.002	0.058	1.031	0.304	0.533	1.877
	r	-0.740	0.186	-0.483	-3.975	0.000***	0.116	8.650
	L	-0.164	0.015	-0.924	-11.184	0.000***	0.250	3.999
	I	0.000	0.000	0.888	9.531	0.000***	0.196	5.091
	M ₂	-0.179	0.152	-0.066	-1.175	0.241	0.548	1.824
	M ₃	0.060	0.243	0.069	0.245	0.806	0.022	45.915
C	0.094	0.229	0.110	0.411	0.682	0.024	41.786	
R ²		Adjusted R ²		F		Prob>F		D.W.
0.667		0.650		39.122		0.000		1.785
Variables Removed								
Model		Beta In	t	Significance	Partial Correlation	Statistics of Collinearity		
						Tolerance	Variance Inflation Factor	Minimum Tolerance
I	M ₁	0.000	.	0.000

Table 2 Diagnosis of collinearity of model I

Model	Numbers of Dimension	Eigenvalue	Condition Index	Variance Ratio										
				α	T	N	P	E	r	L	I	M ₂	M ₃	C
I	1	3.343	1.000	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
	2	2.071	1.270	0.00	0.00	0.00	0.08	0.06	0.01	0.00	0.03	0.00	0.00	0.00
	3	1.342	1.578	0.00	0.15	0.10	0.00	0.00	0.00	0.02	0.01	0.03	0.00	0.00
	4	1.102	1.742	0.00	0.06	0.28	0.05	0.06	0.00	0.00	0.00	0.09	0.00	0.00
	5	1.000	1.828	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	0.963	1.864	0.00	0.12	0.01	0.02	0.02	0.00	0.00	0.00	0.40	0.00	0.00
	7	0.452	2.720	0.00	0.03	0.02	0.19	0.20	0.03	0.13	0.06	0.01	0.00	0.00
	8	0.357	3.058	0.00	0.16	0.38	0.57	0.45	0.00	0.00	0.00	0.00	0.00	0.00
	9	0.293	3.376	0.00	0.43	0.09	0.09	0.14	0.01	0.27	0.16	0.03	0.00	0.00
	10	0.064	7.213	0.00	0.03	0.10	0.01	0.06	0.90	0.56	0.71	0.00	0.01	0.03
	11	0.012	17.020	0.00	0.01	0.02	0.00	0.00	0.03	0.01	0.03	0.43	0.98	0.96

3.1.5 The Modification of Model I

To avoid multicollinearity, correlation coefficients are examined. If the absolute value of correlation coefficient of two variables is bigger than 0.5, they can be thought of as having strong correlation. This may cause serious multicollinearity. So stepwise method is adopted, variables not significant are removed and variables significant are left. (1) I and E: Because the correlation coefficient between I and E is almost 0.6 and the p-value of E in the T-test is 0.304, E is deleted. (2) r: r is strongly related with L, C, M₁ and M₃. (3) M: M₂ and M₃ are not significant at 10% level. (4) C: C is not significant at 10% level. By the means of stepwise,

model I can be modified as model II.

3.2 Model II

$$R = \gamma + \gamma_1 I + \gamma_2 T + \gamma_3 L + \varepsilon \tag{3}$$

3.2.1 Analysis of the regression coefficients

From Table 3, it can be found that γ 、 T 、 L 、 I are all significant at 1% level. Multicollinearity does not exist in Model II.

3.2.2 Analysis of variance

As it is shown in Table 3, this model has passed the F-test and is significant.

3.2.3 Autocorrelation test

Through the Durbin-Watson test, autocorrelation is examined. As it is shown in Table 3, there does not exist autocorrelation in model II.

Table 3 Regression result of model II

Coefficients								
Model		Non-normalized Coefficients		Normalized Coefficients	t	Significance	Statistics of Collinearity	
		B	Std. Error	Beta			Tolerance	Variance Inflation Factor
II	γ	2.212	0.226		9.768	0.000** *		
	I	2.729E-05	0.000	0.661	14.215	0.000** *	0.898	1.113
	T	0.337	0.112	0.154	3.005	0.003** *	0.743	1.345
	L	-0.101	0.009	-0.566	-11.111	0.000** *	0.748	1.336
R ²		Adjusted R ²		F	Prob>F	D.W.		
0.607		0.602		104.166	0.000	1.717		

3.2.4 The economic explanation of the model

Based on the regression equation, it can be seen that R positively correlates with I and T , and negatively correlates with L . The regression coefficients γ 、 γ_1 、 γ_2 、 γ_3 are 2.212、2.729E-5、0.337、-0.101 respectively, and their T-test values are 9.768、14.215、3.005 and -11.111. So they passed statistical tests. The concrete economic meanings can be explained as following:

(1) T: The positive correlation between R and T shows that almost all the winners of the subscription wish to sell stocks subscribed in order to gain higher yield. Meanwhile the losers of the subscription want to buy these stocks eagerly. Because the quantity of the losers is more than that of the winners, supply cannot meet demand in the market. This pushes stock prices upward continually and the closing price on the first listed day is much higher than the issuing price.

(2) I: The partial regression coefficient of the market index is 2.729E-05. This result presents that investors are more confident when the market is in good condition. This will pull the trading price further on the first listed day.

(3) L: The logarithm of the size of the money raised negatively correlates with the abnormal returns of newly issued stocks. This shows that the stocks with smaller size of the money raised are favored by the short-term speculators and their abnormal returns tend to be higher. But the stocks issued by some large-sized companies supported by the state are not favored by the short-term speculators. From another view, this tells that asymmetric information theory of underpricing sponsored by some western economists^[7-9] is not suitable for China's stock market.

4. Conclusion

On the background of the reform of split share structure, through the empirical analysis of 206 A-shares issued and listed from January 1st,2004 to December 31st,2007, it is found that turnover rate on the first listed day, size of money raised, and market index, have significant impact on the abnormal returns of A-shares on the first listed day, whereas, the influence of issuing price, issuing P/E ratio, net asset per share before issuance, real negotiable share ratio after issuance, method of issuance and the reform of split share structure, is not significant.

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