
DETERMINANTS OF LONG RUN PERFORMANCE OF IPOS OF NSE COMPANIES

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INTRODUCTION

Unquestionably, initial public offerings (IPOs) have generated an enormous amount of public interest and are one of the most researched areas in finance. There are a number of theoretical explanations and models underpinning this Initial public offering (IPOs) underpricing. The popular justifications for this observed phenomenon rest upon the possible existence of information asymmetries, mainly in the form of ex-ante uncertainties about share prices. Also, according to (Welch,1989), (Grinblatt & Hwang, 1989) and other similar studies, there exists a signalling mechanism where firms send signals to the market by underpricing their IPOs. Moreover, there are other possible explanations such as underwriter reputation theories, investor sentiment theories and prospect theories to explain the degree of underpricing in the IPO market. Therefore, a number of competing theoretical models have been developed to explain the initial underpricing of stocks. The main theories found in the IPO literature are the winner's curse hypothesis, book building theories, and the principal-agent hypothesis, signaling theories, the law-suit avoidance hypothesis, the ownership and control hypothesis and the investor sen-timent theory. One of the most important models of underpricing is the one developed by (Rock, 1986) based on the winner's curse hypothesis. Rock distinguishes between informed and uninformed investors. If the issues are underpriced, IPOs will be oversubscribed by informed investors, resulting in a limited number of shares being available to uninformed investors. If the issues are overpriced, IPOs will be sold exclusively to unin-formed investors who will earn negative initial returns.

DATA AND METHODOLOGY

Objectives of the Study

1. To determine the Long run returns of IPOs of companies listed on the National Stock Exchange.

2. To analyse the effect of age, issue size, listing delay, performance of issues and premium in comparison to the issues at par.

Data

The Sample in this study comprises of 225 IPOs floated on the National stock exchange between 1994-06 meeting the following criteria:

1. The IPO is in the form of equity share capital.
2. The data regarding the offer price, listing date, issue size, date of incorporation and lead manager are available.
3. The IPOs are listed on the National Stock Exchange.

The selection of samples is greatly affected by the availability. The study sample consists of as many as 225 companies. Nifty is selected as a representative of the market. Daily four values of Nifty are available viz. opening, high, low and closing value. The study is based on the closing values on different dates in order to calculate market adjusted return. In case of non-availability of data concerning the exact date the nearest date (not varying more than a week) was considered.

Methodology

One-Sample t Test

The statistical significance of the average return (AR) is determined by using the usual t-statistic, with $n-1$ degrees of freedom which is computed for each period as:

$$t(AR) = AR_t / SE(AR_t)$$

Where $SE(AR_t)$ is the standard error of the average return in period t and $t(AR_t)$ is the t-statistic for the null hypothesis that the average return in any given period is zero.

Correlation Analysis

This analysis usually precedes regression analysis. The correlation matrix provides information of the direction and extent of linear relationship between different variables. The probability of the problem of collinearity also becomes clear by examining the correlation matrix.

DETERMINANTS OF MEDIUM AND LONG-RUN SHARE PRICE PERFORMANCE OF IPOS

In order to assess the determinants of medium and long run performance of Indian IPOs, multivariate regression analysis has been undertaken. Based on the prior research, the variables have been identified and examined to explain the variations in the share price performance of IPOs.

Description of Variables:

The issue of performance of IPOs in the medium and long run has generated mixed results. In India, mixed results have been reported and not much emphasis has been made to identify the factors that may explain the performance of IPOs in the post issue period. To investigate the possible determinants of medium and long run performance of IPOs in India, various variables have been identified and tested. To investigate the possible determining factors of long run-performance of IPOs, correlations of variables have been described in Table 1.

Model

In order to find out the determinants of underpricing, the following model has been employed.

$$R_1/R_2 = \beta_0 + \beta_1(S_1) + \beta_2(S_2) + \beta_3(S_3) + \dots + \beta_{19}(S_{19}) + e$$

The above stated regression model has been computed using SPSS version 14.0 software package. Stepwise ordinary least square regression has been used by specifying the criteria of entry of independent variable at 5 percent level of significance and removal of independent variables at 10 percent level of significance. β_0 is the constant term, $\beta_1, \beta_2, \dots, \beta_{19}$ are coefficients of independent variables while e indicates error term in the model.

Analysis

The sample consists of 225 companies, which came to the market during 1994 to 2006 and got enlisted on the National Stock Exchange.

Statistical Results

The inter relationships among variables have been analysed through correlation matrix presented in Table 2. Table 2 reveals that several statistically significant correlations exist among variables affecting underpricing and under pricing (measured by R_1 and R_2).

ONE-SAMPLE T TEST

The statistical significance of the average return (AR) is determined by using the usual t-statistic, with n-1 degrees of freedom which is computed for each period as:

$$t(\text{AR}) = \text{AR}_t / \text{SE}(\text{AR}_t)$$

Where $\text{SE}(\text{AR}_t)$ is the standard error of the average return in period t and $t(\text{AR}_t)$ is the t-statistic for the null hypothesis that the average return in any given period is zero.

CORRELATION ANALYSIS

This analysis usually precedes regression analysis. The correlation matrix provides information of the direction and extent of linear relationship between different variables. The probability of the problem of collinearity also becomes clear by examining the correlation matrix.

CORRELATION ANALYSIS

A correlation matrix is shown in Table 2(A), 2(B) 2(C) for all variables which includes correlation coefficients and their associated levels of significance. The correlation matrix reveals the direction and extent of significant bivariate associations between various independent and dependent variables.

From the table 2(A) it is clear that the IPOs in the year 1999 and that belonging to the financial services industry have got significantly higher return compared to other years and industries. Similarly, correlation analysis between the two year long run performance and various independent variables given in table 2(B) reveals that age of a company is positively and significantly correlated with performance, irrespective of the fact that initial returns are included or not. Issue size on the other hand, is positively and significantly correlated with raw return measured from date of offer, but its correlation with performance after excluding the initial return is not statistically significant.

Further, looking at the broader classification of industries, it has been found that the dummy for manufacturing industry is negatively related with the long run performance of IPOs while that for services industries is positively correlated with the performance, indicating that IPOs in the

services industry record stronger performance at the end of two years. Finally, looking at nature of industry, the dummy for financial services industries is found to be positively and significantly correlated with the long run performance, irrespective of the fact that whether the initial return is included or not.

Correlation analysis for the three year long run performance is given in table 2(C) which reveals that age of the company and issue size is positively correlated with the performance. Price of the IPO is also positively and significantly correlated with the long run performance after three years. In none of the year dummy is significantly correlated with three year performance but those for manufacturing and services industries under the broader classification and for financial services under classification of IPOs according to the nature of industry are positive and significant.

Overall, it can be concluded that factors including age of a company, issue size, price of the IPO and nature of the industry and year of issue are found to be significantly correlated with at least one of the measures of long run performance at the end of various time periods considered in this study.

Table 2(A)
Pearson Correlations Matrix of Variables Affecting Performance upto One Year

		R1	L1	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	S ₁₁	S ₁₂	S ₁₃	S ₁₄	S ₁₅	S ₁₆	S ₁₇	S ₁₈	S ₁₉	S ₂₀	S ₂₁	S ₂₂	S ₂₃	S ₂₄	S ₂₅	S ₂₆	S ₂₇	S ₂₈	S ₂₉	S ₃₀	
R1	Initial Raw Return	1.00																																
L1	Initial Market Adjusted Return	0.97***	1.00																															
S ₁	Age	-0.02	-0.04	1.00																														
S ₂	Issue Size	0.07	0.05	0.32***	1.00																													
S ₃	Listing Delay	-0.13	-0.12	-0.10	-0.42***	1.00																												
S ₄	Reciprocal of the IPO price of IPO	0.12	0.12	-0.21**	-0.39***	0.20*	1.00																											

S ₂₈	Software Industry	-0.160	-0.132	-0.244***	-0.223	0.081	0.105	0.087	0.231**	-0.133	0.067	0.0013	0.0076	0.0093	0.0092	0.108	0.0053	0.0048	0.144	0.0095	0.061	0.0044	0.377	0.340	0.296*	0.108	0.296*	0.108	0.1075	0.1093	0.001.0	
S ₂₉	Textile Industry	-0.064	-0.061	-0.087	-0.081	0.208	0.187	0.124	0.048	0.172	0.106	0.0044	0.0023	0.269	0.0044	0.0053	0.494	0.0040	0.0028	0.0087	0.009	0.0769	0.005	0.113	0.103	0.090	0.0033	0.090	0.0033	0.0053	0.0028	0.001.0
S ₃₀	Transport Equipment	0.159	0.126	0.024	0.019	0.073	0.070	0.077	0.114	0.045	0.119	0.0049	0.0026	0.0032	0.0049	0.0060	0.0018	0.145	0.0032	0.0065	0.245***	0.0078	0.129	0.116	0.101	0.0037	0.101	0.0037	0.0060	0.0032	0.0021	0.001.0

*Correlation is significant at the 0.01 level (2-tailed).

**Correlation is significant at the 0.05 level (2-tailed).

TABLE 2(C)
Pearson Correlations Matrix of Variables Affecting Long run Performance upto Three Years

		R3	L3	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈	S ₉	S ₁₀	S ₁₁	S ₁₂	S ₁₃	S ₁₅	S ₁₆	S ₁₇	S ₁₈	S ₁₉	S ₂₀	S ₂₁	S ₂₂	S ₂₃	S ₂₄	S ₂₅	S ₂₆	S ₂₇	S ₂₈	S ₂₉	S ₃₀
R3	Initial Raw Return	1.00																														
L3	Initial Market Adjusted Return	0.99*	1.00																													

S ₃	-.134	.018	.012	2.820	-.177	.031	.023	3.988	-.155	.024	.014	2.422	-.118	.014	.008	2.194	-.149	.022	.014	2.828	-.164	.027	.017	2.700
S ₄	.119	.014	.008	2.229	.458*	.210	.203	32.890	.288*	.083	.073	8.842	.117	.014	.007	2.141	.372*	.138	.131	19.871	.295	.087	.077	9.314
S ₅	-.009	.000	-.006	.014	.085	.007	-.001	.909	.087	.008	-.003	.743	-.005	.000	-.006	.004	.072	.005	-.003	.650	.088	.008	-.002	.767
S ₆	.105	.011	.005	1.740	-.012	.000	-.008	.017	-.023	.001	-.010	.054	.118	.014	-.008	2.207	.020	.000	-.008	.050	.029	.001	-.009	.084
S ₇	.003	.000	-.006	.002	.103	.011	.003	1.319	.134	.018	.008	1.787	-.013	.000	-.006	.027	.123	.015	.007	1.909	.128	.016	.006	1.633
S ₈	.067	-.005	-.002	.701	.004	.000	-.008	.002	.056	.003	-.007	.311	.081	.006	.000	1.013	-.029	.001	-.007	.103	.039	.002	-.009	.151
S ₉	.009	.000	-.006	.014	-.074	.005	-.003	.682	-.097	.009	-.001	.937	.028	.001	-.006	.118	-.076	.006	-.002	.715	-.094	.009	-.001	.874
S ₁₀	-.066	.004	-.002	.670	-.059	.003	-.005	.433	-.057	.003	-.007	.316	-.057	.003	-.003	.507	-.045	.002	-.006	.253	-.048	.002	.008	.226
S ₁₁	-.047	.002	-.004	.336	-.053	.003	-.005	.347	-.055	.003	-.007	.297	-.057	.003	-.003	.503	-.068	.005	-.003	.575	-.051	.003	-.008	.253

S ₁ ₂	.152	.023	.017	3.648	.022	.000	-.008	.062	.078	.006	.004	.597	.169	.028	.022	4.532	.043	.002	-.006	.232	.083	.007	-.003	.682
S ₁ ₃	-.009	.000	-.006	.011	-.015	.000	-.008	.027	-.051	.003	-.008	.258	-.018	.000	-.006	.048	-.028	.001	-.007	.097	-.047	.002	-.008	.217
S ₁ ₄	.042	.002	-.005	.270	-.041	.002	-.006	.206	-	-	-	-	.028	.001	-.006	.119	-.032	.001	-.007	.127	-	-	-	-
S ₁ ₅	-.040	.002	-.002	.246	-.037	.001	-.007	.174	-.079	.006	-.004	.608	-.030	.001	-.006	.137	-.041	.002	-.006	.212	-.083	.007	-.003	.676
S ₁ ₆	-.058	.003	-.003	.516	-.072	.005	-.003	.655	-.072	.005	-.005	.516	-.122	.015	.008	2.328	-.074	.005	-.003	.678	-.082	.007	-.003	.666
S ₁ ₇	-.055	.003	-.003	.473	-.063	.004	-.004	.501	-.097	.009	-.001	.922	-.028	.001	-.006	.123	-.050	.002	-.006	.306	-.090	.008	-.002	.796
S ₁ ₈	.024	.001	-.006	.087	.137	.019	.011	2.371	.075	.006	-.004	.558	.021	.000	-.006	.070	.153	.023	.016	2.981	.103	.011	.001	1.057
S ₁ ₉	-.087	.008	.001	1.174	-.002	.000	-.008	.000	.028	.001	-.009	.076	-.091	.008	-.002	1.290	-.002	.000	-.008	.001	.010	.000	-.010	.010

S ₂ ₀	-.098	.010	.003	1.489	-.266	.071	.063	9.450	-.350*	.123	.114	13.705	-.074	.005	.001	.857	-.261*	.068	.061	9.062	-.332*	.110	.101	12.142
S ₂ ₁	.119	.014	.008	2.235	.283*	.080	.073	10.782	.378*	.143	.134	16.307	.117	.014	.007	2.163	.280*	.078	.071	10.511	.361*	.130	.122	14.693
S ₂ ₂	.025	.001	-.006	.099	-.025	.001	-.007	.079	-.048	.002	-.008	.227	.008	.000	-.006	.011	-.046	.002	-.006	.261	-.045	.002	-.008	.199
S ₂ ₃	-.080	.006	.000	1.007	-.001	.000	-.008	.000	.032	.001	-.009	.100	-.068	.005	-.002	.712	.002	.000	-.008	.000	.020	.000	-.010	.041
S ₂ ₄	.175	.030	.024	4.872	.316*	.100	.092	13.711	.397*	.158	.149	18.376	.167	.028	.022	4.449	.309	.095	.088	13.049	.385*	.148	.140	17.051
S ₂ ₅	.001	.000	-.006	.000	-.081	.007	-.001	.815	-.057	.003	-.007	.324	.003	.000	-.006	.002	-.073	.005	-.003	.668	-.063	.004	-.006	.394
S ₂ ₆	-.058	.003	-.003	.515	-.095	.009	.001	1.122	-.126	.016	.006	1.569	-.041	.002	-.005	.256	-.083	.007	-.001	.866	-.129	.017	.007	1.670

S ₂ ₇	.076	.006	-.001	.903	.023	.001	-.008	.064	-.040	.002	-.009	.160	.057	.003	-.003	.508	.008	.000	-.008	.008	-.048	.002	-.008	.224
S ₂ ₈	-.102	.010	.004	1.620	-.160	.026	.018	3.267	-.118	.014	.014	1.394	-.063	.004	-.003	.609	-.132	.017	.010	2.208	-.100	.010	.000	.990
S ₂ ₉	-.060	.004	-.003	.554	-.064	.004	-.004	.514	-.050	.002	-.008	.244	-.080	.006	.000	1.006	-.061	.004	-.004	.467	-.047	.002	-.008	.214
S ₃ ₀	.050	.003	-.004	.391	.159	.025	.017	3.207	-.059	.003	-.007	.337	.047	.002	-.004	.347	.126	.016	.008	1.985	-.060	.004	-.007	.351

After studying the correlation matrix, now, attempt is being made to examine the contribution of each independent variable in explaining the long run performance of IPOs. The results are summarized in Table 3 for both measures of returns for all the time intervals. A perusal of the table reveals that:-

1. Age of the company is positively related with raw returns at the end of two years and three years in case, return is measured from offer date and at the end of two years when measured from listing. As such, age is found to be positively affecting the long run performance of IPOs.
2. The coefficient of Issue size is significantly positive when regressed against raw return at the end of two years, measured from offer date (L_2), thus indicating a positive relation between issue size and IPO performance in long run.
3. Looking at the listing delays, the coefficient is negative, but insignificant in all the regression (against various measures of raw return) indicating an insignificant or no relation in the study.
4. Reciprocal of the IPO price is positively and significantly related with the returns at the end of two and three years, when measured from offer date. It also positively affects the returns at the end of three years when measured from listing date. Overall, therefore, it can be concluded that the price of the IPO is inversely related to its long run performance.
5. While none of the time dummies are statistically significant, except S_{12} and S_{18} have positive signs for all coefficients (when regressed against various measures of return) whereas, others have negative signs in most cases. It suggests that the raw returns could have been higher in case of IPOs that were listed in 1999 and 2005 compared with other years.
6. Looking at the nature of industry, it was found that, IPOs in case of both manufacturing and services industries have got significantly higher returns at the end of second year, for return measured from offer date and in second and third year when return measured from

listing. Manufacturing industry IPOs also performed better at the end of second and third year when return is measured from offer date.

7. Finally, looking at the type of business, it has been found that long run performance measured in terms of returns from offer date, as well as listing by firms in financial services industry, is better than the IPOs in other industries.

The results discussed above are in line with the results of the correlation matrix. However, it is worth noting that the results obtained through the bivariate analysis, obtained particularly through the regression analysis can suffer from the problem of specification bias, and therefore, are only indicative in nature. To provide more extensive analysis and to get in depth inference, the multivariate effects of the possible explanations of long run performance have to be captured. Accordingly, stepwise regression analysis has been conducted, incorporating the continuous and categorical variables as defined in Table 1.

Overall, in the above analysis, it may be concluded that many variables explain the medium and long run performance of IPOs in India.

These include age of the company, listing delay, IPO price, reputation of lead manager and over subscription. Further, the dummy variables for year and nature of the industry reveal that these factors can also impact the long run performance of IPOs after different lags.

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