Determination of IPOS out Performance through Logistic Regression Analysis

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Abstract*: *This study analyzed empirically evaluate the IPOs independent variables for long run of outperformance observed the effects of factor impact through secondary data of IPOs and the data was collected from NSE. In that the factor impact of IPOs are evaluated Lead time, Issue size, Issue price and IPO Grade, in influencing the IPO performance by buy and hold abnormal raw return on listing day and various timeframes in the long run as well as their influence on outperformance using logistic regression analysis of IPOs was observed that the values of independent variables in the logistic regression

Index Terms*: *Factor impact, long run, lead time, Issue size, Issue price, IPO Grade, abnormal raw returns, outperformance, logistic regression

I. INTRODUCTION

Initial public offering is share market gives a public offering for capital gain of the companies through companies first sale towards public after the successful process companies will survive with sustain period. But the equity shares are the major source of funding. Factors impact on IPOs need every investor and companies because the negative side IPOs are gives lose to the investors and companies so that the research focused on factors impact to preventive works for investors and companies. In that long-term investment by the investor. They use buy and hold investment method and buy and hold abnormal return calculation work function by actual buy and hold return dedicating by the normal buy and hold. performance of IPOs outperformance suggestion to the investor and companies for economical growth because the time and price performance lacking will happened for every beginner so its factor impact analysis much importance for beginner Those shares can be further sold by investors through secondary market trading In that long run analysis was analyzed by abnormal raw return on listing day and various timeframes 1 year, 2 year, 3 year from 93 companies (sector wise selected) in the long run use regression analysis was affected by various variables those are 1.Lead time, Issue size, Issue Price, IPO Grade. Grading was classified with point and score scaling which are poor-grade 1, below average -grade 2, average -grade 3, above average -grade 4, good-grade 5 Good and these four variables are consider for their influence on under pricing and over pricing using logistic regression analysis of IPOs by the values of independent variables.

II. LITERATURE SURVEY

Liang Peng (2008): They stated that the long-term performance through china Shanghai share market exchange and they find he average market adjusted cumulative return and buy and hold return are significantly negative over three years and after a year wealth relative shows positive significance. Over with time CAR and BHAR observation they find after market performance gives positive return in short period after that its shows decline path.

Elizabeth A. Demers. (2005) : They examined that the failure IPOs models with aftermarket return performance with on listing time and the negative models are financial and non-financial supports and models are based on po IPOs models and the models significantly negative abnormal return with first year and second year post initial public offering by technical firm works.

Selvamathi.R, Dr. A.A. Ananth (2018): This study of long run analyzed grade wise IPOs performance of long run during the study period between the three years of 2010 to 2014, observed the effects of grade price performance through secondary data of IPOs and the data was collected from NSE. In that grade wise IPOs performance are evaluated by CARS and BHARS with various tools these are Cumulative Raw Return , Cumulative Market Return , Cumulative Abnormal Return (CAR) ,Wealth Relative was measured and observed by Poor , Below Average , Average , Above Average , Good , All with minimum and maximum and mean, t-value-value statistics parameter In that the comparative studies of grade wise IPOs performance was observed from 2010 to 2014 in NSE

III. RESEARCH METHODOLOGY

A. Research Objectives

- To study the factors that influence 3 years analysis through IPO
- To study logistic regression analysis of selected IPOs by independent variables
- To study the influence of outperformance value by impact factor

B. Variables under study

Independent variables-Lead time, Issue size, Issue price, IPO Grade with constant value

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C. Research Design

The correlation analysis is carried out by multivariate analysis between IPO factors and IPO performance variables in the long-run with the different time frames listing day, 1 year, 2 year, and 3 year by abnormal raw returns

D. Sample selection

93 companies performance through secondary data of IPOs and the data was collected from NSE.

E. Regression model for Methodology

$$BHAR_{iT} = \prod_{i=1}^{T}(1 + r_{it}) - \prod_{i=1}^{T}(1 + r_{mt})$$

The BHAR of selected IPOs is averaged over a time period T following formula mentioned below:

$$BHAR_T = \frac{1}{n}\sum_{i=1}^{n} BHAR_{iT}$$

The statistical significance of the BHAR is ascertained by t-statistic calculated as per the formula defined as:

$$t = \frac{BHAR_T}{\sigma(BHAR_{iT})/\sqrt{n_T}}$$

Where $\sigma(BHAR_{iT})$ is the standard deviation of CAR for month 'T' and 'n' stand for number of IPOs with 'T' month. The specification of the regression model is here under.

$$Y = \alpha + \beta_1 leadtime + \beta_2 issue\ size + \beta_3 issue\ price + \beta_4 IPO\ grade + \varepsilon$$

Where

Y =Raw return, Market adjusted excess return, α=Intercept (Constant)

$\beta_1, \beta_2, \beta_3 \& \beta_4$ =Estimated coefficients, ε=Error-term

The specification of logistic regression model is as given below.

$$ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 leadtime + \beta_2 issue\ size + \beta_3 issue\ price + \beta_4 IPO\ grade$$

Where

P is the probability of underpricing, which is coded as 1 and 1-P is the probability of overpricing, which is coded as 0. β_0 Is constant, and $\beta_1, \beta_2, \beta_3 \& \beta_4$ are the estimated coefficients.

IV. ANALYSIS OF FACTORS AFFECTING THE IPO PERFORMANCE

A. Regression Results Showing IPO Factors Determining BHAR In The Long Run

IPO Factors (Independent)	Dependent Variable: BHAR		
	1-Year	2-Years	3-Years
Intercept	-1.400** -(3.43)	-1.470** -(3.82)	-1.353** -(2.74)
Lead time	0.032 (1.58)	0.046* (2.43)	0.037 (1.54)
Issue Size	0.0009 (1.42)	0.0001 (0.14)	-0.00003 -(0.04)
Issue Price	-0.0003 -(0.63)	-0.0003 -(0.60)	-0.0003 -(0.51)
Grade	0.281** (3.27)	0.212* (2.62)	0.189# (1.82)
R^2	0.2073	0.1493	0.0718
Adjusted R^2	0.1713	0.1107	0.0296
F value	5.75**	3.86**	1.70^{NS}
DF	4,88	4,88	4,88

Source: Secondary Data.

#Significant @ 10% level; *Significant @ 5% level; **Significant @ 1% level

A. Logistic Regression Results Showing Ipo Factors Determining The Outperformance (Based On Bhar) Of Ipos In 1 Year

IPO Factors (Independent)	Dependent Variable: Outperformance based on 1 Year BHAR					
	Beta	**Standard Error**	**Wald Statistics**	**df**	**p Value**	**Odd Ratio**
Constant	-5.0753	1.4901	11.60**	1	0.0007	0.0062
Lead time	0.1507	0.0651	5.36*	1	0.0206	1.16
Issue Size	0.0047	0.0016	8.17**	1	0.0042	1.0047
Issue Price	-0.0024	0.0021	1.31	1	0.2520	0.997
Grade	0.4321	0.2358	3.36#	1	0.0669	1.54
Model χ^2	26.35**					
Degrees of Freedom	4					
Cox & Snell R^2	0.2467					
Nagelkerke R^2	0.3447					

Source: Secondary Data.
#Significant @ 10% level; *Significant @ 5% level; **Significant @ 1% level

B. Logistic regression Results Showing IPO Factors Determining the Outperformance (Based on BHAR) of IPOs in 2 years

IPO Factors (Independent)	Dependent Variable: 2-Year Buy-Hold Outperformance					
	Beta	**Standard Error**	**Wald Statistics**	**df**	**p Value**	**Odd Ratio**
Constant	-4.8826	1.4257	11.73**	1	0.0006	0.008
Lead time	0.1395	0.0628	4.93*	1	0.0264	1.15
Issue Size	0.0018	0.0015	1.47	1	0.2254	1.00
Issue Price	-0.0011	0.0016	0.46	1	0.4971	1.00
Grade	0.5256	0.2286	5.29*	1	0.0215	1.69
Model χ^2	16.95**					
Degrees of Freedom	4					
Cox & Snell R^2	0.1666					
Nagelkerke R^2	0.2380					

Source: Secondary Data. *Significant @ 5% level; **Significant @ 1% level

C. Logistic regression Results Showing IPO Factors Determining the Outperformance (Based on BHAR) of IPOs in 3 years

IPO Factors (Independent)	Dependent Variable: 3-Year Buy-Hold Outperformance					
	Beta	**Standard Error**	**Wald Statistics**	**df**	**p Value**	**Odd Ratio**
Constant	-2.6067	1.0094	6.67**	1	0.0098	0.074
Lead time	0.0427	0.0455	0.88	1	0.3485	1.04
Issue Size	0.0012	0.0015	0.66	1	0.4164	1.00
Issue Price	-0.0013	0.0017	0.65	1	0.4217	1.00
Grade	0.2524	0.2177	1.34	1	0.2463	1.29
Model χ^2	4.70^{NS}					
Degrees of Freedom	4					
Cox & Snell R^2	0.0493					
Nagelkerke R^2	0.0741					

Source: Secondary Data. *Significant @ 5% level; **Significant @ 1% level

V. FINDINGS

The correlation analysis between IPO factors and BHAR from IPOs in long-run duration of 1, 2 and 3 years. From the perusal of the table, it is understood that 'grade' is correlated positive with BHAR in all three long-run time periods at 1 per cent level of significance. The 'issue size' is positively correlated with 1 year BHAR at 1 per cent level while 'lead time' is correlated positively with 2 year BHAR at 5 per cent level of significance. In sum, it is found that there is significant association between 2 year BHAR and lead time, 1 year BHAR and issue size and between 'grade' and BHAR of all three long-run time periods.

The multiple regression results showing the collective and unique influence of IPO factors on BHAR from IPO in 1 year, 2 years and 3 years. As shown in the table, the fitted model for 1 and 2 year BHAR

with IPO factors is significant at 1 per cent level and the model fit for 3 year BHAR is insignificant.

In the significantly fitted model for 1 year BHAR, the estimated coefficient is significantly only for 'grade' (β=0.281, t = 3.27, p <0.01). In the model for 2 year BHAR, the coefficient of 'grade' (β=0.212, t = 2.62, p <0.05) and 'lead-time' (β=0.046, t = 2.43, p <0.05) is significant at 5 per cent level. The effect of IPO factors in predicting the probability of outperformance of IPOs with long-term period from 1 to 3 years based on buy and hold abnormal return is analyzed logistic regression. Table 4.57 shows the results of the analysis. The logistic regression model for outperformance of IPO in 1 year BHAR with four IPO factors is fitted significantly (χ2 = 26.35, p < 0.01) with explained variation in outperforming to the extent between 24.67 per cent (Cox & Snell R^2) and 34.47 per cent (Nagelkerke R^2).

From the observation of Wald statistics, it is evident that the lead time, issue size and grade are the significant IPO factors in positively influencing the outperformance of IPO in 1 year in terms of BHAR. In sum, it is found that the odds of outperformance of IPO in 1 year BHAR is 1.16 times more likely than the odds of underperformance for one unit increase in lead-time. The probability of outperformance is more by 1.0047 times than the probability of underperformance for one unit increase in issue size. The odds of outperformance of IPO in 1 year BHAR is 1.54 times higher than that of underperformance for every one level increase in grading of IPOs issued and listed between 2010 and 2014 in Indian market.

Therefore, it is deduced that BHAR from IPOs in 1 year timeframe is likely increase with increase in the level of grading of IPOs whereas the BHAR from IPOs in 2 year timeframe tend to increase significantly with increase in the level of IPO grading and lead-time. The logistic regression results exposing the power of IPO factors in predicting the probability of outperformance of IPOs in 2 year BHAR.

The logistic regression model for predicting the probability of 2-year BHAR based outperformance is fitted significantly by all four IPO factors (Model χ^2 =16.95, p < 0.01). The proportion of variance accounted for by all four IPO factors together in 2 year BHAR based outperformance is vary between 16.67 per cent (Cox & Snell R^2) and 23.80 per cent (Nagelkerke R^2). The estimated coefficient is significant and positive for 'lead-time' and 'grade' with odds ratio of 1.15 and 1.69 respectively. So, it is found that one level increase in IPO grade is significantly associated 1.69 times increase in the probability of outperformance than the probability of underperformance of IPO in 2 year BHAR. Similarly, the odds of increase in outperformance are 1.15 times higher than underperformance of IPO in 2 year BHAR for every one unit increase in lead-time.

Logistic regression identifying the IPO factors that have notable effect in determining probability of outperformance of IPOs in 3 year BHAR. The logistic regression results shows that insignificant fit of the overall model in predicting the probability of outperformance of IPOs in 3 years with BHAR trading method. Hence, it is found that the four IPO factors such as lead time, issue size, issue price and grade have no effect in predicting the probability of outperformance of IPOs in the long run period of 3 years with BHAR method in Indian market.

VI. CONCLUSION

It is found that the odds of outperformance of IPO in 1 year BHAR is 1.16 times more likely than the odds of underperformance for one unit increase in lead-time. The probability of outperformance is more by 1.0047 times than the probability of underperformance for one unit increase in issue size. The odds of outperformance of IPO in 1 year BHAR is 1.54 times higher than that of underperformance for every one level increase in grading of IPOs issued and listed between 2010 and 2014 in Indian market.

VII. SUGGESTIONS

IPOs factors by long run analysis obtained by this BHAR in long term the issuer and investor advised to make the safe action on investment towards IPOs and they most know the negative side of the IPO and the lead time (listing delay) is an important factor for IPO return. Hence, the IPO issuing companies should avoid lengthening listing date and the process of listing should be quick and prompt. As issue size is the important predictor of IPO returns both in long-run, the investors must consider size of the IPO while investing. The IPO grading also has influence on IPO returns in the presence in issue size. So, while considering issue size, the investors should take the grading of IPOs into account as the grading is based on fundamental and past history of the issuing companies.

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