Determinants of Initial public offerings (IPOs)

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ABSTRACT

This paper interacts to explain ownership structure, post promoters holdings and Ex-ante information at the level of underpricing in the Indian primary market. The study is based on IPO that listed at Bombay stock exchange given that (April-1999 to Dec-2012). Multiple linear regressions are used to distinguish the relationship between various independent variables with the dependent variable, i.e. level of underpricing. Therefore, we used ordered probit regression to find the exact relationship of pricing mechanism (book build pricing mechanism) with the other variables. The outcomes reveal that, Firm's age, book build pricing mechanism, ownership structure, retail subscriptions & market capitalization explained the degree of underpricing, These findings were more important to the retail and institutional investors, who likely to buy IPOs in the Indian primary market.

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1. 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 signaling 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.

2.0. Underpricing Anomalies

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 instructed and uninformed investors. If the issues are underpriced, IPOs will be oversubscribed by authoritative investors, resulting in a limited number of shares being available to uninformed investors. If the issues are overpriced, IPOs will be sold exclusively to uninformed investors who will earn negative initial returns. Thus, uninformed investors will be winning the entire issue but at an unfavorable price, creating a situation termed the winner's curse. In order to keep uninformed investors in the IPO market, securities are offered at a discount from their expected after market prices. Thus, according to the winner's curse theory, IPO underpricing should decrease if the information asymmetry between informed and uninformed investors is reduced.

Empirical studies have found evidence that the underpricing for IPOs of financial institutions is related to proxies for asymmetric information. Signaling (Allen and Faulhaber, 1989) asymmetric information (Ibbotson, 1975) Offer size (W.L.

Megginson and K.A. Weiss, 1991) age of the firm (Muscarella and Vetsuypens, 1989) market capitalization, (McDonald and Fisher, 1972), (Baker and Wurgler, 2007), Pricing mechanism (Bansal and Khanna, 2012) determinants of IPO underpricing at BSE (Bansal and Khanna, 2012). (Booth, 1996) – First started ownership status, (Stoughton, 1998) (Reese, 1998), (La Porta, 1999) – Institutional investors avoid to buy pubic offer (Yong, 2001), (Kim, 2004) described about the behavior pattern of different investors class and the impact of their behavior pattern on the level of underpricing. Their findings are also explained that the significant association of share holdings and the level of underpricing.
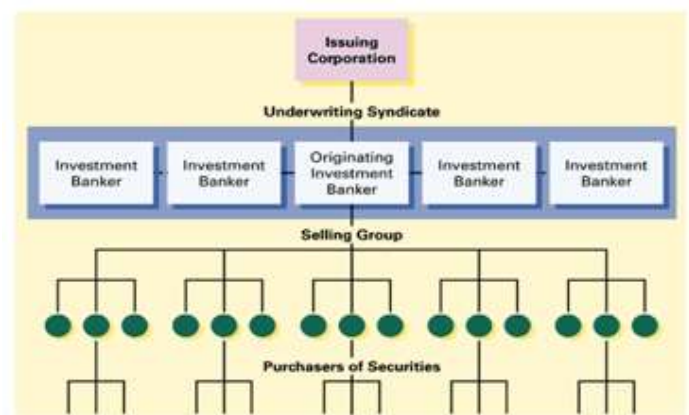
(Leite, 2007), generalized the informational assumptions of the (Rock, 1986) to address empirical evidence and conjectures that the standard model based on informed and uninformed investors is unable to address.

(Dolvin and Jordon, 2008), addressed the question of whether or not periods of high underpricing adversely affect pre-existing shareholders. They found that high levels of underpricing are associated with increased share retention,

which effectively offsets much of the potential cost. Overall, the percentage of shareholder wealth lost is stable over time, unlike underpricing itself.

(Bansal and Khanna, 2012), analyzes that whatever there is any significant difference in the magnitude of level of underpricing of IPOs that priced through the book build with those are priced through the fixed price option.

3.0, Research objectives

To measures the IPOs initial performance on first trading day.

Does ownership structure of Indian stock market affecting the level of the underpricing?

The aim of our study is to find out, the relationship between firm specific, ex-ante uncertainty, such as (subscription, issue size, firm's age, number of offered shares, market capitalization and pricing mechanism) and the level of dependent variable i.e. Underpricing.

4. Research methodology

4.1. Sample and data collection methods

The sample used in this study consists of all Indian firms which went public on the official market of the Stock Exchange of Bombay for the period (april-1999 to 2012). In addition, regular price histories were collected for each sample firm through the period 1999–2012. In particular, we used capital line database and Centre for monitoring information economy (CMIE) for this purpose.

4.2. Measure of underpricing

Consistent with the standard methodology, underpricing is calculated as the percentage change from the offer price to the closing price in the secondary market.

Equation 1 Traditional underpricing = ((closing price - offer price) /offer price) * 100…………..………..…...   (1)

Equation 2 Log underpricing = ln (P1-P0/P0)* 100…. … (2)

Log Underpricing = ln (closing price/ offer price) is used to determine the level of underpricing and to make standard practice and to avoid heteroscadisticity. We have market adjusted returns on securities (MAARO).

Firstly, we calculate the return on i security, where we used $R_i = (P1-P0)/P0$ in which, R_i= return on i security, $P1$= Price of i security on first listing day, $P0$= offer price of i security.

Equation 3 $R_i = (P1-P0)/P0$……………………………….. (3)

Secondly, we calculate index return on corresponding days, where we used $M_i = (I_i - I0)/ I0$ in which, M_i= market return on ith day, I_i = closing index at listing day, $I0$= closing index at offer day.

Equation 4 $M_i = (I_i - I0)/ I0$………………………….…(4)

where P_{i0} is the offer price of the firm i, P_{i1} is the first day closing prices of the shares in firm i, and R_{i1} is the total first day return on the stock. If markets are highly volatile such that there is a major change in the price of most stocks during the IPO period, then initial returns should be market adjusted

Finally, we calculate market adjusted return on security, where we taken Ri from equation (1) and Mi from equation (2).

Equation 5 Maaro = {100* [(1+Ri)/ 1+Mi)-1]}………….. (5)

However, the measure in Eq. (3) rests upon the assumption that the systematic risk of the IPOs under consideration is the same as that of the index. Indeed, it is highly unlikely that the betas of the IPOs average to unity, as a number of studies (e.g., Ibbotson, 1975; Affleck-Graves et al., 1996) have shown that the average betas of the newly listed firms are systematically higher than one. As such, the MAARO may be upwardly biased in the sense that a higher initial performance of the IPO relative to the market could be observed.

Hypothesis

HA: There is positive significant relationship between promoter's holdings and the degree of underpricing.

HB: There is positive relationship between the number of share offered and degree of underpricing.

HC: There is negative significant relationship between firm's age and degree of underpricing.

HD: There is negative significant connection between issue size and level of underpricing.

HE: There is negative relationship between retail subscription and level of underpricing.

HF: There is a negative link between book build pricing mechanism and the level of underpricing.

4.3.0, The Multiple regressions Model

The impact of the independent variables namely, subscription rate, issue size, market capitalization, offer timing, firm's age, number of share offered, Private firm's (dummy), ownership structure, and pricing mechanism (dummy) by Book build option on the dependent variable underpricing is modeled through multiple regression as:

4.3.1, Estimation OLS Regression Equation

(Log Maaro) = α + β_1 Log (Indinprom) + β_2 Log (Issue Size) + β_3 (Book build) + β_4 Log (Market cap) + β_5 Log (Pvt firms) + β_6 Log (Instnonprom) + β_7 Log (Retail- Subsc)+ β_8 (Firm's age)+ β_9 Log (No of shares offered)+ e

Ordered probit regression equation

α + β_1 L. Log β_3 L β_4 Log L Log β_6 Log Lβ_7 Log .e

5.0. Results & Discussions

Based on the multiple linear regression results it was created that the entire variables were regressed against the level of underpricing. It reveals that there is no relevant link between promoter's holdings and degree of underpricing. There is no significant link between non promoters and underpricing. It communicates the positive link between numbers of share offered with the level of underpricing. There is no significant relationship between firm's age and level of underpricing. However, there is the negative link with the level of underpricing. Notwithstanding, market capitalization has a positive effect on the level of underpricing. Consequently, the result reveals the cynical association between the retail subscription and the degree of the underpricing. There is consequential unco-operative difference between book build mechanism and level of underpricing Nonetheless, no weighty link of private issuing firms with the level of underpricing.

Conclusion

Taking into account all firms which have gone public on the official market of the Stock Exchange of Bombay for the period 1999 until 2011, this study examines the evidence on the short-run under-pricing of IPOs. In particular, an average underpricing level within the range 50% is found based on first day. Using a regression approach, the degree of underpricing is explained by the ex-ante uncertainty hypothesis and the ownership structure hypothesis. However, there is limited support for the signaling hypothesis. In particular, the results show that the ex- ante information and have a important positive impact on the initial returns while the ownership structure has no relevant negative effect on short-run underpricing.

5.0 Variables description

Table No .1 Variable's description and symbol used in regression models

	Symbol used in models	Description	Variable/ Dummy	Expected sign
Pricing mechanism	IPO_TYPE	Pricing mechanism is divided into two parts, Book build Pricing mechanism and Fixed option pricing mechanism. However, we introduced pricing mechanism as a dummy variable into our models. As the result of, all those IPOs, issued by book build marked as 1 otherwise 0.	Dummy	**Neg**
Number of shares issued	LGNOOFSHARE	Company issued several numbers of shares to public, raised money via their subscription. However, we transformed it into Natural logarithm and to find the impact of number of shares with the level of underpricing.	Explanatory/ Indp	**Neg**
Difference in Days	LOGDIFF_IN_AG	The ownership structure of a company comprises of a distribution of the size of investor shareholdings. Applying a single measure in the form of a proportion is to be sufficient to delineate distributions with varying shapes. Numbers of shares are holding by promoters and non promoters. We have also taken the total percentage of their shares holding in the ownership structure..	Explanatory/ Indp	**Pos**
Total amount of Issue size	LOGISSUESIZE	Total amount is raised by company via IPOs issue of IPOs to public. However issue size is effect the percentage of underpricing.	Explanatory/ Indp	**Neg**
market capitalization in listing day	LOGMKTCAP	The market capitalization is measured as the total number of shares multiplied by the market price per share. Another time, the natural logarithm of this value is used as a standard practice and to remove heteroscadisticity.	Explanatory/ Indp	**Neg**
Subscription rate	LOGSUBSC	The subscription measured as the quantity of shares of the total times had investors subscribe after the issue. The natural logarithm of this value is used as it is a standard practice and to remove heteroscadisticity.	Explanatory/ Indp	**Neg**

5.1, Data collection and analysis

Table 2 IPOs at Bombay stock exchange from 2000-2011

Year	Total	BSE	BB	FPO	BB-Under	BB-Over	FPO-Under	FPO-over
2000	118	67	11	56	6	5	30	26
2001	16	10	2	8	0	2	2	6
2002	5	5	1	4	0	1	4	0
2003	14	11	4	7	3	1	5	2
2004	28	25	17	8	9	8	6	2
2005	70	67	48	19	26	21	14	5
2006	90	89	68	21	36	32	14	7
2007	106	105	91	14	58	32	7	7
2008	38	38	33	5	16	17	2	3
2009	21	21	21	0	14	7	0	0
2010	73	73	71	2	47	24	2	0
2011	40	39	38	1	19	19	0	1
Total	619	550	405	145	234	169	86	59

5.2. Descriptive statistics:

Table 3 Correlation matrix for all variables

Variables	IPO_TYPE	ISSUE_SIZE	LGNOFSHRE	DIFF_IN_AG	AGE	MKTCAP	SUBSC
IPO_TYPE	1.00						
t-Statistic	-----						
Probability	-----						
ISUE_SIZE	0.10	1.00					
t-Statistic	1.34	-----					
Probability	0.18	-----					
NOFSHARE	0.08	0.68	1.00				
t-Statistic	1.08	11.89	-----				
Probability	0.28	0.00	-----				
DIFF_IN_AG	-0.28	-0.17	-0.18	1.00			
t-Statistic	-3.79	-2.18	-2.40	-----			
Probability	0.00	0.03	0.02	-----			
GAGE	0.11	0.33	0.31	-0.10	1.00		
t-Statistic	1.38	4.53	4.23	-1.34	-----		
Probability	0.17	0.00	0.00	0.18	-----		
MKTCAP	0.36	0.68	0.70	-0.25	0.35	1.00	
t-Statistic	4.93	12.09	12.59	-3.26	4.76	-----	
Probability	0.00	0.00	0.00	0.00	0.00	-----	
SUBSC	0.08	-0.03	0.01	-0.01	0.06	0.33	1
t-Statistic	1.06	-0.37	0.17	-0.19	0.75	4.47	-----
Probability	0.29	0.71	0.87	0.85	0.46	0.00	-----

Table 4 Descriptive statistics for all variables used in multiple regressions

	BB	AGE	NON INS	INDN	INDP	ISSUESIZE	MKTC	MAARO
Mean	0.73	2.56	1.10	2.43	3.83	4.48	6.06	3.02
Media	1.00	2.56	0.00	3.03	4.19	4.44	5.95	3.31
Max	1.00	4.94	4.60	4.60	4.60	9.64	12.28	6.52
Min	0.00	0.00	-4.8	-8.11	-8.11	-0.40	0.24	-0.4
Std. Dev.	0.44	0.97	1.44	1.87	1.35	1.73	2.18	1.48
Skew	-1.0	-0.29	0.20	-2.10	-4.84	0.10	-0.12	-0.46
Kurt	2.11	3.73	2.97	9.29	34.77	3.44	3.64	2.76
Jarque-Bera	69.72	11.73	2.19	761.84	14668.77	3.21	6.27	12.06
Prob	0.00	0.00	0.33	0.00	0.00	0.20	0.04	0.00
Sum	234.00	819.20	351.30	775.52	1224.74	1432.05	1934.001	963.69
Sum Sq. Dev.	62.3	300.31	667.09	1116.10	584.61	959.36	1517.47	700.45
Obs	350	350	350	350	350	350	350	350

5.2. Multiple OLS regression analysis:

Table 5 Result of multiple regression analysis

Source	SS df	MS	Number of obs =		319
		F(10, 308)	=		12.16
Model	198.270951	10	19.8270951	Prob > F =	0.0000
Residual	502.216799	308	1.63057402	R-squared =	0.2830
		Adj R-squared	=		0.2598
Total	700.48775	318	2.20279167	Root MSE =	1.2769

logmaaro	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
logage	-.1214881	.0889739	-1.37	0.173	-.2965617	.0535855
logsubsc	.3461823	.0588988	5.88	0.000	.2302874	.4620772
logmktcap	.2281094	.1086688	2.10	0.037	.0142822	.4419366
logpiph	-.0646031	.1262466	-0.51	0.609	-.313018	.1838117
logforgp	-.0998557	.1070174	-0.93	0.352	-.3104334	.110722
logindp	-.0524819	.0903087	-0.58	0.562	-.2301819	.1252181
logfornonp	.0073583	.0554295	0.13	0.894	-.1017101	.1164267
logissuesize	-.6685558	.1515079	-4.41	0.000	-.9666772	-.3704343
lgnoofshare	.0788038	.0876593	0.90	0.369	-.093683	.2512906
pvtgvtcode	.0822991	.2642359	0.31	0.756	-.4376368	.602235
_cons	3.299305	1.47414	2.24	0.026	.3986459	6.199964

Results of Ordered Probit regression for pricing mechanism
Table 6 Ordered Probit regression for pricing mechanism

Iteration 0:	log likelihood	-184.92546	
Iteration 1:	log likelihood	-99.903538	
Iteration 2:	log likelihood	-84.136192	
Iteration 3:	log likelihood	-81.129742	
Iteration 4:	log likelihood	-80.955073	
Iteration 5:	log likelihood	-80.954332	
Ordered probit	regression	No of observation	= 349
		LR chi2(7)	207.94
Log likelihood	= -80.954332	Prob > chi2	0.0000

Ordered probit		regression		Number of obs		= 349
		LR chi2(7)		=		207.94
		Prob > chi2		=		0.0000
Log likelihood		= -80.954332		Pseudo R2		=0.5622
bb	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
logsubsc	.061289	.0995718	0.62	0.538	-.1338681	.256446
logissuesize	1.657262	.2510587	6.60	0.000	1.165197	2.149328
logmktcap	-.1395548	.1437565	-0.97	0.332	-.4213123	.1422027
lgnoofshare	-.8192385	.1300611	-6.30	0.000	-1.074154	-.5643234
logmaaro	-.1879705	.0835513	2.25	0.024	.024213	.3517279
logindp	.0964437	.0976584	0.99	0.323	-.0949631	.2878506
logpiph	-.0953179	.1723369	-0.55	0.580	-.4330921	.2424562
/cut1	-7.237176	1.832071			-10.82797	-3.646383

Conversely, the results show that there is no statistically significant relationship with other. explanatory factors such as return on firm's age, and IPO years, ownership structure and the level of underpricing.

The results obtained from this study show that fresh issues on the BSE are subject to underpricing, consistent with developed and other emerging markets. In this respect, prospective investors should pursue the strategy of buying the brand new issues at the offer and selling them immediately on the initial day of trading. Notwithstanding, the study also reveals that investors should not hold fresh issues very long as the highest component of the introductory returns is found on the first day of trading and that the average original returns turn negative on the fourth day of trading.

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