Pricing and Performance of IPOs in India

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Abstract- *This study examines listing day recital of IPOs, book-built and fixed-price IPOs, post-listing after market concert of IPOs, book-built and fixed-price IPOs in the Indian stock market. We observe pricing as well as long run performance of 464 (365 book-built IPOs and 99 fixed-price IPOs) Indian IPOs that went public between 2001 and 2011. The study covers 15 years from the financial year 2001 to 2015. Psychotherapy of the results reveals that compared to fixed-price IPOs, book-built IPOs are underpriced by lesser enormity. Moreover, book-built IPOs are connected with negative snowballing average nonstandard returns (CAARs) up to five years and further than, the negative CAARs related with fixed-price IPOs turn positive after one and one-half year and continue to be positive thereafter.*

Keywords- IPOs; underpricing; underperformance; book-building; fixed-price IPO

I. INTRODUCTION

There have been two major anomalies relating to IPO literature worldwide listing day underpricing and post-listing underperformance in the medium to long run. Closing price on the listing day for IPOs has been much higher than the issue price which is termed as "underpricing" of IPOs. When thereturns of these IPOs are calculated for one, three or five years (starting from the closing price on the listing day), the market-adjusted returns have been significantly negative. Loughran and Ritter (2002) in their study original issue price), the total issue proceeds would have been higher by an amount equal to the amount of underpricing. This huge amount of under-pricing was twice as large as the US $13 billion fees paid to the investment bankers. They also noted that the average IPO in their study accounted for underpricing of US $9.1 million. Ritter (1991) finds that firms that went public in the US during the period 1975–1984 have significantly underperformed report that for the period of 1990–1998, companies that went public in the US accounted for underpricing to the tune of US $27 billion. Had these shares been issued at the closing market price on the listing day, (instead of the in the long run. By comparing these "IPO firms" with "firms matched by size and industry", from the closing price on the listing day to their three-year anniversaries, study showed that IPO firms under-performed their matching firms by 29%. The ratio of the terminal wealth of IPO firms to that of matching firms were only 0.831with a numerator of $1.3447 for IPO firms and a denominator of $1.6186 for seasoned firms.

Indian market need to be studied because of the strides it has made in the post-liberalisation period. Many reforms were introduced by the Securities and Exchange Board of India (SEBI) to en-sure transparency in the Indian stock market. These reform measures include dematerialisation, demutualisation of stock exchanges, electronic trading system, shorter trading cycles, rolling settle-ment, circuit filters, derivatives trading, credit rating, IPO grading, lock-in period for promoter hold-ing, price–volume tracking in the trading system, time bound application and allotment of securities, buy-back of shares, mandatory disclosure of securities pledged by promoters with banks for raising loan and book-building process for IPOs. These reforms have transformed Indian stock market and attracted the capital from foreign institutional investors (FIIs) by way of direct investment and port-folio investment. India has national as well as regional stock exchanges but the trading volume is restricted to two prominent exchanges, The Bombay Stock Exchange (BSE) and the National Stock Exchange of India limited (NSE). The total market capitalisation of BSE is around Rs.1,44,90,494 crores as of 17 November 2017. Out of 5,567 companies listed on BSE, 5,146 companies have shares listed on the equity segment. However, about 2,924 companies are traded on the market with 22,70,86,007 orders being placed by the investors. BSE has introduced a number of stock market indices to track the market movement. The prominent among them are the S&P BSE Sensex, S&P BSE Sensex 50, S&P BSE-100, S&P BSE-200, S&P BSE mid-cap, S&P BSE small-cap. Apart from these gen-eral indices, there are also sectoral indices. NSE is relatively younger exchange but has captured the market share of the daily volumes both on cash and derivatives segment. Trading mechanism on both these stock exchanges in India is based on an open electronic limit order book where order matching is done by the trading computer. The entire process is order driven where orders placed by investors are matched with the best available limit orders, automatically. This means, both buyers and sellers remain unidentified in the entire process. Such order-driven market ensures more trans-parency in the entire process. All

orders are placed through registered brokers who provide online trading facility to retail investors. However, institutional investors can use Direct Market Access (DMA) option where they can use trading terminals provided by their brokers and place orders di-rectly into the trading system. The settlement cycle for equity spot market is T+2 rolling settlement. With all these features, Indian market presents an interesting scenario to study one of the issues of capital market, the performance of IPOs. While there have been well-documented studies on the western market on the pricing and performance of IPOs, the literature on the Indian market is scanty in this area. Therefore, we examine pricing as well as long run performance of IPOs in Indian stock market.

The present paper is arranged as follows: The first section provides conceptual background of two of the IPO anomalies that are studied in the current paper. The second section discusses briefly the earlier research conducted on these two anomalies. The third section discusses the objectives of the study and the hypotheses to be tested. The fourth section deals with the methodological issues. The fifth section presents the results of the study about both short run and long run performance of IPOs in India. The last section makes concluding remarks and suggestions for future study.

II. REVIEW OF LITERATURE

The review of literature has been divided into two parts. First part deals with listing day underpricing and second part deals with long run performance.

2.1. Listing day underpricing

Baron (1982) developed an "information asymmetry theory" in which the investment banker is bet-ter informed than the issuer regarding the market conditions and pricing of the issue. The issuer must reward the investment banker for the superior information. Consequently, the decision to set the issue price is delegated to investment banker which is set by him below its true value for his own benefits. However, testing Baron's model Muscarella and Vetsuypens (1989) find that even IPOs of investment banks (self-marketed offerings) are characterised by statistically significant underpric-ing when compared to other IPOs; thus, contradict the model. Also, Cheung and Krinsky's (1994) study failed to establish lower degree of underpricing for the sample of investment bankers' IPOs. Rock (1986) developed another version of information asymmetry theory in which he claimed under-pricing is required because of the information asymmetry between two groups of investors—in-formed and uninformed. Informed investors subscribe only to "good issues" and they stay away when "bad issues" come to the market. Because of this, the uninformed group gets only bad issues; hence, they stay away from the market. Therefore, to attract even uninformed investors to the mar-ket, all the issues are compulsorily underpriced. Using a sample of IPOs listed on Stock Exchange of Singapore, Lee, Taylor, and Walter (1999) showed that large investors (better informed) tend to preferentially request participation in IPOs with higher initial returns which is consistent with Rock's model.

Analyzing "hot issue" market of the 1980s in the US (between January 1980 and March 1981), Ritter (1984) documents average initial return of 16.3% for the rest of the 1977–1982 period, as against 48.4% for the hot issue period. Taking a sample of 664 firm commitment and 364 best ef-forts offers, Ritter (1987) found underpricing of 14.8 and 47.78% for these two sub-groups.

In India, Narasimhan and Ramana (1995) found significant underpricing of Indian IPOs consistent with international observations. Study also revealed that premium issues are underpriced than par issues. Attempting to identify the causal variables responsible for underpricing of Indian IPOs, Chaturvedi, Pandey, and Ghosh (2006) found that the extent of oversubscription of an IPO deter-mines the first day gain; signals that lead to oversubscription are market index during the period of IPO, type and nature of business, foreign collaboration, or the track record of promoters/company. Garg, Arora, and Singla (2008) also documented that Indian IPOs are significantly underpriced and noted that the level of underpricing does not vary much in the hot and cold IPO market. Studying book-built and fixed-price IPOs in India, Bora, Adhikary, and Jha (2012) found underpricing of 21.42% for fixed-price IPOs and 18.22% for book-built IPOs. However, when adjusted for market movement, the corresponding figures are 16.71 and 16.75, respectively. Einar (2015) using a sample of more than 5,000 IPOs, documented significant abnormal returns up towards 5% (excluding Initial Day Returns) during the first months of trading. These abnormal returns are greater and more persistent if general market conditions are strong, supporting a bounded rationality explanation.

2.2. Long run performance

On the Indian front, Madhusoodanan and Thiripalraju (1997) studied both short run and long run performance of Indian IPOs taking a sample of 1922 IPOs that went public between 1992 and 1995. This study reported underpricing of Indian IPOs consistent with international findings. In the long run, Indian IPOs offered positive returns which contradicted most of the international findings. Using BHARs and a sample of 438 IPOs that went public between June 1992 and March

2001, Sehgal and Singh (2007) found that the long run returns have been negative between 18 and 40 months of hold-ing while CAAR exhibited the existence of underperformance in the second and third years. Hoechle et al. (2017) by studying a sample of 7,487 US IPOs between 1975 and 2014, showed that mature firms in terms of Carhart-alphas significantly underperformed over two years (with underper-formance peaking one year after going public). They applied a "regression-based portfolio sorts ap-proach (RPS)", which allows to decompose the Carhart-alpha into firm-specific characteristics and explain one-year IPO underperformance using a multitude of market and firm characteristics in a statistically robust setting.

III. OBJECTIVES AND HYPOTHESES

3.1. Objectives of the study

This study analyses both initial pricing and long run performance of IPOs. Therefore, the objectives of the study are:

(1) To ascertain the listing day performance (underpricing) of IPOs in India.
(2) To analyse listing day performance of book-built and fixed-price IPOs, separately.
(3) To ascertain post-listing aftermarket performance of IPOs in India.
(4) To analyze post-listing aftermarket performance of book-built and fixed-price IPOs, separately.

3.2. Hypotheses

The study examines initial and post-listing performance of IPOs. Therefore, the hypotheses being tested are:

(1) The IPOs are not underpriced based on the listing day performance.
(2) Investors cannot earn abnormal returns from IPOs in the post-listing period performance.

IV. METHODOLOGICAL ISSUES

4.1. Sample and data

The sample of 464 IPOs (365 book-built IPOs and 99 fixed-price IPOs) that went public from the fi-nancial year 2001 to 2011 are selected for the study. The study period covers 15 years from the fi-nancial year 2001 to 2015. The sample is restricted to IPOs that are compulsorily listed on Bombay Stock Exchange (BSE). Daily share prices have been taken from the corporate database of CMIE–Prowess.

V. ANALYSIS OF THE RESULTS OF THE STUDY

The results of the study are analysed in this section
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5.1. Listing day performance

Table 1 displays the listing day performance of 464 IPOs that went public. The results presented in Table 1 reveals that listing day gains, when computed using the closing price, varies little over 28%—both raw and market-adjusted. Investors who are lucky enough to sell their allotted shares at the high price on the listing day make a listing day gain which is little over 50%, while investors who sell their allotted shares immediately on listing i.e. at the opening price, make a gain which is in the range of 24–25%. In addition, the investors who sell their shares at the low price on the listing day could make a gain of around 8%. All these measures of underpricing, both raw and market-adjusted, are found to be statistically significant at 1%. One interesting obser-vation about the different measures of underpricing is that there is not much of difference between raw underpricing and market-adjusted underpricing. This is attributed to the fact that post-2000, SEBI has tightened the rules with respect to listing delays and, thus, the market returns between IPO opening and IPO listing becomes insignificant. Such a phenomenon is consistent with Loughran and Ritter (2002) who noted that market movement between issue opening and listing is so small (an average of 0.05% per day) that it will have little impact on the measure of underpricing. Another observation worth mentioning is that the difference between underpricing computed using high price and low price is more than 40%
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After its introduction in 1995, book-building method became more and more popular among the issuers and many issuers started adopting this method of pricing the issues instead of the traditional fixed-price method. The study next analyses the listing day performance of book-built and fixed-price IPOs, separately. Table 2 shows the listing day performance of IPOs that went public and have followed book-building route.

By comparing the results of the study presented in Table 2 with Table 1, we noticed that various measures of underpricing for book-built issues are much less in magnitude than their corresponding measures for the whole sample which includes fixed-price issues as well. Specifically, when the low price on the listing day is used, raw return, BSE 200-adjusted, BSE 100-adjusted, and BSE 500-ad-justed measures of underpricing are found to be significant at 5%; while Sensex-adjusted and Nifty-adjusted measures are found to be significant only at 10% level. Both raw and various market indices-adjusted measures of underpricing using the closing price on the listing day are found to be in the range of 21–

22%, while the corresponding measures are around 28% for the whole sample. Different measures of underpricing using the opening price are in the range of 17–18%, while the corresponding measures for the whole sample are around 25%. While different measures of underpricing using, high price are in the range of 41–42%, the corresponding measures for the whole sample are found to be around 50%.The listing day performance of fixed-price IPOs are presented in Table 3.

Comparing various measures of underpricing for fixed-price IPOs (revealed in Table 3) against the corresponding measures for book-built issues (disclosed in Table 2), one can clearly make out that fixed-price issues are underpriced compared to book-built issues. This is in line with the international findings that book-building leads to better price discovery; therefore, lower underpricing (Benveniste Spindt, 1989). Underpricing measures using low price are between 3.0 and 3.5% for book-built issues, whereas they are found to be more than 25% for fixed-price issues. Finally, using the closing price on the listing day, book-built issues are underpriced by about 21–22%, while the fixed-price issues are underpriced by about 53–54% using the same price on the listing day. Overall, the listing day performance of IPOs in India leads us to reject the first hypothesis that IPOs are not underpriced based on the listing day performance.

TABLE 1: Listing day performance of 464 IPOs

Type of return	Listing day price			
	Opening price	High price	Low price	Closing price
Average raw return (%)	25.21*** (7.91)	51.21*** (13.30)	8.19*** (3.25)	28.85*** (8.60)
BSE 200-adjusted return (%)	24.88*** (8.07)	50.93*** (13.62)	7.96*** (3.33)	28.65*** (8.88)
BSE 100-adjusted return (%)	24.76*** (8.10)	50.81*** (13.67)	7.85*** (3.31)	28.54*** (8.89)
BSE sensex-adjusted return (%)	24.72*** (7.92)	50.74*** (13.42)	7.78*** (3.20)	28.46*** (8.71)
Nifty-adjusted return (%)	24.63*** (7.89)	50.67*** (13.41)	7.70*** (3.17)	28.40*** (8.70)
BSE 500-adjusted return (%)	24.84*** (8.06)	50.90*** (13.63)	7.92*** (3.31)	28.61*** (8.87)

Note: Parametric *t*-test values are shown in parenthesis.
***Significant at 1% level.

Table 2: Listing day performance 365 Book-built IPOs

Type of return	Listing day price			
	Opening price	High price	Low price	Closing price
Average raw return (%)	17.85*** (12.27)	41.84*** (16.37)	3.49** (2.12)	22.05*** (8.77)
BSE 200-adjusted return (%)	17.35*** (12.71)	41.40*** (16.70)	3.07** (2.00)	21.68*** (8.93)
BSE 100-adjusted return (%)	17.32*** (12.69)	41.37*** (16.67)	3.06** (1.99)	21.66*** (8.92)
BSE sensex-adjusted return (%)	17.26*** (12.58)	41.28*** (16.57)	2.99* (1.93)	21.58*** (8.85)
Nifty-adjusted return (%)	17.25*** (12.53)	41.32*** (16.59)	2.99* (1.92)	21.61*** (8.86)
BSE 500-adjusted return (%)	17.32*** (12.71)	41.37*** (16.71)	3.03** (1.98)	21.64*** (8.93)

Note: Parametric *t*-test values are shown in parenthesis.
*Significant at 10% level.
**Significant at 5% level.
***Significant at 1% level.

Table 3: Listing day performance of 99 fixed – price IPOs

Type of return	Listing day price			
	Opening price	High price	Low price	Closing price
Average raw return (%)	52.37--- (3.84)	85.72--- (5.73)	25.51-- (2.56)	53.92--- (4.34)
BSE 200-adjusted return (%)	52.63--- (3.98)	86.07--- (5.95)	25.98--- (2.73)	54.34--- (4.57)
BSE 100-adjusted return (%)	52.18--- (3.98)	85.64--- (5.97)	25.52--- (2.72)	53.89--- (4.57)
BSE sensex-adjusted return (%)	52.21--- (3.89)	85.63--- (5.83)	25.47--- (2.63)	53.84--- (4.44)
Nifty-adjusted return (%)	51.84--- (3.86)	85.16--- (5.80)	25.06--- (2.59)	53.44--- (4.42)
BSE 500-adjusted return (%)	52.59--- (3.98)	86.02--- (5.95)	25.94--- (2.73)	54.30--- (4.57)

Note: Parametric *t*-test values are shown in parenthesis.
**Significant at 5% level.
***Significant at 1% level.

5.2. Post-listing performance

Table 4 presents average abnormal returns (AARs), cumulative average abnormal returns (CAARs) and t-test statistics for the first 60 days (three months) from listing for the entire sample of 464 IPOs.

Analysis of short run or three months' post-listing performance of IPOs from Table 4 reveals that soon after listing, Indian IPOs underperform the market (which is in line with most of the international findings). Twelve of the 60 post-listing daily AARs are positive, with only one of them being significant at 5% level i.e. day 50 with AAR and t-statistic of 0.004 and 2.09, respectively. Among the remaining 48 negative AARs, 14 are significant at 5% level and 6 are significant at 1%. Except for day one for all the remaining 59 days, CAARs have been negative. Further analysis reveals that of the 59 negative CAARs, 57 have been significant at 1% level. In addition to the short run analysis, Figure 1 displays long run or five years (1,250 trading days) post-listing performance of AAR and CAAR.

Even beyond three months post-listing, IPOs that have gone public consistently underperformed their benchmark as shown in Figure 1. The CAAR for the sample is having consistently declining trend up to five years post-listing. The five-year post-listing performance (trading day 1,250) registers CAAR and the corresponding t-statistic of −0.30 and −3.67, respectively, indicating that the long run performance of IPOs that have gone public during the post-2000 decade has been negative (abnor-mal loss) and significant at 1% level.

Table 4: Sixty-days post-listing performance of 464 IPOs

Day	AAR_c	*t*-statistic	$CAAR_c$	*t*-statistic	Day	AAR_c	*t*-statistic	CAAR	*t*-statistic
1	0.0023	0.3953	0.0023	0.3953	31	−0.0039	−2.0448	−0.0943	−8.8728
2	−0.0043	−1.2834	−0.0019	−0.4081	32	−0.0019	−1.0201	−0.0962	−9.1127
3	−0.0094	−3.4830	−0.0113	−2.4219	33	−0.0004	−0.2084	−0.0966	−8.7491
4	−0.0026	−1.0046	−0.0139	−2.6729	34	−0.0039	−2.3684	−0.1005	−10.2403
5	−0.0069	−2.5841	−0.0208	−3.4687	35	−0.0036	−2.1526	−0.1041	−10.6494
6	−0.0066	−2.7514	−0.0274	−4.6459	36	−0.0001	−0.0005	−0.1042	−10.4740
7	−0.0036	−1.4313	−0.0310	−4.8831	37	0.0010	0.5241	−0.1032	−9.3557
8	−0.0059	−2.4633	−0.0369	−5.4763	38	0.0018	0.9010	−0.1014	−8.8850
9	−0.0013	−0.5684	−0.0382	−5.6171	39	−0.0028	−1.7030	−0.1042	−10.3289
10	−0.0024	−1.0766	−0.0406	−5.7023	40	−0.0039	−2.3861	−0.1080	−10.5746
11	−0.0052	−2.5051	−0.0458	−6.6874	41	−0.0037	−2.1406	−0.1117	−10.1767
12	−0.0018	−0.8488	−0.0476	−6.4058	42	−0.0012	−0.7087	−0.1129	−10.4439
13	−0.0010	−0.5123	−0.0486	−6.7574	43	0.0006	0.3886	−0.1123	−10.3146
14	−0.0008	−0.3289	−0.0494	−6.7656	44	−0.0004	−0.2497	−0.1127	−9.8929
15	−0.0038	−1.8876	−0.0531	−6.9062	45	0.0015	0.7255	−0.1112	−9.1096
16	−0.0074	−4.1886	−0.0605	−8.5962	46	−0.0003	−0.1649	−0.1115	−8.8870
17	−0.0034	−1.7257	−0.0638	−7.9658	47	−0.0019	−1.0500	−0.1135	−9.0365
18	−0.0006	−0.3197	−0.0645	−7.9041	48	−0.0024	−1.5733	−0.1159	−10.8912
19	0.0001	0.0275	−0.0644	−7.6871	49	0.0000	0.0121	−0.1158	−10.1307
20	−0.0032	−1.2062	−0.0666	−8.3255	50	0.0037	2.0893	−0.1121	−8.9536
21	−0.0028	−1.6448	−0.0693	−8.0247	51	0.0007	0.4410	−0.1114	−8.3297
22	−0.0015	−0.9011	−0.0708	−8.1545	52	−0.0011	−0.5964	−0.1125	−8.8096
23	−0.0026	−1.4177	−0.0734	−8.2758	53	−0.0003	−0.1862	−0.1128	−8.5878
24	−0.0012	−0.5899	−0.0746	−7.6234	54	−0.0024	−1.3771	−0.1151	−8.8819
25	−0.0004	−0.2003	−0.0750	−8.3357	55	−0.0033	−1.9450	−0.1184	−9.4622
26	−0.0016	−0.8312	−0.0765	−7.9012	56	−0.0020	−1.2954	−0.1204	−10.4638
27	−0.0037	−2.0572	−0.0802	−8.6560	57	−0.0014	−0.7911	−0.1218	−9.2959
28	−0.0011	−0.5628	−0.0813	−7.9987	58	0.0005	0.3156	−0.1212	−9.6163
29	−0.0042	−2.5471	−0.0855	−9.6076	59	0.0024	1.4657	−0.1188	−9.3802
30	−0.0030	−1.9238	−0.0904	−9.7323	60	0.0002	0.1330	−0.1186	−9.3866

To understand whether there is any industry effect in the long run performance of IPOs, we divide the sample firms based on the industry groups. A large number of sample firms are from "infrastructure" with a size of 136 out of total 464 IPOs. The post-2000 decade in India witnessed massive pumping of funds into infrastructure by both the government and private sector. According to a re-port by the Planning Commission (2011) the total investment in infrastructure during the eleventh five-year plan (2007–2012) is estimated at around Rs.20,00,000 crores. Out of this amount, 70% in-vestment was from Government and 30% from private sector. As against this, the first two years of the 11th five-year plan had witnessed private sector investment in infrastructure of 34.32 and 33.73%. A few of the areas to which infrastructure IPOs belong are power generation, railways, port building, gas pipelines, rural infrastructure, etc. Other industries in our sample are: Chemicals and Engineering (79), Fast Moving Consumer Goods (FMCG) (64), Media and Entertainment (58), Software and Information Technology (56), Banking and Finance (39), Pharma and Healthcare (28) and Agriculture and Allied Activities (04).

When the long run performance of IPOs is studied industry-wise, we find that FMCG IPOs severely underperformed consistently up to five years and beyond. The CAAR and relevant t-statistic for peri-ods of 60 days, 250 days, 750 days and 1,250 days are found to be −0.1319 (−3.3695), −0.1768 (−2.6678), −0.5858 (−3.1646) and −0.7392 (−3.6807), respectively. The largest sub-group ofinfrastructure IPOs, though underperform, the underperformance is not found to be severe. The cor-responding figures for the above four periods for infrastructure IPOs are −0.0839 (−3.66), −0.2795 (−0.6057), −0.4514 (−1.17) and −0.0292 (−0.0641), respectively.

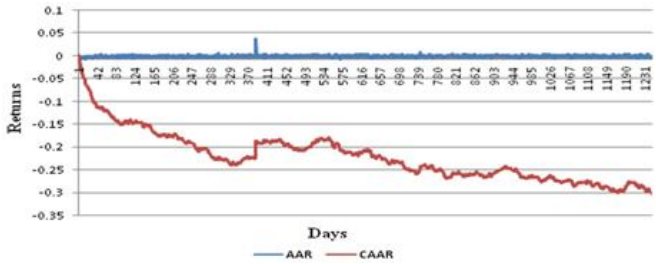

Figure 1: Five years post-listing performance of AAR and CAAR for 464 IPOS

While it is important to know the long run performance, it is interesting to know how the IPOs in India have performed in the short run. We present the short run post-listing performance of book-built IPOs that have gone public during the period 2001–2011 in Table 5.

Analysing 60-days post-listing performance of book-built IPOs presented in Table 5, there is no significant difference between the performance of sub-sample and the entire sample. Even though 13 of the AARs are positive, none is found to be significant. Among the remaining 47 negative AARs, 14 are significant at 5%; while 7 are significant even at 1%. Regarding CAARs, only 2 are positive though not significant. Among the remaining 58 negative CAARs, 57 are significant at 5% and, of them; 56 are significant at 1% also.

Figure 2 displays the long run or five-year (1,250 trading days) aftermarket performance of book-built IPOs. The long run performance of book-built IPOs also has been negative and significant which is in line with the performance of the whole sample. By the end of five years post-listing, the CAAR and the corresponding *t*-statistic have been −0.57 and −6.33, respectively. Once again, considering the significantly negative short run and long run performance of book-built IPOs, study leads us to reject the second hypothesis that investors cannot earn abnormal returns post-listing. Finally, study analyses the post-listing performance (both three-months and five-years) of the sub-sample of fixed-price IPOs. Analysing the short run or 60-days post-listing performance of fixed-price IPOs presented in Table 6, we find that even though 20 AARs are positive, none is found to be significant. Among the remaining 40 negative AARs, only 5 are significant at 5% level and only 1 is significant at 1% level. Therefore, in analysing AARs, we are unable to get a clear

trend about the three-months post-listing performance of fixed-price IPOs. However, about CAARs, all 60 are negative while 51 of them are significant at 5%, 47 are significant at 1% level. This reveals that Classified-price IPOs underperform in the short run. Further, Figure 3 shows the performance trend of AAR and CAAR over the long run or five-years from listing.

TABLE 5: Sixty- days post listing performance of 365 book-built IPOs

Day	AAR_t	*t*-statistic	$CAAR_t$	*t*-statistic	Day	AAR_t	*t*-statistic	$CAAR_t$	*t*-statistic
1	0.0055	1.2895	0.0055	1.2895	31	-0.0040	-2.0097	-0.0917	-8.2485
2	-0.0019	-0.8181	0.0026	0.2169	32	-0.0018	-0.9221	-0.0935	-8.4649
3	-0.0105	-3.5273	-0.0079	-1.5347	33	-0.0009	-0.4379	-0.0943	-8.3278
4	-0.0050	-1.7660	-0.0129	-2.2794	34	-0.0021	-1.1205	-0.0964	-9.6269
5	-0.0077	-2.5995	-0.0206	-3.1151	35	-0.0041	-2.2854	-0.1006	-9.3741
6	-0.0072	-2.7072	-0.0278	-4.2440	36	0.0012	0.7243	-0.0993	-9.8455
7	-0.0044	-1.6035	-0.0322	-4.4134	37	0.0007	0.3670	-0.0986	-9.3017
8	-0.0064	-2.4032	-0.0386	-5.1031	38	0.0016	0.7270	-0.0970	-7.3521
9	-0.0008	-0.3352	-0.0394	-5.3540	39	-0.0046	-2.7490	-0.1016	-9.7871
10	-0.0012	-0.5003	-0.0417	-5.6153	40	-0.0023	-1.4172	-0.1039	-9.9980
11	-0.0060	-3.0028	-0.0477	-7.1691	41	-0.0050	-2.7104	-0.1089	-9.2489
12	-0.0018	-0.7845	-0.0495	-6.1260	42	-0.0017	-0.9750	-0.1106	-10.0959
13	0.0008	0.3867	-0.0487	-6.1567	43	0.0020	1.1151	-0.1086	-9.2876
14	0.0003	0.1434	-0.0483	-5.3572	44	-0.0009	-0.4877	-0.1095	-8.8810
15	-0.0036	-1.7501	-0.0519	-6.5414	45	0.0029	1.3880	-0.1066	-7.7098
16	-0.0073	-3.6873	-0.0592	-7.4547	46	-0.0016	-0.8074	-0.1082	-8.1510
17	-0.0044	-2.0598	-0.0636	-7.1999	47	-0.0010	-0.5530	-0.1092	-8.6653
18	-0.0002	-0.0891	-0.0638	-7.1264	48	-0.0029	-1.8020	-0.1121	-10.2310
19	0.0011	0.5224	-0.0627	-6.9275	49	-0.0007	-0.4260	-0.1128	-10.2245
20	-0.0020	-0.9926	-0.0647	-7.2208	50	0.0023	1.2097	-0.1105	-9.3837
21	-0.0006	-0.3108	-0.0653	-7.6802	51	0.0026	1.4326	-0.1079	-8.3494
22	-0.0015	-0.8295	-0.0668	-8.0671	52	-0.0017	-1.0057	-0.1096	-9.0796
23	-0.0053	-1.6302	-0.0701	-7.2753	53	-0.0008	-0.4731	-0.1104	-8.9117
24	-0.0012	-0.5759	-0.0713	-6.8526	54	-0.0039	-2.1363	-0.1143	-9.3110
25	-0.0009	-0.5008	-0.0722	-7.8592	55	-0.0032	-1.9078	-0.1175	-9.3705
26	-0.0013	-0.6578	-0.0735	-7.1744	56	-0.0010	-0.6025	-0.1185	-9.9304
27	-0.0035	-1.8592	-0.0770	-7.8780	57	-0.0009	-0.5320	-0.1194	-8.8822
28	-0.0029	-1.4559	-0.0799	-7.5664	58	0.0003	0.1813	-0.1191	-8.8870
29	-0.0042	-2.3381	-0.0841	-8.8657	59	0.0008	0.5305	-0.1183	-8.8931
30	-0.0036	-2.0427	-0.0877	-9.0301	60	-0.0007	-0.3702	-0.1189	-8.7821

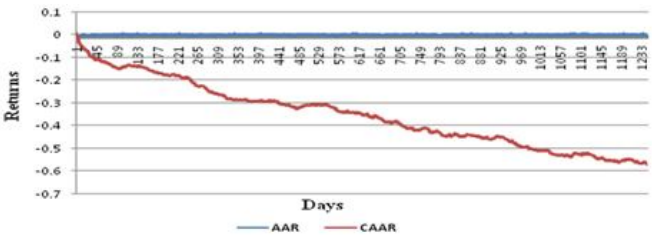

Figure 2: Five years post-listing performance AAR and CAAR for 365 book-built IPOS

Table 6: Sixty-days post listing performance of 99 fixed price ipos

Day	AAR_t	*t*-statistic	$CAAR_t$	*t*-statistic	Day	AAR_t	*t*-statistic	$CAAR_t$	*t*-statistic
1	-0.0092	-0.9462	-0.0092	-0.9462	31	-0.0037	-0.7038	-0.1042	-3.2694
2	-0.0093	-1.0928	-0.0185	-1.5372	32	-0.0023	-0.4581	-0.1065	-3.7644
3	-0.0052	-0.8412	-0.0237	-2.1962	33	0.0013	0.2441	-0.1052	-3.4245
4	0.0062	0.9908	-0.0175	-1.4071	34	-0.0104	-2.4390	-0.1156	-4.6393
5	-0.0042	-0.6660	-0.0218	-1.5372	35	-0.0014	-0.3542	-0.1170	−5.0511
6	-0.0044	-0.7979	-0.0262	-1.9235	36	-0.0050	-1.1074	-0.1220	-4.5257
7	-0.0035	-0.6839	-0.0297	-1.7157	37	0.0018	0.3993	-0.1202	-4.3523
8	-0.0038	-0.7120	-0.0305	-1.8561	38	0.0025	0.5374	-0.1176	-4.0243
9	-0.0031	−0.5118	-0.0336	-1.8414	39	0.0040	0.9020	-0.1137	-4.1396
10	-0.0031	-0.5174	-0.0367	−1.9115	40	-0.0095	-2.0998	-0.1231	-4.3139
11	-0.0020	-0.3249	-0.0388	-1.8680	41	0.0012	0.2751	-0.1220	-4.4354
12	-0.0018	-0.3414	-0.0405	-2.2384	42	0.0005	0.1129	-0.1214	-3.9545
13	-0.0079	-1.6977	-0.0485	-2.8818	43	-0.0043	-1.0408	-0.1257	-4.6326
14	-0.0048	-0.7983	-0.0533	-2.3657	44	0.0013	0.2840	-0.1244	-4.1267
15	-0.0044	-0.7963	-0.0576	-2.7223	45	-0.0036	-0.6178	-0.1280	-3.2748
16	-0.0075	-1.9784	-0.0651	-4.2765	46	0.0043	0.7579	-0.1237	-3.2067
17	0.0006	0.1234	-0.0646	-3.4570	47	-0.0053	-0.9980	-0.1290	-3.2677
18	-0.0022	-0.4802	-0.0668	-3.4555	48	-0.0008	-0.1931	-0.1298	-4.4241
19	-0.0038	-0.7916	-0.0705	−3.4114	49	0.0026	0.5132	-0.1272	-3.6342
20	-0.0028	-0.6965	-0.0733	-4.1212	50	0.0090	1.9468	-0.1182	-3.6030
21	-0.0108	-2.8639	-0.0841	-4.8675	51	-0.0061	-1.3044	-0.1243	-4.2913
22	-0.0016	-0.3739	-0.0856	-4.3579	52	0.0013	0.2261	-0.1231	-3.0668
23	-0.0002	-0.0497	-0.0859	-3.9535	53	0.0016	0.3662	-0.1215	-3.9230
24	-0.0010	-0.1968	-0.0869	-3.4365	54	0.0034	0.7909	-0.1181	-3.7586
25	0.0017	0.3382	-0.0852	-3.3830	55	-0.0035	-0.7133	-0.1216	-3.5565
26	-0.0024	-0.4916	-0.0876	-3.4662	56	-0.0058	−1.3911	-0.1274	-4.0884
27	-0.0043	-0.9175	-0.0919	-3.7786	57	-0.0030	-0.6242	-0.1304	-3.5869
28	0.0026	1.0975	-0.0863	-3.1672	58	0.0013	0.2977	-0.1291	-3.9669
29	-0.0044	-1.0410	-0.0907	-3.9710	59	0.0083	1.6063	-0.1208	-3.0204
30	-0.0099	-2.1961	-0.1005	-4.0933	60	0.0034	0.8305	-0.1174	-3.6837

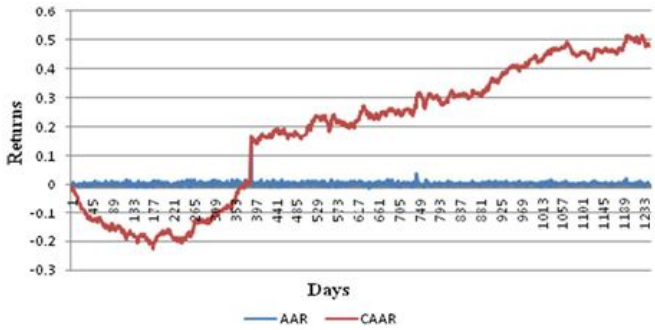

Figure 3: Five years post listing performance of AAR and CAAR for 99 fixed price IPOs

TABLE 7: One-year, Three-year and Five year Post-listing performance of IPO

	one-year post-listing (250 days post-listing)		three-year post-listing (750 days post-listing)		five-year post-listing (1,250 days post-listing)	
	CAAR	*t*-statistic	CAAR	*t*-statistic	CAAR	*t*-statistic
Whole sample (N = 464)	-0.19	-6.39	-0.24	-3.78	-0.30	-3.67
Book-built issues (N = 365)	-0.20	-7.69	-0.42	-6.58	-0.57	-6.33
Fixed-price issues (N = 99)	-0.17	-1.69	0.32	1.99	0.48	2.82

The results of the study presented in Figure 3 reveals that in line with the three-month performance, CAARs have been negative for about one and a half year from listing (till day 374). However, after this (day 375 onwards), CAAR turns positive and this positive performance continues. By the end

of five years post-listing (trading day 1,250), the CAAR and the corresponding t-statistics have been 0.48 and 2.82, respectively, indicating that the long run post-listing performance has been positive and significant for fixed-price issues. Consequently, this leads us to reject the hypothesis—that investors cannot earn abnormal returns in the long run. Such positive performance of fixed-price issues is, in fact, the reason why the underperformance for the whole sample is less severe when compared to that of book-built issues in the long run.

Table 7 presents one-year, three-year and five-year post-listing performance of IPOs.

It is clear from the results presented in Table 7 that there is not much of difference in the one-year post-listing performance between the entire sample and book-built sub-sample. However, by the end of three years post-listing, even though the whole sample underperforms (CAAR = −0.24), the magnitude of underperformance is less when compared to the underperformance of book-built is-sues for the same period (CAAR = −0.42). This is attributed to the fact that three years post-listing, fixed-price issues register positive performance (CAAR = 0.31) and this positive performance of fixed-price issues partially offsets the negative performance of the whole sample. By the end of five years, the positive performance of fixed-price issues becomes much more evident; thus, the gap between the negative performance of whole sample and book-built sub-sample further widens. Overall (except for the one-year performance for fixed-price issues) this study leads us to reject the second hypothesis—that investors cannot earn abnormal returns from IPOs in the post-listing period performance. With regard to the one-year performance for fixed-price issues (even though it is negative) it is not significant; thus, we accept the hypothesis that investors cannot earn abnormal returns in the post-listing period.

VI. CONCLUSION

This study finds that IPOs in India are underpriced based on their performance on the first trading day. lower underpricing of IPOs, we document that book-built IPOs in India are underpriced by lesser magnitude. This confirms the findings of Bora et al. that book-built IPOs in India are less underpriced when compared to fixed-price IPOs.

However, the positive return documented on the listing day is not sustained thereafter. The short run post-listing performance i.e. three-months return computed from the closing price on listing day turns negative and significant. This is consistent with Garg et al. (2008) who computed long run underpricing using offer price/first day opening price to closing price on 90th and 120th trading day and find that Indian IPOs are overpriced in the long run.

As far as the medium run performance is concerned (except for fixed-price IPOs), the one-year (250 days) performance has been negative and significant which is consistent with the findings of Aggarwal and Rivoli (1990), and Mcguinness (1993) for the same period. The one-year return for fixed-price IPOs is not significant (though negative). The three-year (750 days) and five-year (1,250 days) returns have been negative and significant except for fixed-price IPOs which is positive and significant for these two periods. Again, such negative return documented over the medium and long run is consistent with various international findings i.e. Aggarwal and Rivoli (1990), Aggarwal et al. (1993), Jaskiewicz et al. (2005), and Álvarez and González (2005), to mention a few. However, the notable exceptions are Ahmad-Zaluki et al. (2007) who reported significant positive returns for Malaysian IPOs up to three years post-listing and Madhusoodanan and Thiripalraju who found that the long run performance of IPOs in India has also been positive and high.

The important implications of our study are that like in many other capital markets, companies in India time their issues. They come out with their IPOs during the time when the market sentiment is high. In the long run, the same IPOs which had initially offered positive return, underperform. Considering the existence of such windows of opportunity for issuers, policy-makers must come out with measures to protect the long run interest of investors. The retail investors while investing in IPO shares should consider the fundamentals and prospects of IPO companies rather than the prevailing market sentiments. Otherwise, they will incur loss due to the underperformance of IPOs in the long run.

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