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Impact of IPO Pricing Mechanisms on Short and Long-Run Returns in India: An Empirical Study

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ABSTRACT

This study explores the extent of underpricing amongst IPOs issued using either fixed-price or bookbuilt pricing mechanism, as well as their long-run performance over a span of 3 years (36 time-periods of 21 consecutive trading days). IPOs listed on the National Stock Exchange in India during the period April-1999 until March-2014 (15 financial years) were considered for analysis using a sample of 291 IPOs for the short-run and 284 IPOs for the long-run study. The sample excludes Small and Medium Enterprise IPOs as well as any Follow-Up Public Offerings.
Marginally Adjusted Return on Opening (MAARO) are used as a measure of performance to determine the extent of short-run underpricing. Average Buy-Hold-Abnormal-Return (ABHAR), as well as Wealth Relatives (WR), is used to study long-run performance.
Our results of short-run performance reveal that market feedback hypothesis plays a role in reducing the level of underpricing in bookbuilt issues. The extent of underpricing for bookbuilt issues is much smaller than fixed-price IPO issues and the difference is statistically significant.
Our results from an IPO long-run performance standpoint is indifferent in regards to the pricing mechanism used with either returning losses. Our findings on long-run performance reveal that bookbuilt IPOs exhibit no statistically significant abnormal returns while fixed- price IPO issues do so for a few months in the study.

Keywords: IPO, Issue Type, Short & Long Run, Event Study, India.

INTRODUCTION:

Liberalisation of markets, increased global presence and strong regulations in the capital market have been some of the noteworthy changes in India. This has resulted in the firms needing more capital for implementing their projects with a listing of IPOs being one of the mechanisms used to raise capital in the primary markets.
Until 1999, Indian firms used to price their IPOs using the fixed-price mechanism where the stock price on offer is decided without taking bids from the investors. A downside of this approach is that firms in the absence of any forecast or estimate of the demand underpriced their IPOs which resulted in manipulations so that stocks could be allotted to the investor. Post-1999, the Securities and Exchange Board of India (SEBI), introduced a book-building process, that allowed pricing flexibility with control over discretion in allocation. The cost to firms using a bookbuilt mechanism is higher, and hence, smaller issues by relatively small firms continued with the public offerings on a fixed-price basis. Past empirical findings indicate that there is significant underpricing, and substantial money is 'left on the table' by issuers.

In the case of bookbuilt issues, underwriters and bankers undertake roadshows/marketing campaigns to garner interest as a means of price discovery from regular investor's which aid in pricing the issue. Based on the market feedback, the offer price may be adjusted in the final prospectus. The investor risk for subscribing to such issues is offset by the level of underpricing in the issue.

Many past studies on the performance of IPO issues using either fixed-price or bookbuilt methods (pricing mechanisms) such as Rock (1986); Allen and Faulhaber (1989); Ritter and Welch (2002); Ljungqvist, Jenkinson, and Wilhelm Jr (2003) conclude that both mechanisms are subject to underpricing. This could be because of factors such as the presence of asymmetric information, conflict of interest and agency problems or the importance of the signaling role. International evidence suggests that bookbuilt issues are expected to have lower underpricing than fixed-price issues.

This study is further divided as follows. This introduction is followed by a review of literature, methodology of the study, results and discussion and finally the conclusions.

LITERATURE REVIEW:

There exists conflicting international evidence on the comparison of short and long-run market performance between bookbuilt and fixed-price offerings. A study by Giudici and Paleari (1999) finds no difference in underpricing between fixed-price and bookbuilt offers. Ljungqvist et al. (2003) find that bookbuilt issues do not necessarily lower underpricing in all countries. Derrien and Womack (2003) in their study on French IPOs found both, bookbuilt and fixed-price approaches to be inefficient. Kumar (2007) in a study on the Indian markets find that bookbuilt IPOs provide positive returns on opening. The author finds that in the long-run, bookbuilt IPOs provide positive returns for up to 24 months after which they underperform the market. Huang, Chiang, Lin, and Lin (2017) find that on listing and in the long-run, bookbuilt IPOs provide higher returns than fixed price issues. Testing the validity of the market feedback hypothesis in capital markets has been of interest to many researchers. Benveniste and Spindt (1989) identify that underpricing is a cost that the firm takes to get investors to share their perceptions of the offered stock. Benveniste and Spindt (1989); Benveniste and Wilhelm (1990); Spatt and Srivastava (1991) posit that the book-building mechanism allows underwriters to obtain information from informed investors. Hanley (1993) identifies that the most common factor behind book building theories is the effect of revisions in the offer price and that the greatest underpricing is observed when the issues final price exceeds the offer range. This concludes that when demand is strong, underwriters do not fully adjust their pricing upward to keep underpricing. These results corroborate with those of Benveniste and Spindt (1989), who suggests that shares in an offering are limited and prices only partially adjust to new information. Lee, Taylor, and Walter (1999) delve into the information revelation theory of book-building and find that a large number of better-informed investors (Institutional Investors) tended to preferentially request participation in IPOs with higher initial returns. (Cornelli & Goldreich, 2003) evaluated institutional bids submitted under the book-building procedure for a sample of international equity issues and concluded that information in bids that included a limit price, especially those of large and frequent bidders, affected the price.

The phenomena of poor long-run IPO returns have been examined across the world by many researchers such as Ibbotson (1975); Ritter (1991); Kooli and Suret (2004); Purnanandam and Swaminathan (2004); Kumar (2007); Sahoo and Rajib (2010); Dutta and Swain (2012). These IPOs never seem to revert to their fair values in these studies except the study conducted by Purnanandam and Swaminathan (2004) where IPOs revert to fair values over the long run.

METHODOLOGY:

A universe of IPOs of firms listed from FY 1999-2013 on the National Stock Exchange (NSE) in India is under study. Small and Medium Enterprise IPOs, as well as any Follow- On Public Offerings, are not considered. Access to listing information as well as historical price data for each issue is retrieved from Prime database. There are 291 IPOs considered for the short-run performance and, 284 IPOs are considered for long-run performance analysis.

To evaluate short-run performance, Marginally Adjusted Return on Opening (MAARO) are calculated for each IPO. In this analysis, the historical NIFTY is used as the market index. MAARO is calculated by subtracting the percentage difference between the IPO raw return and the index return. The offer and listing dates are considered when calculating these returns on the stock and the index. Towards achieving results on non-

normalised data, MAARO is transformed using the Johnson transformation (Johnson, 1949). All results on normalised data are back transformed for clarity in the results and discussion section.

For long-run performance, we measure abnormal performance as measured by the buy and hold abnormal return (BHAR) and subsequently, the average BHAR (ABHAR). BHAR methodology is often the most cited method for studies on long-run performance and is referenced in research papers such as Lyon, Barber, and Tsai (1999); Fama (1998). Barber and Lyon (1997) cite that the appropriate measure of long-run performance is BHAR rather than the long-run cumulative abnormal return (CAR). BHAR provides a measure of long- run investor experience whereas CAR measures average periodic performance and is a biased estimator of the BHAR. BHAR approach suffers from skewness bias (predominantly t-statistics). Our study uses skewness-adjusted t-statistics as introduced by Hall (1992) to overcome the problem with skewness bias. We measure ABHAR to evaluate long-term performance for 3 years (36 time-periods of 21 consecutive trading days) from the listing date. The study also uses wealth relative (WR) as another measure to evaluate the long-run performance of IPOs at a point in time. This method was adopted by Ritter (1991) and further by Levis (1993). A WR of more than one indicates better performance of IPOs over the market index, while a value of less than one indicates an under-performance of IPOs.

Book-building is a much more systematic process of gauging investor demand for shares during an IPO issuance process and inherently supports efficient price discovery. If that is correct, the extent of underpricing amongst IPOs issued using the bookbuilt mechanism should be less as compared to those IPOs issued using the fixed-price mechanism. The first objective of this study compares the short-run performance between fixed-price and bookbuilt issues to find if underpricing is lower for either pricing mechanisms in the Indian context for the period of study. The second objective of this study explores the impact of pricing mechanisms (Bookbuilt or Fixed-Price) on the long-run performance by IPOs over the period of study.

There is conflicting international evidence on short and long-run IPO performance across issue types. From past studies, there is also evidence of the market-feedback hypothesis coming into play for bookbuilt issues. Given this, for the comparison of short-run performance, we hypothesise that MAARO is not statistically significantly different for IPOs issued using either bookbuilt or fixed-price mechanisms. This hypothesis will be examined using an Independent Samples t-test.

For the comparison of long-run performance, we hypothesise that the distribution of BHAR is the same for IPOs issued using bookbuilt or fixed-price mechanisms. This hypothesis will be verified using the Mann-Whitney U-test.

RESULTS AND DISCUSSIONS:

Table I summarises the performance of underpriced IPOs across both pricing mechanisms. The sample includes 56 and 235 underpriced fixed-price and bookbuilt IPOs respectively. Figure I reveal the extent of underpricing across financial years for each of the pricing mechanisms. Fixed-price IPOs have lower MAARO than bookbuilt IPOs for the years that both pricing mechanisms were used in a fiscal year.

Table II reveals the results of the independent samples t-test. There were two outliers on inspection of a box plot and were ignored for further analysis. Normalised MAARO for fixed-price as well as bookbuilt issues were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$). Data are mean +/- standard deviation unless otherwise stated. There were 233 bookbuilt and 56 fixed-price issues considered. Underpricing was lower in the case of bookbuilt issues (25.92 ± 75.90) than fixed-price issues (39.22 ± 93.88). The variance for fixed-price issues (8813.02) was almost 1.5 times than that of bookbuilt issues (5761.07). The assumption of homogeneity of variances on normalised returns was violated, as assessed by Levene's test for equality of variances ($p = .025$). Underpricing for bookbuilt issues was 13.30 (95% CI, 29.62 to 60.52) lower than underpricing for fixed- price issues. There was a statistically significant difference in mean underpricing between bookbuilt and fixed-price IPO issues, $t(72.882) = 2.202$, $p = .031$, and therefore, we can reject the null hypothesis.

We now examine the long-run performance of IPOs issued using the fixed-price or the bookbuilt mechanism. Our sample includes 230 bookbuilt and 54 fixed-price issues.

From Figure II, we observe that IPOs issued using a fixed-price mechanism provided positive abnormal returns for very brief intervals in the 17th month (1.07%), 19th month (0.26%) and the 34th month (0.10%). Bookbuilt IPO issues fail to provide positive abnormal returns for the entire period of study. By the 36th month, bookbuilt IPOs returned -22.68% while fixed-price IPOs returned -14.59%. Wealth Relative (WR), our second measure of long-run performance also exhibits poor performance from IPOs issued using either pricing mechanisms with

WR below a value of one for almost all the periods. While on listing day, bookbuilt issues exhibit the least level of underpricing when compared to fixed-price issues, bookbuilt IPOs have fared worse than fixed-price IPOs over the long-run.

As shown in Table III, a Mann-Whitney U test was run to determine if the distribution of BHAR between IPOs issued using either bookbuilt or fixed-price mechanisms was the same. Distributions of BHAR between either pricing mechanisms were not similar, as assessed by visual inspection. For the months examined, BHAR was statistically significantly different between IPOs issued using fixed-price and bookbuilt pricing mechanisms in the 1st and 6thmonth. We reject the null hypothesis for these months. For the 1st month, BHAR was statistically higher for bookbuilt issues (mean rank = 149.01) than fixed-price issues (mean rank = 114.06), U = 7708.00, z = 2.7580, p = .006. For the 6th month, BHAR was statistically higher for bookbuilt issues (mean rank = 147.35) than fixed-price issues (mean rank = 121.86), U = 7324.50, z = 2.0520, p = .040. Fixed-price issues exhibit statistically abnormal returns in 9 out of the 36 months with two months being statistically significant at 99%.

CONCLUSIONS:

This study is focused on comparing the short-run performance of underpriced IPO issues and explore the impact of pricing mechanisms (Bookbuilt or Fixed-Price) on the long- run performance by IPOs over the period of study. Listing data was obtained from Prime database for IPOs listed between fiscal years 1999-2013 (15 years). The sample excludes Small & Medium Enterprise as well as Follow-on Public Offerings. Our sample consists of 291 IPOs for the short-run and 284 IPOs for the long-run study.

By way of determining the extent of underpricing between the two issue types, we conclude that market feedback hypothesis plays a role in reducing the level of underpricing for bookbuilt issues. Our findings suggest that the extent of underpricing in the case of bookbuilt issues is much smaller than fixed-price IPO issues. The bookbuilt mechanism allows for the adjustment of the offer price upwards or downwards in the final prospectus based on the market feedback and hence could be the reason behind lower underpricing.

From the long-run performance of IPOs issued using either pricing mechanism, we observe that bookbuilt IPOs fared much worse (-22.68%) when compared with fixed-price IPOs (-14.59%). Bookbuilt IPOs exhibit no statistically significant abnormal returns while fixed-price IPO issues do so for a few months. Wealth Relative (WR) also exhibit poor performance over the long-run from IPOs issued using either fixed-price or bookbuilt mechanism. Our sample result from a long-run performance standpoint is indifferent in regards to the pricing mechanism used with either returning losses.

Benveniste and Spindt (1989) find that underpricing is a cost that the issuing firm or underwriter takes to get investors to share information about the perceived value of the stock. However, Ljungqvist et al. (2003) find that bookbuilt issues do not necessarily lower underpricing in all countries. We observe that the extent of underpricing with bookbuilt issues is far less than that of IPOs issued using the fixed-price mechanism and hence the market feedback hypothesis is applicable. Our observation of poor long-run performance of IPOs is similar to other studies which have been examined across the world by many researchers such as Ibbotson (1975); Ritter (1991); Kooli and Suret (2004); Purnanandam and Swaminathan (2004); Sahoo and Rajib (2010); Dutta and Swain (2012).

Scope for further research would include the influence of factors such as the presence of bull markets, cold/hot markets, sectors, issue size and IPO grades on the short and long-run performance of underpriced IPOs.

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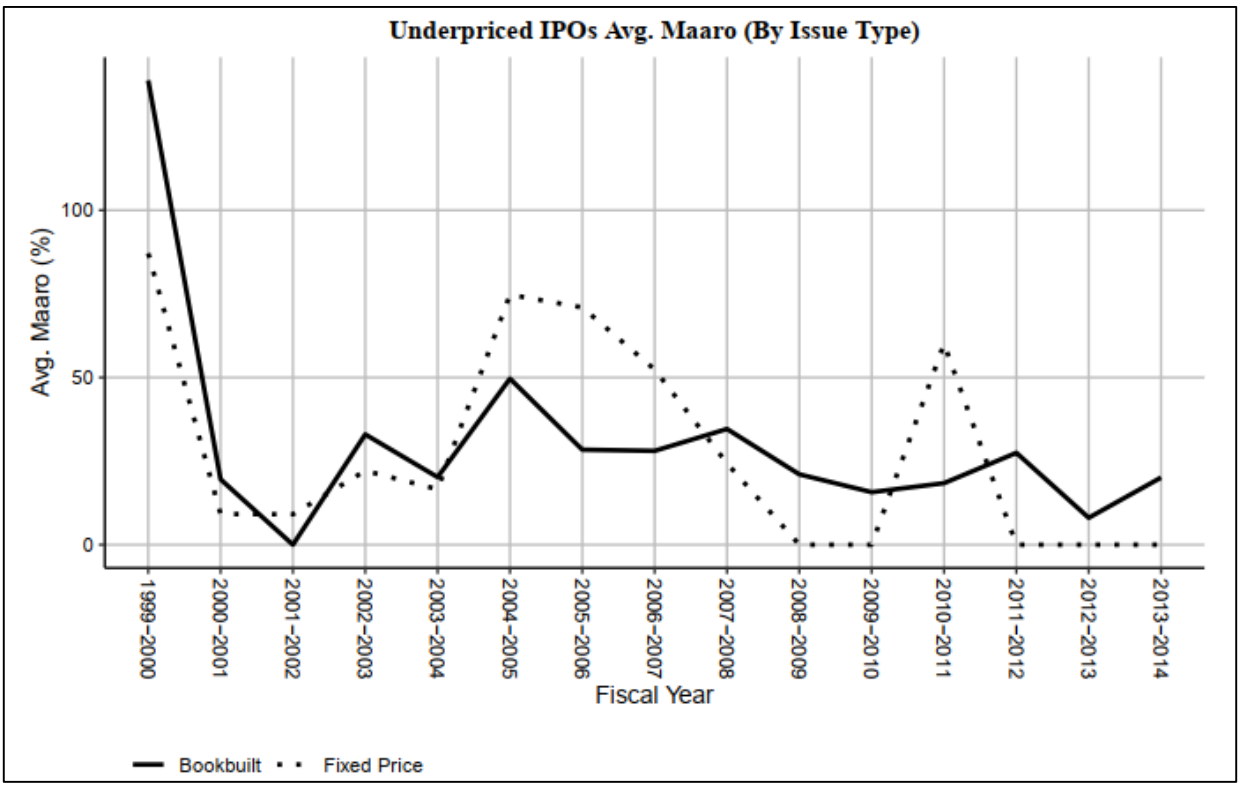
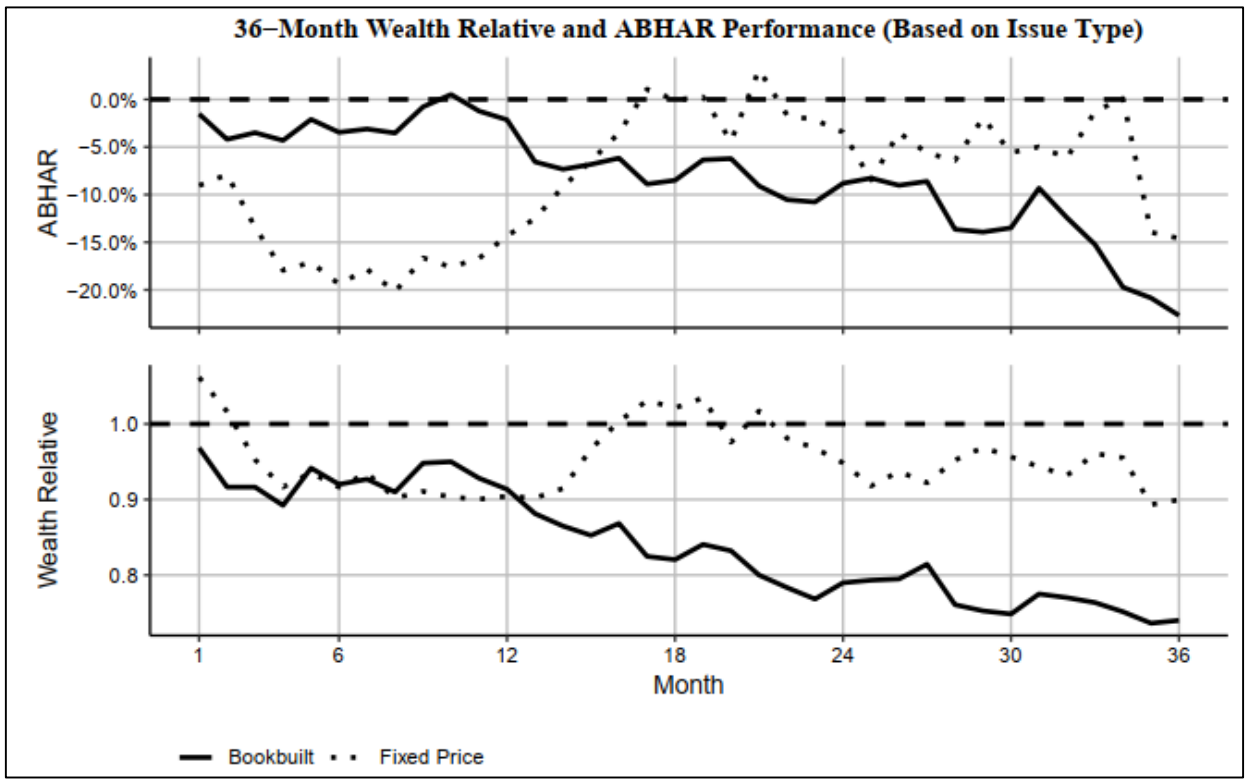
FIGURES:

Figure I: Underpriced IPOs Avg. Maaro by Issue Type (FY 1999-2013)



Source: Computed

Figure II: IPO Long-Run performance based on Issue Type



Source: Computed

TABLES:

Table I: Underpriced Fixed-Price & Bookbuilt IPO Issues (FY 1999-2013)

Fiscal Year	Underpriced IPOs		Average MAARO (%)	
	Fixed-Price	Bookbuilt	Fixed-Price	Bookbuilt
1999-2000	10	2	87.14	138.83
2000-2001	10	9	9.18	19.55
2001-2002	1	0	9.10	
2002-2003	4	1	22.11	32.99
2003-2004	5	6	16.58	20.21
2004-2005	5	14	74.76	49.65
2005-2006	11	37	70.95	28.41
2006-2007	5	35	52.38	28.06
2007-2008	3	53	24.34	34.61
2008-2009	0	11		21.04
2009-2010	0	17		15.72
2010-2011	2	31	60.10	18.40
2011-2012	0	13		27.48
2012-2013	0	5		8.05
2013-2014	0	1		20.08
	56	**235**		

Source: Computed

Table II: Extent of underpricing between fixed-price and bookbuilt IPOs using MAARO

IPO Pricing Mechanism	Mean	Variance	Std. Deviation	t-test
Fixed-Price Bookbuilt	39.22 25.92	8813.02 5761.07	93.88 75.90	2.202

Source: Computed

Table III: Mann-Whitney U test: Long-run performance of Book Built/Fixed Price IPO Issues

Month	Median (%)		Mann-Whitney U	Z	Asymp. Sig. (2-tailed)	Decision
	Fixed-Price	Bookbuilt				
1	-10.91%	-2.64%	7,708.00	2.7580	0.006	Reject
6	-28.10%	-14.63%	7,324.50	2.0520	0.040	Reject
12	-34.63%	-24.62%	6,935.50	1.3360	0.182	Retain
18	-40.27%	-30.27%	6,368.50	.2920	0.770	Retain
24	-45.32%	-35.94%	6,322.50	.2070	0.836	Retain
30	-49.66%	-44.35%	6,224.50	.0270	0.979	Retain
36	-58.05%	-54.43%	6,331.50	.2240	0.883	Retain

Source: Computed
