4. Underpricing of Initial Public Offerings: Indian Evidence

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ABSTRACT :

This paper investigates the listing day performance of 137 Indian IPOs issued between February 2007 and December 2010 divided into pre-recessionary, recessionary and post-recessionary periods affecting IPO activities in the Indian Capital Market. Benchmark-adjusted initial return is found to be around 17% with nearly two-third of the sample IPOs offering positive returns on the listing day. Study finds positive return, both raw and benchmark-adjusted, across all the three sub-periods. While IPOs with larger issue price are found to be with greater underpricing, consistent with information asymmetry theory issues of smaller size experienced greater underpricing. Further, higher the subscription rate, higher is the initial listing day return found. Finally, book-built issues are found to be less underpriced providing evidence that book building procedure is a more efficient mechanism of price discovery among IPOs.

Key words: IPOs, Underpricing, Information Asymmetry, and Price Discovery

I. Introduction

Of the three anomalies associated with Initial Public Offerings (1POs) – underpricing, 'hot issue' markets, and long-run underperformance – the significant average underpricing of IPO issues, which is conventionally defined as the percentage difference between the initial offer price and the closing market price on the first day of trading, is the best known and most widely studied and is one of the most extensively documented anomalies in financial economics. This measure, typically called the initial or first-day return, is the percentage gain earned by an investor fortunate enough (in most cases) to purchase the stock at the offer price and liquidate at the first-day close. Research findings on common equity IPOs worldwide confirm that they are generally underpriced at offering and that significant abnormal returns are generated on the initial day of trading. Underpricing is an almost universal feature of the IPO market. Loughran, Ritter, and Ridqvist (1994) report that underpricing generally occurs in virtually all of the IPO markets around the world. In effect, underpricing appears to be an obligatory cost to the issuer. Clearly, from most issuers' point of view, excessive underpricing is not optimal since proceeds 'left on the table' are a cost and not available to the issuers' or earlier investors' use. However, some positive amount of underpricing appears to have positive benefits as well. The short-run underpricing is confirmed by Logue (1973), Ibbotson (1975), Ibbotson and Jaffe (1975), Ritter (1984), Chalk and Peavy (1987), Miller and Reilly (1987), Jog and Riding (1987), Ibbotson et al. (1988), Clarkson and Merkely (1994), Affleck-Graves et al. (1996), and Lee et al. (1996). The present paper makes an attempt to study the degree of underpricing among Indian IPOs. Study also aims to compare the degree of underpricing in the Indian Capital Market across different sub-periods and across different sectors. The rest of the paper is structured in the following way. In Section II we discuss the review of literature on IPO underpricing. Section III discusses some of the important theories of IPO underpricing. Data source and methodology are covered in Section IV. Section V deals with the analysis and interpretation of the findings. Finally, Section VI presents conclusion.

II. Review of Literature:

Ritter (1984) reports that for the approximately 5,000 firms that went public during 1960-82 in the U.S., the average initial public offering was trading at a price 18.8 percent higher than its offering price shortly after public trading started.

Ibbotson et al. (1988) find an average daily return of 16.4% for 4,534 IPOs during the period 1977-1987, as computed from the offer price to closing price on first trading day.

Jog and Riding (1987) examine the degree of underpricing of IPOs in 100 Canadian stocks during the period between

January 1971 and December 1983 and find that IPOs are, on average, underpriced by 9 to 11.5%. Aggarwal and Rivoli (1990) investigate the price performance of a sample of 1,598 IPOs during the period 1977-1987 and find that IPOs are subject to overvaluation or fads in early aftermarket trading. Their results also show that IPOs are profitable investments in the short-run but perform quite poorly over a longer period.

Dawson (1987) finds that the average underpricing for 21 IPOs in Hong Kong is 13.8%. He also documents that the IPOs are generally underpriced in Singapore over the period 1978-1985. McGuinness (1992) investigates 92 IPOs in Hong Kong in the period 1980-1990 and finds that most of the post-listing returns are attained by the close of the first trading day.

Lee et al. (1999) use the application and allocation schedules to explain the underpricing phenomenon of IPOs in Singapore and show that large investors tend to preferentially request participation in IPOs with higher initial returns, consistent with these investors being better informed. Derrien and Womack (2003) find that the auction mechanism is associated with less underpricing and lower variance of underpricing. Study shows that auction procedure's ability to incorporate more information from recent market conditions into the IPO price is an important reason.

III. Theories of Underpricing:

If underpricing is a universal phenomenon, question arises why would issuers and underwriters leave money on the table in IPOs. Various theories have been developed by researchers explaining why issuers or underwriters deliberately underprice their issues even though it is a direct cost to them. Most of the theories developed are based on information asymmetry between various parties involved. Baron (1982) offers an agency-based explanation for underpricing. His theory has the issuer as less informed, but relative to its underwriter, not relative to investors. To induce the underwriter to put in the requisite effort to market shares, it is optimal for the issuer to permit some underpricing, because the issuer cannot monitor the underwriter without cost. Muscarella and Vetsuypens (1989), however, find that when underwriters themselves go public, their shares are just as underpriced even though there is no monitoring problem. This evidence does not favour the Baron hypothesis, although it does not refute it either. After all, underwriters may want to underpice their own offerings in order to make the case that underpricing is a necessary cost of going public. Habib and Ljungqvist (2001) also argue that underpricing is a substitute for costly marketing expenditures. Rock (1986) develops a model where uninformed investors face a bias in IPO share allocation due to the presence of a group of informed outsiders. Relatively better informed investors do not bid if, based on their superior information, they consider the offering to be overpriced. Hence, if shares are allocated pro rata, based on the amount bid by each investor, uninformed investors receive a larger allocation of 'lemons' and a smaller allocation of 'peaches'. Therefore, firms are forced to underprice in order to compensate uninformed investors for this adverse selection, since they would otherwise receive below-average returns and withdraw from the new issues market. Thus, underpricing is a cost imposed on the issuing firm by the informed outsiders. Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989) attempt to explain IPO underpricing in a signalling equilibrium framework. These models assume that high quality firms deliberately underprice their IPOs to signal their quality to the investors and recoup this cost of underpricing by charging higher price in follow-on offerings. High-quality firm's value underpricing as a signalling device and therefore such firms have no incentive to avoid underpricing. However, low-quality firms must invest in imitation expenses to appear to be high-quality firms, and that with some probability this imitation is discovered between offerings which induces low-quality firms to reveal their quality voluntarily. Welch (1992) focuses on fixed-price procedure used in some European countries, and shows that this procedure can cause informational cascades: investors who observe the investment choice made by previous investors can update their beliefs about the value of the issued shares. This possibility forces issuing firms to underprice their shares, choosing a price that is likely to create positive informational and price cascades. Pricing just a little too high leaves the issuer with too high a probability of complete failure, in which investors abstain because other investors abstain. In support, Amihud, Hauser, and Kirsh (2003) find that IPOs tend to be either undersubscribed or hugely oversubscribed, with very few offerings moderately oversubscribed. Benveniste and Spindt (1989), Benveniste and Wilhelm (1990), and Spatt and Srivastava (1991) argue that the common practice of 'book building' allows underwriters to obtain information from informed investors. With book building, a preliminary offer price range is set, and then underwriters and issuers go on a 'road show' to market the company to prospective investors. This road show helps underwriters to gauge demand as they record 'indications of interest' from potential investors. If there is strong demand, the underwriter will set a higher offer price. But if potential investors know that showing a willingness to pay a high price will result in a higher offer price, these investors must be offered something in return. To induce investors to truthfully reveal that they want to purchase shares at a higher price, underwriters must offer them some combination of more IPO allocations and underpricing when they indicate a willingness to purchase shares at a high price. Consistent with the information revelation theory of book building, Lee, Taylor, and Walter (1999), and Cornelli and Goldreich (2001) show that informed investors request more, and preferentially receive more, allocations. Sherman and Titman (2002) argue that

there is an equilibrium degree of underpricing which compensates investors for acquiring costly information. However, Sherman (2000) has noted that the average level of underpricing required to induce information revelation is reduced if underwriters have the ability to allocate shares in future IPOs to investors.

There are also theories of underpricing that do not rely on asymmetric information which is resolved on the first day of trading. Logue (1973), Ibbotson (1975), and Tinic (1988) propose a potential explanation for the pervasive short-run underpricing of IPOs of equity which relies on issuers' and underwriters' desire to avoid legal liabilities. Firms with higher litigation risk underprice their IPOs by a greater amount. Underpricing results because the issuing firms want to avoid lawsuits as lawsuits by unhappy investors are less likely when new issues are underpriced. Thus, underpricing represents a form of insurance against future litigation.

IV. Data Source and Research Methodology

The sample of the study consists of companies that went public for the first time during February 2007 and December 2010 and have been listed on the BSE. The sample period is divided into three sub-periods – the twelve month pre-recessionary period starting from February 2007 till January 2008; the seventeen month recessionary period starting from February 2008 till June 2009; and the eighteen month post-recessionary period starting from July 2009 till December 2010. Various issue-related information about IPOs has been collected from the website **http://www.chittorgarh.com/ipo/ipo_detail.asp.** Alternatively, where listing day trading information is not available, the same is obtained from the Archives of BSE website. The final sample consists of 137 IPOs that went public between February 2007 and December 2010.

Underpricing or the initial return on IPOs is computed as the difference between the closing price on the first day of trading and the offer price, divided by the offer price.

$$IR_i = \frac{P_{i1} - P_{i0}}{P_{i0}}$$

Where, IR is the initial raw return, P_1 is the closing price on the first day of trading and P_0 is the offer price. Benchmark-adjusted abnormal return is calculated as the raw return on the stock minus the return on benchmark over the same period as under

$$AIR_i = \frac{P_{i1} - P_{i0}}{P_{i0}} - \frac{P_{m1} - P_{m0}}{P_{m0}}$$

Where, AIR_i is the benchmark-adjusted abnormal return for stock i, P_{m1} denotes the closing value of the benchmark index on the listing day and P_{m0} is the closing value on the offering day. The return on BSE Sensex is used as the benchmark index. Significance of returns, both raw as well as market-adjusted, for various cross-sectional analyses is tested at 1 percent, 5 percent, and 10 percent levels using single-sample t test.

IV. Analysis and Interpretation:

Consistent with the international evidence on IPO underpricing, the present study finds that Indian IPOs are also underpriced. Study provides comparison of both raw return, calculated from offering price to closing price on listing day not adjusted for market return, and the benchmark-adjusted return using return on BSE Sensex during the same period. For most of the cross-sectional analyses, study finds that benchmark-adjusted return is more than the raw return. This is because for most part of the study the market return has been negative.

As shown by Table 1, investors who purchase IPO shares at the offer price and sell them on the listing day yield an average of 16.56 percent, while the benchmark-adjusted return for these initial subscribers is 17.12 percent. This finding is similar to various international findings on IPO underpricing. For example, Aggarwal et al. (1993) find an initial return of 16.30 percent for their study on Chilean IPOs; Keloharju (1993) find an underpricing of 14.40 percent for IPOs in Finland; and McGuinness (1993) in his study on IPOs in Hong Kong find underpricing of 17.60 percent. However, the underpricing found by the present study – both raw and benchmark-adjusted – is far below the results of other Indian studies like Shah (1995) who reported mean initial unadjusted return of 105.6 percent and Sehgal and Singh (2007) who reported mean initial unadjusted return of 101.64 percent and benchmark-adjusted return of 99.20 percent. Nearly two-third of the sample IPOs have provided positive initial returns to the subscribers while the highest return offered by an individual IPO has been over 200 percent. Both raw return and benchmark-adjusted return for the entire sample are significant at 1% level.

Table 1: Listing Day Performance of IPOs

Characteristics	Raw Return (%)	Benchmark-Adjusted Returns (%)
Mean	16.56*	17.12*
Maximum	214.17	206.80
Minimum	-39.45	-40.42
Positive Returns (%)	64.96	67.15
Negative Returns (%)	35.04	32.85
* Significantly different from zero at the 1% level		

Table 2 provides information on IPO underpricing across different sub-periods considered by the study. The highest return is provided by the pre-recessionary period of February 2007 to January 2008. Even though the returns, both raw and market-adjusted, for the post-recessionary period are significant at the 1 percent level, these returns are the lowest among all the three sub-periods. Further, the highest number of IPOs during this sub-period is consistent with the 'windows of opportunity hypothesis' where issuers time their issues to take advantage of the market sentiment. Discussing a behavioural explanation for poor performance subsequent to equity offerings, Ritter (1991), Lerner (1994), Loughran and Ritter (1995, 2000), Baker and Wurgler (2000), and Hirshleifer (2001) suggest that stock prices periodically diverge from fundamental values, and that managers and investment bankers take advantage of overpricing by selling stocks to overly optimistic investors. Also this is consistent with with Ritter (1984), Loughran et al. (1994), Ljungqvist (1995) who find clustering of IPOs. While for pre-recessionary period sub-sample, both the returns are significant at 5 percent level, for the recessionary period, only the benchmark-adjusted return is significant at 5 percent level.

Table 2: Listing Day Performance of IPOs across Different Sub-periods

Sample Size (N)	Sub-periods	Raw Return (%)	Benchmark-Adjusted Return (%)
137	All	16.56***	17.12***
29	Pre-Recessionary Period	26.21**	26.82**
28	Recessionary Period	16.83*	22.00**
80	Post-Recessionary Period	12.97***	11.89***
* Significantly different from zero at the 10% level ** Significantly different from zero at the 5% level *** Significantly different from zero at the 1% level			

Table 3 segments the IPOs firms by sectors based on the activities in which they are engaged. The table reveals that companies that went public during the study period are not evenly distributed across different sectors. The highest number of IPOs came from the infrastructure sector consisting of building and construction material, telecom, power and energy companies. In the light of importance given for the development of infrastructure in the eleventh five year plan (2007-2012) by the Planning Commission, this finding is consistent with the 'capital demand hypothesis' of Lowry (2003) who finds that changes in firms' demands for capital along with changes in the level of investor optimism explain a substantial portion of variation in IPO volume i.e. they are important determinants of IPO volume. Another striking feature of sectorwise classification of IPOs is that IPOs from banking and finance provided the highest listing day return, both raw and benchmark-adjusted, followed by IT/ITES, and metals and minerals IPOs. However, only returns from Metals and Minerals and PSU IPOs are found to be significant at the 5 percent level.

Table 3: Listing Day Performance of IPOs across Different Sectors

Sample Size (N)	Sector	Raw Return (%)	Benchmark-Adjusted Return (%)
137	All	16.56***	17.12***
08	Textile	-5.42	-3.19
08	Realty	3.88	3.48
10	Metals and Minerals	37.68**	39.65**
04	Chemicals	28.36	31.53
10	IT/ITES	46.24*	41.85*
10	FMCG	20.95*	22.30*
05	Banking and Finance	57.63	59.96
03	Auto Ancillaries	-4.33	-9.74
09	Engineering and Technology	5.51	7.55
06	Healthcare/Pharma	4.41	7.72
07	Media and Entertainment	8.56	5.23
30	Infrastructure	11.60	12.39*
08	PSUs	13.19**	14.25**
19	Miscellaneous	13.40	14.26
* Significantly different from zero at the 10% level ** Significantly different from zero at the 5% level *** Significantly different from zero at the 1% level			

Table 4 provides an insight into the listing day returns according to issue prices. Study finds that the highest listing day returns have been provided by IPOs whose issue prices have been over `500 followed by IPOs whose issue price is in the range of `200 to `500. Underpricing of IPOs whose issue price is in the range of `10 to `100 is found to be similar to that of the whole sample. Even though returns associated with all the sub-samples are significant at 5% level, for the sub-sample of issue price being greater than `200 but less than or equal to `500, both the returns are significant at 1% level.

Table 4: Listing Day Performance of IPOs by Offer Price

Sample Size (N)	Offer Price (`)	Raw Return (%)	Benchmark-Adjusted return (%)
137	All	16.56***	17.12***
47	$10 \leqslant P \leqslant 100$	16.43**	16.82**
47	$100 < P \leqslant 200$	13.66**	15.40***
35	$200 < P \leqslant 500$	18.36***	18.11***
08	P>500	26.52**	24.61**
** Significantly different from zero at the 5% level *** Significantly different from zero at the 1% level			

Table 5 exhibits underpricing by issue size. The highest listing day returns are given by small issues with a size of less than `100 crores, while the issues with size of more than `1,000 crores offered the least raw return. This is consistent with the findings of Sehgal and Singh (2007) on Indian IPOs who argue that logically issues with smaller sizes should have high underpricing as these are generally offered by small or new companies and that these companies possess higher degree of information asymmetry. Moreover, smaller issue size means the available number of shares is less in comparison to bigger issues. So, it may create a demand-supply gap assuming fixed number of players in the marketplace. Therefore, it can be inferred that the smaller the offer size, the higher are the initial returns. Thus, issue size does play an important role in deciding the listing day performance of IPOs in the Indian market. The returns offered by both smallest size IPOs with an issue size of less than or equal to `100 crore as well as with an issue size of greater than `100 crore but less than or equal to `500 crore are found to be significant at 1% level.

Table 5: Listing Day Performance of IPOs by Issue Size

Sample Size (N)	Issue Size (` in Crores)	Raw Return (%)	Benchmark-Adjusted Return (%)
137	All	16.56***	17.12***
56	S≤**100**	22.21***	23.34***
55	100<S≤**500**	16.29***	15.81***
11	500<S≤**1000**	5.48	5.94
15	S>1000	4.58	6.86**
** Significantly different from zero at the 5% level *** Significantly different from zero at the 1% level			

Table 6 below displays the relationship between the number of times the IPO issues are subscribed and the listing day returns. Issues which are subscribed more than 50 times offer the highest listing day returns followed by issues subscribed more than 10 times but less than or equal to 50 times, with both the forms of returns for these two sub-samples being significant at 1 percent level. Issues with subscription of less than 3 times offer the least return which is also statistically not significant. This is consistent with Ritter (1991) who points out the link between IPO underpricing and investor sentiment and suggest that when investors are over-optimistic, they bid up the aftermarket price of the IPO firms resulting in higher IPO initial returns. Also, the finding is consistent with Chaturvedi et al. (2006) who identify causal variables responsible for underpricing of Indian IPOs and find that it is the extent of oversubscription of an IPO which determines the first day gains. Oversubscription leads to larger first-day gain for the IPO as many of the unsuccessful applicants approach the secondary market on the first day of trading bidding for the shares and thus putting upward pressure on the price.

Table 6: Listing Day Performance of IPOs by Issue Subscription

Sample Size (N)	Issue Subscription (times)	Raw Return (%)	Benchmark-Adjusted Return (%)
137	All	16.56***	17.12***
58	sub≤**3**	3.71	3.88
29	3<sub≤**10**	10.43*	13.42***
38	10<sub≤**50**	31.35***	30.18***
12	sub>50	46.64***	48.63***
* Significantly different from zero at the 10% level *** Significantly different from zero at the 1% level			

Finally, study examines the relationship between the underpricing of IPOs and two of the issue methods – fixed price and book building. Table 7 exhibits that IPOs that follow fixed price mechanism in pricing their issues are severely underpriced even though test of significance shows that they are significant only at 10 percent level. This is consistent with Benveniste and Spindt (1989) and others who argue that with book building, a preliminary offer price range is set, and then underwriters and issuers go on a 'road show' to market the company to prospective investors. This road show helps underwriters to gauge demand as they record 'indications of interest' from potential investors and if there is strong demand, the underwriter will set a higher offer price. Also Hameed and Lim (1998), demonstrating the impact of different pricing methods on the underpricing of IPOs in Singapore, find a greater extent of underpricing in the fixed tranche of the tender option.

Table 7: Listing Day Performance of IPOs by Issue Method

Sample Size (N)	Issue Method	Raw Return (%)	Benchmark-Adjusted Return (%)
137	All	16.56***	17.12***
08	Fixed Price	53.09*	54.26*
129	Book Building	14.30***	14.81***
* Significantly different from zero at the 10% level *** Significantly different from zero at the 1% level			

V. Conclusion:

The findings of the study about underpricing of Indian IPOs issued between February 2007 and December 2010 provide evidence of positive listing day returns consistent with international evidence on IPO underpricing. As most part of this period saw decline in market index while many of the IPOs offered positive returns, for many of the cross sectional analyses study finds that benchmark-adjusted return is more than the raw return. The post-recessionary period which saw heavy rush in IPO activities witnessed the lowest listing day returns consistent with issuers successfully exploiting 'windows of opportunity' and pricing their issues fairly high. Sectorwise analysis reveals that all the sectors with the exception of textile and auto ancillary provided positive listing day returns. Study finds positive relation between offering price and listing day returns. Consistent with information asymmetry theory of IPO underpricing, study finds negative relation between issue size and IPO underpricing. IPOs with higher subscription rate offered the highest listing day returns consistent with the argument that unsuccessful allottees create a rush for these IPOs in the secondary market and thus push the price upward on the listing day. Further investigation reveals that majority of these IPOs with the highest subscription rates occurred either in the pre-recessionary period or in the post-recessionary period when the ruling investor sentiment was very high. Finally, study provides strong justification for the increasing popularity of book building mechanism of price discovery among Indian IPOs with the finding that the average underpricing, both raw and market-adjusted, associated with fixed price issues is more than 50 percent even though they are significant at the 10% level.

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