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INITIAL PUBLIC OFFERINGS UNDERPRICING: A STUDY ON THE SHORT RUN PRICE PERFORMANCE OF BOOKBUILT IPOs IN INDIA

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ABSTRACT

Issuing of shares through book building process leads to efficient price discovery. This study attempts to examine how the initial public offerings (IPO) issued through book building fare in short-run. The study examines the first day returns of 288 book-built IPOs in India for a 7 year period (2004-2010). Based on this set of observations this study builds a comprehensive model of the short term price performance of the new offerings. Results indicate that the IPOs are underpriced in India. Oversubscription and market volatility was found to be the major factors influencing underpricing. The results imply that the investors over react to the market. The presence of deliberate underpricing by the underwriters or the issuing firm to decrease block holdings by the shareholders is also evident. Finally, results illustrate a trend towards a less aggressive underpricing.

KEYWORDS | IPOs, Underpricing, Book-building

INTRODUCTION:

An Initial Public Offering (IPO) is a critical moment for a company. A firm going public relies on the capital raised in its IPO to grow and thrive. The stakes also are high for other parties. Investors can reap huge profits or sustain big losses. For the firm's owners and managers, as well as the venture capitalists with a stake in the firm and the investment bankers who underwrite the sale, careers and fortunes can be made. It is well known that initial public offerings (IPOs) are underpriced. IPO is when an unlisted company makes either a fresh issue of securities or an offer for sale of its existing securities or both for the first time to the public. In the last decades thousands of firms around the world have preferred to go public. Plentiful studies have documented recurring mysteries regarding IPOs and an extensive theoretical literature has attempted to explain the anomalies in the IPO's market. McDonald and Fisher (1972), Ibbotson (1975), Ritter (1984), Koh and Walter (1989), Kim *et al.* (1995), Mohan and Chen (2001), Loughran and Ritter (2004), Kerins *et al.* (2007), among others, consistently document that, on average, the offer price of IPO shares are substantially lower than the closing price on the first day of trading. Rock (1986) proposes a winner's curse model based on information asymmetry. Rock assumes that investors are informationally heterogeneous; that is, some investors (better-informed) know more than others (ordinary investors) about the quality of IPO firms. Hence, better-informed investors only bid on the attractive IPO offerings and leave the overpriced IPOs to ordinary investors. Therefore, to entice the continued participation of ordinary investors, IPO firms use IPO underpricing to compensate for losses by ordinary investors due to the winner's curse. Many studies offer evidence to support the information asymmetry explanation of IPO underpricing. Underpricing is such consistent phenomena across countries with very different company populations, corporate control mechanisms, and institutional, legal, taxation, regulatory, historical and cultural frameworks. Moreover, the challenge for the underwriter is to design a mechanism that induces investors to reveal their information truthfully, by making it in their best interest to do so. Benveniste and Spindt (1989), and all, show that book-building can under certain conditions, be such a mechanism.

The process starts off with the issuing company appointing the lead manager for the issue who in turn will enter into an agreement with a set of underwriters called as syndicate members who will elicit bids from prospective investors. The bids from the investors have to be in a price band determined in the following way. The company in consultation with the lead managers specifies a minimum acceptable price known as the floor price. Once the floor price is fixed the upper price of the issue is automatically capped at 120% of the floor price as per regulation. Of course, the floor price could be revised by 20% upwards or downwards but subsequently the ceiling price will also gets revised and the books shall be open for a minimum period of three days consequent to the revision subject to the condition that the total bidding time will not exceed thirteen days. Therefore it appears a little restrictive but book building gives ample opportunities for price discovery. All the institutional investors have to place limit orders while retail investors 'can place their bids at the cutoff price to be determined later. Once the bidding process is complete the lead manager and issuer will determine the cut off price or the market clearing price and shares will be allocated[1] on a uniform price basis.

Fig 1: IPO process at a glance

Book building involves soliciting from the professional investors how much they are willing to buy and at what price. On the basis of the resulting demand curve, the firm and its investment bankers determine the IPO offer price.

SEBI brought forward guidelines[2] for issuing shares through book the building 1998 An Issuer Company can issue capital through book building in following two ways:

(1) 75% Book Building process

The option of 75% Book Building is available to all body corporates that are otherwise eligible to make an issue of capital to the public. The securities issued through the book building process are indicated as 'placement portion category' and securities available to public are identified as 'net offer to public'. In this option, underwriting is mandatory to the extent of the net offer to the public. The issue price for the placement portion and offers to public are required to be same.

(2) 100% of the net offer to the public through Book Building process

In the 100% of the net offer to the public,entire issue is made through Book Building process. The Equity Shares may be offered to the public through the 100% Book Building Process

in accordance with the SEBI Guidelines, wherein

A minimum of 50% of the Net Issue shall be allocated on a proportionate basis to Qualified Institutional Buyers[3] ("QIBs") (including 5% of the QIBs' portion that would be specifically reserved only for Mutual Funds and Mutual Fund applicants shall also be eligible for proportionate allocation under the balance available for QIBs);

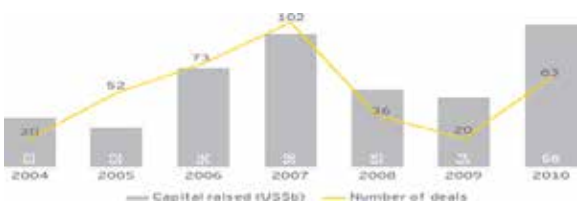
Up to 15% of the Net Issue shall be available for allocation on a proportionate basis to Non-Institutional Bidders; and

Up to 35% of the Net Issue shall be available for allocation on a proportionate basis to Retail Individual Bidders, subject to valid bids being received at or above the Issue Price

This research which investigates the correlates of IPO performance (i.e., those factors associated with the performance of the IPO firm on the day of the initial stock offering) may assist potential investors in evaluating IPO investment opportunities. There have been a lot of theoretical explanations on underpricing. Some of them explain underpricing as a result of asymmetric information. There are some theories which give institutional explanations and explain through ownership and control too. The various factors taken for this study are based on some of these literatures which have been discussed in the next section.

The top issues of 2010 were from Coal India limited (Rs.15, 199 crore), NMDC (Rs.9,930 crore), NTPC (Rs.8,480 crore), Power Grid (Rs.7,442 crore), Rural Electrification Corp (Rs.3,530 crore) and Jaypee Infratech (Rs.2,262 crore). The figure below shows the overall IPO activity from 2004 to 2010 in India in terms of the number of deals made and the capital rose.

Fig 2: Overall IPO activity in India by year



Source; Dealogic, Thomson Financial, Ernst & Young

India saw a dramatic recovery in its IPO markets in 2010. This revival has been a domestic consumption led–growth story, driven by an influx of capital from Western economies and a booming local stock market. India saw a growth of 215% in the number of IPOs compared to 2009. **2010 saw a string of IPOs and follow-on offerings** from many previously state-owned enterprises in the materials sector such as steel, oil and gas — all of which helped the Indian Government raise funds to build roads, ports and power plants. This materials sector activity stems from India's US$10 billion divestment program that spawned the largest IPO in India ever, the listing of the world's largest coal producer, US$3.4 billion Coal India, a former state-owned enterprise (Ernst & Young).

Objectives of the study are as follows: 1. To find the underpricing of IPOs in India for the past 7 years and the excess returns after adjusting for the market movements.

2. To build a comprehensive model of the short term price performance of the offerings in India.

This paper presents a brief literature review followed by data and methodology used in this paper. Results are analyzed and policy implications are discussed in detail.

LITERATURE REVIEW

There are various models suggested in the literature which throw light on the IPO behavior. In most of the studies the first day returns after the IPO announcements are positive. There are some theoretical underpinnings which explain this phenomenon; they are discussed below:

(A) ASYMMETRIC INFORMATION

Rock (1986) assumes that some investors are better informed about the true value of the shares on offer than are investors in general, the issuing firm, or its underwriting bank. Informed investors bid only for attractively priced IPOs, whereas the uninformed bid indiscriminately. Hence, underpricing ensures the participation of uninformed investors in the IPO market.

Beatty and Ritter (1986) argue that as repeat players, investment banks have an incentive to ensure that new issues are underpriced by enough lest they lose underwriting commissions in the future. Investment banks thus coerce issuers into underpricing.

Duane B Kennedy, Ranjini Sivakumar and Kennath R Vetzal (2005) differentiated and assessed some of the competing hypotheses about IPO underpricing (6 models) by focusing on explanations based on asymmetric information in sequential financing setting. They assume IPO as the first stage of a two period sell out strategy. The second being seasonal offerings. The data of 2381 IPO from period 1991-1998 were taken. They find that the most compelling explanation comes from entrepreneurial losses model.

Ellul and Pagano (2006) bring in a new theory wherein they say that the investors worry about their after market illiquidity that may arise from asymmetric information after the IPO. To analyze this theory 337 British IPOs from a period June 1998 and Dec 2000 were taken. Liquidity concerns along with adverse selection and risk are taken as a motive for underpricing. They find that after market liquidity and liquidity risk matter for IPO underpricing.

a) Underpricing as a Signal of Firm Quality

Franklin Allen and Gerald Faulhaber (1988) develops a model consistent with the observation that the existence of hot-issue markets for initial public offerings and in certain periods and in certain industries new issues are underpriced and rationing occurs. The model assumes the firm itself best knows its prospects. In certain circumstances, firms with the most favorable prospects find it optimal to signal their type by underpricing their initial issue of shares and investors know that only the best can recoup the cost of this signal from subsequent issues.

Vong and Trigueiros (2010) made a study on the short run price performance of IPOs in Hong Kong. The first day returns of over 483 companies IPOs in Hong Kong were taken for a 12 year period (1994-2005) .In the study the returns were regressed on a set of variables reflecting the three hypothesis (1) the informed demand, (2) signaling by means of the reputation of underwriters and (3) signaling with intentional underpricing, together with other variables which might affect the underpricing. They came to a conclusion that irrespective of the time period, the number of underwriters involved in an IPO, their reputation helps to reduce excess returns. The study also showed that the firms facing good prospects tend to under price more so as to distinguish themselves from less accepted firms.

b) Principal-Agent Model

Baron and Holmström (1980) construct models which focus on the underwriter's benefit from underpricing and found that in order to compensate underwriters for the use of their superior information, issuers rationally let underwriters under-price, in an informational environment in which underwriters have superior information about the demand for new shares and that their marketing efforts are unobservable and unverifiable. The more uncertain the value of the firm, the greater the asymmetry of information between issuer and underwriter, and thus the more valuable the latter's services become, resulting in greater underpricing

Beatty and Ritter (1984) developed two propositions in their paper. Firstly, they establish a monotone relation between the underpricing of an IPO and the uncertainty of investors regarding its value. And secondly, that this underpricing equilibrium is enforced by the investment banking industry. For this purpose 1028 IPOs in US from the period 1977-82 were taken. The results showed that IB enforces the underpricing equilibrium. And if the level of ex-ante uncertainty is endogenous, issuing firm can reduce the IPO uncertainty voluntarily.

c) Information Relevation Theories

Marisetty and Subrahmanyam (2009) document the effects of group affiliation on the initial performance of 2,713 initial public offerings (IPOs) in India under three regulatory regimes during the period 1990–2004. They find that the long- run performance of IPOs in general is negative. They also find that Indian investors over-react to IPOs and their over-reaction (proxied by the oversubscription rate) explains the extent of underpricing.

Deb and Marisetty (2010) argue that the introduction of a unique certification mechanism for IPOs in 2007, whereby all IPOs have to undergo mandatory quality grading by independent rating agencies, provides a better opportunity to test the well established certification hypothesis, especially in the context of emerging markets with institutional voids. Using a sample of 163 Indian IPOs they test the efficacy of IPO grading mechanism. They find that grading decreases IPO underpricing and positively influences demand of retail investors. Grading reduces secondary market risk and improves liquidity. However, grading does not affect long run performance of the IPOs. IPO grading successfully capture firm size, business group affiliation and firm's quality of corporate governance. Their findings imply that, in emerging markets, regulator's role to signal the quality of an IPO contributes towards the market welfare.

(B) INSTITUTIONAL EXPLAINATION

Kunz and Aggarwal (1993) discusses special institutional settings in the Swizz stock market and provides some explainations implying that underpricing can be regarded as an equilibrium situation. They say underpricing is deliberately done to get free publicity and make investors invest in their stock, and as an indication of growing competition among the investment banks.

a) Price Support

Ruud (1991) addresses the apparent systematic underpricing of initial public offerings. She finds that most IPOs with zero one-day returns subsequently fall in price, suggesting that underwriter price support may account for the skewed distribution of initial returns observed in her study and hence gives the phenomenon of positive average initial IPO returns, even if offering prices are set at expected market value. This paper thus challenges the presumption underlying previous research that positive average initial IPO returns result primarily from deliberate underpricing.

b) Lawsuit Avoidance

Hughes and Thakor (1992) propose a trade-off between on the one hand minimizing the probability of litigation, and hence minimizing these costs, and on the other maximizing the gross proceeds from the IPO (and thus the underwriter's commission thereon). Crucially, they assume that the probability of litigation increases in the offer price: the more overpriced an issue, the more likely is a future lawsuit. In addition, they predict that underpricing reduces not only (i) the probability of a lawsuit, but also (ii) the probability of an adverse ruling conditional on a lawsuit being filed, and (iii) the amount of damages awarded in the event of an adverse ruling

(C) OWNERSHIP AND CONTROL

Brennan and Franks (1997) argue underpricing gives managers the opportunity to protect their private benefits by allocating shares strategically when taking their company public. Managers seek to avoid allocating large stakes to investors for fear that their non-value-maximizing behavior would receive unwelcome scrutiny. Small outside stakes reduce external monitoring, owing to two free-rider problems.

Laura Casares Field, Dennis P. Sheehan (2004) they analyze whether there is any relation between underpricing when a firm goes public and the subsequent outside block ownership of the firm's stock. They find that the link between underpricing and ownership structure is weak. Most firms have outside blocks in place at the IPO and retain them afterwards. In terms of acquiring new blockholders, there is no difference between firms that underprice and those that do not. Their results say that underpricing is simply not a powerful lever with which to influence the firm's outside blockholdings.

(D) SOCIAL COMPARISON THEORY

Chih-Hsiang Chag (2010) studies a social comparison perspective on IPO underpricing. The social comparison theory in behavioral psychology suggests that when people do not know how to make a decision or are exposed to new information, they refer to the behavioral norm of the public or the behavior of others to frame their decisions. He argues that when IPO firms and underwriters are uncertain about an IPO firm's intrinsic values, they refer to similar IPO issuing firms in the same industry that went public earlier to determine the IPO offer price. Analyzing a sample of Taiwan 1558 IPOs from a period 1962-2009 he found that IPO offer-price setting and first-day IPO abnormal returns are positively correlated with IPO firm peers that went public earlier i.e., he finds evidence that supports the social comparison explanation of IPO underpricing.

The literature review shows that there are various theories explaining the reasons for IPO underpricing. However, the reasons for IPO under prising may be different for different countries. The literature on the asymmetric information highlights on how the informational environment affects under pricing. It is seen that underpricing is regarded as a deliberate action chosen by the issuing firm in the pursuit of some wealth-maximizing objective and to Signal its true value. The institutional explanations concentrate mainly on the price support provided by the underwriters and the fall of litigation risk by lowering the offer price. The literature also provides explanation on deliberate underpricing for retaining ownership by means of oversubscription. Research studies also include factors brought in by the exchanges of the respective country.

The present study highlights on the book-built IPOs price performance in India. The movement of the returns has been captured in a time period which has not been previously analyzed. This time frame has many notable developments to its credit like: the grading system, introduced by SEBI in 2007 and the issuance through book-building at high rate.

An attempt has also been made to examine various factors by classifying them into three categories, namely market related variables, variables relating to issuing firm characteristics and issue related factors. This gives a complete understanding of the factors that might have an influence on the IPO underpricing.

DATA AND METHODOLOGY

Data

The list of the companies which came up with IPOs was taken for a seven year period from January 2004 to December 2010 from the National Stock Exchange (NSE) website. A total 369 public issues were made in this period. The data has been chosen keeping in mind the following criteria

Data should be available for all the variables for the time period 2004 to 2010.

Issuance of stock subsequent to the company's initial public offering i.e. follow-on offering is to be excluded from the data.

Only the valid IPOs through Book building has been taken, which accounted for a sample of 286[4] companies.

In the first part of the study the underprising of the issue has been examined. In order to calculate the underpricing of the issues, the closing price on the first day and the offer price was taken from NSE website. In a well-developed capital market and in the absence of restrictions on how much prices are allowed to fluctuate by from day to day, the full extent of underpricing is evident by the end of the first day of trading, and hence, most studies use the first-day closing price when computing initial underpricing returns. First day returns were calculated for the purpose of the study.

The excess returns were calculated to adjust the returns for the market movements. The market returns when deducted from the IPO's returns give the excess returns. For this purpose the market returns were calculated using NSE Index from the NSE website.

Variable Selection

For the second part, my objective is to study the short run price performance of the IPO. The variables used for the study was collected from different literatures on which similar kind of study were already done. The variables I have chosen for my study are the following:

Dependent Variable

Initial Return (Excess Return) (En):

If the initial return is positive, one can infer that the issue is under-priced. If the initial return is negative it may be inferred that the issue is over-priced and if it is zero, it implies that the issue is appropriately priced. As there is a lag between the offer day and listing day (varying from) the price observed in the market on the listing day may be different from the offer price as a result of the overall market movements. Market adjusted returns of the IPOs for the same period are also calculated and excess returns were found to be present the the firms in the sample. If excess returns are positive, one can infer that the issue is under-priced after adjusting for the market movements in the intervening period and a negative value for excess returns indicates that the issue is over-priced. If there are no excess returns, it implies that the issue is fairly priced.

INDEPENDENT VARIABLES

(I) Issue related Variables

(i) *Number Of Underwriters* (UNDERWR_NUM): Corwin and Schultz (2005) noticed that offerings where more than one underwriter is involved tend to be less underpriced, since information-gathering and price-setting activities are more efficient. The data was collected from the companies IPO prospectuses.

(ii) *Price Band Width* (BAND):

It is the difference between the cap and floor of the price is taken as price band. This makes a proxy for valuing uncertainty. The range at which the IPOs fix the price range is not binding. Hence, it seems plausible to assume that issues for which valuation uncertainty s greater, is marked with wider price range (Hanley 1993). The data was collected from NSE.

(iii) *Subscription Rate* (LNSUBR):

A measure of times the share offering is over subscribed. The higher the extent of over-subscription, the more severe will be the shortage in the investors' allocation. In order to reach their desired allocation, investors will be forced to buy the stock after listing in the stock market, thus driving up the price. This results in greater underpricing of the IPO, as measured by its initial return. Thus, underpricing and oversubscription should be positively related. This shows that the excess demand of investors, manifested by the extent of their oversubscription, is an important explanatory variable for the greater underpricing of group-affiliated firm IPOs. The data was collected from basis of allotment of the companies published after the IPO is listed.

(iv) *Offer Size* (LNASSET):

It is taken the logarithm of the offering size of the firm. A standard control in IPO underpricing studies is the IPO offer size (see, e.g., Ritter, 1984). Offer size may account for a number of factors, including risk and information asymmetry. Initial offer size is calculated as the offering size multiplied by the offer price of the shares. The data was taken from NSE website.

(v) *Offer Price* (LNPRICE):

The initial price of an IPO offering is the offer price. Logarithm of the offer price was taken. Firms with unusually low offer prices experience very high levels of underpricing. Issuers might choose to set a low price to encourage information production, which could presumably take place in the after market. Also, when new issues are priced lower than they should be, investment bankers reduce their legal liability by lowering the chance of price declines. In the early stages of an IPO, the lead investment bank is responsible for assessing the premarket demand for its client's prospective IPO in an effort to set the offer price. Presumably, a very modest offer price will signal little demand, little value, or both (e.g., Jain & Kini, 1999a). Interestingly, however, Ibbotson, Sindelar, and Ritter (1988) note that firms with unusually low offer prices experience very high levels of underpricing. It has also been demonstrated that lower-priced stocks are associated with higher mortality rates (Seguin & Smoller, 1997) These findings suggest that lower offer prices indicate greater uncertainty with regard to the IPO firm's prospects. Hughes and Thakor (1992) say that lesser offer price reduces the litigation risk. The data was collected from NSE.

(II) Issuing Firm Characteristics

(vi) *Age Of The Company* (LNAGE):

It is the age of the firm going public at the time of IPO. Logarithm of the age was taken. The age of the firm has served as a surrogate for risk in previous IPO research, i.e., more established firms are less risky (Carter, Dark, & Singh, 1998; Ritter, 1984, 1991). Less-seasoned firms will have fewer years of published financial data and are less likely to have been assessed by financial analysts (Rasheed, Datta, & Chinta, 1997). The IPO literature reflects the posited relationship between firm age and performance (e.g., Megginson & Weiss, 1991; Mikkelson, Partch, & Shah, 1997; Ritter, 1998). Data for this variable was taken from capitaline.com.

(vii) *Net Asset* (LNASSET):

Logarithm of the asset was taken. Larger organizations, for example, have greater access to resources essential for firm survival and profitability (Finkle, 1998). Larger firms, as compared to smaller firms, present less uncertainty for potential investors. The total asset of the firm in the year preceding that of an IPO was taken, in order to eliminate the inflation effects that distort the result. The data was taken from IPO prospectus and CAPITALINE database.

(III) Market related characteristics

(viii) *Market Volatility* (MKTVOLA):

Measure of market volatility and is calculated as the standard deviation of daily market return (NSE Index) over the two months before the closing date of subscription. Ritter (1984) finds that its industry specific events, rather than the changes in the risk that drive changes in the initial returns. The data for the NIFTY was taken from NSE website.

(ix) *Year*:

A dummy variable has been introduced in the model to capture the time effect. After conducting the first part of the study, it was observed that there was a drastic decline in returns indicating weak underpricing after 2007. Hence a dummy variable (Year) was introduced in the model. This variable accords a value of one if it occurs after 2006 and zero otherwise. The reason for the change in IPO underpricing level may be attributed to recession or the grading system adopted by SEBI during 2007.

(x) *Hot and Cold Market Years* (HOT_COLD):

Another dummy variable has been introduced in the model. This variable tells us if increased IPO activity has been affecting the underpricing. The period with high volume of offering of IPO is taken as the hot years and assigned the dummy 1 and the ones with lesser activity have been taken as the cold years with dummy 0.

Methodology

The initial returns are calculated using the following formula:

$$Underpricing\ (IRi) = [\ (Pi - Po)/\ (Po)\ ] \times 100\%$$

Where P_i is the first-day closing price and P_o is the offer price. These returns measure whether an investor gained (or lost) by buying the shares during the IPO at the offer price and selling at the prevailing price on the opening day. If initial return is positive one can infer that the issue is under-priced; if initial return is negative it may be inferred that the issue is over-priced and if initial return is zero it means the issue is aptly priced.

As there is a lag between the offer day and listing day (varying from) the price observed in the market on the listing day may be different from the offer price as a result of the overall market movements, we also computed market adjusted returns of the IPOs for the same period. This adjustment is made first by computing the returns on the market index (Nifty) during the same period.

$$R_m = [(I_t - I_o)/ I_o] \times 100\%$$

Where I_t is the Nifty index closing/opening value on day of listing of IPO and I_o is the closing level of Nifty on the last day of the IPO offering. If market return, is positive it means the market on the whole has moved up; if it is negative it may be considered that there is a decline in the over all market and if it is equal to zero it may be concluded that market remained unchanged during the interval between IPO offering to its listing.

$$E\ R = IR_i - R_m$$

If ER is positive one can infer that the issue is under-priced after adjusting for the market movements in the intervening period and a negative value for ER indicates that the issue is over-priced and it is equal to zero it may be concluded that the issue is fairly priced.

For the 2nd part of the study a cross-sectional regression is done for the variables. The initial return is taken as the dependent variable and the others as independent variable.

The model is a linear regression model:

$$ER = \alpha_0 + \alpha_1 LNAGE + \alpha_2 LNSIZE + \alpha_3 LNASSET + \alpha_4 MKTVOLA + \alpha_5 LNSUBR + \alpha_6 UNDERWR_NUM + \alpha_7 LNPRICE + \alpha_8 BAND + \alpha_9 YEAR + \alpha_{10} HOT_COLD + u_i$$

The model was subjected to cross sectional regression and the significance of different variables was found.

RESULTS

The initial return was calculated using the formula mentioned in section 3.3 and the initial returns were calculated for the firms in the sample. The excess return was calculated after adjusting for the market returns and the results are tabulated below. Table 4.1 shows the average offering sizes, initial return, and excess return of IPOs for each of the 7 years from 2004 to 2010. The average excess return for the IPOs for 7 years with their median values and minimum and maximum values are given in Appendix tables A.1 in the end.

Table 1: Under pricing for the years 2004-2010

YEAR	NO. OF IPO OFFERINGS	INITIAL RETURN (%)	MARKET RETURN	EXCESS RETURN (%)
2010	57	15.6269	0.423622	15.13638
2009	20	12.4893	0.934396	9.062267
2008	28	8.7053	-2.09455	11.03253
2007	82	21.8949	-2.52455	29.11834
2006	55	22.7341	3.297601	18.74087
2005	34	27.1144	3.833149	31.21535
2004	10	31.1723	3.091892	38.48989
Total	286	22.4464	0.706532	21.73987

From the table above, one can observe that the initial returns of the IPOs are 22.50 % for the sample period (2004-2010). It implies that the issue is underpriced (positive returns). The market return was is found to be positive indicating that the market on the whole has moved up. We can see that the excess return is also positive. Hence, the issue is under-priced even after adjusting for market movements in the intervening period. The excess return is found to be 21.73%, which differs from the simple return by less than one percent.

The initial returns have followed a decreasing trend. The initial returns on 2004 were 38.48% which has decreased to 15.13% by the year 2010. The decrease is seen to be almost half of the returns in 2004. The returns were on an all period low on 2009, when the underpricing was just 9%. The period after 2007 shows lesser underpricing compared to the period before 2007. This might be because of the grading system adopted by the SEBI wherein any company which has filed the draft offer document for its IPO with SEBI, on or after 1st May 2007, is required to obtain a grade for the IPO from at least one Credit Rating Agency. The grade represents a relative assessment of the fundamentals of that issue in relation to the other listed equity securities in India. Such grading is generally assigned on a five-point point scale with a higher score indicating stronger fundamentals and vice versa. The late-2000s financial crisis is another notable event which occurred during this period of study. Though, the latter cannot be considered as a very valid reason as the crisis had not affected the Indian markets much.

Fig 1: Initial simple returns and Excess returns

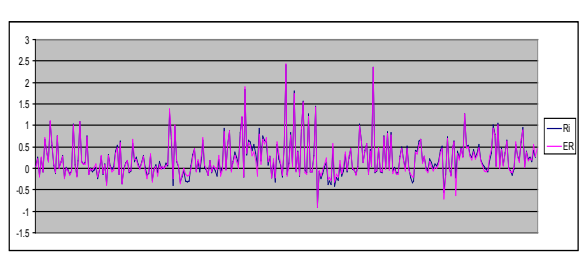


Figure 4.1 graphically explains the simple returns and the excess returns for the sample for the 7 year period. It is evident that the returns after adjusting for the market movements do not differ much from the simple returns. The returns are concentrated more on the region 0-1, implying positive returns which already has been calculated and shown above.

For analyzing the short run price performance of IPOs, a cross sectional regression is done on the variables mentioned in 3.2 before. This would show how significant the different factors are on in affecting the initial returns of the shares. Firstly, a

simple cross sectional regression is done and then the stepwise regression showing the overall significant factors and the factors based on market, firm and issue related characteristics is done separately.

(I) The cross sectional regression results are presented in Table 2 below. The adjusted R^2 was found to be 24.78 percent, which implies that the model softly explains the variability of under-pricing of IPOs.

Table 2: Cross sectional regression results

VARIABLE	Coef.	Std. Err.	P>T
LNAGE	0.028424	0.042414	0.503
LNASSET	-0.01647	0.019351	0.395
MKTVOLA	0.00056	0.000277	0.044
YEAR	0.003246	0.06001	0.957
HOT_COLD	-0.03161	0.05022	0.530
LNSIZE	-0.03786	0.032176	0.240
LNSUBR	0.164447	0.017748	0.000
UNDERWR_NUM	0.001818	0.013267	0.891
LNPRICE	-0.0363	0.042604	0.395
BAND	-0.00037	0.001464	0.800

The results show a positive relationship between age of the firm and the underpricing. Better established the firm is considered to be, more the firm can maintain itself in the long run after underpricing its issues. This acts as a signaling effect for the firm. More well established firms are less risky and hence the relationship should be negative. But the regression results are not significant for this variable and hence are not a hindrance to our study.

The results of the regression model also show that there is a negative relationship between asset of the firm and underpricing. Larger firms, as compared to smaller firms, present less uncertainty for potential investors. Smaller firms may also be perceived as offering lower performance potential, leading prestigious underwriters to avoid these issues so that they do not directly bear any loss through undersubscribed issues. This implies that the more assets the firm has, the less underpriced it will be. But this factor is not found to be significant.

There is positive relationship between the level of under-pricing and market volatility and also it is significant (at 95%). The regulatory authorities try to minimize the probability of unsuccessful issues by lowering prices as long as market volatility is high. Hence, high market volatility will lead to greater underpricing. It seems plausible that both underwriters and investors would have greater difficulty valuing IPO firms when the level of market-wide uncertainty about prices and value is especially high. This might lead us to conclude that another significant reason for underpricing must be the high market volatility which leads to greater uncertainty and higher risk.

The results show that, there is an insignificant relationship between size and the level of under-pricing. They show a negative relationship, premising that larger the issue size less will be underpricing because larger issues will be less risky as they are followed and analyzed by a large set of prestigious analysts.

The results of the regression show a positive and very high significance of subscription rate (99%) on the underpricing. The reason behind this is that more the issue is underpriced, the informed investors knowing the true value of the firm will invest on it. The uninformed follow the informed and buy the shares leading to high level of subscription. Hence, this is consistent with both the absorption capacity of the market and the winners curse model discussed in Rock's (1986).

Table also shows that there is a positive relationship between the number of underwriters underwriting the issue and the underpricing. It is because increased number of underwriters will increase the agency cost incurred. More number of underwriters will also reduce the uncertainty and risk and hence should have a negative relationship. But this factor is insignificant and therefore is not important.

Issue price show a negative relation. Low offer prices experience very high levels of underpricing. In the early stages of an IPO, the lead investment bank is responsible for assessing the premarket demand for its client's prospective IPO in an effort to set the offer price. Presumably, a very modest offer price will signal little demand, little value, or both . This factor is found to be insignificant.

The relationship between price band and the underpricing is found to be insignificant. The relationship is found negative in the study. When valuation uncertainty is greater, it is usually marked with wider price range.

Analysis and Interpretation of Results

Oversubscription was found to be highly significant. The probable reason could be that underwriters deliberately cause oversubscription which results in under pricing of the issue. As a result they don't loose the ownership and control of the firm. This is consistent with the theory that underpricing induces oversubscription, which allows the firm to discriminate against large block-holders in the allocation of shares (Field and Sheehan (2004)).

Moreover, there might be over reaction to avoid legal liability. The over-reaction hypothesis asserts that the excess demand results from the attention that group-affiliated firms attract in relation to stand-alone firms (e.g., perhaps due to their respective reputations), and creates uncertainty about the allocation that investors will obtain from the IPO. This holds true when the allocation process is rationed accordingly to a well-publicized formula, as in the case of Indian market. The higher the extent of over-subscription, the more severe will be the shortage in the investors' allocation. In order to reach their desired allocation, investors will be forced to buy the stock after listing in the stock market, thus driving up the price. This results in greater underpricing of the IPO, as measured by its initial return. Underwriters might also deliberately under-price to reduce the litigation risk. The probability of adverse judgment and the amount of damages if litigation occurs is lowered by underpricing (Hughes and Thakor (1992)).

High market volatility causes the firms to scale back on their IPOs or price them below the expectations. Market volatility has been high in the past few years in India (Table 3.8). The significance of market volatility in Indian market must be the cause of the underpricing.

(II) A stepwise regression is done as the next part of the analysis for gaining much clear results. A step wise regression is the step-by-step iterative construction of a regression model that involves automatic selection of independent variables. Stepwise regression can be achieved either by trying out one independent variable at a time and including it in the regression model if it is statistically significant, or by including all potential independent variables in the model and eliminating those that are not statistically significant, or by a combination of both methods. The Table 3 and 4 present the regression results.

Table 3: Stepwise regression results: overall model

ER	Coef.	Std. Err.	P>t
LNSIZE	-0.06248	0.017687	0
LNSUBR	0.15792	0.015891	0
MKTVOLA	0.000528	0.00025	0.036

The analysis yielded market volatility, size of the offering and the subscription rate significant. The oversubscription and market volatility are positively related to the excess return. They indicate the need for underpricing by means of ownership and control theory, which states that issuers deliberately under price to prevent large holdings by outside shareholders and the investors over reaction to the market. The size of the offering unlike in the cross sectional regression if found to be significant. The relation is positive which point out that larger the number of issues, the less will be the underpricing. We premise that larger the issue size will reduce underpricing because larger issues will be less risky as they are followed and analyzed by a large set of analysts.

The market related characteristics, issue related characteristics and firm related characteristics were separately regressed to find the significance of each on the underpricing.

(i) *Market Related*: Market related characteristics include the market volatility, the year before and after 2007 and the hot and cold market years.

Table 4: Stepwise regression: market related characteristics

ER	Coef.	Std. Err.	P>|t|
MKTVOLA	0.00052	0.000309	0.093
YEAR	0.178386	0.056927	0.002
_cons	0.020901	0.076299	0.784

The adjusted R^2 is found to be to be 2.74 percent. Hence, very less underpricing is explained by the market related characteristics. The year and market volatility were found to be significant (Table 4.5). The year on and after 2007, saw a decrease in the underpricing level. These years seems to have a noteworthy effect on the underpricing, which might be because only the investment bankers have been very careful about the pricing of the issue and the investors, fearing a loss might have invested in only safe issues. The market volatility is seen to be significant throughout. This shows that the volatility has considerable effect on the pricing of the issues.

(ii) *Issuing Firm Characteristics*: It was found that Firm related characteristics do not have any significant effect on the underpricing of IPOs. The age and asset of the firm, which were taken as a proxy for issuing firm characteristics, were found insignificant through stepwise regression.

(iii) *Issue Related Characteristics*: the variables grouped under this are: offering size, subscription rate, number of subscribers, offer price and price band. The stepwise regression results are depicted in the Table 5 presented below.

Table 5: Stepwise regression: issue related characteristics_

ER	Coef.	Std. Err.	P>|t|
LNSIZE	-0.05982	0.017749	0.001
LNSUBR	0.152841	0.015803	0
_cons	0.465664	0.171227	0.007

The size of the offering and the subscription rate are found to be significant under this category. It was found that 24.86% (R^2) of the returns are explained by the issue related characteristics.

Conclusion

(i) The IPO underpricing: The result shows that the issues are underpriced in India. The rate of underpricing from the year 2004-2010 was found to be 22.44%. The excess return in this period was found to be 21.73%, which implies underpricing.

(ii) The factors significantly influencing IPO underpricing are found to be subscription rate and market volatility though the cross sectional regression. Market volatility, subscription rate and the offering size are significant according to the results of step wise regression. Once the firms under study were categorized based on market characteristics, issuing firm factors and issue related variables, issue related factors seemed to be highly significant in the step wise regression model. Upon introducing market related factors, market volatility and the year dummy were found to be significant. Once the issue related variables were included in the model, offering size and subscription rate were found to be highly significant.

The main purpose of the study was to examine the level of underpricing in the past seven years (2004-2010) for the IPOs issued through book building. Upon listing the IPOs on an average offered positive returns (after adjusting for market movements), which follows the general theory exhibited across countries across time periods. Results show that the subscription rate (which confirms the informed demand hypothesis) and market volatility influence the excess returns the most at the time of IPO, irrespective of the number of underwriters, the value and the characteristics of the firm. One can conclude that in India, underpricing might be because of the ownership structure of the firm which promotes large block holdings or because of the investors' over reaction.

The performance of IPOs is of importance to investors, issuers, investment banks, policy-makers and academicians. This paper helps the firms to decide whether or not to launch an initial public offering (IPO) in the current scenario and the factors which might have an impact on the investors' reactions towards a particular IPO.

The study has following limitations: (i) Theories on underpricing detail about the litigation risk and the internal management of the firm which can affect the returns. These factors were not taken due to the complexity of collecting the data necessary for such a huge group of firms and relying on their authenticity.

(ii)The grading system started by the SEBI on 2007 which value the firm based on their fundamentals is another factor which might play a major role in investor decisions. As the grading started at a later time, this variable was not included. In this study.

In the future course of action, IPO under pricing effect can be studied in detail in the short and the long run. As we can see from the current literature that long run the returns tend to be negative and firms underperform after the initial period is still valid for Indian scenario, future studies can be extended to examine the long run performance of IPO firms and the underlying theories. Further studies can elaborate on the pricing efficiency of book-building process by comparing the excess returns from the fixed price offerings during the same period. The effect of PO grading can be seen on the pricing of an issue which can bring new insights into the study.

APPENDIX

Table A.1: Annual average excess return and offering size in India: 2004-2010

year	no. of offerings	excess return			
		mean	median	minimum	maximum
2010	57	0.151364	0.086317	-0.39323	1.109995
2009	20	0.090623	0.036217	-0.31053	1.37901
2008	28	0.110325	0.022691	-0.36263	1.015943
2007	82	0.291183	0.147287	-0.90783	2.419057
2006	55	0.187409	0.056953	-0.71998	2.3553
2005	34	0.312154	0.27561	-0.09925	1.267004
2004	10	0.384899	0.322028	0.02626	0.897255

Fig A.1: The distribution of the number of subscribers for the issue for the sample period

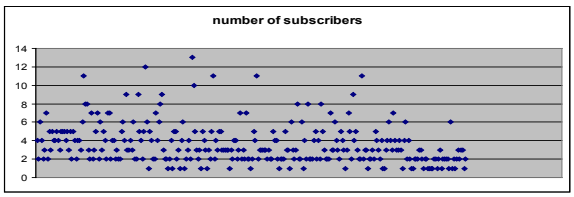


Fig A.2: The distribution of the price range for the issue for the sample period

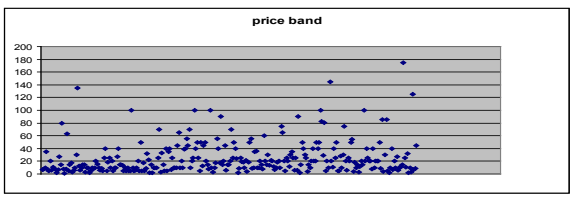


Fig A.3: The distribution of the subscription rate per issue for the sample period

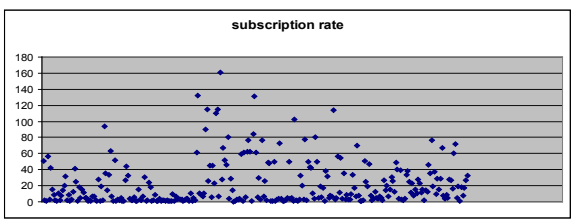


Fig A.4: The distribution of the size of the offering for the sample period

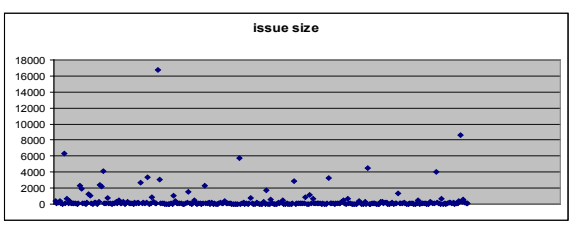


Fig A.5: The distribution of the offering price of the issue for the sample period

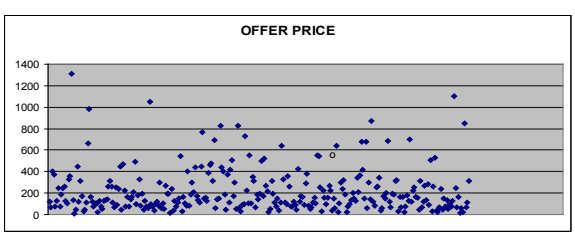


Fig A.6: The distribution of the ages of the firms which made IPOs for the sample period

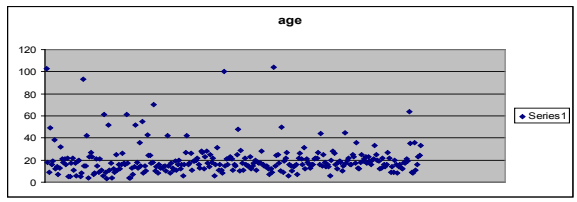


Fig A.7. The distribution of the assets of the issuing firms for the sample period

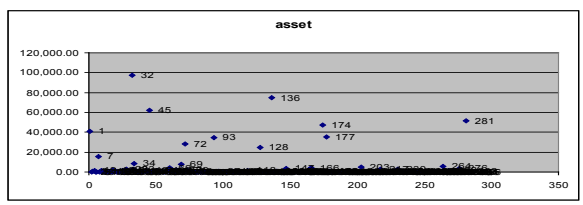
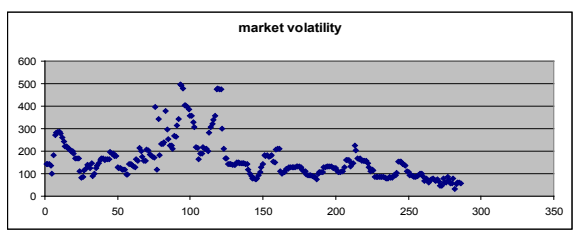


Fig A.8. The distribution of the market volatility for the sample period (NIFTY)



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