Under Pricing Anomaly – Empirical Evidence from Indian Capital Market

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Abstract:
In this paper, we examine the IPO anomaly "Under Pricing" for Indian Capital Market during the period of 2002-2012. Stepwise regression was carried out to find out the factors explaining under pricing. Results obtained in this study are a bit ahead of the earlier empirical findings in terms of adjusted R2. We found factors such as degree of over subscription, market rate of return, issue price and post issue promoters holding are significant and explaining 42.2% of under pricing. The shift in degree and factors explaining under pricing may be attributed to the change in regulatory and institutional environment of the Indian Capital Market. The findings of this paper may have strong implication for the policy makers, market intermediaries as well as retail investors.

Keywords: Under pricing, Indian Capital Market, policy makers, retail investors.

1. Introduction

Selling stock to the general public is one of the important method by which firms are able to raise new equity capital. If the firm sells stock for the first time to the general public, it is called new issues offerings or an initial public offering (IPO). Subsequent to the new issues, firms may seek to raise further equity capital by offering to sell new shares through a seasoned equity offering (SEO).

In India, most young/small firms initially raise equity capital from a small number of investors through private placements. If a firm prospers and needs additional equity capital, it may choose to go public by selling stock through new issues offerings. By issuing publicly traded equity, the firm establishes both a market value for the firm and a market for its common stock.

The market for new issues in the India revived during the 1990s. Not only did the number of companies going public grow tremendously, but also the gross proceeds raised during the decade were almost four times that of the earlier three decades combined. The trend continued after the year 2000 with increase in gross proceeds. With the booming new issues market, the phenomenon of under pricing became more pronounced. The average percentage first-day returns of new issues each year were routinely above two digits. As a result, researchers since Ibbotson (1975) have continued their attempt to explain the under pricing of new issues.

There have been many new issues related studies that record the so-called "Under pricing anomaly" as a primary stylized fact of new issues. The under pricing refers to the significant increase of the offer price of the new issues market price over the first few days after the initial listing. The degree of under pricing (over pricing) can be measured by initial return which is difference between the offer price (P_0) and listing day closing price (P_1) divided by offer price (P_0). Under pricing (over pricing) occurs when P_1 is higher (lower) than P_0. The change in the ratio of P_1 and P_0 is called as initial return and if adjusted for changes in market returns R_m, called as market adjusted return. On this background this study is conducted with research objective to find out the factors explaining the under pricing of new issues during period of 2002-2012.

The rest of paper is organized as follows. Section 2 discuss the review of literature, section 3 methodology, section 4 for empirical findings and discussion and section 5 conclusion.

2. Review of Literature

The present section attempts to review the studies that have tested the validity of theoretical consideration advanced in new issues literature, for continual incident of under pricing. Empirical studies have been conducted in India and many other countries to study the under pricing. In the literature of new issues, term under pricing is synonym for "listing day performance" or "short run performance".

To study the under pricing, one of the popular models was developed by Rock in 1986. He assumes information asymmetry as reason behind under pricing of new issues. He categorizes investors into two categories based on information they have. Investors with more

information about new issues were termed as informed investors (II) and investors with less information were termed as uninformed investor (UI). Because of this information asymmetry, II compete with UI for "good" issues only. This increases probability of UI towards allotment of "bad" issues. Thus, "good" issues will have excess demand and "bad" issues will have excess supply. Because of superior information IIs will book good issue earlier. Therefore, to induce UIs in new issues, issuers under price the issue deliberately. Yet this explanation is insufficient to explain under pricing, Rock's (1986) study has been major innovation towards new issues under pricing.

Rock's model was further explored by Beatty and Ritter (1986). They studied *ex-ante* uncertainty faced by new issues investors. They used number of uses of the proceeds and the inverse of the gross proceeds are proxies for *ex-ante* uncertainty. They argued that many issues avoid detailed information about use of issue proceeds to hide the proprietary information to market competitors. Their study found positive relations between *ex-ante* uncertainty factors and degree of under pricing. Taking Beatty and Ritter (1986) as base study, many researchers developed new models to explain new issues under pricing.

Peavy III (1990) examined 41 closed-end fund initial public offerings during the period 1986 to 1987. His result did not show evidence of significant positive initial returns. Instead, new fund shares were overpriced. While the new funds had minimum initial price declines to offset initial overpricing, they experienced significant negative aftermarket returns.

Frederikslust, Geest (2001) investigated initial returns performance of new issues in UAE using a sample of 38 private equity backed (PEB) new issues and 68 non PEB new issues in the period 1985-1998 on the Amsterdam stock exchange and found average initial return on day 1 for the full 55 sample of about 16 per cent. He has also calculated corrected abnormal returns and uncorrected abnormal returns but found almost same initial returns in both the categories.

Hao (2007) identified factors that correlate the effect of laddering on initial public offering (IPO) pricing. Laddering is a practice whereby the allocating underwriter requires the ladderer to buy additional shares of the issuer in the aftermarket as a condition for receiving shares at the offer price. He showed that laddering has a bigger effect on the market price of new issues with greater expected under pricing (without laddering) and greater expected momentum in the aftermarket; laddering increases the new issues offer price, the aftermarket price, and the money left on the table but does not necessarily increase the per cent under pricing; laddering contributes to long-run underperformance and creates a negative correlation between short run and long run returns; and profit-sharing increases the extent of laddering and the per cent under pricing.

Dimovski and Brooks (2008) examined the prospectus of 114 Australian gold mining new issues from 1994-2004 and found a significant downside shift of under pricing. He observed average under pricing of 13.3 per cent as compared to 119.51 per cent of under pricing found by How (2000) who examined 100 Australian gold mining new issues from 1979 to 1990. The difference in under pricing was attributed to the change in legislative environment and institutional environment between two periods.

Zouari, Boudriga and Taktak (2009) analyzed the short run performance of Tunisian initial public offerings (IPO), a market characterized by low information efficiency, high information asymmetry, thin trading and the presence of "noise" traders. With a sample of 34 Tunisian new issues during the period 1992-2008, they found that the average market adjusted initial return for the first trading day was about 16.0 per cent.

Jones and Swaleheen (2010) examined the relationship between underwriter reputation and initial public offerings (new issues) initial returns from 1980 to 2003 by using two stage least-squares regression analysis. This study showed that underwriter reputation is statistically significant and negatively related to initial returns from 1980 to 1991 and statistically significant and positively related to initial returns from 1992 to 2003, when reputation is taken as an exogenous variable. When considering the choice of the reputation of underwriter as endogenous to characteristics of the firm, the reputation of an underwriter is significantly positively related to initial returns for 1980 to 2003 and 1992 to 2003 and insignificantly related, for 1980 to 1991.

2.1. Empirical Evidences from India

Shah (1995) under took a study of 2056 new issues, which hit to the market between January 1991 to April 1995 in India. He found that India's new issues market was suffused by constant under pricing. The observed data showed, on an average an under pricing of 105.6 per cent and 3.8 per cent per week. Narasimhan and Ramana (1995) conducted empirical study to examine the new issues pricing situation in post CCI (Control of Capital Issues Act 1947, which was repealed in 1992) system. The focus of study was the determination of short term returns of new issues to test whether stock has been priced at its intrinsic worth. The selected sample during the period of study was categorizes as bearish (April-May 1994) and bullish (November 93 - January 94). Their study found under pricing and movement in market index is not correlated. They further added that premium issues were far greater underpriced than par issues.

Nandha and Sawyer (2002) studied 381 new issues floated during 1994-95 and found positive correlation between initial returns and post issue promoter holding. Their findings were contradicting with the empirical study by Su (2004) on Chinese capital market.

Madhusoodanan and Thiripalraju (2004) found that under pricing of 1922 new issues which came out with issues and listed on BSE from 1992 - 1995. Their finding about under pricing in India in short run was higher than the results of other countries. They noted that no merchant banker had a capacity of better pricing of shares.

Ghosh (2005) analyzed under pricing in India for 1842 new issues hit the market during 1991-2001. The study assumed that under pricing is negative function of issue size. Study found that uncertainty and number of days between offer closing day and listing day, size are significant while age and industry classification are not significant determinant of under pricing. Another finding of the study was about state of market condition. During hot market conditions issues are less under priced. His study further concludes that

successful large issues and firms with higher under pricing again offered new issues, know as follow-on public offer (FPO) to take the advantage of the good taste of market.

Shelly and Singh (2008) studied 1963 fixed price new issues listing on Bombay Stock Exchange during July 1992 to August 2006. Average under pricing during observed period was found average under pricing was at about 70%. Also under pricing was negatively with issue size and positively correlated with subscription to the issue. They stated that number of uninformed investors participating in Indian new issues market is significantly very large as against institutional investors compared to other markets.

Pande and Vaidyanathan (2009) explored factors of under pricing of 55 new issues floated during 2004-2006. Average initial return was around 22.62% with positive correlation between under pricing and independent variable listing delay.

Shelly (2010) in a study based on 1967 offerings during the period July 1992 to March 2005 for the 62 companies listed on Bombay Stock Exchange, revealed an under pricing of 73.59 per cent. The study reported that variable of oversubscription is positive and significant determinant of under pricing in Indian New issues. Sahoo and Rajib (2010) studied listing day and long run performance of 129 new issues during a period 2002-2006. They documented that the new issues were under priced up to 46.55 of the offer price.

Mishra A (2012) conducted study on 235 new issues listed during April 1997-March 2008. Empirical findings suggested that 60% of new issues were over priced with positive initial return of 14.45%. He documented that Indian markets were experiencing under pricing from year 2003, and was high during 2007 which decreased from year 2008. Also, he extends the literature by studying whether type of pricing mechanism (fixed pricing or book building) is affecting degree of under pricing or not.

3. Methodology

3.1. Sample Construction
The present study is conducted on 427 new equity issues which raised capital for the first time since their inception & have been listed on NSE / BSE during January 2002 to December 2012. However due to reasons like non availability of data, missing information about a variable and outliers, sample size is reduced to 318 (74.12%) for analyzing under pricing of the new issues.

To form part of study, following filters were applied:
(a) The firm is listed on the NSE/BSE
(b) The instrument of issue is equity share.
(c) Firm is going to the public for the *first time*. FPOs are excluded from the scope of this study.
(d) The firm has at least three years' financial information prior to its date of listing.
(e) Data regarding offer price, listing date, issue size, date of incorporation, lead managers, Listing Delay, oversubscription, and industry are available.

3.2. Time Period of the Study
The study analyses the pricing and performance of new issues in India during the period from January 2002 to December 2012 as per the list of new issues available on the website of National Stock Exchange.

3.3. Sources of Data
This study is based on secondary data. List for New issues during the period of study is obtained from NSE website. Fundamental information like sales, profitability, net worth, cash flow, rate of dividend, assets, debt, P/E ratio is obtained from the prospectus available on website of Securities and Exchange of India (SEBI). The information regarding sectors such as offer price, date, and size, listing date, age, industry, lead manager and oversubscription of IPOs has been taken from capitaline database and closing values of NIFTY have been taken from NSE. For comparing IPOs return with market return Nifty has been selected as a representative of the market. Daily four values of Nifty are available viz. opening, high, low and closing value. The study is based on the closing values on different dates in order to calculate market-adjusted return. In case of non-availability of data concerning the exact date the nearest date (not varying more than a week) has been considered. For opening, closing and listing date of issues and opening day opening price and opening day closing price are obtained from reliable websites as referred in bibliography.

3.4. Regression Model Specification
There are several approaches to assist the researchers in finding the best regression model. The Step-wise regression approach is employed to identify variables, which explain the greatest variation in the dependent variable. It does this by selecting and adding to the model the variables contributing the greatest explained variance, followed by the second, third and so on, until additional variables do not contribute further to adjusted R^2. The dependant variable under pricing hereafter referred as "UP" is the initial return on the day of listing of the stock. With reference to various studies refereed in literature review, the under pricing model is formulated as follows.

$UP_{xyi} = \beta_0 + \beta_1$Age of the Firm$_i + \beta_2$Leverage$_i + \beta_3$L_Issue Price$_i + \beta_4$Market Return$_i + \beta_5$Over Subscription$_i + \beta_6$Post Issue Promoter Holding$_i + \beta_7$Return on Opening$_i + \beta_8$Rate of Dividend$_i$ + Resi

3.5. Variable Definition
UP = Under pricing (the dependent variable)
Consistent with the standard methodology, it is calculated by dividing the difference between listing day closing price *(P₁)* and issue price *(P₀)* by issue price *(P₀)*. In mathematical form it can expressed as UP = ((P1 – P0)/P0)*100   Eq. 1

Equation (1) assumes that there is no time lag between the offer and trading of the stock which means a legitimate market. If the first condition is not fulfilled, returns should be adjusted for changes in market conditions during this period. In India, there is substantial time gap between the offering and listing of the stock. During this period, a major change could occur in market conditions and the observed premium (discount) measured by equation (1) could be caused by a change in market conditions rather than initial mispricing (Singh and Mittal (2003)). Therefore, the initial or raw return estimated by equation (1) is adjusted for market return as by subtracting market rate of return from raw under pricing calculated as per eq no 1.

3.6. Explanatory Variables

3.6.1. Issue Price
The price at which shares are offered by issuing company to the investors. Under fix price mechanism issuing company fixes the offer price of shares. However, in case of book building, issuing company gives price band and investors have liberty to bid for the shares at price convenient to them. Final issue price is decided after closing of the issue based on bidding received by the issuing company. Issue price of the studied sample varies from a minimum issue price of 10 to a maximum value of 1310 with standard deviation of 203.88. To overcome the problem of highly skewed distribution and heteroscedasticity, log transformation is applied. By these means statistically well behaved variables were obtained. Using log transformation, Nafid S (2014) found shift of issue price variable from insignificant to significant category.

3.6.2. Market Return
Popularly, in India, NIFTY index is considered as market barometer and it measures status of economic activity in the country. To include market related aspects into regression, we used return on NIFTY index as proxy for market return.
Analyzing the impact of macroeconomic factors on Indian capital markets it is found that the capital market indices are dependent on macroeconomic indicators i.e. inflation rate and interest rate. Importance of market return in explaining and forecasting under pricing was also highlighted by Gupta et *al* (1998). This study considered the average of the NIFTY return (monthly) for the period three month prior to the month in which issue open for subscription to the general public.

3.6.3. Return on Opening
Under pricing is also depends on listing price of the new issues. Higher the listing price, higher is the under pricing and vice-versa. Many issues in India during the research period gave the substantial return on listing and thereby increasing the under pricing when calculated as difference between listing price and listing day closing price. Kumar (2007) finds return on opening as a significant variable of under pricing. This study considered return on opening as a proxy for investors' willingness to pay. As in book-building mechanism of pricing, investors get the chance to price the issue in a price band only which has the maximum difference of 20 per cent between cap and floor price. If the return on opening is positive, it indicates that investors are willing to pay more than the offer price. Therefore, the share price in the equilibrium (closing price on the listing day) increases which results in higher under pricing. If return on opening is negative, it shows that investors are willing to pay less than the offer price. If it is zero, it means investors are willing to pay equal to the offer price. This study calculated return on opening as difference between listing price and offer price deflated by offer price.

3.6.4. Over Subscription
Rock (1986) pioneered the significance of oversubscription for under pricing of new issues. He contended that over subscription is a result of large orders placed by uninformed investors. Koh and Walter (1989) tested Rock's (1986) model for Singapore market and found a significant and positive correlation between level of oversubscription and listing day initial return. Sidik et al (2000) reported positive and high correlation coefficients for both adjusted and raw returns with their oversubscription ratio. Rock's (1986) model is expected to work for Indian market as well. This study also expects result similar to the findings of Shelly and Singh B (2008) which are depicted in table 1.

3.6.5. Post Issue Promoters Shareholding
The offering of new issues involved diluting the ownership by existing shareholder – generally promoters or large shareholders. Leland and Pyle (1977) explain that this retention ratio shows issuer's willingness in company business and conveys high expectation about future cash flows of the issuing company. Therefore, higher ratio implies higher the value of issuing firm. Allen and Faulhaber (1989) assume that the high value firm keeps more with them so that they can come with follow on offer in the future. In the present study data about post issue promoter holding is obtained from prospectus of issuing company.

3.6.6. Age of the Firm
The firms having longer operating history witnessed lesser uncertainties in pricing, because sufficient amount of information is available at the time of firms going to public for issue of new shares. One of the most popular proxies on company characteristics in terms of maturity is age of the firm. Age is estimated in years as difference between the date of incorporation and the date at which the company goes public (rounded to whole numbers). Ritter (1991) finds that age of the firm and under pricing moves in opposite direction. However, Suchard and Singh (2007) find a positive association between under pricing and age of the firm. As asserted in

Ghosh (2005), this study also assumes that an older firm can provide longer operating history than a new firm; hence investors can have more trust in the performance of an older firm, which reduces the risk and signals a high value of the firm.

3.6.7. Leverage
On the basis of capital structure theories, it can be inferred that high pre-IPO leverage indicates high financial distress costs, high agency cost, and also that the firm is not having enough internal financing or profit. Therefore, this study assumes that the value of the highly levered firm is low at the time of IPO. This variable is defined as the ratio of total debt to total assets of the firm. (Average of 3 years pre IPO). As per the capital structure theory, high pre-IPO leverage indicates high financial distress costs, agency costs, and lower profitability; therefore, high pre-IPO leverage increases the risk and thereby decreases the firm value.

3.6.8. Rate of Dividend
Pre-public offer, shareholders use dividends as a means to secure liquidity around the IPO (Martin J and Zeckhauser R 2009). In such a way they avoid the bad signal of selling shares at the IPO itself. Furthermore, managers are actively managing their cash holdings prior the IPO. They fear the market undervalues the marginal dollar of excess cash in the IPO and reduce their cash holdings accordingly. Brau and Fawcett (2006) find that managers are indeed concerned about pre public offer signal given by the firm. Thus, managers might try to use dividends as a means to circumvent sending this negative signal: either by substituting the dividend payment prior to the IPO for selling secondary shares to secure liquidity. We used 3 years average dividend rate obtained from the prospectus of the issuing company.

3.7. Testing for Assumptions for Regression

3.7.1. Outliers
For checking the presence and influence of outliers, standardized residual was analyzed. In the first trial, maximum value of standardized residual was 5.76 against acceptable value of < 3.29. The problem was overcome by deleting cases as reported in case wise diagnostic table. In the 3rd trial, findings were within acceptable value (max = 3.09) against standard value of <3.29 with cook's distance (also known as D) at .97 (Refer Table no. 6) Cook's distance (Cook and Weisberg 1982) less than one indicate even if outliers are forming part of sample their presence do not influence the robustness of the model.

3.7.2. Collinearity
Researched data do not have the problems of multi collinearity. Highest value of VIF is 1.156 against recommended value of 10 (See Hair, Anderson, Tatham, & Black, 1995; Kennedy, 1992; Marquardt, 1970; Neter, Wasserman, & Kutner, 1989) or 5 (See Rogerson, 2001) and even 4 (See Pan & Jackson, 2008) indicating multi collinearity is not a concern.

3.7.3. Independent Errors
The assumption of independent errors to check uncorrelated residual terms was tested using Durbin-Watson statistic. Value of 1.957 indicating the assumption of independent errors has been met (Refer Table no.7)

3.7.4. Random Normally Distributed Errors and Homoscedasticity and Linearity
Normality was tested by observation method. The histogram of standardized residuals (fig 1) indicated that the data contained approximately normally distributed errors, as did the normal P-P plot of standardized residual (fig 2), which showed points that were not completely on the line, but close. Minor disturbance pictured in the graph are may be due to the presence of outliers which were taken care by observing standardized residual value and Cook's distance. The scatter plot of standardized predicted value (Fig 3) showed that the data met the assumption of homogeneity of variances and linearity.

3.7.5. Non-Zero Variances
Looking at the table no. 8, it can be conclude that the data also met the assumption of non zero variances. All observed variables are showing non zero value of variance.

4. Empirical Findings and Discussion
This section of the paper presents and discusses the empirical results relating of under pricing in the new issues. Two empirical models have been developed to undertake under pricing analysis with two dependent variables (DV) i.e. Raw Under Pricing and Market Adjusted Under Pricing. Same 8 variables were regressed with change in dependent variable. The descriptive statistics for model 1 (DV is Raw Under Pricing) is given in following table no. 2.
It shows that the under pricing has a mean (median) value of 18.68% (11.25) and is significantly different from zero at the 95% levels of significance indicating existence of under pricing in the research sample (table no 3)
It implies that on average, investors, who buy new issues from the primary market at offer price and sell them at the closing prices of the listing day, are better off by 18.68% from their investment. Most of the new issues in the research sample are under priced. 103 (forming 32.38%) out of sample size of 318 are overpriced and 5 are accurately priced (under pricing less than 1%) are remaining 210 new issues (66% of sample size) are observed as under priced. The highest and lowest under pricing is 240.96% (Everonn System

India Limited, year 2007) and 0.07% (Niraj Cement Structure, year 2008) respectively. The second highest degree of under pricing was also observed in the year 2007 followed by third in the year 2006 indicating concentration highly under priced issued during 2006-2007. The current study has several critical differences with previous studies on Indian IPOs. First of all, the average under pricing of 18.68% is remarkably different from 105.6%, as reported by Shah (1995), for the sample of IPOs listed from 1991 to 1995, 22.62% as reported by Alok Pande and R Vaidyanathan (2009). This reduction in under pricing can be attributed in part to the change in regulation, whereby the allocations to informed institutional investors was allowed.

Fama and French (1995) argue that the book to market ratio contains the information of the shares riskiness. Moreover, they argue that the firms with high book to market ratios *(BV/Po)* tend to be persistently distressed. Conversely, firms with low book to market ratios are associated with sustained strong profitability. Therefore, the implication of such information to the new issues initial investors is that "more risk is associated with higher BV/Po ratio" therefore high degree of under pricing is expected to compensate for the additional risk. On the other hand, new issues with lower *BV/Po* ratio are less risky; hence lower under pricing is expected. To examine that relationship, the research sample is divided into the low and high *BV/Po* ratio groups based on the observed median value of 0.45. Then the average under pricing of each group is examined for which statistic is given in table 4 & 5.

The above table shows the result of independent *t* test between mean of under pricing of two groups formed on the basis of low and high book value to offer price ratio. Levene's test for equality of variances is non-significant (*p*=.37) resulting acceptance of null hypothesis that the differences between the variances is zero and variances are roughly equal. Two tailed value of *p* is .066 (> .05) and so we would have to conclude that there was no significant difference between means of the two groups. In other words, in the analyzed sample data the high ratio of book value to offer price report equal under pricing as shown by low ratio of book value to offer price. The findings of Fama and French (1995) are not empirically evidenced in Indian context during the period of study.

In all three trials, 8 variables were entered as explanatory variable. In first and second trial same three variables, over subscription, market rate of return and log of issue price were found significant. However, in an attempt to improve model by removing 3 outliers, third trial was conducted with same explanatory variable. Four variables, which are 50% of variables entered, were found to be significant. Using stepwise regression method, it was found that over subscription, market return, log of issue price and post issue promoters share explain significant amount of variation in the value of under pricing. *(F(4, 298) = 56.18, p < .01, R^2 = .43, $R^2_{Adjusted}$ = .422).* Of the four, constant coefficients of the two variables are positive and two are significant at 1% and remaining two at 5%. The results showed persistence of under pricing as an addition the earlier empirical evidences. Following is the discussion about those significant variables as reported in table no. 9 and 10.

4.1. Over Subscription

Rock's (1986) model as explained earlier is expected to work for Indian market as well. And our results are as per the expectations shown in the table 11. The Table shows the statistic about over subscription and under pricing observed in the research data. Under pricing is increasing with increase in the over subscription to the issue. Regression results showed highest *β* value of .985 (p = 0.000) for this variable which is in line with empirical evidence by Shelly and Singh B ((2008), *β .216, p = 0.000)),* Chowdhury B and Sherman A (1996), Sehgal S and Sinha B K (2013) and Jain N and Padmavathi (2012). Anna P. I. Vong, (2006) when initial return was regressed against the subscription rate only, around 55% of its variability is explained (Anna P. I. Vong, (2006))

4.2. Market Return

Supporting Rock's (1985) winner's curse hypothesis, our regression result generates (β =0 .865, p = 0.000) *for* market return thus confirming findings of Chaturvedi A, Pandey A and Ghosh S K (2006) and Dimovski W and Brooks R (2006) Actually it is the extent of over subscription of new issues, which determines the under pricing. But then, what determines oversubscription of new issues.? The answer lies in several factors which work as strong "signals". If the signals are strong, it leads to a "rush" for that particular new issues and, thus, oversubscription. This over subscription, as mentioned earlier, leads to larger under pricing of new issues. The signals that lead to over subscriptions are Market-index during the period of new issues (Chaturvedi A, Pandey A and Ghosh S K (2006).

4.3. Post Issue Promoters Share Holding

In consonance with, (Sahoo and Rajib (2010)), this study found post issue promoters share holding as significant variable for explaining under pricing (*β = -.241, p = .043),* As per SEBI guidelines, 20 per cent of the post issue equity is mandatory to be held by the promoters of the issuing company, which will have lock in period of 3 years. This restriction has direct impact on liquidity (higher the promoter holding, less liquidity and vice versa) of shares available for trading in the market. Therefore, investors applying to the new issues during research period are reluctant to subscribe such issues, resulting in less over subscription. Therefore, it can be concluding that post issue promoters share holding pulling under pricing downwards by establishing inverse relationship with "over subscription" to the issue. However, our findings are contradicting with Chaturvedi A, Pandey A and Ghosh S K (2006) and Sehgal S and Sinha B K (2013) who found this variable as insignificant in Indian market.

4.4. Issue Price

This study revels a negative relationship between issue price and under pricing (*β = -10.48, p = .036).* Findings are in line with the empirical evidences by Madan A. A. (2003) and Nafid S ((2014), *β = -1.3, p = .0461))* Chalk and Peavy (1987), Dimovski W and Brooks R (2006). Negative coefficients imply that that higher is the issue price, lower is the under pricing. Therefore, it could be concluding that firms going to public during the research period are secure entities in terms of their financial soundness. Observed

negative coefficients advocates the intention of the issuers of new shares during researched period is to issue less number of shares by keeping higher offer price. This will have two merits to the issues. Firstly, it will reduce money left on the table. Secondly, post issue servicing cost to each shareholder for statutory compliance will be less. But, due to lesser number of shares offered, liquidity of the shares reduces. There by resulting in low subscription to the issue. Therefore, as explained above in the variable, low subscription pulls down the degree of under pricing. Overall findings of this study conclude that over subscription to the new issues is major contributor to the under pricing of new issues in the Indian Capital Market during the period of study.

5. Conclusion

The present study is conducted to understand, analyses and decompose the factors explaining pricing and short run performance of the new issues in the Indian capital market during period of January 2002-2012. It is observed that the anomaly of under pricing is still continued in the Indian Capital Market during the period of research. However, there is shift in the degree of under pricing and factors explaining it. This shift can be attributed to the change in economic and legislative environment, investor's preferences, overall market performance and domestic as well as international monetary environment in which market operates. Explained variance of the regression model is found to be higher than the few empirical evidences. An attempted to change the dependent variable from raw under pricing to market adjusted under pricing. The results are close to indifference between two types of under pricing. Significant factors explaining under pricing is reduced from four to three due the change in the dependent variable from raw under pricing to market adjusted under pricing. This show under pricing is highly correlated with the market performance. Age of the firm is well researched and found to be significant variable in the earlier studies. However, the present study contradicts with the previous studies. This helps researcher to conclude that investors during the research period are giving more thrust on future potential of the business that the earlier operational history. Finally, the empirical relationship between over subscription and under pricing would act as an important signal for the initial day traders regarding fate of initial performance of the new issues.

Over subscription of Indian New Issues during1992-2006	Sample Size	775	332	271	168	106	70	92	149
	Oversubscription (times)	Less than 2	2 to 4	4 to 8	8 to 12	12 to 16	16 to 20	20 to 30	30 and above

Table 1: Degree of over subscription of New issues

Variables	N Valid	N Missing	Mean	Median	Std. Deviation	Min.	Max.
Under Pricing	318	0	18.68	11.25	39.61	-68.72	240.96
Market Return	318	0	0.23	1.28	8.04	-99.98	23.63
Age of the Firm	318	0	16.29	13.00	13.11	2.00	100.00
Leverage	318	0	1.64	0.89	3.33	0.00	26.37
Post Issue Promoters Shareholding	304	14	61.36	62.47	15.15	25.50	90.23
Over Subscription	317	1	18.89	7.00	25.88	1.00	159.00
Return on Opening	318	0	12.23	7.69	26.97	-100.00	260.00
L_Issue Price	318	0	2.16	2.15	0.38	1.00	3.12
Rate of Dividend	318	0	94.76	0.71	757.08	0.00	8733.33

Table 2: Descriptive Statistics for Under Pricing Model

Test Value = 0					
t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
8.412	317	.000	18.68	14.31	23.05

Table 3: One Sample t Test for Under Pricing

Independent Samples Test for Under Pricing									
Levene's Test for Equality of Variances			t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	0.802	0.371	1.847	300	0.066	8.4613	4.5812	-0.554	17.4766
Equal variances not assumed			1.847	299.291	0.066	8.4613	4.5812	-0.554	17.4767

Table 4: Independent Samples Test for Under Pricing

Group Statistics for Under Pricing				
Indicator	N	Mean	Std. Deviation	Std. Error Mean
Low	151	23.18	40.76	3.32
High	151	14.72	38.83	3.16

Table 5: Group Statistics for Under Pricing

Residuals Statistics[a]					
	Min	Max	Mean	Std. Deviation	N
Residual	-82.84	93.45	0.00	30.06	303
Std. Residual	-2.74	3.09	0.00	0.99	303
Stud. Residual	-2.75	3.14	0.00	1.01	303
Deleted Residual	-83.83	99.99	0.14	31.00	303
Stud. Deleted Residual	-2.78	3.18	0.00	1.01	303
Cook's Distance	0.00	0.97	0.01	0.06	303

Table 6: Residual Statistics

Model Summary										
Trial	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.639[b]	.409	.405	30.7263	.028	14.168	1	300	.000	
2	.650[c]	.422	.416	30.4243	.014	6.985	1	299	.009	
3	.656[d]	.430	.422	30.2657	.008	4.143	1	298	.043	**1.957**

Table 7: Regression Model Summary

Statistics									
	Under Pricing	Market Rate of Return	Age of the Firm	Debt / Equity Ratio	Post Issue Promoters Shareholding	Over Subscription	Return on Opening	L_Issue Price	Rate of Dividend
Variance	**1568.81**	**64.63**	**171.84**	**11.06**	**229.39**	**669.79**	**727.28**	**0.14**	**573172.67**

Table 8: variances statistics

Coefficients for Raw Under Pricing									
	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
Constant	37.967	11.378		3.337	.001	15.575	60.360		
Over Subscription	.985	.069	.649	14.199	.000	.848	1.121	.917	1.091
Market Return	.865	.215	.176	4.024	.000	.442	1.289	.996	1.004
L_IssuePrice	-10.48	4.983	-.099	-2.105	.036	-20.29	-.681	.865	1.156
Post Issue Promoters Shareholding	-.241	.118	-.092	-2.035	.043	-.474	-.008	.942	1.062

Table 9: Results of Regression Analysis for Raw Under Pricing

Regression for Market Adjusted Under Pricing							
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	38.352	11.350		3.379	.001		
Over Sub	.985	.069	.658	14.224	.000	.917	1.091
L_Issue Price	-10.620	4.973	-.102	-2.136	.034	.867	1.154
Promo	-.244	.118	-.094	-2.060	.040	.943	1.061

Table 10: Results of Regression Analysis for Market Adjusted Under Pricing

Over subscription of Indian New Issues during 2002-2012		
Sample size	Oversubscription (times)	Under Pricing
318 (Total)	18.89(Average)	18.79 (Average)
183	1-10	2.92
38	11-20	14.57
27	21-30	31.13
19	31-40	44.32
18	41-50	44.64
21	51-80	63.71
12	80 and above	83.42

Table 11: over subscription of Indian New Issues during 2002-2012
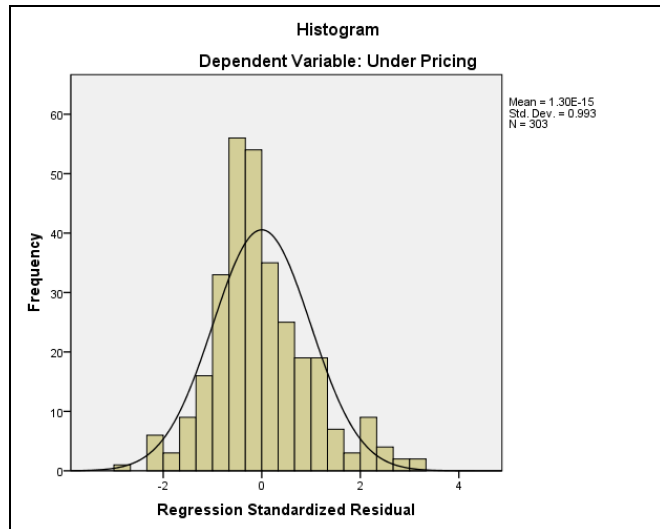

Figure 1: Histogram of Standardized Residuals
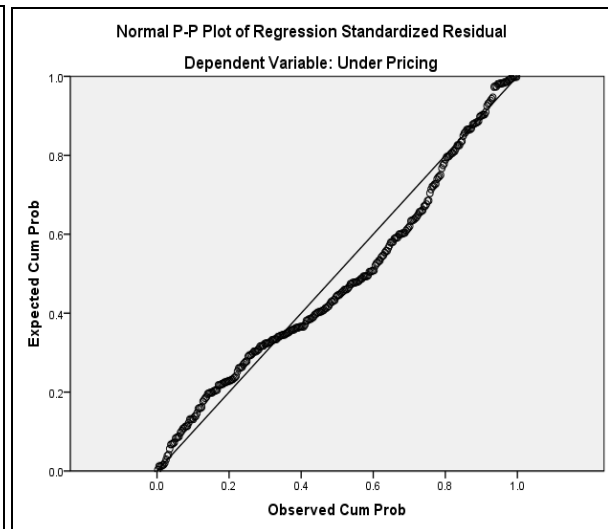

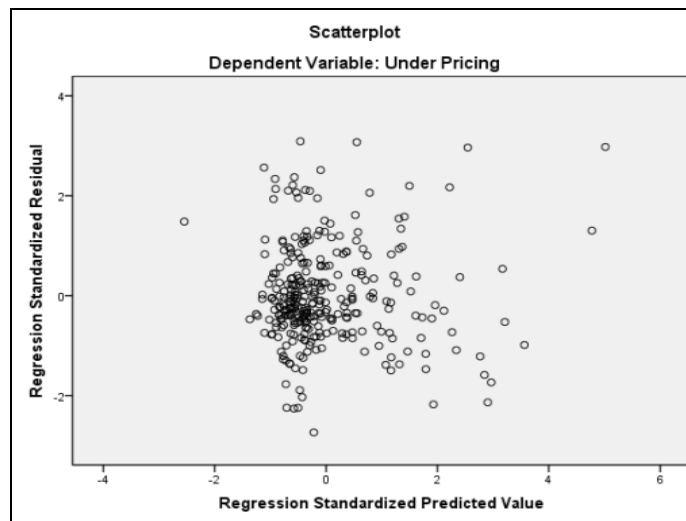*Figure 2: P-P Plot of Standardized Residuals*

Figure 3:Scatered Plot of Standardized Predicted Value

6. References
    i. Booth, J.R et al. (2003), "The Benefits and costs of organizational form: Evidence from closed-end fund IPOs".
    ii. Chan et al. (2008), "IPO underpricing in China: New Evidence from the primary and secondary markets" Emerging Markets Review (9) 1-16.
    iii. Chen et al. (2010), "Leverage, liquidity and IPO long run performance evidence from Taiwan IPO market", International Journal of Accounting and Information management, Vol.18(1) ,31-38.
    iv. Dimovski, W and Brooks, R. (2008), "The underpricing of gold mining Initial public offerings", Research in International Business Finance, 22, 1-16.
    v. Ghosh, S. (2005), "The Post-Offering Performance of IPOs in the Indian Banking Industry", Applied Economics Letters, 12, 89-94.
    vi. Ghosh, Saurabh (2002), "Underpricing of IPOs: The Indian Experience over the last decade", Working Paper, (SSRN).
    vii. Ghosh, Saurabh (2004), "Revisiting IPO underpricing in India", Working paper (SSRN).
    viii. Hao. Q (2007), "Laddering in IPO". Journal of Financial Economics, (85) 102-122. Hill, P (2006), "Ownership structure and IPO Underpricing". Journal of Business Finance and Accounting (33), 102-126.
    ix. Ibbotson, Roger G. (1975), "Price Performance of Common Stock New Issues", Journal of Financial Economics, 2(3), 235-272
    x. Jog. V, (1997). "The Climate for Canadian Initial Public Offerings", Institute P. Halpern, eds, Financing Growth in Canada, University of Calgary press, pp. 357-401.
    xi. Krishnamurti, C (2002), "The Initial listing performance of Indian IPOs." Managerial Finance, 28, 39-51.
    xii. Krishnamurti, C. and Narasimhan, M.S. (2001), "The Initial and After-Market Performance of Indian IT IPOs", Working Paper, Indian Institute of Management, Bangalore.
    xiii. Lee, P., Taylor. S. and Walter, T. (1996), "Australian IPO Underpricing in the Short and Long Run", Journal of Banking and Finance, 20, 1189-1210.
    xiv. Ljungqvist.A. P, Nanda. Y and Singh (2001), "Hot Markets, Investor Sentiment and IPO pricing." Working Paper (SSRN).
    xv. Loughran, T and Ritter, J. (1995), "The New Issues Puzzle", The Journal of Finance, 50 (1), 23–51.
    xvi. Loughran, T. and Ritter, J.R. (2004), "Why Has IPO Underpricing Changed Over Time?" Financial Management, 33(3): 5-37.
    xvii. Madan, A.A. (2003), "Investments in IPOs in the Indian Capital Market", Bimaquest, III (1), 24-34.
    xviii. Madhusoodan, T.P. and Thiripalraju, M. (1997), "Underpricing in Initial Public Offerings: The Indian Experience", Vikalpa 22(4), 17-30.
    xix. Pandey, A. (2004), "Initial Returns, Long Run Performance and Characteristics of Issuers: Differences in Indian IPOs Following Fixed Price and Book Building Processes", Working Paper, Indian Institute of Management, Ahmedabad.
    xx. Peavy III, John W., (1990), "Returns On Initial Public Offerings of Closed-End Funds", Review of Financial Studies, 3(4), 695-709