

## Underpricing, Ownership and Liquidity of Initial Public Offers (IPO) and Their Impact on Performance of IPO Stocks in Equity Markets of India

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Received 23 May 2013, Accepted 4 February 2014

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### ABSTRACT:

Paper studies the impact of the liquidity, underpricing and ownership up on both the short term and long term performance of the Initial Public Offer (IPO) stocks in the equity markets of India. Empirical analysis is undertaken to study the impact of liquidity, underpricing and ownership on Performance of IPO stocks. Multiple regression analysis is undertaken for analyzing the impact. It is found that the short term and long term performance of underpriced IPO stocks is highly dependent on the amount of underpricing at IPO time, Whereas the overpriced IPO stocks depends on the long term liquidity characteristics for the long term performance. However the market adjusted returns are influenced by the liquidity in the long term and non-significantly by the underpricing. Holistic model built in the study explains 80 percent variance of first week returns, 30 percent variance of first year returns and 20 percent variance in the 3 years returns. Inclusion of Ownership structure and liquidity variables in the model provides better explain ability of the IPO stocks performance in the long term.

**Keywords:** *IPOs, Liquidity, Ownership structure, Performance, Underpricing*

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### INTRODUCTION

Organizations go for the external financial markets to raise capital needed to meet their financial needs. The need could be for expansion, to maintain growth rate, to attain optimum capital structure and so on. Capital-raising activity causes an impact on the capital structure

Characteristics of IPOs have been studied for many decades by various researchers (Varshney and Robinson, 2004). Underpricing phenomena, ownership structure and liquidity are found to be important characteristics of IPO process. These characteristics of IPOs influence the significance

of impact on their performance in short as well as in long term.

Primary markets in India prior to 1993, was regulated by a Government run body. Fixed Pricing process was the only mechanism available to issuers in order to float IPO issues. Securities and Exchange Board of India (SEBI) was formed in, On the basis of recommendations of the Malegam committee, the Book Building process was introduced in 1995 in Indian financial markets. The full-fledged implementation of Book the Building process was in place by 1999. SEBI has recently mandated IPO grading of

issues before the IPO is offered in the market. National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) are two major active stock exchanges running at national level.

Equity-raising by firms through Initial public offers was in focus of researchers for past three decades. Past literature contributed to the genesis of IPO, necessities of an IPO and identified the various characteristics of an IPO process. Underpricing, liquidity, ownership structure and performance are majorly identified characteristics of an IPO. Underpricing in an IPO process and performance of IPO stocks in the secondary markets, and the interrelation among each other were areas of interest for many researchers for the past couple of decades. Pritsker (2006) emphasizes the importance of studies for underpricing and its impact on the long term performance of IPO stocks in secondary markets. Sahoo and Rajib (2010) also emphasizes the necessity of further studies on underpricing, post-performance of IPO stocks in the Indian context.

Ownership structure and liquidity are in the naïve stages of research. Past researches argue the influence of underpricing on the ownership structure and at the same time, the influence of ownership structure on liquidity. However the study finds a dearth in literature regarding the influence of ownership structure and liquidity on the post-performance of IPO stocks in secondary markets. Holistic studies of dependence post market performance of IPO stocks on underpricing, ownership structure and liquidity are found to be absent in the literature. Varshney and Robinson (2004) emphasizes the necessity of studies in the area of ownership allocation and underpricing, and long run underperformance of IPO stocks.

There is nonexistence of studies on IPO characteristics in the Indian context, in specific, with liquidity and ownership structure. Abolition of Controller of Capital Issues (CCI), full-fledged implementation of book building process in the post internet bubble era demands the longitudinal studies of IPO markets in Indian markets.

#### **Literature Review**

Firms undertake external financing in order to meet growth rate and demands arising due to expansion of operational activities or increment

in investment activities. Both, the expansion of investment and operational activities need huge investments in physical infrastructure. Similarly smaller organizations undertake external funding as equity capital in order to facilitate growth (Dawson, 1987). Various alternatives availed in external financing channels are equity, debt and hybrid of both like convertibles, rights etc. Primary market undertakes either debts or equity or both, in order to raise additional capital required by the organization (Ishwara, 2009). The major channels availed in equity are rights issue, bonus issue, public issue and private placement.

Myers (1984) highlights pecking order in capital-raising by firms. Pecking order presents the priority levels as undertaken by shareholders in raising additional capital. Common equity forms the last alternative for capital-raising activity to meet capital requirement. A firm also follows a pecking order in availing the new financing options (Myers, Majluf and National Bureau of Economic, 1984). Corporate characteristics like firm size, risk, growth rate, and the corporate governance characteristics (number of independent directors etc) have also been found to be major drivers for determination of capital structure in an organization, as studied in the developed economies (Al-Najjar and Hussainey, 2011).

The cost of capital raising by IPOs is costlier than Seasoned Equity Offering (SEOs), debts, whereas debts have lowest cost in raising capital through external financing (Lee et al., 1996). The cost of going public includes both, the direct costs and indirect costs (Ritter, 1987). Direct costs consist of the investment banker fees, advertisement and other costs involved in the floatation processes of IPO, whereas underpricing forms the major part of indirect costs.

#### **Underpricing**

Underpricing is defined as the positive returns provided on initial day of listing relative to the offered price of IPO share (Ghosh, 2005). It is calculated as the difference between a post-offering market price (in the newly listed shares) and initial offering price, divided overall by initial offering price of shares (Keasey and McGuinness, 1995).

The underpricing phenomena is also active in the Indian financial markets (Krishnamurti and Kumar, 2002; Deb and Marisetty, 2010). It has been familiar in past couple of decades, across global markets and peaked at the time of internet bubble. This phenomenon is generally credited to the result of the Information acquisition and Winners curse model. However during the time of internet bubble, it was observed that the CEOs' indirect benefit, analyst coverage and Venture capital influence were also among the major contributors to the underpricing (Loughran and Ritter, 2004). Studies also identified the impact of the failure of IPO floatation risk on underpricing i.e. higher risk in floatation of IPO leads to higher underpricing (Krishnamurti and Kumar, 2002).

Information asymmetry was in focus of study for past few decades for the explanation of the underpricing phenomena in the IPOs also known as 'Winners curse'. Winners curse is explained as the scenario where the uninformed investor would be landed with higher subscription of overpriced IPO stocks and lower subscription level in the better IPO issue. This is because of application of higher subscription by informed investors in the better IPOs (Rock, 1986). Ellul and Pagano (2006) also detail winners curse i.e. the information asymmetry at different phases of the IPO process, resulting against the favor of uninformed shareholders in allocation of shares.

The amount of underpricing differs from one category of stakeholders to another, due to the difference in initial investments. Dawson (1987), Barry (1989), Keasey and McGuinness (1995) find that underpricing from the perspective of existing shareholders is greater than the underpricing obtained by new shareholders. Hence loss is borne by the existing shareholders. Ibbotson (1980) finds the presence of abnormal returns in the initial post IPO performance. However in long term the performance of new issued shares have no significant deviation from the market performance. Baron (1982) highlights the increment of underpricing due to the presence of investment bankers, since investment bankers in the process of prevention of under subscription of IPO issue, indulge in providing higher underpricing. Beatty and Ritter (1986) find that lower underpricing results in loss of clients (regular investors) for investment

bankers. However, higher underpricing of IPO issue leads to loss of credentials of investment bank in IPO market. Beatty and Ritter (1986) article shows the significant results in the study stating the loss of future business for investment banks with history of higher underpricing of issues. Studies have also found that the underpricing is carried out even in the absence of external underwriters (Allen and Faulhaber, 1989).

Book building process helps investment bankers to have long term relation with institutional investors, as institutional investors are benefited with the allocation of underpriced IPO stocks. These institutional investors in turn, oversubscribe the IPOs floated by investment bank (Sherman, 2000). The promoter of issue and employees also opt to underprice by higher amount in present firm IPO in order to get into the list of regular customers of the investment banker. These investors get benefited with allocation of Underpriced stocks by the investment banker in future IPO issues to their personal brokerage accounts (Loughran and Ritter, 2004).

In India, Book building process has been familiar since 1994. Ellul and Pagano (2006) specify about the importance of mechanism for the release of information in IPO process. That is, the amount of private information released in book building process is higher (Busaba and Chang, 2010). Whereas in the auction process the information released is lower to all parties and hence lower is the asymmetry in the information.

Underpricing phenomena mainly depends on the risk and incentives of different stakeholders and issuer objectives (Loughran and Ritter, 2004). Underpricing is also observed in the presence of lock up period (Aggarwal et al., 2002). This behavior is explained by two possible reasons, either due to manager risk averseness or will to increase their wealth abundantly at the time of lockup period expiration.

Analyst's coverage forms a critical factor in underpricing of IPO process. Since the issuers never directly pay for the coverage, they would indulge in indirect payment by underpricing of IPO (Loughran and Ritter, 2004). Analyst's coverage is increased by provision of underpricing (Cliff and Denis, 2006). Aggarwal

et al. (2002), also detail the manager's intention is to increase analysts' following, resulting in increment in investors due to positive recommendation by analysts. This increased analyst's coverage of abnormal returns generated by IPO shares in post IPO market leads to higher wealth generation at the expiration of lockup period. Increased analyst's coverage of IPOs under the influence of lead underwriter had greater performance due to periodic boost by the same analysts (James and Karceski, 2006).

Deb and Marisetty (2010) find that the implementation of the IPO grading by the regulators has resulted in market welfare in terms of information symmetry resulting in lower underpricing. Recent IPOs in Indian markets have appeared to face the threat of litigation risk. That is the overpricing or under performance in the post market of IPO stock has resulted in a number of legal cases registered against the issuers by investors Drake and Vetsuypens (1993) in the American markets. This risk has made both, the issuers and the investment bankers take precautionary measures. The issuer does a tradeoff by providing the underpricing of IPO issue, in case of a threat of potential litigation by investors (Hughes and Thakor, 1992).

The objective of issuers and investment bankers on the ownership structure in the post market impacts the underpricing phenomena. Investment bank overprices the issue in order to decrement the number of owners or to have the ownership concentrated with few investors. However in order to have scattered ownership IPO offer needs higher participation by various segments of investors. Underpricing forms the solution for increased participation i.e. higher underpricing results in the increment in the demand of investor participation in IPO process (Sherman and Titman, 2002). Hung-Bin and Kuntara (2009) detail the high stake ownership structure of family ownership even in the post IPO scenario and long lock-up period would provide positive signal to the market. Whereas dissolving of the ownership would send a negative signal to the market.

#### **Ownership Structure**

Ownership structure has been one of the important characteristics in both pre and post market listing of IPOs stocks.

Ritter and Welch (2002) state that the allocation process has significant impact on Post IPO ownership structure, Underwriter compensation and Underpricing. Aggarwal et al. (2002), study the relation between insider holding and their strategies used in IPO, being specifically focused on underpricing and its impact. It concludes that the lockup period ensures the presence of insider's ownership remains intact. However the liquidation process happens immediately after the lock up period.

Ritter and Welch (2002) highlight that market conditions are primary factor, whereas stage in life cycle of company and age of the firm form secondary factors for underpricing. Block holders have the advantage of better monitoring skills with lower agent costs, though it results in lower liquidity. Heflin and Shaw (2000) detail the tradeoffs between the agency costs and liquidity of stocks with the variation of the block holder's percentage in ownership of the firm. The paper finds that the results do apply to both, the managerial and non-managerial block holders. Li et al. (2005) find that the higher retention of ownership by the pre owners would result in higher liquidity in the after markets, due to higher demand in secondary markets.

Booth and Chua (1996) also highlight the importance of secondary market liquidity. The increment in the liquidity is generated by widespread ownership. That is, the increment in number of shareholders would result in the liquidity of the stocks. However to have diversified investors segment, one needs to provide additional concession to the potential shareholders in order to overcome the asymmetry information. This result is achieved by underpricing of the IPO.

#### **Liquidity**

Liquidity forms a subject of interest in the present study for the performance of IPOs. Underpricing impacts the allocation process and finally has an impact on ownership. Ownership has direct impact on liquidity of IPO stocks in post market performance.

Hahn and Ligon (2006) find a positive relation between liquidity and underpricing of IPOs. That is, higher underpricing leads to decrement in the liquidity risk and increases the liquidity of the shares in secondary market.

Secondly, analysts following also increase the post IPO market liquidity of shares. There is a strong correlation between underpricing and higher trading volumes. At the same time, mispricing is found to be adjusted at a very fast pace in the Indian markets as such, that is in congruence with the Efficient Market Hypothesis, due to higher liquidity (Deb, 2009).

Ellul and Pagano (2006) find that expected aftermarket liquidity and liquidity risk are important determinants of IPO underpricing. Johnson (2008) has specified that there is no relation between the liquidity and volumes of financial assets. However, there is a strong relation of volume with variance of liquidity of financial stocks. Sarr, Lybek, International Monetary Fund and Exchange Affairs (2002) have worked on the measurement of liquidity of the market indices across the globe. Liquidity measures are categorized into four major categories: on the basis of transaction costs, volume based, price based and market impact measurements. The paper has focused on the significance of the liquidity of markets over the liquidity of individual financial assets. Market efficiency coefficient (MEC) is used to understand liquidity in terms of resilience of market, calculated as the ratio of long term variance of returns to product of 'n' and short term variance of returns, where 'n' value is the number of short terms in a long term. Ellul and Pagano (2006) also highlight the literature relating to the measures of liquidity variables that are related to asymmetric information in trading process: the probability of informed trading (PIN) and the adverse selection component of the spread.

### **Performance**

Krigman et al. (1999), find that first day performance provides short term period return i.e. stock that performed better in the first few days would provide higher returns in first three months and the stocks which failed in the first three days would provide negative returns. However the stocks which provided extra ordinary returns on the first day would be a disaster in the long term. It is also found that the transaction costs etc lead to no profit on first intraday transaction of IPO stocks. Hence, the investors allocated in the IPO allocation gained out, whereas investors who attempted to gain out

on first day trade ended up with holding of lower return shares ( Barry and Jennings, 1993). Krigman et al. (1999) say that the flipping activity generally brings down the fair value of the firm. Krishnamurti and Kumar (2002) find that in Indian financial markets, longer delay between the approval date and the actual date of public issue lead to abnormal returns on the initial returns.

Ang and Boyer (2009) find long term performance of issues belonging to new sector is better in relation to IPOs belonging to established industries. Aggarwal and Rivoli (1990) state that IPO performance is abnormal in the short term and has lower significance in the longer term as due to the fad phenomena in the initial stages of IPO performance, resulting in success only in short term.

Abnormal returns are observed in short term, in the performance of IPO shares that are floated in the hot markets. This is due to higher demand in hot markets. Higher demand would lead to initial positive returns, but in long term, the IPO stocks are found to be overpriced, as they are way above the intrinsic value and hence bring negative returns in the long term (Derrien, 2005). Ritter and Welch (2002) also find that the Fama French multifactor analysis provides odd results as they indicate internet bubble burst era as the best IPO period, whereas actually, the IPO performance was declined at high pace in that same era.

Ljungqvist (1997) finds that long term performance in the three years of the IPO shares, has negative returns. Sahoo and Rajib (2010) have found that various variables like initial day return, offer size, leverage at IPO date, ex-ante uncertainty, and timing of issue had an impact on the underperformance of the IPO shares in the long term, in primary markets of India. At the same time, subscription rate, price to book value and promoter's retention had no significant impact on the performance of the IPOs. Pande and Vaidyanathan (2007) find that greater the delay in the listing, results in greater demand and hence higher returns are generated on the initial day trading. Further it also finds that the IPO stocks had a negative performance after first month of listing. Sehgal and Singh (2007) conclude that short term performance of the IPO stocks have positive returns as measured in a year. However it is found to be negative in



the second and third year for both the BHAR and CAR. Finally long term performance is positive if the returns are considered for a time period of four or five years. Moshirian et al. (2010) conclude that the BHAR of IPOs had positive impact on the long term performance whereas the returns calculated on the basis of monthly returns had no significance in the long term performance of IPOs.

Performance of the IPO stocks in post market also depends on the liquidity risk in the aftermarket. Underpricing of IPO stocks also includes aftermarket liquidity risk of the stocks, as the illiquid security buyers need to be compensated for higher risk undertaking. Ellul and Pagano (2006) find that higher underpricing leads to higher liquidity in the post IPO process, leading to decrement in the liquidity risk. Li et al. (2005), highlight that larger firm size leads to increment in the liquidity of IPO stocks in the post market period. The paper also finds that the trade volume, share price and turnover etc. also have an impact on aftermarket liquidity of IPO stocks. Higher liquidity results in incorporation of information in share prices and hence helps in the price discovery process by the issuers and investment bankers. Better are the price discovery results in the lower volatility in the aftermarket performance (Sherman and Titman, 2002)

### Control Variables

Krishnamurti and Kumar (2002) study the performance of IPOs in the Indian financial markets. Study finds that underpricing has an impact on the subscription rates. Whereas Sahoo and Rajib (2010) find the non-significant impact of subscription rate on long term performance. Arun and Ajay (2001) find subscription rate to be a major factor influencing the underpricing in the Indian markets. Marisetty and Subrahmanyam (2010) find that Indian investors over-react in the IPO issue process and hence this results in higher subscription rate leading to higher returns in short term.

Size of the organization and market to book value ratio are two significant factors which impact returns generated by IPO shares (Loughran and Ritter, 1995). Li et al. (2005), explain that firm size, trade volume, and share price have a significant impact on the aftermarket liquidity of the IPO shares. Sahoo and Rajib (2010) find that age, price to book value and promoters retention have no significant impact on the performance of the IPOs. Underpricing is higher in smaller organizations and in smaller offer size (Ajay, 2005). It also concludes that the offer price above face value has lower underpricing as in the post market listing. Underpricing, firm size and operating performance are also found to be important factors that influence the IPO shares' post market performance (Chi et al., 2010). Figure 1 provides the holistic model, derived on the basis of the literature.

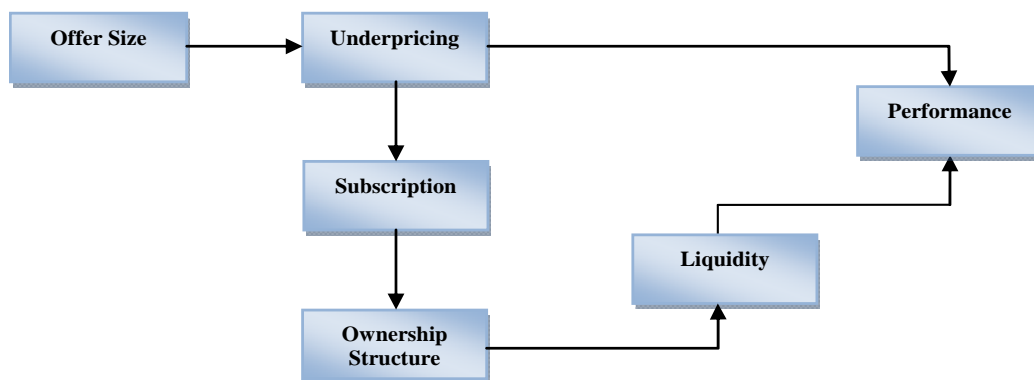


Figure 1: Theory driven conceptual model

**Research Question:** To analyze the comprehensive impact of underpricing, ownership and liquidity upon the secondary market performance of IPO stocks

The characteristics (underpricing, ownership and liquidity) individually impact the performance of the IPO stocks in the secondary markets. However the present research also focuses on the comprehensive impact of underpricing, ownership and liquidity on the performance of IPO stocks.

### **RESEARCH METHOD**

For the purpose of this study, data of IPOs offered in NSE stock exchange from 2000 to 2010 was attained from NSE, Capitaline data bases. Daily stock prices and stock volume of each firm for a minimum of one year from IPO listing were collected from the NSE data base. The Nifty index data was also collected from the NSE database. The data for the firms which had completed at least one year trading in the post IPO market are considered. 373 firms raised capital by IPO process from January 2000 to December 2010. Information of 246 firms is captured in this study i.e. 66 percent of the total issues. IPOs with offer size greater than 75 crore and below 1000 crore were undertaken for the analysis. SPSS software was used to perform the Ordinary Least Square Regression test and Multiple regression analysis to test the hypothesis.

The whole model was analyzed in order to test the implication of underpricing, ownership structure and liquidity on the performance of the IPO stocks. This was conducted in two major stages i.e. for short term performance and long term performance.

In the initial stage, it was conducted in two phases i.e. short term performance was measured by first week returns and first year returns of the IPO stocks in the secondary markets. In the first phase, Multiple regression analysis was done with first week returns as the dependent variable and underpricing, liquidity and ownership variables as independent variables. The test was conducted twice for both the normal and market adjusted returns. In the second phase, Multiple regression analysis was done with first year returns as the dependent variable and underpricing, liquidity and ownership variables as independent variables. The test was conducted

twice for both, the normal and market adjusted returns.

In the second stage, tests were conducted in three phases i.e. long term performance was measured by three year returns (calculated as cumulative returns), three year returns (calculated from point to point) and six month returns in third year of the IPO stocks in the secondary markets. In the initial phase, multiple regression analysis was done with three year returns as the dependent variable and underpricing, liquidity and ownership variables as independent variables. The test was conducted twice for both, the normal and market adjusted returns. In the second phase, Multiple regression analysis was done with three year returns (calculated from point to point) as the dependent variable and underpricing, liquidity and ownership variables as independent variables. The test was conducted twice for both, the normal and market adjusted returns. In the final phase of second stage, Multiple regression analysis was done with six month returns in third year (calculated from point to point) as the dependent variable and underpricing, liquidity and ownership variables as independent variables. The test was conducted twice for both the normal and market adjusted returns.

The results obtained in all regression analysis have a better explanation in linearity model. Finally the standardized residual of the regression analysis has compliance with the normality curve.

### **RESULTS AND DISCUSSION**

Indian Markets have floated an INR1.5 lakh crore equity in primary markets, between January 2000 to December 2010 by 521 issuers. The fixed priced process had a strong presence till 2003 and lost its significance thereafter. There were 59 issuers that got listed through fixed pricing IPO channel in NSE and another 315 issuers floated through the book building process. NSE has been majorly loaded with the book building channel for floatation, in comparison to other stock exchanges of India. The equity issue amount raised from the primary capital markets has continuously increased in the past one decade. There was a decrement between 2007 and 2009, due to recession in the global economies. However in the same time, an increment in the average issue amount resulted

in a decent amount of equity raised in capital markets. On the basis of the centered moving average of the number of IPO offers floated in every month, the timeline of 132 months are categorized in to Hot, Cold and Neutral scenarios in this study. There are 21 cold months in terms of IPO volumes and 58 hot and 53 neutral months.

ANOVA analysis was taken to study the difference of the returns obtained by the underpriced and overpriced stocks. IPOs were categorized into four major categories depending on the amount of underpricing involved in the IPO process. The categories are

- ✓ Overpriced – underpricing is lower than zero percent
- ✓ Normal underpricing – underpricing between 0 and 25 percent
- ✓ Abnormal underpricing – underpricing between 25 and 100 percent
- ✓ Very high underpricing – underpricing above 100 percent

The results obtained in ANOVA analysis are significant for first week returns (WKRT), First month returns (MNRT), first year return (YRRT), first three year return (LNRT) and PPLT. It is found that the overpriced IPO stocks have negative performance across all the time periods, the negative returns increase in magnitude with increasing time period. The normal underpriced IPOs have strong performance in both, short term and long term, for a year. However they are found to have negative returns in a very long period. That is,

the normal underpriced IPO stocks have negative returns for three year period. The abnormal underpricing IPO stocks have positive performance till one year and have negative returns in three years. First month performance is greater than one year performance. Very highly underpriced IPO stocks have positive performance across all the tenure periods of the IPO stocks in market. However these very highly underpriced IPO stocks have declining performance after one year of trading.

In the pre analysis, ANOVA test is conducted for impact of market scenario on returns of IPO stocks. The short term returns had no significant difference in mean returns and long term performance of IPO stocks had significant difference in the mean returns. It is found that the IPO stocks offered in neutral market scenario had higher returns for one year in comparison to the hot and cold period IPOs, whereas IPOs in the hot period had the lowest percent returns as compared to rest of the market scenario IPOs (Yung et al., 2008). The three year returns were also found to have the same pattern as the one year returns. The results are in sync with the world markets phenomena ( Helwege and Liang, 2004; Coakley et al., 2008).

Regression analysis was done with subscription rate (SUBS) as dependent variable and analyst rating (ALST) as the independent variable. Logarithm of the book value of the assets (BKVL) was considered to be the controlling variable. The analysis was conducted on the data of 51 IPOs floated in 2008 – 2010. Table 1 provides the details of the results of the regression analysis.

**Table 1: Regression analysis of subscription rate and analyst rating**

Dependent Variable	SUBS
BKVL	-0.102
ALST	0.369*
R Square	12.2
F value	3.335*

\*Significant at 95 percent, \*\*significant at 99 percent

BKVL BV of assets (Cr)  
 ALST Analyst rating  
 SUBS Subscription rate



It was found that the better the analyst-rating, the higher is the subscription rating. This is in sync with global markets trend. Deb and Marisetty (2010) found that there is a significant relation between analysts rating and underpricing i.e. the study finds that the better the grade, the lower is the underpricing. However the present study has found no significant relation between the analyst rating and underpricing in Indian markets. This is because analyst coverage prior to IPO offer as such, in the Indian context is in nascent stage. Major analysts are restricted to industry specific domain/areas and hence results in lower number of reports for each IPO offer are of less importance.

A multiple regression analysis was performed with underpricing, liquidity and ownership impact on the performance of the IPO stock in the post market performance. The controlling variables were leverage (LEVR), Market Book value (MBRT) and Market scenario (MKTS). This step was carried out in two stages: In stage one, multiple regression analysis was conducted to find the impact of liquidity, underpricing, and allocated ownership variables, on short term performance. In the second stage, multiple regression analysis was conducted to find out the impact of liquidity, underpricing, and ownership structure on long term performance.

In the initial stage, multiple regression analysis was done to analyze the relation between the IPO stock short term performance and underpricing, liquidity and ownership structure. This was carried in four phases. In the first phase, multiple regression analysis was done with WKRT as the dependent variable and log of offer size (OFRL), Subscription rate (SUBS), first week turnover rate (WKTR), underpricing (UNDP), dummy variable for retail investors (RETD), dummy variable for non-institutional investors (NIID), dummy variable for qualified institutional investors (QIBD), dummy variable for anchor investors (ANCD) and dummy variable for employees (EMPD) as the independent variables. It was found that 83.5 percent of variance of WKRT was explained by the independent variables with results significant at 99 percent confidence level. Underpricing, first week turnover rate and non-institutional

investors had a significant positive coefficient. Underpricing, ownership and liquidity had a significant role in first week performance. In the second phase, multiple regression analysis was done with market adjusted first week returns (MAWK) as the dependent variable and OFRL, SUBS, WKTR, Market adjusted underpricing (MAUP), RETD, NIID, QIBD, ANCD and EMPD as independent variables. It was found that 83.7 percent of variance of MAWK was explained by the independent variables with results significant at 99 percent confidence level. Underpricing, first week turnover rate and non-institutional investors had a positive coefficient of significance. Underpricing, ownership and liquidity had a significant role in the first week performance.

In the third phase, multiple regression analysis was done with YRRT as the dependent variable and Market efficiency coefficient for first year (MEC1), UNDP, RETD, NIID, QIBD, ANCD and EMPD as independent variables. It was found that 31 percent of variance of YRRT was explained by the independent variables with results significant at 95 percent confidence level. Only market efficiency coefficient had a positive coefficient of significance. That is, only liquidity played a vital role as the period of performance was increased. In the final phase, multiple regression analysis was done with Market adjusted first year returns (MAYR) as the dependent variable and MEC1, MAUP, RETD, NIID, QIBD, ANCD and EMPD as independent variables. It was found that 35.3 percent of variance of MAYR was explained by the independent variables with results significant at 99 percent confidence level.

Hence all the identified characteristics played a vital role in the short term performance and narrowed down to liquidity, as the measured period of performance was increased. Summarized results of all the phases in this stage are presented in table 2.

In the second stage, the model was tested for the relation and impact of underpricing, liquidity, and ownership structure on long term performance of the IPO stocks. Multiple regression analysis was done to analyze the relation between the IPO stock long term performance and underpricing, liquidity and ownership structure. This was carried in six phases.

**Table 2: Summary of regression analysis of short term performance (dependent variable) and short term liquidity, underpricing, ownership structure (independent variables)**

Dependent Variable	WKRT	MAWK	YRRT	MAYR
DILU	-0.029	-0.023		
LEVR	0.025	0.016	0.143	0.12
MKTS	-0.029	-0.038	0.338**	0.322**
BKVL	-0.008	-0.005	0.162	0.379**
MBRT			0.233	0.335*
OFRL	-0.007	0.003		
SUBS	0.128*	0.126*		
WKTR	0.117*	0.102*		
UNDP	0.821**		0.133	
MAUP		0.825**		0.171
RETD	-0.032	-0.033	0.033	0.123
NIID	0.103*	0.122*	0.076	0.072
QIBD	-0.03	-0.01	0.002	-0.004
ANCD	-0.01	-0.016	-0.048	-0.052
EMPD	0.044	0.029	-0.024	-0.129
MEC1			0.31**	0.154
R Square	0.835	0.837	0.313	0.355
F value	37.253**	38.027**	2.526*	3.046**

\*Significant at 95 percent, \*\*significant at 99 percent

WKRT = a1\*UNDP + a2\*OFRL + a3\*SUBS + a4\*RETD + a5\*NIID + a6\*QIBD + a7\*ANCD + a8\*EMPD + a9\*WKTR + c1  
 MAWK = a10\*MAUP + a11\*OFRL + a12\*SUBS + a13\*RETD + a14\*NIID + a15\*QIBD + a16\*ANCD + a17\*EMPD + a18\*WKTR + c2

YRRT = a19\*UNDP + a20\*RETD + a21\*NIID + a22\*QIBD + a23\*ANCD + a24\*EMPD + a25\*MEC1 + c3

MAYR = a26\*MAUP + a27\*RETD + a28\*NIID + a29\*QIBD + a30\*ANCD + a31\*EMPD + a32\*MEC1 + c4

BKVL, MBRT, MKTS and LEVR are taken as control variables

a1, a2, a3, a4, a5, a6, a7, a8, a9, a10, a11, a12, a13, a14, a15, a16, a17, a18, a19, a20, a21, a22, a23, a24, a25, a26, a27, a28, a29, a30, a31, a32: Coefficients of independent variables

c1, c2, c3, c4: Constant

WKTR 1st week average turnover rate

MEC1 Market Efficiency Coefficient for 1 year

OFRL log of offer size (cr)

LEVR Debt to Equity

BKVL BV of assets (Cr)

SUBS Subscription rate

MBRT Market to Book ratio of equity

UNDP 1st day return

WKRT 7 day return

DILU % of dilution

YRRT 1 year return

MAUP 1 day market adjusted returns

MAWK 1 week market adjusted returns

MAYR 1 year market adjusted returns

RETD Dummy variable of Retail investors

NIID Dummy variable of Non institutional investors

QIBD Dummy variable of qualified institutional investors

ANCD Dummy variable of anchor investors

EMPD Dummy variable of employee investors

In the first phase, multiple regression analysis was done with LTRT as the dependent variable and Market adjusted efficiency coefficient for three years (MEC3), UNDP, dummy variable for institutional promoters (IPMD), dummy variable for non-promoter institutional investors (NPID), and dummy variable for non-promoter retail investors (NPRD) as independent variables. It was found that 20.5 percent of variance of LTRT was explained by the independent variables with results significant at 95 percent confidence level. Three year market efficiency coefficient and underpricing had a positive coefficient of significance. Liquidity and underpricing had an impact on the long term performance of IPO stocks.

In the second phase, multiple regression analysis was done with market adjusted three returns (MALT) as the dependent variable and MEC3, MAUP, IPMD, NPID, and NPRD as independent variables. It was found that 18.6 percent of variance of MALT was explained by the independent variables with results significant at 95 percent confidence level. Market adjusted Underpricing had a positive coefficient of significance. Only liquidity had a stronger impact on the long term performance of IPO stocks.

In the third phase, multiple regression analysis was done with three returns calculated on BHAR (PPLT) as the dependent variable and MEC3, UNDP, IPMD, NPID, and NPRD as independent variables. It was found that 26 percent of variance of PPLT was explained by the independent variables with results significant at 99 percent confidence level. Three year market efficiency coefficient and underpricing had a positive coefficient of significance. Liquidity and underpricing had an impact on the long term performance of IPO stocks.

In the fourth phase, multiple regression analysis was done with market adjusted three returns calculated on the basis of BHAR (MAPP) as the dependent variable and MEC3, MAUP, IPMD, NPID, and NPRD as independent variables. It was found that 19.6 percent of variance of MAPP was explained by the independent variables with results significant at 95 percent confidence level. Non promoter retail investors had a significant negative coefficient. That is, the performance increased

with increasing promoter holding in the long period.

In the fifth phase, multiple regression analysis was done with six month return of third year (LPLT) as the dependent variable and market efficiency coefficient of six months in third year (LMEC), UNDP, IPMD, NPID, and NPRD as independent variables. It was found that 29.9 percent of variance of LPLT was explained by the independent variables with results significant at 99 percent confidence level. Institutional promoter investors had negative coefficient of significance. The summarized results of the entire test in this step are presented in table 3. In the sixth phase, multiple regression analysis was done with market adjusted returns of six months in third year (MALP) as the dependent variable and LMEC, MAUP, IPMD, NPID, and NPRD as independent variables. The results were found to be non significant and hence no relation could be established (table 3).

Liquidity acts as a major factor for long term performance of the IPO stocks. The common results of normal returns and market adjusted returns provide the importance of only liquidity. At the same time, the non promoters play a negative role in the long term performance. However, on consideration of only six months performance in third year was found that promoters had a negative coefficient.

In summary, study finds that underpricing, liquidity and ownership structure have a direct influence on the performance of the IPO stocks in the secondary markets. 80 percent of the first week variance in the returns is explained by these characteristics. Whereas 28 percent of variance in the first year returns, i.e. the three characteristics have a strong explanation in the short term performance of the IPO stocks. Secondly, in the long term, i.e. for three year performance it is above 20 percent. Hence the impact of underpricing, liquidity and ownership structure on long term performance is also explained by the empirical results obtained for this model.

Underpricing has been a subject of long time interest for researchers. However the inclusion of the ownership structure and liquidity has provided a holistic approach in the analysis of the returns generated by the IPO stocks.

**Table 3: Summary of regression analysis of long term performance (dependent variable) and long term liquidity, underpricing, ownership structure (independent variables)**

Dependent Variable	LTRT	MALT	PPLT	MAPP	LPLT	MALP
BKVL	-0.097	-0.126	-0.006	0.141	0	0.056
LEVR	-0.09	-0.039	-0.091	0.018	-0.323**	-0.109
MBRT	-0.226	-0.196	-0.094	-0.014	-0.3*	0.012
UNDP	0.261*		0.268*		-0.009	
MAUP		0.34**		0.219		0.108
IPMD	0.084	0.15	0.023	-0.049	-0.291*	-0.057
NPID	-0.033	0.095	0.085	0.096	-0.056	-0.029
NPRD	-0.153	-0.037	-0.061	-0.25*	0.09	-0.131
MEC3	0.251*	-0.169	0.336**	-0.114		
LMEC					-0.209	0.261
R Square	0.205	0.186	0.26	0.196	0.299	0.142
F value	2.675*	2.368*	3.332**	2.319*	2.885**	1.119

\*Significant at 95 percent, \*\*significant at 99 percent

$LTRT = a1*UNDP + a2*IPMD + a3*NPID + a4*NPRD + a5*MEC3 + c1$

$MALT = a6*MAUP + a7*IPMD + a8*NPID + a9*NPRD + a10*MEC3 + c2$

$PPLT = a11*UNDP + a12*IPMD + a13*NPID + a14*NPRD + a15*MEC3 + c3$

$MAPP = a16*MAUP + a17*IPMD + a18*NPID + a19*NPRD + a20*MEC3 + c4$

$LPLT = a21*UNDP + a22*IPMD + a23*NPID + a24*NPRD + a25*LMEC + c5$

$MALP = a26*UNDP + a27*IPMD + a28*NPID + a29*NPRD + a30*LMEC + c6$

BKVL, MBRT, MKTS and LEVR are taken as control variables

a1, a2, a3, a4, a5, a6, a7, a8, a9, a10, a11, a12, a13, a14, a15, a16, a17, a18, a19, a20, a21, a22, a23, a24, a25, a26, a27, a28,

a29, a30: Coefficients of independent variables

c1, c2, c3, c4, c5, c6: Constants

LTRT	three year returns
MALT	three year market adjusted returns
PPLT	Point to point 3 year returns
MAPP	point to point 3 year market adjusted returns
LPLT	last 6 months return of third year
MALP	6months market adjusted return
MEC3	Market Efficiency Coefficient for 3 years
LMEC	Market Efficiency Coefficient 6 month in third year
LEVR	Debt to Equity
BKVL	BV of assets (Cr)
MAUP	1 day market adjusted return
MBRT	Market to Book ratio of equity
UNDP	1st day return
IPMD	Dummy variable of institutional promoters
NPID	Dummy variable of non-promoter institutional investors
NPRD	Dummy variable of non-promoter Retail investors

## CONCLUSION

The pre IPO analyst ratings had a significant positive impact on the subscription rate; however the analyst rating had no significant impact on the underpricing of IPO issues. This is

due to the nascent stage of analyst rating in Indian financial markets as compared to developed markets.

In the holistic approach, all three characteristics-underpricing, liquidity and

ownership structure were considered for the impact on the performance of the IPO stocks in secondary markets. It was found that underpricing, liquidity and non institutional investors (allocated ownership) had stronger influence on the short term performance of the IPO stocks. This is a similar case even for the market adjusted short term returns. All the significant variables have a positive impact upon the performance of the IPO stocks. The model explains above 80 percent variance in first week returns and above 30 percent variance in the first year returns. In long term performance the role of underpricing decreases, that is, the lower positive coefficient has 95 percent significance. However liquidity has a significant impact on the long term performance. Secondly, the ownership variables have negative impact on the long term performance. Finally, the model explains in and around 20 percent of the long term performance. It however fails to explain the performance of the IPO stocks in the last six months in the third year. The comprehensive model results in increment in the explanation of the IPO stocks performance in the long term.

#### Future Research

Inclusion of operational performance of the firm in both, pre and post IPO may provide added reasons for the short and long term performance of the IPO stocks in the secondary markets.

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