International Journal of Economic Research

ISSN : 0972-9380

available at http: www.serialsjournals.com

Volume 14 • Number 15 (Part 4) • 2017

Initial and Long run Performance of Indian Stock Market IPO's: Evidence from 2012-2016

Charmi Shah[1], Gowri Sankar[2], Shasank Pramode[3], Ragul R[4] and K.T. Vigneswara Rao[5]

[1]Corresponding author, Assistant Professor, Institute of Finance & International Management Business School, #8P & 9P, KIADB Industrial Area, Electronic City 1st Phase, Bangalore – 560100. Email Id:charmi@ifimbschool.com

[2]PGDM (Finance) Student, IFIM Bangalore

[3,4]PGDM Student, IFIM Bangalore

[5]Accendere Knowledge Management Services Pvt. Ltd.

ABSTRACT

The focus of this study is to identify key determinants and examine initial and short-to-long run performance of IPO's in India during January 2012 to December 2016. The present study investigates IPO performance based on IR (Initial Returns) and BHAR (Buy and Hold Abnormal Returns). Our empirical results reveal that IPO's are initially underpriced andinvestors'get18.3% initial average returns during the window of 4 years. Moreover, IR of sampled firms has a significant positive relationship with of age of firm and no of times of subscription. The BHAR results reveal that IPO's are even good bet for medium-term i.e from listing day to 6M and 1 year, as during this period investors get an average return of around 11.5% to 13,5%. Short term or even long-term performance IPO's is not much impressive. The regression results of BHAR shows that age of the firm, leverage and no of times subscription are major determinants of IPO performance for different time period horizons of short termto-long term.

JEL Classification: G100, G240, C200.

Keywords: Initial public offering, Market Adjusted Abnormal Returns, Buy and Hold Abnormal Returns, Underpricing.

1. INTRODUCTION

Going public, that is, offering company's shares in capital markets is one form of raising equity and it is generally done through initial public offerings (IPOs). Usually, IPOs are sold to the public at a price lesser

than the first-day trading. This is the reason underpricing is called a costly affair for the corporate houses. Despite this, researchers have given evidence that underpricing is a common phenomenon prevailing in the majority or almost all equity markets. This is the reason that studies of short- and long-run performance of IPOs have created much hype in the world of corporate and academics. Empirical examination in this area confirms two types of phenomena related to IPOs. First, IPOs at the time of listing are underpriced and this is the reason investors are able to earn an abnormal higher rate of return compared to market; second, IPOs are overpriced and so under performing in the long run.

The major objective of this study is to examine post-issue share price performance of IPOs issued during January 2012 to December 2016 and for that post-issue IPOs performance has been studied with respect to listing price up to 2 years from the listing day. To empirically find out the initial performance of IPOs, it was tested based on Market Adjusted Abnormal Return (MAAR) and further, long-run performance was tested by applying methodologies like Buy and Hold Abnormal Return" (BHAR). The outline of this paper is structured into six sections. Section 2 provides a survey of literature review related to the study. Section 3 provides the data and sample used in the study. Section 4 outlines the methodology employed in this study. This is followed by a discussion on the results in Section 5. Section 6 provides the conclusion of the study.

2. LITERATURE REVIEW

Crutchley et. al., (2002) studied the link between the Board Stability and the Long-Term Performance of the IPOs by using scale-invariant stability metric. The study found that IPOs with greater board instability had performed poorly initially, while Firms with greater stability was associated with improvement in subsequent time. Drobetz et. al., (2005) analyzed the underpricing and long-run performance of Swiss IPOs by using buy and hold method for the period of 1983 to 2000. They found average market-adjusted initial return was 34.97% and concluded that under performance of IPO only in the long run.

Choi et. al., (2010) examined the long- run stock return of Privatization of IPOs, with a sample of 241 privatized IPOs across 42 countries for the time frame1981-2003. The stocks were calculated by comparing one-three and five-year holding period returns of domestic to privatization market indices. Next, the calculated returns have been compared to size and size and B/M equity ratio with the matched firms from the same countries. The result stated that Privatized IPO outperforms their domestic stock market in the long run. It proved that market valued privatization IPO firms more than the private companies IPO's without much systematic bias after the IPO.

Carter et. al., (2011) studied the risk of IPO and long-run performance with the objective to discover the fact that New Issue Puzzle could disappear in a Fama-French three-factor framework by using cumulative returns, portfolio time series factor regression, robustness tests for the period of 1981-2005. The study reveals that in the long run, large firms outperform and the factors for investment, momentum, liquidity help to determine the aftermarket returns. Investors in IPOs receive smaller expected return due to high liquidity in exchange and negative momentum. Dong et. al., (2011) investigated the relationship between the quality of underwriters and the long run performance of the IPO. The study reveals that many managing underwriters and reputation were strongly correlated for the IPOs who got higher uncertainty. They concluded that documentation role of investment bankers plays an important role in the long run performance of IPO.

Brav & Gompers (1997) applied the methods of equal weighted returns to examine the long-run under performance of IPO of both ventured and non-ventured backed firms for a period of 20 years. Their study concluded that ventured backed firms outperform the non-ventured backed firms in the long run. By using asymmetric information model and average return method, Beatty and Ritter (1986) examined the investment banking and the underpricing of IPO, found a relationship between underpricing and the uncertainty of investors regarding value by using average return method.

Shah and Mehta (2015) applied regression method to investigate the relationship between the degree of under-pricing and issue price, size, oversubscription, market returns by using a sample of 113 for a period of four years. The study concluded that investors can invest in the new issues that are underpriced during the initial time period. In the context of India,

Madhusoodanan &. Thiripalraju (1997) examined the effect of under-pricing to investigate how issue size can affect the extent of under-pricing of IPOs by using Rock's model. The study concluded that institutional investors always try to subscribe for the good underpriced issues and hence uninformed investors were left with the overpriced issues.

Sharma et. al., (2013) examined the performance of IPOs in India, by examining the sector-wise behavioral pattern of different companies from the time of listing, short-run, long-run and for three years. The study reveals that public sector and finance companies exhibit a maximum change in value on the listing day and end of the month day. The study concluded that underpricing of IPOs attracts a large no of potential buyers to purchase stocks or shares at an attractive price to assure profits. Kumar (2007) studied the IPOs issued through book building process with an objective to find fare pricing in short run as well as long run. His study found that the IPOs are under-priced and outperformed for a period of 2 years after IPO.

Chemmanur & Yan (2017) found that firms going for an IPO with extensive advertising are valued higher, after controlling effects of investor attention, are also associated with greater upward price from the pre-IPO filling rage to lower long-run stock return post-IPO. The study concluded that some firm managers consider the effect of the product on customers and investors. Binay et. al., (2007) examined the role of underwriter-investor relationship in the IPO process, the study showed that the underwriters favor institutions they know well, or they have worked for. They concluded that the better is the relationship between the underwriter and investor; more is the benefit that the investor gets.

Brau & Fawcett (2006) analyzed theory and practice of IPO by studying motivation timing, underwriter selection, under-pricing signaling and decision to remain private. The author's used survey method to get the data from 336 chief financial officers regarding IPO, found that most of the firms perform IPO to aid acquisitions, and the timing of the IPO the most priority than other factors. Companies remain private to have the ownership control within them. Chambers & Dimson (2009) applied using time series and regression analysis to examine the IPO underpricing over the long run. The authors have studied two-time frames 1917-1945-1986 and found that from 1917 to 1945, the offers were underpriced by an average of only 3.8% as compared to 9.15% in the period from 1945 to 1986.

Su & Fleisher (1999) studied the Chinese IPO market and how IPO works by using a sample of 308 companies. The study explained underpricing in depth by using asymmetric information and signaling their value to the investors. Their study concluded that bribery is an unlikely to cause of the high IPO underpricing

and the lottery mechanism for allocation of IPO has worsened it more. Chan et. al., (2004) investigated the impact of institutional factors affect on the long term and short term IPO performance. The study reveals the direct relation between the underpricing and time period between the offerings, listing and the stock investors in the area, whereas it is inversely correlated with issued number of shares to the public.

Jain & Kini (1994) studied the post-issue operating performance of IPO firms, with the purpose to identify the relation between IPO and changes in operating performance of firms with the change in ownership. The study found post IPO operating performance positively related to equity retention by original owners, whereas no relation found between post-IPO operating performance and level of initial underpricing. Overall it can be concluded that IPO'S cannot strengthen their after-issue performance levels.

Teoh. et. al., (1998) examined the relationship between earning management and the long-run market performance of IPO, demonstrated evidence that issuers with accumulation in the IPO experience a downfall in the stock returns three years thereafter. The result of this paper shows that issuers with the higher flexibility of choosing the components of accounting regulations experience a fall in their stock returns during the period of three years. Loughran & Ritter (2004) analyzed the reasons as to why there has been a change in IPO underpricing over time. Their study concluded that IPO underpricing can be by explained by the changing risk composition, the realignment of incentives and the changing issuer objective functions.

Gompers & Lerner (2003) studied the long-run performance of IPO before NASDAQ was formed. The study investigated IPO performance of US companies from 1935 to 1972. The authors have used a calendar -time-analysis, CAPM, Fama-French three-factor regression model. Found using calendar-time -analysis that IPO returns as much as the market return. The intercept between CAPM and Fama French three-factor regressions are not significantly different from zero, suggesting normal performance. Ritter (1991) studied the long-run performance of the initial public offering, by considering 1526 IPOs in the USA for the period of 1975-84. They analyzed the data average-benchmark and cumulative average-benchmark adjusted aftermarket performance is used together with regression analysis.

Sahoo & Rajib (2010) analyzed the Pricing Performance of IPOs in the Indian Market with the objective to evaluate price performance for the period of 3 years from listing date to the long-run post-issue price performance of IPOs. The data were collected from 92 IPOs, and the long run pricing performance was evaluated using wealth relatives and Buy-and–Hold Market-adjusted Return. The study found that over expectations of the investors' leads to high initial day return, while using BHAR methodology reveals that if investors buy at offer get positive returns throughout the period, while the intraday traders wait for more than a year to earn a positive return. The research concluded that some features like pre-IPO firm Age, Post-IPO promoter holdings and price to book value are not effective criteria to judge long term and short term performance, instead of Offer size, timing and leverage need careful consideration.

Bansal and Khanna (2013) analyzed IPOs with an objective to verify that investors can earn a positive return or not and to investigate whether the various ex-ante factors affect the level of underpricing. It also focused on whether the number of underwriters created any difference with the initial performance or short-term return on IPO. They studied 320 IPOs using the methods of cross-sectional multiple regressions, 2-way ANOVA and Vector Auto Regressive (VAR) analysis. The study found that level of underpricing is negatively related to issue size, Age, First time issuing IPO, Pricing mechanism, and number of underwriters. Another result reveals that a number of shares offered at the level of underpricing is positively related to

market capitalization and the rate of subscription. There is no significant difference between timing of the offer and level of underpricing.

Pande & Vaidyanathan (2009) analyzed IPO issues of NSE based on comparison between offered and priced towards the higher end and the lower end of the price. The greater the listing delay for a firm, the higher would be the degree of underpricing, and the degree of underpricing of a firm would be lesser if issue proceeds are spent in marketing fees. They studied 55 IPOs out of 121 issued during the period 2004-2006. It shows that the degree of underpricing in the Indian market has reduced over the years and that the after-market in India regards the final offer price. The study found that IPO gains get diffused within one month and on an average, the gains in one month after listing are lesser than those of the market.

Garg et. al., (2008) focused on investigating whether underpricing of the IPOs exists in the Indian stock market, the impact of first-day opening and closing price and impact of the hot and cold IPO markets on the abnormal returns generated from the underpricing of IPOs. The further objectives suggested investigating the difference in the level of underpricing of IPOs in the bullish and bearish phase of the Indian stock market and the differences in the nature of returns for issues at par and issues at a premium. The data was collected for the period 2000-2006. Their empirical results reveal is a significant level of underpricing in short run while in the long run, there is overpricing, the level of underpricing doesn't vary in different seasons of IPO markets, the odd returns from the IPO underpricing differ significantly in the upwards and downward trend of the market and there is no much difference between opening price returns and closing price returns.

Mayur & Mittal (2014) analyzed the Relationship between Under-Pricing and Post IPO Performance. The basic objective was to investigate the change in performance of Indian public firms post their IPOs and its relationship with the level of underpricing. For this purpose, they studied 306 IPOs that were issued during the period 2000-2010. It was found that the performance of the IPO deteriorates over the period but the reason is not underpricing.

Sahoo (2015) analyzed the relationship between aftermarket volatility and as ubscription rate of IPOs in India. For this 339 IPOs were studied out of 433 which were issued during the period 2002-2012. The research found that the highly- subscribed IPOs are more volatile relative to the lesser subscribed IPOs. It also shows that underpricing causes aftermarket volatility in a positive way. On examining the listing day volatility, it was concluded that oversubscription rate is positively influencing the price variability on listing day.

Agarwal (2016) analyzed the FII Inflows into Indian IPOs and its Impact on the Indian Stock Market. The main objective of the paper was to understand the link between India's financial sector development and economic growth. The study was done on 308 IPOs issued during the period 2006-2011. It was found that the predictive capacity of GDP is approximately 3 times more as compared to that of FII investments in IPO.

Chaturvedi et. al., (2006) combined the leading theories with IPOs, to see the influence of non-fundamental factors on the IPO price. For this, the 50 IPOs issued through book building during the period 1999-2005 were only considered. It was observed through the analysis that these companies also faced underpricing. It's oversubscription that leads to first-day gains for IPO. There are signals that lead to oversubscription but they are weak and only indicative.

Mayur & Mittal (2011) analyzed the Waves of Indian IPOs: Evolution and Trend. The sample taken for this purpose was of 306 IPOs which were issued during the period 1997-2007. The study results suggested that firms go public during the hot market and try to maximize the total proceeds at the time of IPO. Their study results concluded that most of the IPOs were issued by the private sector companies: the first being IT sector companies followed by banking sector companies.

Jain & Singh (2012) analyzed the determinants of IPO subscription for different types of investors. The sample taken is of 2017 book built equity IPOs issued in the period 2004-2009. The study found that the QIBs' subscription is positively related to the high index returns and negatively related to high index volatility. The NIIs' subscription decreases with higher promoters' holding and they follow QIBs while RIIs follow NII. The study concluded that IPOs with high promoters' holding results in higher subscription which leads to higher underpricing.

Raju & Kunde (2009) investigated IPO index and the performance of IPOs in the Indian context, along with its importance to the regulators, the stock exchange, to the financial markets, and the investing public at large. They concluded that IPOs face great listing gains on their first day of trading and give good returns for short term and long term.

Banerjee (2015)examined whether certain financial parameters may differ for companies with different IPO Grade. The study was conducted on 171 IPOs issued during the period 2007-2013. It was observed that there was a significant change in different financial parameters like current ratio, debt to equity ratio, return on assets and return on equity for companies with different IPO grade while debt to total assets ratio doesn't vary significantly. Herawati et. al., (2017) analyzed IPO Company Stock Valuation. The objectives of the paper were to analyze the fair prices of stock companies doing IPOs, differences in fair prices of stock based on valuation by the stock price at the time of IPO and also, to analyze whether the differences in prices were due to differences underwriter. For this purpose 240 IPOs issued during the period, 2000 to 2014 were studied. According to the analysis, the price-earnings ratio shows a reasonable stock price assessment which is 65% higher than the stock price set at thetime of IPO and also every underwriter produces different levels of the price difference.

Pandya (2016) analyzed After Market Pricing Performance of IPOs. The objectives of this paper are to ensure whether the IPO issues are underpriced or overpriced in India and to examine short run to long-run performance of IPOs in India. They studied a total of 183 IPOs during the period 2004-2013 and the pricing was taken from listing date to till 365 days. For the analysis, the methods used were CAPM, WR, MAAR, and BHAR. It was observed that IPOs are under performed on the first day and immediate period, after which, the return decreases and from medium to long-term it becomes negative. Further, it was concluded that IPOs can be best relied upon from immediate to short-term and at most till medium term.

Narasimham (2012) analyzed the Information Asymmetry in the Post-IPO Market. The objective of this paper was to analyze their regular flow of information in the post IPO market based on share holding pattern data for IPOs from India. They analyzed 34 IPOs out of the 38 which were issued in the year 2008. It was found that IPOs with high share holding level by informed investors performed well in the post IPO market and also Foreign Institutional Investors influenced the returns from IPOs in the post IPO market while Domestic Institutional Investors didn't. Satya & Guruprasad (2014) investigated pricing performance of IPO in both short and long run with a sample of 24 IPOs by using Market adjusted abnormal return and Buy and hold abnormal return respectively.

Gupta et. al., (2014) investigated the impact of grading on Indian IPO underpricing and to compare the return of high-grade IPOs and low-grade IPOs in short run. The study was conducted on 186 IPOs issued in the period 2007-2012. It was concluded that grading hadn't solved the problem of underpricing of IPOs in Indian capital market. Additionally, it was observed that there were mixed opinions in the literature on the performance of grading process.

3. RESEARCH OBJECTIVES

Objectives of the Study

1. To analyze initial returns of IPO's and factors influence initial performance of IPO's.
2. To examine the short-run and long-run performance of IPOs in India.
3. To identify key determinants of IPO performance for short run to long run time horizons.

4. DATA AND SAMPLE

There have been varied results with regard to the performance of IPOs after they are listed. After going through all such works, it was decided to examine the performance of Indian IPOs for a short to medium to long term. For this purpose, 60 IPOs issued during the period 2012-2016 were studied. The index selected for the analysis is NSE SENSEX. The study is based on the secondary data and closing prices of IPOs from their listing till 28th February 2017 were taken. The required data was collected from www.nseindia.com, www.yahoofinance.com, www.chittorgarh.com.

Selection Criteria of IPO Issues to be Undertaken for the Study

The basic sample of the study comprised a total of 74 IPOs which were issued during the period 2012 and 2016. A few were eliminated due to various reasons. The IPO's were eliminated based on the two following criteria:

1. Listing date is not available.
2. Closing prices were not available for all days from the date of listing till 2 years

Out of the 74 IPOs issued during this period, 14 were eliminated on the basis of their non- fulfillment of the above conditions. The data was collected for the remaining 60 IPOs and analyzed.

Table 1
Description of the Sample of IPOs and Sample Selection Criteria

Number of IPOs offered during sampling period	74
Exclusion: Number of IPOs missing listing date	5
Remaining	69
Exclusion: Number of IPOs withdrawn	6
Remaining	63
Exclusion: Number of IPOs missing financial and another issue specific information	3
Remaining total number of IPOs eligible for study	60
Percentage of eligible companies in the sample for study	81.08%

Market Adjusted Abnormal Return (MAAR) or Initial Return (IR)

It is the difference between a single stock's performance and the expected return over a set period of time. MAAR or IR is calculated as on the date of listing of the IPO.

$$\text{MAAR or IR} = \left[\frac{1+R_t}{1+R_m} - 1\right] \times 100$$

where, IR is the market-adjusted initial return for stock.

MAAR = market adjusted abnormal return for IPO on day 1

R_t = percentage change in list price i.e. offer price on day 1

R_m = percentage change in the index on the day of listing of the IPO

Buy and Hold Abnormal Return (BHAR): It is calculated to evaluate the change in the wealth of investors. It's assumed that the amount invested on the initial day is held until the specific period days. The rise or fall in the return from initial day to holding day is compared with the benchmark index.

$$\text{BHAR}_{it} = \prod_{i=1}^{T}(1+R_{it}) - \prod_{t=1}^{T}(1+R_{mt})$$

5. METHODOLOGY

This study has employed ordinary least square (OLS) regression method in order to investigate the post-market pricing performance of IPO for the sample period. The following table shows the details of variables used in the study:

Dependent Variable	*Description*
BHAR	Buy and Hold abnormal return
IR	Initial return is the market adjusted initial return which is calculated using the SENSEX as a proxy for market Index
Independent Variable	*Description*
Offer Size (OS)	Offer Size is the amount of capital that the company wants to raise through IPOs.
Time Subscribed (TS)	This is the ratio of application size to the issue size.
Age of IPO firm (AGE)	Age is calculated as the difference between the date of incorporation and the date at which the company decides to go public.
Leverage Ratio (LEV)	Leverage is calculated as the ratio of book value of long-term debt to the paid-up equity capital of the firm at the IPO date.
Offer Price (OP)	The offer price is the price at which the IPO is offered to the public for the first time.

Analysis of Initial performance of IPO's: The following model (1) has been used for empirical analysis:

$$IR = \beta_0 + \beta_1 AGE + \beta_2 OP + \beta_3 IS + \beta_4 LEV + \beta_5 TS + e \quad (1)$$

Analysis of short to long run of IPO's: The following regression model (2) has been used for analysis: BHAR (Buy and Hold Abnormal Returns) have been calculated for the 6 different time Horizons. 15 days BHAR, 1-month BHAR is considered as a short run period. While 6M and 1Y BHAR are considered as medium term period and 2Y is considered as the long-term horizon. (Falguni Pandya, 2016). For few of The IPO's which are listed in 2016, 2-year BHAR is considered till September 2017. The OLS regression model

has been applied by assuming all five variables age, offer price, Issue size, leverage and Times subscribe as independent variables and BHAR as dependent variables.

$$BHAR = \beta_0 + \beta_1 AGE + \beta_2 OP + \beta_3 IS + \beta_4 LEV + \beta_5 TS + e \quad (2)$$

6. RESULTS AND DISCUSSION

The summary statistics reported in Table 2 reveals that the minimum and maximum initial return (IR) of sampled IPOs considered for the study is –40.9% and 374% respectively. The mean IR of the observed sample is 18.3% percent with a standard deviation of 0.503 percent. The median IR for the sampled equals to 0.084 percent. The mean value of age is 20.87 years with a standard deviation of 13.484. The average issue size of sampled firms is 17.511 with a standard deviation of 1.7. The value of skewness and kurtosis reported for the variables suggest that there is non-normality in the distribution of sampled data. The variance inflation factors (VIF) suggest that the problem of collinearity does not exist in the given model.

Table 2
Summary Statistics of Variables used in the model

Variable	*Mean*	*Median*	*Minimum*	*Maximum*	*Std. Dev.*	*C.V.*	*Skewness*	*Ex. Kurtosis*	*IQ range*
IR	0.183	0.084	–0.409	3.742	0.503	2.751	5.592	36.714	0.285
Age	20.856	19.000	5.000	74.000	13.484	0.647	2.038	4.875	12.000
OP	5.495	5.389	3.807	6.957	0.804	0.146	–0.165	–0.592	1.019
IS	17.511	16.907	15.267	21.500	1.699	0.097	0.716	–0.727	2.748
LEV	1.230	0.350	0.000	16.130	2.666	2.167	4.021	17.103	1.120
TS	23.359	6.850	0.758	143.990	31.013	1.328	1.764	3.190	38.480

Source: Author's own calculation.

Table 3
OLS Regression Result: Dependent variable: IR

Variable	*Coefficient*	*Std. Error*	*t-ratio*	*p-value*	
Const	0.475	0.030	15.880	0.000	***
Age	0.000	0.000	3.291	0.001	***
OP	–0.001	0.005	–0.345	0.730	
IS	–0.021	0.002	–11.41	0.000	***
LEV	–0.005	0.001	–6.902	0.000	***
TS	0.004	0.000	24.960	0.000	***

***indicates significance at the 5% level

Mean dependent var	0.185	S.D. dependent var	0.505
Sum squared resid	2399.533	S.E. of regression	0.490
R-squared	0.058	Adjusted R-squared	0.057
F(5, 9994)	1364.391	P-value(F)	0.000
Log-likelihood	–7052.830	Akaike criterion	14117.660
Schwarz criterion	14160.920	Hannan-Quinn	14132.300

Source: Author's own calculation.

Based on the results reported in Table 3, we found that the estimated model is statistically significant at 5% level in explaining the IR of sampled firms with F-value of 1364.4 ($p = 0$). The adjusted R-square value of 0.057 implies that about 5.7% of the variation in the IR of sampled firms has been explained by the five explanatory variables. This study used robust standard errors for controlling the heteroskedasticity and serial correlation problems. The *t*-statistics related with the independent variables AGE, issue size (IS), leverage (LEV) and times of subscription specify that they are statistically significant at five percent level, it implies that the IR of sampled firms has a significant positive relationship with the independent variables of age and no of times of subscription. On the contrary, we found that IR of sampled firms has a significant negative relationship with the LEV, IS an offer price of the IPO.

The empirical results of OLS regression method presented in Table 4 show that investors get highest average BHAR of 13.5% for 6M and 11.5% for one year period. Very short-term BHAR or long term up to 2-year BHAR average returns is not impressive. Age of the firm does not have a significant relationship with short-run returns but has an inverse relationship with returns for first three-time horizons and a direct relationship with returns for next three time horizons. It suggests young firms perform better for short term though the opposite is true for the next subsequent time period as well subsequent to issue. The offer price is showing negative significance for all short term, medium term and long run time horizons. The issue size is also showing positive as well as negative significance over different time horizons. Leverage is having positive significance for most of the time horizons and times subscribed to the issue are having a positive and significant impact overall horizons.

So the results of cross-sectional regressions reveal that there is a negative relation between underpricing and long-run returns for long-term market which, correct its overpricing caused in the initial period once the initial returns are realized.

7. CONCLUSION AND IMPLICATIONS

The major purpose of this study is to investigate the post-market price performance of IPOs issued during the period of 2012-2016. Our study contributes significantly to the IPO literature with a sample fresh sample of IPOs included in the study. The results reveal that average IR of sampled firms IPO's is 18.3% whereas highest returns are up to 374%. Further for IR of the firms have a significant positive relationship with age of the firm and number of times subscriptions. So investors should carefully evaluate these two determinants before investing in IPO's for getting good IR. Investors investing in IPOs at the offer price and selling it off on a listing day or holding these shares over a medium period (6 months or 1 year) are better-off compared to investors holding for short term and long term time horizons as per both regression models. Investors should take caution while holding the highly underpriced stocks for more than one year after the issue. They give very high returns till the end of the first year.

However, the same stocks do not perform well in short term up to three months and in long run up to two years as well. The study indicates that Indian IPOs have under performed the broad market over the long run, in general. After the IR period, the issues generally under perform the broad market and thereby generate negative returns over an extended period of time. Though the short-term investors (those selling the allotted shares at the time of listing) are making money, the long-term investors are actually losing money in the equity primary market. If this trend continues, it would be difficult to create an equity culture in the country. IPO offer pricing should be carefully determined by looking into industry P/E and EPS so

Table 4
OLS Regression results

Independent variable	*Dependent variable– BHAR*											
	BHAR 15 days				*BHAR 1M*				*BHAR 3M*			
	Estimated coeff	*SE*	*t ratio*	*P value*	*Estimated coeff*	*SE*	*t ratio*	*P value*	*Estimated coeff*	*SE*	*t ratio*	*P value*
Intercept (constant)	0.648	0.064	10.110	0.000	–0.055	0.037	–1.480	0.1389	–0.162	0.165	–0.983	0.325
Age	–0.000	0.000	–9.247	0.000	–0.000	0.000	–15.83	0.000	–0.000	0.000	–3.436	0.001
Offer price	–0.031	0.002	–18.11	0.000	–0.022	0.001	–18.09	0.000	–0.061	0.004	–14.190	0.001
Issue size	–0.148	0.021	–7.170	0.000	0.063	0.012	5.242	0.000	0.169	0.051	3.293	0.001
Leverage	0.005	0.001	9.035	0.000	0.000	0.000	2.894	0.000	–0.002	0.001	–3.368	0.001
Times subscribed	0.001	0.000	11.490	0.000	0.001	0.000	18.94	0.000	0.002	0.000	16.76	0.001
Mean Dependent variable (BHAR)		0.015				0.011				0.061		
S.D. dependent var		0.100				0.130				0.247		
R-squared		0.095				0.041				0.095		
Adjusted R-squared		0.094				0.041				0.094		
F(5, 9994) Value		104.771				125.858				172.564		
P value (F)		0.000				0.000				0.000		

Indicates significance at the 5% level. *Source:* Author's own calculation.

Table 4
OLS Regression results (Cont..)

Independent variable	*Dependent variable- BHAR*											
	BHAR 6 M				*BHAR 1 year*				*BHAR 2 Year*			
	Estimated coeff	*SE*	*t ratio*	*P value*	*Estimated coeff*	*SE*	*t ratio*	*P value*	*Estimated coeff*	*SE*	*t ratio*	*P value*
Intercept (constant)	2.225	0.311	7.162	0.000	0.247	0.057	4.298	0.000	0.886	0.112	7.916	0.000
Age	0.004	0.000	8.917	0.000	0.005	0.000	35.230	0.000	0.004	0.000	20.01	0.000
Offer price	–0.140	0.008	–17.54	0.000	–0.046	0.002	–21.59	0.000	–0.044	0.003	–14.63	0.000
Issue size	–0.480	0.101	–4.752	0.000	0.003	0.017	0.161	0.873	–0.225	0.036	–6.210	0.000
Leverage	0.016	0.003	6.352	0.000	–0.006	0.000	–13.17	0.000	0.010	0.001	10.32	0.000
Times subscribed	0.002	0.000	10.630	0.000	0.001	0.000	17.930	0.000	0.001	0.000	6.755	0.000
Mean Dependent variable (BHAR)		0.135				0.115				0.046		
S.D. dependent var		0.471				0.420				0.533		
R-squared		0.091				0.040				0.015		
Adjusted R-squared		0.090				0.040				0.015		
F(5, 9994) Value		99.689				739.092				149.455		
P value (F)		0.000				0.000				0.000		

Indicates significance at the 5% level. *Source:* Author's own calculation.

that IPO's won't be expensive at the time of offer and appropriate prices as per the valuation will sustain in short run-to-long run. Then only investors will also not carry away by the initial euphoria surrounding the IPO and listing gains.

Acknowledgement

Authors wish to acknowledge with gratitude to Dr. K T Vigneswara Rao, Research Mentor, Accendere Knowledge Management Services (P) Ltd., for his valuable comments and suggestions in the preparation of the manuscript.

References

Agarwal, B. (2016). FII Inflows into Indian IPOs and its Impact on the Indian Stock Market.*Emerging Economy Studies, 2*(1), 129-144.

AnjanaRaju, G., & Kunde, R. R. (2009). Indian IPO: A Goldmine Sans Index. *The Journal of Wealth Management, 12*(1), 62-74.

Banerjee, S. (2015). Do Financial Parameters Differ Based on IPO Grade: An Empirical Analysis of the Indian Equity Market?.*SIES Journal of Management, 11*(2) 53-62.

Bansal, R., & Khanna, A. (2013). Vector Auto-Regressive Analysis of Determinants of IPO Underpricing: Empirical evidence from Bombay Stock Exchange. *Global Business Review, 14*(4), 651-689.

Beatty, R. p. , & Ritter, J. R. (1986). Investment Banking, Reputation, and the Underpricing of Initial Public Offerings. *Journal of Financial Economics, 15*(1-2), 213-232.

Binay, M., Gatchev, V., &Pirinsky, C. (2007).The Role of Underwriter-Investor Relationships in the IPO Process. *The Journal of Financial and Quantitative Analysis, 42*(3), 785-809.

Brau, J., & Fawcett, S. (2006). Initial Public Offerings: An Analysis of Theory and Practice. *The Journal of Finance*, 61(1), 399-436.

Brav, A., & Gompers, p. (1997).Myth or Reality? The Long-Run Underperformance of Initial Public Offerings: Evidence from Venture and Non-venture Capital-Backed Companies. *The Journal of Finance*, *52*(5), 1791-1821.

Carter, R., Dark, F., Floros, L., & Sapp, T. (2011).Characterizing the Risk of IPO Long-Run Returns: The Impact of Momentum, Liquidity, Skewness, and Investment.*Financial Management, 40*(4), 1067-1086.

Chambers, D., & Dimson, E. (2009).IPO Underpricing over the Very Long Run. *The Journal of Finance, 64*(3), 1407-1443.

Chan, K., Wang, J., & Wei, K. J. (2004).Underpricing and Long-term Performance of IPOs in China. *Journal of Corporate Finance, 10*(3), 409-430.

Chaturvedi, A., Pandey, A., &Ghosh, S. K. (2006). Firm Financing through IPOs: A Study of Causal Variables Responsible for Under-Pricing. *Vision, 10*(3), 23-33.

Chemmanur, T., & Yan, A. (2017). Product Market Advertising, Heterogeneous Beliefs, and the Long-run Performance of Initial Public Offerings. *Journal of Corporate Finance, 46*, 1-24.

Choi, S., Lee, I., & Megginson, W. (2010). Do Privatization IPOs Outperform in the Long Run? *Financial Management, 39*(1), 153-185.

Crutchley, C., Garner, J., & Marshall, B. (2002).An Examination of Board Stability and the Long-Term Performance of Initial Public Offerings. *Financial Management, 31*(3), 63-90.

Dong, M., Michel, J., &Pandes, J. (2011).Underwriter Quality and Long-Run IPO Performance. *Financial Management, 40*(1), 219-251.

Drobetz, W., Kammermann, M., &Wälchli, U. (2005). Long-Run Performance of Initial Public Offerings: The Evidence for Switzerland. *Schmalenbach Business Review*, *57*(3), 253-275.

Eckbo, B. E., & Norli, Ø. (2005).Liquidity risk, leverage, and long-run IPO return. *Journal of Corporate Finance, 11*(1), 1-35.

Garg A, Arora P and Singla R (2008), "IPO Underpricing in India", *The IUP Journal of Applied Finance*,*14*(3), 33-42.

Gompers, p. , & Lerner, J. (2003). The Really Long-Run Performance of Initial Public Offerings: The Pre-Nasdaq Evidence. *The Journal of Finance, 58*(4), 1355-1392.

Gupta, G., Gupta, M., & Sharma, A. (2014).Grading of IPO's in Indian Capital Market: An Analysis of Market Performance. *Asian Journal of Research in Banking and Finance, 4*(6), 26-37.

Herawati, A., Achsani, N. A., Hartoyo, S., & Sembel, R. (2017). IPO Company Stock Valuation Analysis 2000-2014. *International Journal of Organizational Innovation, 9*(3), 72C.

Jain, B., &Kini, O. (1994).The Post-Issue Operating Performance of IPO Firms. *The Journal of Finance, 49*(5), 1699-1726.

Jain, N., & Singh, R. (2012).Determinants of IPO Subscription in India. *Vilakshan:* T*he XIMB Journal of Management*, 9(2), 121-130.

Kumar, S. S. S. (2007). *Short and Long Run Performance of IPOs in Indian Capital Market* (No. 27).

Loughran, T., & Ritter, J. (2004). Why Has IPO Underpricing Changed Over Time?.*Financial Management, 33*(3), 5-37.

Madhusoodanan, T. p. , & Thiripalraju, M. (1997).Underpricing in Initial Public Offerings: The Indian evidence.*Vikalpa, 22*(4), 17-30.

Mayur, M., & Mittal, S. (2011). Waves of Indian IPOs: Evolution and Trend. *Asia Pacific Business Review, 7*(3), 24-33.

Mayur, M., & Mittal, S. (2014). The relationship between Underpricing and Post IPO Performance: Evidence from Indian IPOs. *Asia-Pacific Journal of Management Research and Innovation, 10*(2), 129-136.

Nandini S.A., & Guruprasad L. (2014). The Pricing Performance Puzzle of Initial Public Offerings (IPOS) Evidence from Indian IPO Market. *Focus: The International Journal of Management Digest. 10* (1), 53-60.

Narasimham, N. V. (2012). Information Asymmetry in the Post-IPO Market: Analysis Based on Shareholding Pattern Data for Initial Public Offerings (IPOs) from India. *Botswana Journal of Business, 5*(1), 53-64.

Pande, A., &Vaidyanathan, R. (2009). Determinants of IPO Underpricing in the National Stock Exchange of India. *IUP Journal of Applied Finance, 15*(1), 14-30.

Pandya, F. H. (2016). After Market Pricing Performance of Initial Public Offerings (IPOs).*Jindal Journal of Business Research, 5*(1), 1-16.

Ritter, J. R. (1991). The Long-run Performance of Initial Public Offerings. *The Journal of Finance*, *46*(1), 3-27.

Sahoo, S. (2015). Subscription Rate and Volatility: An Investigation for Indian IPOs. *Journal of EmergingMarketFinance, 14(*1), 20-58.

Sahoo, S., &Rajib, p. (2010). After Market Pricing Performance of Initial Public Offerings (IPOs): Indian IPO market 2002–2006. *Vikalpa, 35*(4), 27-44.

Sehgal, S., & Singh, B. (2008).Determinants of Initial and Long-run Performance of IPOs in Indian StockMarket. *Asia Pacific Business Review, 4*(4), 24-37.

Shah, S. N., & Mehta, D. H. (2015). Initial Performance of IPOs in India: Evidence from 2010-2014. *Samvad*, 9, 77-86.

Sharma, S. K., Mittal, S., & Gupta, N. K. (2013).Post-issue Performance of IPOs in India. *International Journal of Financial Management*, *3*(1), 19-30.

Su, D., & Fleisher, B. M. (1999).An Empirical Investigation of Underpricing in Chinese IPOs. *Pacific-Basin Finance Journal, 7*(2), 173-202.

Teoh, S. H., Welch, I., & Wong, T. J. (1998). Earnings Management and the Long-Run Market Performance of Initial Public Offerings. *The Journal of Finance, 53*(6), 1935-1974.