Valuation Errors and Initial Price Efficiency of NSE Listed IPOs

** Inderpal Singh*
*** Anand Nayyar*

Abstract

This paper examined the valuation errors and initial price efficiency of NSE (National Stock Exchange) listed IPOs. The main objective of the study was to determine whether the valuation errors occurred due to deliberate discount given by issuers or due to wrong valuation method used and also attempted to find out the determinants that impacted the performance of IPOs in the initial market. The research study was also aimed to analyze the impact of certain determinants on the performance of IPOs in the initial market. The study examined an initial sample of 151 IPOs listed on the National Stock Exchange over the period from 2009 up to 2016, but there were 31 IPOs that were not listed and traded on NSE. All data were collected from secondary sources, and the majority of the data were collected and extracted from IPO prospectuses. Other variables were collected from companies' websites. After these exclusions, our final sample consisted of 113 IPOs that had complete data on all the variables employed in multiple regressions, and the dependent variable was taken as offer price and independent variables taken were : sales, age of the company, issue size, MAR, net asset value, and debt - equity ratio. The study found the relation between valuation errors and deliberate discounting, and it was found that out of a total of 113 IPO companies, 67 of the IPOs were underpriced, 45 IPO companies were overpriced, and the remaining one IPO traded at its offer price at the end of the first trading day.

Key words : **IPO, deliberate discounting, under-pricing**

JEL Classification : F3, G1, G2, G3

Paper Submission Date : February 21, 2017 ; Paper sent back for Revision : May 5, 2017 ; Paper Acceptance Date : June 24, 2017

IPOs are a very unique event in the history of a company because these are valued by two different sets of external investors for the first time on this date. A well-documented and heavily researched anomaly associated with the valuation of IPOs is that IPOs are underpriced, as evidenced by the average positive difference between the offer price and the first day closing price (Ibbotson, 1975). Considering the importance of investments in stock exchange markets and significance of pricing to create a center of attention for investors and success of suppliers, the present paper studies the valuation errors of IPOs and factors affecting it.

Initial Public Offerings (IPOs)

An initial public offering (IPO) is defined as a procedure through which a fresher, young firm, or a mature firm can go public by offering its shares to the common public and leading to a stock market listing. Funds can be raised with the help of IPOs in two ways - either by issuing new shares (equity and preference) to the general public or by selling the shares of existing shareholders to the general public without raising any new capital (Dimitrios, 2004).

* *Associate Professor & Dean Research,* Department of Management, KCL Institute of Management and Technology, Jalandhar, Punjab. E-mail : arora_inderpal@yahoo.com
** *Assistant Professor,* Department of Computer Applications & IT, KCL Institute of Management and Technology, Jalandhar, Punjab. E-mail : anand_nayyar@yahoo.co.in

The firm which issue its shares, is known as an 'issuer', by taking assistance of investment banks or underwriting firms. In an IPO, the issuer takes advice of an underwriting firm, which makes it easy to find what kind of security to issue (common or preferred), and what is the best time to come in the market by introducing the best offered price. After IPO listing, the firm's shares are exchanged in an open market. These shares can be further sold by investors through secondary market trading.

(i) Initial Public Offering Methods : Initial public offering can be opened in many ways and the highlighted methods of this affair are: registration, public offering as auction method, fixed price public offering, and innovative Internet methods. Utilizing each of these methods and the rules and regulations in different countries vary, but generally, registration as compared to other methods, is more commonly used.

(ii) Under Pricing and Overpricing : Underpricing means that the issuing company on the first day offers its shares quite lower than its true value, leading to huge return gain for buyers. Underpricing refers to the condition where a firm tries to list its shares at a discount relative to its intrinsic value to the general public. Its opposite, overpricing, refers to the condition where a company offers its shares higher than its true value, leading to huge loss gain for buyers. These cases permit investors to receive optimistic abnormal profits and loss if investors were to sell their stocks once trading starts. The initial abnormal returns are normally measured by taking the difference between the offering price and the opening market price on the first trading day or closing market price at the end of the first day, or first week, or first month after listing (Fabozzi, 2008 ; Pande, 2009).

Literature Review

Chiu and Sinha (2010) examined valuation and underpricing of initial public offerings and the purpose of discretionary accounting. The research was conducted for 704 IPOs to study the purpose of pre - IPO optional accumulations in the valuation and underpricing of IPOs. Investigators found that firms with positive pre - IPO optional accumulations tend to have greater initial returns ; whereas, no such relationship existed for the firms with negative pre - IPO optional accumulations.

Kim and Ritter (1999) examined the reflecting importance of firm valuation in practice of IPOs and how application of accounting information in combination with comparable firm multiples affected the valuing of IPOs. The study was done on 190 domestic operating company IPOs, where data was analyzed with the help of regression tool. It was concluded that price-to-earnings, price-to-sales, enterprise value-to-sales, and enterprise value-to-operating cash flow ratios of comparable firms had been of minimum use only when historical numbers were considered rather than forecasted.

Bhagat and Rangan (2004) examined the valuation of financial variables, insider with holding, growth, and investment banker. The research was conducted for a sample size of 1655 IPOs. The authors found that average valuations of IPOs were not statistically different from the recent booms and those of the late 1980s.

Demirakos, Strong, and Walker (2010) investigated the value estimation practices of investment analysts by observing the valuation methods that were applied on a sample size of 26 large firms listed in the U.K. stock exchange. The empirical results showed that use of valuation by a comparative approach was lesser in pharmaceuticals or electronics as compared to the beverages sector.

Guo, Lev, and Zhou (2005) investigated valuation errors of bio-tech IPOs. In order to conduct the analysis, a through examination of the long-term performance of IPOs in the market was done. The research was conducted for 122 firms. The authors used multiple regressions, t - ratios in the study and found that direct valuation, relative valuation, price revisions, long term performance, internet and non-internet IPOs were different in terms of the impact of financial statement variables on IPO prices.

Chan, Wu, and Kwok (2007) examined the impact of offer price valuation between the global offering companies and domestic offering companies, which went public between the periods of 1986 up to 1998 by using a stochastic frontier approach. The research was conducted on a sample size of 2307 IPOs by using the regression tool. Empirical results showed that global IPOs witnessed high offer price valuation accuracy as compared to domestic IPOs.

Demirakos, Strong, and Walker (2004) examined whether the selection of valuation model affected the efficiency of anticipated target prices revealed in the equity research reports by investment analysts and tried to provide basis for controlling the factors that influenced the selection of a valuation model. The study was conducted on a sample size of 94 U.K listed firms that went public over the period of July 2002 - June 2004. The empirical results propagated an unbiased analysis based on the measure of target price efficiency, which indicated that the target price was met within a forecast period of 12 months.

Murugesu and Santhapparaj (2009) investigated the valuation methods used by the IPO companies to determine their offer price that contributed to underpricing and studied the efficiency of the Malaysian IPO market. A sample of 264 companies listed on MESDAQ were analyzed. In the study, by using regression and auto correction function tool, it was concluded that possible factors like price efficiency of the Malaysian IPO market and valuation errors contributed to the level of underpricing of the Malaysian market.

Lowry, Officer, and Schwert (2010) investigated the variability of IPO initial returns. The research was conducted for 6840 IPOs to inspect the economic factors which drive the statistical designs and the authors found that the strength of initial returns differed highly over time while the hot market IPOs were characterized by extraordinarily high variability of initial returns, which implied that there was a strong correlation between the mean and the instability of initial returns over time and it was observed that when the underpricing was main and most unspecified, book building was the major drawback during hot matters markets.

Hutagaol, Siauw, and Ekaputra (2011) investigated the determinants that contributed to the management earnings forecasted error mentioned by the company officials in the IPO prospectus. To fulfill the aim of this paper, a study was done on the firms that were public in the Indonesian market between the period from 1997 - 2005. By using the regression tool, it was found that firm size, anticipating interval period, and array of firm's businesses were the most important factors for the management forecasted errors.

Jeon and Kim (2011) attempted to verify the influence of R&D expenses of IPO firms on the firms' value by making use of firms' financial materials before and after of newly listed firms on the share market after 1990. To accomplish the purpose of the study, 631 firms that listed their IPOs (from 1990 to 2005) on the Korea Stock Exchange (KSE) were analyzed. This study employed both regression and Ohlson's (1995) model. Regarding the results of comparison of financial results before and after the first IPO listing, total assets, total liabilities, earnings, and R&D expenses after listing were all significantly lower than prior to listing.

Sohn, Tsui, Zhang, and Zhang (2012) examined an empirical assessment of A-Share IPO underpricing in China and the research was conducted for 230 A-share IPOs to study the effect of valuation method on underpricing in IPOs. The researchers used multiple regression (cross-functional regression, IOS regression, etc.) in their research and found that A-share IPOs were severely under-valued by issuers and under-writers at the offer but overvalued by the investors on the listing day. Mainly, the findings were robust across stock exchange, classification of companies, criteria to choose matching companies, absence of CSRC (China Securities Regulatory Commission) regulation, and B-share market prices.

Bateni and Asghari (2014) studied whether pricing the initial offering exchange on Tehran stock exchange was less than the actual price. For this paper, 115 stock exchange companies from 2006 to 2012 were studied. Multiple regressions were used and the results showed that only P/E variable had a significant relation with price changes on initial offerings and had the highest impact on price of initial offerings.

Suraj (2014) examined the value investing strategy for the public-sector banks based on price earnings ratio

Table 1. Brief Overview of the Literature Review

Country	Author and Time Period	Sample Size	Recommended method
Malaysia	Murugesu & Santhapparaj (1999-2004)	264	P/E and net assets valuation
United States	Kim & Ritter (1992-1993)	190	P/E multiples
France	Roosenboom (1990 -1999)	309	Discounted cash flow (DCF)
United States	Dittmann & Maug (1994-2003)	52,112	Discounted cash flow (DCF), Dividend discount model (DDM)
India	Suraj (2005-06) (2010-11)	15	PE ratio
England	Demirakos, Strong, & Walker (1997-2001)	53	PE model and DCF valuation model
India	Sehgal & Pandey (1993-2007)	6	Price-to-book (P/BV)
Iran	Bateni & Asghari (2006-2012)	115	P/E model
Canada	Lie & Heidi (1998-1999)	8,621	P/E multiple, EBITDA multiple
England	Demirakos, Strong, & Walker (2002-2004)	94	Discounted cash flow (DCF)
Italy	Cassia, Paleari, & Vismara (1999-2002)	83	Price-to-book value (P/BV) and (PE) ratio
China	Sohn, Tsui, Zhang, & Zhang (1997-1998)	230	Price to-value (P/V) ratios
United States	Colaco, De Cesari, & Shantaram (2013)	522	Discounted cash flow
United States	Lowry, Officer, & Schwert (1965-2005)	6840	Book building method, auction method, propensity scoring method
United States	Chan, Wu, & Kwok (1986-1998)	2307	OLS method, Stochastic frontier method
United States	Chiu & Sinha (1990-2002)	704	Cross sectional regression model, OLS model

*The above table has been drawn from the literature.

approach and also determined and selected the undervalued and overvalued public-sector banks based on the earnings multiple ; 15 public sector banks were investigated by applying regression analysis. The empirical result was that low PE public sector bank stocks showed better performance than high PE stocks on an average for the last 5 years in India.

The brief overview of Literature Review is presented in the Table 1.

Need and Scope of the Study

Studies have been conducted in the past regarding the pricing of initial public offerings to find out explanations as to why IPO valuation errors exist. Many incidences have been witnessed where the firm and the investing public, issuers intentionally price their shares below the true value to persuade investors to reveal their demand in order to avoid the winner's curse problem or to pay back unaware investors for the costs of assembling information regarding the firm. For instance, in relation to the Indian IPO market, few theories have observed the occurrence of valuation errors between the listed price and offered price of IPOs. So, it is important to find out whether any evidence of difference between the list price and offer price exists in India for the firms coming out with IPOs. The present study would try to fill this gap since the Indian capital markets have been significantly transformed after liberalization of the economy in 1991.

There is a lot more interest in the Indian capital markets now by the foreign investors as India has had one of the fastest growth rates in the economy in recent times. So, it is important to study whether or not underpricing or overpricing exists because of valuation errors. Also, the research is relevant to practitioners, such as investment bankers and analysts, who use multiples to determine the true value of their firms, and also for academic

researchers. For example, already established public firms or young firms can use the insights offered by the experimental study about valuation methods that generate true value of the IPOs.

Objectives of the Study

The main objectives of the study are to determine whether the valuation errors occur due to deliberate discount given by issuers or due to wrong valuation method used and the study also attempts to find out the determinants that impact the performance of IPOs in the initial market.

Research Methodology

As from the literature, it has been observed that P/E ratio, DCF, and NAV lead to least valuation errors, and to find out the determinants that impact the performance of IPOs, regression tool has been used (Murugesu & Santhapparaj, 2009). So, this allowed us to run the regression tool in order to find out the factors that affect the performance of IPOs. This research verifies the value relevance of firms' in prospectuses. The valuation model employs parameters such as links between firms' book values, earning per share, NAV, DCF, and other information. So, in order to check the accuracy of valuation methods and existence of deliberately discounting phenomena of IPOs, this study uses these parameters to verify the objectives of the study.

(1) Tools Used : The following tools were used for the analysis :

(i) Underpricing : Underpricing was measured by taking the difference between the closing market price of an IPO company on its first trading day and the company's offer price (Ritter, 1984). To reflect the different sizes of IPO companies, the difference between closing market price and offer price was deflated by net asset value *(NAV)* per share to arrive at a relative measure of underpricing. Mathematically, this is expressed as :

$$UP = (CMP - OP) / NAV$$

where,

UP = Under pricing per share,
CMP = Closing market price per share on the first trading day,
OP = Offer price per share of the IPO, and
NAV = Net asset value per share after the public issue and offer for sale.

Based on the above formula, if the *UP* ratio is positive, the issue is priced at a discount. If the ratio is zero, the issue is accurately priced, and if the ratio is negative, it is overpriced. From the standpoint of the existing shareholders, they would like to set the offering price per share as high as possible as this increases the issue proceeds and net worth of the company.

(ii) Absolute Prediction Errors : The difference is taken between the opening market price on listing and the offer price and then it is divided by the offer price (Alford, 1992).

$$Absolute\ Prediction\ Error = (OMP - OP)/OP$$

where, *OP* is the offer price and *OMP* is the opening market price on listing.

Alford (1992) suggested that if the valuation method is accurate, the absolute prediction errors should approximate to zero. This is based on the assumption that the valuation method used results in an offer price that correctly reflects a company's fundamentals.

(iii) Market Adjusted Return : Market adjusted return is calculated as :

$$MAR_{i,t} = R_{i,t} - Rm_{i,t}$$
$$R_{i,t} = [CMP_{i,1} - OP_{i,0} / OP_{i,0}]$$
$$Rm_{i,t} = [I_{i,1} - I_{i,0} / I_{i,0}]$$

where,
$CMP_{i,1}$ = Closing market price of IPO company *'i'* at the end of the first trading day,
$OP_{i,0}$ = IPO offer price as per the prospectus of company *'i'* (time index 0 refers to the issue date of the prospectus),
$I_{i,0}$ = NSE Index at the issue date of prospectus for company *'i',*
$I_{i,1}$ = NSE Index at the close of the first trading day for company *'i'*.

(iv) Multiple Regression Tool : Data analysis method uses several independent variables to predict the outcome of a dependent variable. The goal of multiple linear regression *(MLR)* is to model the relationship between the explanatory and response variables.

The model for *MLR*, given six observations, is :

$$Offer\ Price = B_0 + B_1(Debt\ equity) + B_2\ (MAR) + B_3\ (Issue\ size) + B_4(NAV) + B_5\ Age + B_6\ (Sales)$$

The dependent variable is offer price and independent variables are sales, age of the company, issue size, *MAR*, net asset value, and debt equity ratio.

where,
B_0 is offer price intercept,
B_1 is the slope of offer price with *MAR* (market adjusted return),
B_2 is the slope of offer price with debt-equity ratio,
B_3 is a slope of offer price with issues' size as independent variable,
B_4 is the slope of offer price with net asset value per share,
B_5 is the slope of offer price with age,
B_6 is the slope of offer price with sales.

The variables - offer price, net sales are defined as the operating income that a company earns by selling its products or rendering services ; issue size of a security is defined as the total amount of capital which is raised from the public by a company on the listing date of the IPO ; age of the company and debt-equity ratio are calculated to study the composition of type of capital raised by a company.

(2) Data Collection : As from the Review of Literature it is clear that primary data is not required, so all data were collected from secondary sources - the majority of the data were collected and extracted from IPO prospectuses. Other variables were collected from companies' websites.

↳ **Sample Size :** The study examined an initial sample of 151 IPOs listed on the National Stock Exchange over the period from 2009 up to 2016, but there were 31 IPOs that were not listed and traded on NSE. So, the final

sample used for analysis consists of 120 companies that were listed on the NSE. The study also excluded 7 IPOs from the initial sample because of non-availability of red herring prospectuses for these firms. After these exclusions, our final sample consisted of 113 IPOs that had complete data on all the variables employed in our regression.

Analysis and Results

(1) Valuation Error and Deliberate Discount : The Table 2 indicates that out of a total of 113 IPO companies, this study found that 67 of the IPOs were underpriced, 45 IPO companies were overpriced, and the remaining one IPO was trading at its offer price at the end of the first trading day. As Alford (1992) suggested, if the valuation method is accurate, the absolute prediction errors should approximate to zero. The Table 2 demonstrates that there are 12 companies for which the absolute prediction errors are equal to zero ; so, it means that their valuation method were accurate but they deliberately underpriced their IPOs in which three companies were underpriced and nine companies were overpriced.

According to Table 3, other IPO companies' absolute prediction errors are approximate to zero ; so, 25 of the IPOs were underpriced, eight of the IPOs were overpriced, and one IPO was trading at its offer price. The remaining 67 IPO companies were underpriced or overpriced due to error in the valuation method.

(2) Determinants that Affect the Performance of IPOs : As can be inferred from the Table 3, the value of *R* square comes to be 0.642 or 64.2%. This implies that a 64.2% change in the offer price (dependent variable) of the initial public offer is explained by the variation in the value of all independent variables, that is, sales, net asset value, market adjusted return, debt equity, issue size, and the age of the company.

The Table 4 shows the correlation between all the variables, that is, offer price, debt - equity ratio, age, issue size, *NAV, MAR*, and sales of the IPO company. It can be clearly inferred from the table that the highest correlation is witnessed between the two variables, that is, net asset value and the offer price of the IPO company, which is 0.788 or 78.8% with level of significance being 0.000. These two variables are significantly correlated to each other. Similarly, the second highest correlation is seen between the debt-equity ratio and age variables, that is, .471 or 47.1%, with level of significance being 0.000. On the contrary, no relation at all is witnessed between the two

Table 2. Underpricing and Overpricing of IPOs

Valuation Method	APE (Absolute Prediction Error)	Number of Companies	Underpriced	Accurately Priced	Overpriced
Zero Error	0	12	3	0	9
	0 – 0.04	34	25	1	8
Less Error	0.041 – 0.06	13	5	0	8
	0.061 – 0.19	25	23	0	2
More Error	0.2 – 0.61	10	10	0	0
	(-0.001) – (- 0.34)	19	1	0	18

Table 3. Model Summary

Model	*R*	*R* Square	Adjusted *R* Square	Std Error of the Estimate
1	.801	.642	.622	122.91074

a.Predictors: (Constant), sales, net asset value, market adjusted return, debt equity, issue size, age

Table 4. Relationship Between Offer Price and Independent Variables

Correlation	*Offer Price*	*Market Adjusted Return*	*Debt Equity*	*Issue Size*	*Net Asset Value*	*Age*	*Sales*
Pearson Correlation:							
Offer Price	1	.117	.000	.140	.788	.112	.023
Debt equity	.117	1	.028	.032	.027	.021	.071
Issue Size	.000	.028	1	.022	.132	.461	.022
Net Asset Value	.140	.032	.022	1	.128	.089	.271
Age	.798	.027	.132	.128	1	.230	.007
Sales	.112	.021	.461	.089	.230	1	.144
	.023	.071	.022	.271	.007	.144	1
Sig (1-tailed):							
Offer Price	.109	.109	.499	.070	.000	.118	.405
Debt Equity	.499	.383	.383	.369	.388	.413	.229
Issue Size	.070	.369	.409	.409	.082	.000	.410
Net Asset Value	.000	.368	.082	.088	.088	.175	.002
Age	.118	.419	.000	.007	.007	.007	.471
Sales	.405	.229	.410	.471	.471	.064	.064
N							
Offer Price	113	113	113	113	113	113	113
Debt Equity	113	113	113	113	113	113	113
Issue Size	113	113	113	113	113	113	113
Net Asset Value	113	113	113	113	113	113	113
Age	113	113	113	113	113	113	113
Sales	113	113	113	113	113	113	113

Table 5. Beta and Standardized Coefficients of Independent Variables

Model	Unstandardized Coefficients		Standardized Coefficients	*t*	Sig
	B	Std Error	Beta		
1(Constant)	56.038	19.303		2.903	.004
Offer Price	-2.273	1.653	.091	-1.375	.172
Debt equity	51.244	33.614	.089	1.525	.130
Issue size	-.043	.065	-.040	-.657	.512
Net asset value	2.534	.192	.798	13.207	.000
Age	.000	.002	-.027	-.399	.691
Sales	.000	.001	.024	.390	.697

variables, that is, debt - equity ratio and offer price of the IPO company, that is, 0 with level of significance being extremely weak (0.499).

$$DEGREE\ OF\ OFFER\ PRICE = [56.038 - 2.273\ DEBT\ EQUITY + 51.244\ MAR - 0.043\ ISSUE\ SIZE + 2.534\ NAV + 0.000\ AGE + 0.000\ SALES]$$

Table 6. Summary Statistics of Independent Variables

	Mean	Standard Deviation	*N*
Offer Price	1.8326E2	199.92891	113
Debt equity	2.1181	7.97174	113
Market Adjusted Return	.0995	.34719	113
Issue size	59.5235	186.36	113
Net asset value	53.0782	62.979	113
Age	6.304E3	5928.355	113
Sales	1.7238E3	10975.908	113

The dependent variable, that is, offer price intercept (B_o) is computed as 56.038. This indicates the expected offer price when all values of the independent variable are taken as zero. In other words, this is the offer price when net asset value per share, issue size, age, debt-equity ratio, sales, and market adjusted return are equal to zero.

B_1 is the slope of offer price when *MAR* (market adjusted return) is taken as the independent variable, holding another independent variable constant. From the Table 5, it can be clearly seen that value of B_1 is 51.244, which implies a positive relationship, holding all other independent variables constant ; a 1% change in *MAR* will result in 51.244 times change in the offer price. Similarly, B_2 is the slope of offer price, with debt-equity ratio as the independent variable ; here, the value of B_2 comes out to be -2.273. The negative sign of coefficient B_2 indicates an inverse relationship, that is, keeping other independent variables constant, a 1% increase in the debt-equity ratio will result in -2.273 times predicted decline in the value of offer price and vice- versa.

B_3 is the slope of offer price with issues size as independent variable, holding all other independent variables as constant. B_3 equals to -0.043 as it depicts an inverse relationship ; hence, a 1% increase in the value of issue size will bring -0.043 times predicted decline in the offer price of the IPOs and vice - versa.

B_4 is the slope of offer price with net asset value per share being the independent variable. B_4 equals to 2.534, which implies a positive relationship, that is, with a 1% change in the *NAV*, the forecasted offer price will change to 2.534 times in the same direction while keeping another variable constant. The level of significance of net asset value comes to be 0.000, which implies it has significant impact on offer price.

B_5 and B_6 are the slope of offer price with age and sales as independent variables, respectively. Here, the value of both coefficients is zero, which implies the value of predicted offer price is not affected by any variation in the value of these independent variables.

The Table 6 presents the summary statistics of mean and standard deviation of dependent variable (offer price) and the main independent variables - net asset value, debt equity ratio, market adjusted return, issue size, age, and sales, respectively used in our regression. As can be observed from the Table 6, the mean of offer price is 1.8326 and standard deviation is 199.92891. In addition, the mean and standard deviation of *NAV* are 53.0782 and 62.97960, respectively ; market adjusted return has standard deviation of 0.995 and mean of 0.34719, which is lesser than the other independent variables. The remaining independent variables as issue size, age, and sales have means of 59.5235, 6.3048, and 1.7238, respectively.

Discussion

While studying the relation between valuation errors and deliberate discounting, it is found that out of a total of 113 IPO companies, 67 of the IPOs were underpriced, 45 IPO companies were overpriced, and the remaining one IPO was trading at its offer price at the end of the first trading day. The R^2 of multiple regression analysis depicts a 64.2% change in the offer price (dependent variable) of the initial public offer, which is explained by the variation

in the value of all independent variables, that is, sales, net asset value, market adjusted return, debt - equity ratio, issue size, and the age of the company (Chiu & Sinha, 2010). While studying the correlation matrix between all the variables, that is, offer price, debt - equity ratio, age, issue size, *NAV*, *MAR,* and sales of the IPO company, a significant correlation is witnessed between the two variables, that is, between net asset value and the offer price of the IPO company, which is, 0.788 or 78.8% with level of significance being 0.000. On the contrary, no relation at all is witnessed between the two variables - debt - equity ratio and offer price of the IPO company, that is, correlation being 0 with level of significance being 0.499.

The regression coefficients' analysis reveals the relationship between offer price (dependent variable) and all independent variables - net asset value per share, issue size, age, debt - equity ratio, sales, and market adjusted return. Out of all the variables, an inverse relationship with offer price is witnessed in case of two independent variables only - debt - equity ratio (-2.273) and issue size (-0.043) ; whereas, offer price is found to be independent from the variations that take place in case of age and sales with regression coefficients being 0, respectively.

Recommendations and Conclusion

Investors should consider various factors like age of the company, proportion of debt equity in capital structure, net asset value per share, and sales of the IPO companies before investing. Investors should also consider the method adopted by merchant bank and company to launch an IPO to a new issue market ; also, Indian investors should check the IPO ratings that are now offered by CRISIL and ICRA before investing.

The regulatory authority SEBI should review the accuracy of the offer price of IPO companies in order to assure that the offer price set by the IPO companies reflects their true intrinsic value. When the difference between setting the date of offer price and the start of trading is larger, IPO companies might record a higher closing market price on the first trading day due to general increase in share prices, and the arbitrageurs often take advantage of this situation ; so, in order to control this effect, the IPO companies should consider *MAR* (market adjusted returns).

The study concludes that companies do not fix the offer price as it is fixed by different processes, and it has been observed from the study that those companies which are younger in age have less debt equity ratio, moderate net asset value, and are fairly priced in contrast to older in age IPO companies. Also, it is found that net asset value significantly impacts the offer price.

Limitations of the Study and Scope for Further Research

Appropriate data regarding particular share valuation method used by the IPO companies was not available as it was not disclosed in the red herring prospectus or in any other secondary data documents that were published by the IPO companies. One more limitation is that the study is entirely based upon the secondary data, where it may be possible that the data has been manipulated.

As the R^2 explained by our research analysis shows only a 64.2% relationship between offer price and the independent variables ; hence, other factors like research and development costs, time lag, ownership retention of the companies must be considered in order to study the effect of these variables on the offer price performance. In the present study, the elements corresponding to systematic risk like sub - prime crisis, dividend announcements, mergers and acquisitions announcement, update in SEBI regulations, etc. are assumed to be constant. The different methods (e.g. book building process, auction process, fixed price method, etc.) adopted by merchant banks and companies to launch an IPO may contribute to IPO underpricing, which can be examined in detail by future studies in this area.

References

Alford, A. (1992). The effect of the set of comparable firms on the accuracy of the price earnings valuation method. *Journal of Accounting Research, 30* (1), 94 - 108.

Bateni, L., & Asghari, F. (2014). Study of factors affecting the initial public offering (IPO) price of the shares on the Tehran Stock Exchange. *Research in World Economy, 5* (2), 68 -73.

Bhagat, S., & Rangan, S. (2004). *Determinants of IPO valuation*. Retrieved from http://cep.lse.ac.uk/seminarpapers/01-06-04-BHA.pdf

Cassia, L., Paleari, S., & Vismara, S. (2004). The valuation of firms listed on the Nuovo Mercato : The peer comparables approach. In, *The rise and fall of Europe's new stock markets* (Vol. 10, pp. 113-129). Emerald Group Publishing Limited. doi:10.1016/S1569-3732(04)10005-4

Chan, Y. C., Wu, C., & Kwok, C. C. (2007). Valuation of global IPOs: A stochastic frontier approach. *Review of Quantitative Finance and Accounting, 29* (3), 267 - 284.

Chiu, H.- H., & Sinha, P. (2010). *Valuation and underpricing of initial public offerings: Role of discretionary accounting accruals*. doi=10.1.1.175.6496

Colaco, H. M., De Cesari, A., & Hegde, S. P. (2013). *Retail investor sentiment and IPO valuation.* Retrieved from http://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2013-Reading/papers/EFMA2013_0527_fullpaper.pdf

Demirakos, E. G., Strong, N. C., & Walker, M. (2004). What valuation models do analysts use? *Accounting Horizons, 18* (4), 221- 240.

Demirakos, E. G., Strong, N. C., & Walker, M. (2010). Does valuation model choice affect target price accuracy? *European Accounting Review, 19* (1), 35 -72.

Dimitrios, G. (2004). Associations between management forecast accuracy and pricing of IPOs in Athens Stock Exchange. *Multinational Finance Journal, 15* (3/4), 235 - 272.

Dittmann, I., & Maug, E. G. (2008). *Biases and error measures: How to compare valuation methods.* DOI : http://dx.doi.org/10.2139/ssrn.947436

Fabozzi, F. J. (2008). *Handbook of finance: Investment management and financial management* (Vol. 2). London : John Wiley and Sons.

Guo, R.-J., Lev, B., & Zhou, N. (2005). The valuation of biotech IPOs. *Journal of Accounting, Auditing & Finance, 20* (4), 423 - 459.

Hutagaol, Y., Siauw, F., & Ekaputra, I. A. (2011). The determinants of management forecasts error and the IPO underpricing: A case study of Indonesian IPO. *Journal of Applied Finance and Accounting, 3* (2), 136 -152.

Ibbotson, R. G. (1975). Price performance of common stock new issues. *Journal of Financial Economics, 2* (3), 235 - 272.

Jeon, S. I., & Kim, J. E. (2011). The role of R&D on the valuation of IPO firms. *Journal of International Business Research, 10* (2), 39 - 58.

Kim, M., & Ritter, J. (1999). Valuing IPOs. *Journal of Financial Economics, 53* (3), 409 - 437.

Lie, E., & Heidi, H. (2003). Multiples used to estimate corporate value. *The Canadian Institute of Chartered Business Valuators, 9* (2), 1-33.

Lowry, M., Officer, M. S., & Schwert, G. W. (2010). The variability of IPO initial returns. *The Journal of Finance, 65* (2), 425 - 465.

Murugesu, J., & Santhapparaj, S. (2009). Valuation errors and the initial price efficiency of the Malaysian IPO market. *IUP Journal of Applied Finance, 15* (10), 19 - 38.

Pande, A. (2009). *Studying earnings management in initial public offerings (IPOs) and its impact on IPO pricing in India.* DOI : http://dx.doi.org/10.2139/ssrn.2138717

Ritter, J. R. (1984). The 'hot issue' market of 1980. *Journal of Business, 57* (2), 215 - 240.

Roosenboom, P. (2012). Valuing and pricing IPOs. *Journal of Banking & Finance, 36* (6), 1653 - 1664.

Sehgal, S., & Pandey, A. (2010). Equity valuation using price multiples: A comparative study for BRICKS. *Asian Journal of Finance & Accounting, 2* (1), 68 - 91.

Sohn, C. H., Tsui, A. K., Zhang, F., & Zhang, Z. (2012). An empirical assessment of A-share IPO under-pricing in China. *Seoul Journal of Business, 18* (1), 25 - 57.

Suraj, E. (2014). Value investing using price earnings ratio for public sector bank stocks in India. *Indian Journal of Research in Management, Business and Social Sciences, 2* (2), 64 - 68.

About the Authors

Dr. Inderpal Singh is currently working as Associate Professor and Dean - Research in Department of Management at KCL Institute of Management and Technology, Jalandhar. He has published several research papers in the area of Management in National and International Journals. He has acted as Session Chair and Keynote Speaker in various National and International Conferences.

Er. Anand Nayyar is currently working as Assistant Professor and Head - Research and Developement Cell in Department of Computer Applications and IT at KCL Institute of Management and Technology, Jalandhar. He has published more than 200 research papers and 20 books. He is a certified professional and has acquired various professional certifications from Microsoft, CISCO, Oracle, Exin, Cyberoam, and many more.