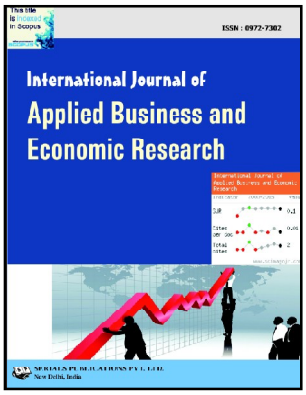

International Journal of Applied Business and Economic Research

ISSN : 0972-7302

available at http: www.serialsjournals.com

Volume 15 • Number 16 (Part - II) • 2017

Underpricing of Initial Public Offerings in Indian Capital Market

Dr. Asha Nadig[1] and Dr. T. Viswanathan[2]

[1] Associate Professor, Symbiosis Institute of Business Management, Bengaluru, (Constituent of Symbiosis International University)
E-mail: asha.nadig@sibm.edu.in
[2] Assistant Professor, Symbiosis Institute of Business Management, Bengaluru, (Constituent of Symbiosis International University)
E-mail: viswanathan@sibm.edu.in

Abstract: IPOs are one of the largest sources of capital for the firms to invest in the growth opportunities. It encourages investment activities in the economy by mobilizing funds from low growth opportunities to high growth opportunities.

It has been observed that IPOs are underpriced in most of the countries (Loughran, Ritter and Rydqvist 1994). Underpricing is pricing an issue at a price lesser than the intrinsic value of the issue. The degree of underpricing is not the same amongst different issues. An underpriced IPO results in loss of capital to the company and a gain to investors who get positive initial returns on the underpriced shares. Though underpricing is a cost for the issuing company, it is generally found that the issuing company underprices the issue.

This paper is an attempt to empirically explore the possible determinants of underpricing of 85 Initial Public Offerings listed in the Bombay Stock Exchange for the period April 2014 to September 2017. The size of the issue, age of the firm, number of times the issue is subscribed (demand multiple), underwriters' reputation and timing of the issue are some of the determinants influencing an IPO.

Keywords: Initial Public Offerings, Underpricing, Subscription, Book building

INTRODUCTION

Initial Public Offerings (IPOs) is one of the major sources of business financing. Fast growing companies raise capital through public subscriptions and fuel their growth requirements. The investors also consider IPOs as a suitable investment opportunity to get good returns.

Empirical studies over the past few years have reported high positive returns on the first day of listing of IPO. It is observed that IPOs have received high first day gains. This feature is referred to as underpricing and has been identified as a robust feature of new issues across the world (Loughran and Ritter (1995).

These gains reflected may be due to external factors and not necessarily the company's intrinsic value which in turn suggests that the IPO is underpriced. Many studies across various markets suggest that underpricing is apparent in both the book building and fixed price band offers.

Book building process is a process used for raising capital through Public Offerings, both initial public offers (IPOs) and follow-on public offers (FPOs) to aid price and demand discovery. A mechanism whereby investors bid for shares in the price range specified by the issuer. After the closing of the bid, the final issue price is decided based on the demand for shares. As there is no predetermined price for the shares, this procedure leads to price discovery.

LITERATURE REVIEW

Studying the long run impact on the share return, Arwah Arjun Madan (2003), conclude that returns are negative between the second and the fifth year after listing.

K. C. John, Sasi Kumar (2010) opine that the IPOs in Indian markets are a reason to cheer about. Retail investors find that the IPO market is a safe and secure investment.

Nitish Ranjan & T P Madhusoodanan (2004) determine that IPOs in India yield abnormal returns in the short run. The abnormal returns is because of the pricing error4s in the issue process. Irrespective of the issues floated on the book building or fixed price mechanism, they are underpriced. In particular, smaller issues are underpriced than larger ones and underpricing is inversely proportional to size. However, signaling equilibrium does not exist in the case of informed investors. High value firms do not signal their value as aggressively as the lower value firms.

Documenting the effect of group affiliation on Indian IPOs, Marisetty and Subrahmanyam (2005) study 2713 IPOs for the period 1990 to 2004, and conclude that underpricing is more prominent in the offers of business group companies than that of standalone companies and private Indian companies' shares are underpriced. The long run performance of IPOs is found to be negative and also, the investors were found to over react to IPOs which translates to the extent of underpricing.

Reviewing the difference caused due to allocation, Pandey (2004) studied a sample of 20 book building method and 64 fixed priced IPOs in the 1999-2000 period and found that the initial returns were higher on fixed offer pricing. This study is of particular significance as fixed price method was used for allocating of IPOs until 1999 and later both fixed price and book building is allowed.

Analyzing 107 companies coming out with IPOs in the financial year 2007-08, found that new issue market is dominated by private companies. The study also found that of these 107 issues, 86 companies listed on BSE and NSE reported positive returns and the rest were found to be giving lower returns. The study also came with an interesting conclusion—a company, Global Broad Caste News Ltd, gained more than 88% in financial year 2007-08. The study also pointed out that companies' performances and market forces are reflected stock prices.

Pande Alok and Vaidyanathan R (2008) observed the pricing of IPOs in NSE. They point out that the first day underpricing was caused due to three reasons, (a) the demand generated during the book building phase of the issue, (b) the listing delay between the book building closure date and the first day listing of the issue and (c) the money spent on the marketing activities of the IPOs by firms. The post IPO

returns for 1 month in the NSE for the reasons mentioned above were also analyzed. The study concluded that there were positive effects on the demand generated for an issue during the book building process and the listing delay, whereas the marketing activities did not have any effect.

The long term performance of US companies after IPO were reviewed by Akhigbe et al in 2006. They reported that the mean of 1, 2 and 3 year buy and hold abnormal returns were -27.07%, -19.05% and -10.16% respectively and the returns found to be statistically significant at 1% significance levels.

A similar study was conducted by Shelly and Singh in 2008. They studied the factors affecting the initial returns after oversubscription. 1963 fixed price IPOs for the period July 1992 to August 2006 were studied. It was reported that on an average, IPOs are underpriced by about 70%. The reputation of the lead manager, company's age and initial returns are some factors influencing the subscription of IPOs. Large IPOs were found to be less underpriced and IPOs of older firms were also underpriced than the younger ones.

Evaluating the price performance of 92 Indian IPOs during the period 2002 to 2006, Sahoo & Rajib (2010) report that on an average, the IPOs as compared to the market index are underpriced (listing day return vis a vis issue price) by 46.55% on the listing day.

The study also concluded that investors investing through direct subscription earned a positive market adjusted return and investors buying shares on the listing day earned negative returns for 12 months from the listing date. Thereafter, they earned positive market-adjusted returns. The research summarized by concluding that underperformance was more pronounced in the initial year of trading.

However, contrary to this, the post-performance of IPOs issued through the book building route in India for the period 1999 to 2006 was examined by Kumar (2007). He studied a sample of 156 firms listed on NSE for the period 1999 to 2007 and came to a conclusion that larger issue prices lead to less underpricing of IPOs. Another inference of the study was that IPOs offer positive returns immediately after listing and in the long run.

Vaidyanathan (2007) studied 55 IPOs of Indian companies for the period March 2004 to October 2006 and found that a delay in listing has a positive impact on the first day performance of IPO whereas the money spent on marketing activities does not have any significant impact on performance.

The performance of the Indian IPOs between April 2001 and March 2009 was researched by Deb & Mishra (2009). The results of the study show that positive returns accrue to investors on the listing day. They also conclude that IPOs in the long run yield a return equal to the market if the initial return is ignored.

OBJECTIVES OF THE STUDY

- To ascertain the factors that contribute to the underpricing or overpricing of IPO in India
- To examine the performance of the IPO's in the market during the financial year 2014-2017

Scope of the proposed study

The scope of the study is limited to only the IPOs during the years May 2014 and September 2017.

DATA AND METHODOLOGY

For the study, a sample size of 72 companies seeking public subscription through book building process in 3 years, between May 2014 and Sep 2017 are chosen. The IPOs across all sectors are considered. 6 independent variables (Market returns for 15 days from the listing date), IPO Issue Size, age of the company coming out with an IPO, the number of times the IPO is subscribed (oversubscription or demand multiple), underwriter's reputation, beta of the market and timing of the IPO are considered.

Literature reviews reveal that there are other control variables like size (SIZE); age (AGE); underwriter's reputation (UR); oversubscription (DM); beta of the market (Beta) and timing of the IPO (period). Therefore, in addition to the 5 explanatory variables listed above, these 8 control variables are also considered. The combined effect of the explanatory variables is examined using a multivariate regression model and the ones that are significant are determined to describe the IPO underpricing level.

The multivariate equation is as below: $MAIRi = \alpha + \beta 1 SIZEi + \beta 2 AGEi + \beta 3 URi + \beta 4 DMi + \beta 5 BETAi + \beta 6 period + \varepsilon i$

A set of multiple regression models is run and the initial performance on the first day of trading is measured using the formula

Initial Return (IR) = $(P_{i,1} - P_{i,0}) / P_{i,0}$

Where $P_{i,0}$ is the offer price of company *i*, and $P_{i,1}$ is the first day closing price.

This equation is used in perfect market conditions where the opportunity costs are nil and there is no time lag between the subscription closing date and the first day of trading. However, the period between subscription closing date and first trading day is witnessed by many changes in the market. Therefore, the market adjusted initial return (MAIR) is calculated with the equation:

$$\mathbf{MAIR}_{i,t} = \{(P_{i1} - P_{i,0})/P_{i,0}\} - \{(M_{i,j} - M_{i,0})/M_{i,0}\}$$

Where MAIR is the market adjusted initial return on the first day of IPO listing, $M_{5ØVÜ,0}$ is the market index at the end of the subscription period, $M_{5ØVÜ,1}$ is the market index at the end of first trading day.

Both the underpricing methods are studied in this research, though market adjusted initial return is a better indicator.

Hypotheses

The relationship between underpricing and the explanatory variables is tested by using the Ordinary Least Squares (OLS) regression model. After going through the available literature on IPO, the following 6 variables are finalized.

(a) Size

The syndicate size is another factor having a crucial role in the price of an IPO. Large syndicates help in bigger post IPO activities. The size of the issue is an indicator of an IPOs success.

$H_0$1: There is no relationship between the issue size and initial returns

(b) Age

Dewenter et al, (2001) and Chemmanur (1993) report that firm specific factors such as age are also critical in determining the degree of IPO underpricing. Age is a pointer to an IPOs success. It is generally believed that older firms have more successful IPO.

$H_0$2: There is no relationship between a firm's age and initial returns.

(c) Underwriter's Reputation

Involvement of underwriter in the process of IPO has significant impact on the pricing, after market liquidity and price stabilization process in the secondary market. Studies in the extant literature explored influence of underwriter reputation on IPO underpricing. It is found that well reputed underwriters are able to price the issue more accurately and attract long term investors. Carter and Manaster (1990) found that offerings by well reputed underwriters are associated with less risk and result in lower degree of underpricing. Therefore, if the issue is associated with well reputed underwriters, the investors are confident about the investment in that issue. In addition, reputed underwriters use their clientele to make the issue successful Carter (1992); Dunbar and Craig (2000); Beatty and Welch (1996), Carter and Dark (1998)). Hence, well reputed underwriters are successful in reducing the degree of IPO underpricing. Therefore, selection of an underwriter is pivotal in the process of IPO issuance.

$H_0$3: There is no risk and no low initial returns for IPOs managed by reputed underwriters. (Carter and Manaster, (1990); Booth and Chua, (1996); Johnson and Miller, (1988).

(d) Demand Multiple (DM)

The number of times the IPO is subscribed is the Demand Multiple. The closing price on the listing day will rise and consequently result in high initial returns to the investors if the demand exceeds supply.

$H_0$4: There is no positive influence of the level of oversubscription on the initial return (Rock, 1986; Keloharju, 1993;.

(e) Beta or Market condition

(MC) which is represented by the volatility (standard deviation, of daily returns of the BSE index over 15 days before the day of listing). High index volatility is an indicator of uncertainty reflecting the pessimism about IPOs.

$H_0$5: There is no relationship between good market condition and initial return (Beatty and Ritter, (1986); McGuinnes, (1992); Kumar, (2007).

(f) Market Timing

The decision of "When to issue initial equity offering?" is quite critical for the issuer. Market timing theory justify the decision of issuer based on market timing by considering different market parameters such as volatility, number of IPOs belonging to the same industry and IPO volume in the market.

Market timing of IPO is differentiated into "Hot" and "Cold" market period. In hot market period large number of firms issue IPOs. Ritter (1984) studied 1028 IPOs from 1977 to 1982 and observed that the period of January 1980 to March 1981 was hot market period (325 issues) with the mean underpricing of 48.4% as compared to 16.3% during other time period. Through time series analysis they analyzed two types of industries – 1) industry heavily dependent on natural resources (oil and gas) and 2) industry that is referred as non-natural. Both types of industries showed positive correlation between risk and average degree of underpricing

It is seen that during some times of a year, the markets are flooded by many IPOs which is referred as the hot issue periods and sometimes there is a lull in IPOs which is referred as the cold issue periods (Ritter (1984)). During a hot issue period, there is a lot of optimism about the issuer's future performance and is often oversubscribed. The initial return of IPOs listed in hot periods is expected to be higher than the one of IPOs listed in cold periods (Ritter, 1984.

$H_0$6: The initial IPOs returns listed in hot periods are not higher than the ones listed in cold periods.

RESULTS

(i) Collinearity test

	Variance Inflation Factor
Intercept	
Size	1.38989802
Age	1.02012234
DM	1.21903984
UR	1.3302274
Beta	0

Variance Inflation Factor (VIF) test is performed to study the collinearity amongst the independent variables. VIF is a measure to check the degree to which the variance of the estimated regression coefficients is inflated in comparison to the predictor variables that are not linearly related. The level of correlation between multi-collinearity predictors in the regression analysis is described by this test.

In this study, we find that all independent variables, size, age, demand multiple and underwriter's reputation have values above 1, but less than 5 which indicates that the variables are moderately correlated.

(ii) Multi Variate Regression Analysis

The multi variate regression equation is run twice—one on the entire set of 72 IPOs during the period of study and second, on the data whose issues are oversubscribed by more than 20 times—29 IPOs. This is done to understand if the company's name is a factor having an influence on the number of times the shares are over-subscribed.

(a) Summary Output of the Entire Data Set

Regression Statistics

Multiple R	0.678046557
R Square	0.459747133
Adjusted R Square	0.409877638
Standard Error	0.2420488
Observations	72

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	3.240717511	0.54012	9.219005124	2.67112E-07
Residual	65	3.808195414	0.058588		
Total	71	7.048912925			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.153685028	0.20162741	0.762223	0.448684094	-0.248992716	0.55636277	-0.24899272	0.55636277
Size	-0.040154085	0.034293191	-1.17091	0.245911519	-0.108642317	0.02833415	-0.10864232	0.02833415
Age	-0.001032014	0.001843443	-0.55983	0.577520017	-0.004713623	0.0026496	-0.00471362	0.0026496
DM	0.00406451	0.000691824	5.875065	1.58631E-07	0.002682843	0.00544618	0.00268284	0.00544618
UR	0.054795893	0.02133332	2.568559	0.012518071	0.012190312	0.09740147	0.01219031	0.09740147
Beta	0.012755182	0.024980965	0.510596	0.611363715	-0.037135249	0.06264561	-0.03713525	0.06264561
period	-0.061769344	0.066256267	-0.93228	0.354642277	-0.194092247	0.07055356	-0.19409225	0.07055356

Summary of the hypothesis

Variable	*P value*	*Conditional value test*	*Hypothesis*	*Remarks*
Issue size	*0.245912*	*0.25>0.05*	*Accepted*	*IPO issue size has a significant impact upon IPO performance*
Age	0.57752	0.58>0.05	Accepted	Age has a significant impact upon IPO performance
DM	1.59E-07	1.59>0.05	Accepted	Demand multiple has no significant impact upon IPO performance
UR	0.012518	0.01<0.05	Rejected	Underwriter's reputation has a significant impact upon IPO performance
Beta	0.611364	0.61>0.05	Accepted	Beta has a significant impact upon IPO performance
Period	0.354642	0.35>0.05	Accepted	Period has a significant impact upon IPO performance

The impact of independent variables on the dependent variable (whether significant or non- significant) are studied and the values are given in the above table. The independent variables having values more than 0.05 signify that they do not have significant impact on the IPO returns.

The results of the multi variate regression analysis on the entire data set reveal that $H_0$4, underwriters' reputation, is the only variable which is rejected. Underwriters' reputation has a positive influence on the level of oversubscription and the initial returns.

The other 5 null hypotheses, $H_0$1, $H_0$2, $H_0$3, $H_0$5 and $H_0$6, are accepted, the variables being, issue size, age, demand multiple or the number of times the issue is subscribed, beta and the period of offer. These variables do not have significant impact on the performance of IPO.

(b) Summary Output of the Partial Data Set

Regression Statistics

Multiple R	0.766070966
R Square	0.586864724
Adjusted R Square	0.474191467
Standard Error	0.334444911
Observations	29

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	3.495566692	0.582594	5.208554	0.001806
Residual	22	2.460774774	0.111853		
Total	28	5.956341466			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.021911916	0.652359755	-0.03359	0.973508	-1.37482	1.330999	-1.37482	1.330999411
Issue Size	-0.028716635	0.125716622	-0.22842	0.821427	-0.28944	0.232004	-0.28944	0.232003682
Age	-0.000689583	0.003983599	-0.17311	0.864151	-0.00895	0.007572	-0.00895	0.007571896
DM	0.00564006	0.002251294	2.505253	0.020135	0.000971	0.010309	0.000971	0.010308957
UR	0.116453721	0.054547154	2.134918	0.044154	0.00333	0.229578	0.00333	0.229577594
Beta	0.026709551	0.053139122	0.502634	0.620216	-0.08349	0.136913	-0.08349	0.136913345
Period	-0.228276289	0.214654204	-1.06346	0.299107	-0.67344	0.216889	-0.67344	0.216889283

Summary of the hypothesis

Variable	*P value*	*Conditional value test*		*Hypothesis* *Remarks*
Issue size	0.82142685	0.821>0.05	Accepted	IPO issue size has a significant impact upon IPO performance
Age	0.86415129	0.86>0.05	Accepted	Age has a significant impact upon IPO performance
DM	0.02013476	0.02<0.05	Rejected	Demand multiple has no significant impact upon IPO performance
UR	0.04415376	0.04<0.05	Rejected	Underwriter's reputation has no significant impact upon IPO performance
Beta	0.62021584	0.62>0.05	Accepted	Beta has a significant impact upon IPO performance
Period	0.29910735	0.29>0.05	Accepted	Period has a significant impact upon IPO performance

In the second multi variate regression analysis on the partial data set which had a demand multiple of more than 20 times, a total of 29 observations were found. This analysis reveals that 2 hypotheses, $H_0$3 and $H_0$4 are rejected. The variables, demand multiple (oversubscription) and underwriters' reputation have a significant impact on the performance of IPO and initial returns, while the other hypotheses, $H_0$1, $H_0$2, $H_0$5 and $H_0$6 are accepted. Issue size, age, beta of the market and period have no impact on the performance of IPO and their returns.

CONCLUSION

The stock markets regard the final offer price set by the book building process as a signal for the firm's pricing policy. The general mood of some investors is that the IPOs are low hanging fruits. Getting shares allotted through IPO processes and flipping them on the listing day help them earn returns higher than the market.

This study examines the variables like issue size, age of the company coming out with an IPO, the number of times the IPO is subscribed (oversubscription), underwriter's reputation, beta of the market and timing has an impact on the listing day underpricing of an IPO. Macro-economic factors like the global and political issues also play a prominent role in the success of an IPO. 72 IPOs listed in the Bombay Stock Exchange during 2014 to 2017 are considered and the multi variate regression equation is run twice—(i) on the entire set of IPOs during the period under study and (ii) on the set of IPOs whose issues are oversubscribed by more than 20 times.

The results of the first data set analysis suggest that issue size, underwriters' reputation and timing of the issue are not significant variables. However, age of the company, market conditions and oversubscription are important variables contributing to underpricing.

The second data set analysis prove that underwriters' reputation, number of times an issue is oversubscribed and market timing are not important contributors to underpricing, whereas, issue size, age of the company and market beta are important variables contributing to underpricing.

These results are in consonance with the existing studies on the post IPO performance.

Areas for possible research

The study did not focus on the allocation pattern of shares between the retail and institutional investors which to a great extent determines the degree of underpricing. Secondly, the flipping behavior of the retail and institutional investors is also not considered. These are the areas of possible future research.

REFERENCES

Akhigbe. A, Johnston. J and Madura. J (2006). "Long term Industry Performance following IPOs", The Quarterly Review of Economics and Finance, Vol 46, No 4, 638-651.

Arwah Arjun Madan (*2003*). Investments in IPOs in the Indian Capital Market, Bimaquest, Bimaquest - Vol. III Issue 1, January 2003.

Beatty, R. and Ritter, J. R. (1986). Investment banking, reputation, and the underpricing of initial public offerings. Journal of Financial Economics, 15, 213-232.

Beatty, R., and I. Welch, (1996). Issuer Expenses and legal liability in Initial Public Offerings, *Journal of Law and Economics,* Vol. 39, pp. 542-602.

Booth, J. R. and L. Chua, (1996). Ownership Dispersion, Costly Information and IPO Underpricing, *Journal of Financial Economics,* Vol. 41, No. 2, pp. 291-310.

Carter, R. and S. Manaster, (1990), Initial Public Offerings and Underwriter Reputation, *Journal of Finance,* Vol. 45, No 4, pp. 1045-1067.

Carter R B (1992), Underwriter Reputation and Repetitive Public Offerings, Journal of Financial Research, 15(4), 341-354.

Carter, Richard B., Frederick H. Dark, and Ajai K. Singh (1998), "Underwriter Reputation, Initial Returns, and the Long-Run Performance of IPO Stocks", Journal of Finance 53, 285-311.

Chemmanur T. J., (1993), The Pricing of Initial Public Offerings: A Dynamic Model with Information Production, *journal of Finance,* Vol. 48, No. 1, pp. 285-304.

Dewenter. K, Malatesta, P., (1997). Public offerings of state-owned and privately-owned enterprises: an international comparison. Journal of Finance 52, 1659–1679.

Dewenter, K., Novaes, W., Pettway, R. H., (2001). Visibility versus complexity in business groups: evidence from Japanese keiretsu. Journal of Business74,79–100.

Dunbar, Craig G. (2000). "Factors Affecting Investment Bank Initial Public Offering Market Share", Journal of Financial Economics 55, 3-41.

Loughran, T; Ritter, J and Rydqvist, K (1994). "Initial Public Offerings: International Insights," Pacific-Basin-Finance Journal, 2, 165-199.

Loughran, T. and Ritter, J. R. (1995). "The New Issues Puzzle", Journal of Finance, 50: 23–51. doi:10.1111/j.1540-6261.1995.tb05166.x

Johnson J M and Miller R E (1988). Investment Banker Prestige and the Underpricing of Initial Public Offerings, Financial Management, 17(1), 19-29.

K. C. John and Sasi Kumar (2010). "Indian Primary Market – A Review", International Journal of Contemporary Business Studies, Vol. 1, No. 1, Page 6.

Keloharju M (1993). Winner's Curse, Legal Liability and the Long Run Price Performance of Initial Public Offerings in Finland, Journal of Financial Economics, 34(2), 251-277.

Kumar SSS (2007). "Short and Long run Performance of Bookbuilt IPOs in India", International Journal of Management Practices and Contemporary Thoughts, Vol. 2, No. 2, Pages 20-29.

Deb, S. G., & Mishra, B (2009).

Long-Term Risk-Adjusted Performance of Indian IPOs. Bhubaneswar.

Nitish Ranjan & T P Madhusoodanan (2004) "IPO underpricing, issue mechanism and size", Social Science Research Network E-Library, SSRN ID 520744.

Marisetty, Vijaya & Subrahmanyam, Marti (2010). Group affiliation and the performance of IPOs in the Indian stock market, Journal of Financial Markets. 13. 196-223. 10.1016/j.finmar.2009.09.001.

McGuineness P (1992), An Examination of the Underpricing of Initial Public Offerings in Hong Kong, 1980-1990, Journal of Business Finance and Accounting, 19(2), 165-186

Pandey, Ajay (2004). Initial Returns, Long Run Performance and Characteristics of Issuers: Differences in Indian IPOs Following Fixed Price and Book building Processes", working paper, Indian Institute of Management Ahmadabad, Ahmadabad.

Ritter, Jay R. (1984). "The Hot Issue Market of 1980", Journal of Business 57, 215-240.

Rock K., (1986). Why New Issues are Underpriced, *Journal of Financial Economics,* Vol. 15, No 1-2, pp. 187-212.

Shelly and Singh, B (2008). "Oversubscription and IPO Underpricing: Evidence from India," ICFAI Journal of Applied Finance, 14(12), 65-73.

Seshadev Sahoo and Prabina Rajib (2010). "After Market Pricing Performance of Initial Public Offerings (IPOs): Indian IPO Market 2002-2006", Vikalpa, Vol 35-4, October – December 2010, 27-43.

Vaidyanathan R. & Alok Pande (2008). "Determinants of IPO Underpricing in the National Stock Exchange of India", Social Science Research Network E-Library, SRRN ID 1081272.