

Role of Uncertainty in Explaining Underpricing of IPOs in Emerging Market

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Abstract

Objectives: The study examines the role of uncertainty in explaining underpricing (i.e., over performance) of IPOs immediately after listing in the context of the Indian IPO market over the study period 2000-01 to 2015-16.

Methods: We have collected data through different sources, like, Prime Database, CMIE Prowess, the official websites of BSE and NSE. For the purpose of evaluating the objectives of the study, ordinary least square (OLS) method is used to estimate parameters.

Findings: The study shows that there is a monotonic relationship between uncertainty among investors regarding the firm value and underpricing of IPOs. We see that the small issues being speculative are associated with higher uncertainty. Further, it is also observed that the degree of uncertainty is higher in the period of economic meltdown compared to the normal period.

Applications: From the estimated results of the study, it is apparent that underpricing of IPOs is persistent in India immediately after listing. Further, it is also appeared that uncertainty is deep-rooted with information asymmetry. Higher the degree of information asymmetry among the investors higher will be the underpricing of IPOs.

Keywords: Uncertainty, Investors, underpricing of IPOs, Indian IPO market.

1. Introduction

Pricing of IPOs is one of the most unresolved areas of corporate financial theory and practice. Globally, IPOs are, on an average, underpriced immediately after listing. Hence, initial investors of IPOs enjoy the comparative advantage of receiving IPOs at a lower price. Price or return of any asset is closely associated with its uncertainty. But uncertainty is deep rooted with the market structure. To be specific, uncertainty plays vital roles in both the sides—supply side and demand side of the market. The supply side uncertainty is associated with issuers of the IPOs and underwriter/s associated with the issue. Before and after road show issuers as well as underwriters are also uncertain about the final demand for the IPOs. However, once trading starts the supply side uncertainty goes down and finally disappears. However, the perpetual uncertainty among the investors takes a long time to incorporate with the market [1] in his adverse selection model assumes that some investors, classified as informed investors, may know the correct value of the firm with certainty and these investors purchase only those IPOs whose offer price is less than its correct (or, intrinsic) value. But this will create a negative externality to uninformed general investors who have no perfect information regarding the value of the firm and these uninformed investors may adversely select the overpriced IPOs. Generally uninformed investors get full allotment (equal to their applied no. of shares) of overpriced IPOs, but informed investors get allotment of underpriced IPOs on a proportionate basis (i.e., if applied number of shares is four times of the issue size, each will get one-fourth of their shares initially applied for). In the financial literature this is termed as the winner's curse. To compensate the general uninformed investors for their adverse selection, IPOs should be underpriced. Several studies witness the similar view and support [1] winner's curse theory. In presence of information asymmetry, the market remains highly uncertain. The problem of information asymmetry and uncertainty among investors are two sides of the same coin. It is quite natural that higher risk is associated with higher return to be derived by the investors after listing.

In this study, we empirically examine how the uncertainties among investors affect underpricing of IPOs. The remainder of this paper is organized as follows: Section-2 covers the review of the existing literature along with identification of research gaps and also the objectives and the hypotheses of the study. Section-3 deals with database and methodology used in the study. Section-4 presents analysis and discussion of the results. Section-5 provides a summary, conclusion and limitations of the paper.

2. Literature survey

Notable scholars and academicians in the context of the developed market provide a number of theoretical models and empirical findings on mispricing of IPOs. Researchers, like, [2-7] and others have documented that IPOs are, on an average, underpriced. These scholars made their studies mainly in the context of the U.S market. In India, IPO literature is relatively new one. There are a number of studies, which have focused on many stylized features of the Indian primary market and a few research questions are taken into consideration in the context of its underpricing phenomenon.

In a study [8] has documented that IPOs are, on an average, underpriced in the Indian context during the period January 1991 to April 1995. The study observed that the quantitative magnitude of underpricing is as high as 105.6%. [9]. Have also found that the Indian IPOs are, on an average, underpriced. Further, [10-15] have investigated underpricing phenomenon in the Indian market and have documented the similar pattern of underpricing of IPOs.

1. Research gaps

From the review of existing literature, it appears that over the years pricing of IPOs becomes one of most important issues among the policy makers as well as researchers worldwide. Already a number of research studies have been made in order to quantify the magnitude as well as to justify the reasons behind the mispricing of IPOs. By examining the trend and pattern of the IPO pricing mainly in the developed countries, various theories have been formalized by the researchers that provide insights into the factors responsible for volatile and uncertainty in price movements of IPOs.

Firstly, from the review of the existing studies in the Indian IPO market, it appears that only a few researchers have paid their attention to measure the magnitude of mispricing of IPOs here in both the short and the long run for a relatively longer the study period, (for our case 2000-01 to 2015-16).

Secondly, we get almost hardly serious study in India that provides explanations of short run mispricing of IPOs. There arises the need of explaining short run underpricing of IPOs in India on the following counts:

Small IPOs are generally speculative in nature and high risk is associated with them. In India, a good number of small companies are found to raise money through IPOs. Hence, uncertainty is highly prevalent in the Indian IPOs. Consequently, one should give much importance to *ex-ante* uncertainty in examining underpricing of IPOs in India.

We have made a modest attempt to cover up these gaps in the study.

2. Objectives and Hypotheses

In the study, we like to examine the nature of pricing of IPOs in the context of the Indian primary market. Now relating to this basic research problem, we have set the following research questions as objectives of our study for enquiry:

1. What is the nature of pricing of the IPOs in the Indian Primary Market immediately after listing?
2. Does uncertainty in IPO affect its underpricing? Further, how does uncertainty to investors affect underpricing phenomenon in pre-recession, recession and post-recession periods?

We can classify the objectives in terms of following hypotheses.

1. IPOs are, on an average, underpriced in India in the short run.
2. The higher is the degree of uncertainty regarding the firm value of IPOs in India, higher will be the level of its underpricing.
3. The effect of uncertainty to investors in explaining underpricing phenomenon is higher in the recession period compared to that in pre-recession and post-recession periods.

3. Database and Methodology

In order to collect reliable secondary data, we have used different data sources separately and finally, we have selected all the data series after their cross-examinations and cross verifications corresponding to their different available sources. More specifically, in order to conduct our data collection for the study smoothly, firstly, we focus on the historical database of Bombay Stock Exchange (BSE) and National Stock Exchange (NSE), PRIME Database and Draft Prospectus.

Prime Data base reports that 586 companies were listed during the study period, 2000-01 to 2015-16 in the Indian Stock Exchanges (like, BSE, NSE & other regional stock exchanges). Indian firms can be listed on multiple stock exchanges simultaneously. Generally, all the issuing firms prefer Bombay Stock Exchange (BSE) and National Stock Exchange (NSE).

Underpricing of IPOs has been estimated on the basis of return of IPOs immediately after the listing. It is computed as percentage difference between first day market closing price on listing date and offer price:

$$\text{Underpricing (U)} = [(CP_t - OP) / OP] * 100$$

Where CP_t is the first day (i.e., listing day) market closing price, OP represents the offer price of IPOs. This underpricing is alternatively regarded as unadjusted underpricing or raw return or first day return of an IPO. Besides, we have alternatively used market-adjusted return and period-adjusted return of IPOs. Market-adjusted return of any IPO is computed as the difference between raw return (as defined above) after 21 days (when the IPOs are presumed to be stable) and the corresponding market return, i.e.,

$$\text{Market-adjusted Return} = \text{Raw Return of IPO} - \text{Market Return}$$

We have also computed period adjusted return of an IPO dividing it raw return by holding period. Here, holding period implies the number of days between date of payment for IPO (by the investors) and listing date. Here, we have calculated market return on the basis of return on Nifty.

In our study, mainly using OLS we have estimated a number regression equations. Further, in order to explain role of uncertainty in explaining underpricing of IPOs, like, earlier researchers [16], our focus is on gross proceeds of IPOs. In order to examine the role of uncertainty factor on underpricing of IPOs, we have used reciprocal of gross proceeds. In functional form the relationship can be written as: $U = f(1/\text{Gross proceeds})$ and the regression model is specified as follows:

$$\text{Underpricing}_i = a + b * \text{reciprocal of gross proceeds}_i + \varepsilon_i \dots \dots (1)$$

Here, ε_i represents the disturbance term, which is assumed to be white noise. Here it is also postulated that larger (smaller) the firms having higher (lower) gross proceeds, lower (higher) will be the risk. So, uncertainty can be represented by the proxy variable, reciprocal of gross proceeds.

Also, we have extended our analysis by considering whether market timing along with uncertainty factor has any effect on underpricing phenomenon. In order to capture the role of market timing we have employed a dummy variable, namely, timing dummy. We have subdivided our analysis into two different periods—pre-recession period covering from 2000-01 to 2007-08 and later period of recession, i.e., from 2008-09 to 2015-16. The timing dummy takes value one for the pre-recession period and zero otherwise. Therefore, our revised regression model is:

$$\text{Underpricing}_i = a + b * (\text{reciprocal of gross proceeds})_i + c * \text{market timing dummy}_i + \varepsilon_i \dots \dots (2)$$

4. Analysis of results

This section is mainly devoted to examine the stated hypotheses. Firstly, we are considering the nature as well as quantitative magnitude of underpricing of IPOs over the study period. The next sub-section focuses on the role of uncertainty in explaining mispricing of IPOs.

1. Nature and quantitative magnitude of mispricing of IPOs

The nature of pricing of IPOs is measured in two different ways viz. nominal measure and monetary measure. The nominal measure of underpricing is reported in percentage term. In this measure underpricing of IPOs is computed as the percentage difference of first day market closing price from its offer price. On the other hand, money left on the table is defined as first day price gain (which is measured by the difference between first day market closing price and offer price, multiplied by number of shares issued). This is simply the monetary return of IPOs. Therefore, it is nothing but the money value of underpricing. It is seen from Table 1 that in nominal measure, average underpricing during the study period is 26.43% per year whereas in monetary measure the year wise average money left on the table during the same period is INR 327 million crore.

Table 1. Nature of pricing of IPOs

Year	No. of Observations	Percentage Measure of Underpricing		Monetary Measure of Underpricing (MLOT)	
		Average Underpricing	CV	Money Left on Table (INR Million)	
				Average MLOT	CV
2000-01	52	26.33	201.73	14.81	714.53
2001-02	4	274.69	203.74	160.77	193.19
2002-03	6	19.81	124.21	272.11	232.35
2003-04	12	61.37	112.49	719.34	107.75
2004-05	21	52.30	108.12	830.49	188.00
2005-06	76	37.82	123.16	399.44	209.98
2006-07	74	15.96	284.75	442.18	466.31
2007-08	82	39.92	150.42	774.56	494.82
2008-09	21	11.98	479.55	-33.49	-1462.71
2009-10	39	8.16	280.39	106.61	643.10
2010-11	49	14.75	230.31	96.40	535.09
2011-12	31	1.28	4325.09	-27.78	-177.60
2012-13	8	-1.45	-528.63	-473.68	-323.23
2013-14	1	26.08	--	472.70	--
2014-15	5	20.83	145.34	793.89	138.08
2015-16	19	0.81	1897.82	3.92	18010.69
All	500	26.43	263.52	327.51	569.12

From Table 1, it is also seen that in all the years during the study period, the IPOs have been underpriced except the year 2012-13 in which we actually observe overpricing of IPOs. However, the magnitude of overpricing is as low as 1.45%. Moreover, this overpricing occurs in the country in 2012-13 mainly due to fall in Indian rupee value in terms of foreign currency, excessive fiscal deficit, volatility in exchange rate etc. But the general phenomenon in the Indian IPO market is the underpricing of IPOs. Moreover, the extent of underpricing was highest (274.69%) in 2001-02 when, however, only four IPOs were issued and that was lowest in the year 2015-16 (0.81%). Again, we observe wide variations of underpricing of IPOs in the years 2011-12 and 2015-16 when the respective values of the coefficient of variation are 4325.09 and 1897.2. In the other years, underpricing among IPOs remains more or less stable having year-wise moderate values of C.V. Strictly speaking, C.V is found to be low having values less than 150 in the years, like, 2002-03, 2003-04, 2004-05, 2005-06 and 2014-15. Therefore, we may conclude that underpricing of IPOs in India is a commonly observed phenomenon and that remains year-wise more or less stable among IPOs. From Table 1, it is also seen that in all the years of the study period except (2011-12 and 2012-13), IPOs left significant amount of money on the table. The money left on the table was highest in 2004-05 where firms left almost INR 830 million on the table.

The magnitude of money left on the table was also higher in the years, like, 2003-04 and 2007-08. During these years, many Indian companies were listed; the period might be termed as boom for the Indian IPOs and most of the successful IPOs in these years left high amount of money on the table. However, during the recession, boom of IPO market had been faded out. During 2008-09, IPOs actually acquired (which is the reverse of the 'money left on table') INR 33 million which was, however, not so high in comparison to loss of the secondary market. In the later period of recession, the market tended to rise. In 2009-10 and 2010-11, IPOs left INR 106 million and INR 96 million respectively. However, as a result of uncertainty in post-recession period, (i.e., in the years 2011-12 and 2012-13) also IPOs acquired money from the table. Again, we witness massive dispersion in the money left on the table by IPOs in 2000-01 and 2009-10 when the respective values of the coefficient of variation are 714.53 and 643.10. Again it was highest (18010.69) in the year 2015-16. But out of 16 years, however, C.V. in money left on table was low (having values less than 600) in as many as 11 years. Therefore, we may conclude that money left on the table among IPOs was positive (having average value of INR 327.51 million) and that remained more or less stable.

In the last one and half decades, global economy faced so many difficulties. The hardest moment arrived with global economic meltdown in 2007-08. Almost all the global markets were highly affected by the financial meltdown. The Indian IPO market was also documented slump during that time period. In order to capture the effects of recession, we divide the study period into three phases – pre-recession period, recession period and post-recession period. By pre-recession period, we consider the period from 2000-01 to 2007-08. However, the effects of recession were realized after a year lag. Hence, the period 2008-09 to 2009-10 is regarded as recession period and the latter phase is known as post-recession period.

2. Role of uncertainty in the explanation of Underpricing of IPOs

In this section, the basic assumption is that there is no agency conflict between issuer's and underwriters. To measure the rationality behind underpricing the initial focus is on information asymmetry based explanations where like issuers and underwriters only a part of investors know the value of the firm whereas the other segment of investor are unable to know the firm value. Hence, there is uncertainty among investors regarding the value of the firm. To measure the role of uncertainty on underpricing of IPOs, the underpricing of IPOs (or, first day return) is regressed on the uncertainty factor. In order to measure uncertainty, the proxy variable, reciprocal of gross proceeds (like earlier studies) is taken into consideration. Gross proceeds are defined as product of offer price and number of shares offered. Here, we have used inflation adjusted gross proceeds in order to neutralize the effect of inflation. Firms' quality can be measured by its offering size as evidenced from standard IPO literature [16] and others have suggested that higher gross proceeds is an indicator of better firm's quality. Hence, smaller offerings are more risky and speculative compared to bigger sized offer. Therefore, reciprocal of gross proceeds captures ex-ante uncertainty associated with IPOs. In [16] have used 'number of uses of gross proceeds' along with 'reciprocal of gross proceeds' as two proxies of uncertainty in the same regression. But two separate proxy variables (namely, reciprocal of gross proceeds, number of uses of gross proceeds) representing same factor uncertainty should not be used in the same regression equation to avoid interpretation problem and mis-specification errors. Further, in our case we do not have reliable data on number of uses of gross proceeds for all the issuing firms. So, only one proxy variable, namely, inflation adjusted reciprocal of gross proceeds is used as an independent variable representing uncertainty in firm value. In this connection, we have also examined whether the effects of uncertainty on mispricing of IPOs changes in the pre-recession period and later phase of recession period.

Table 2 reports the results of the regression analysis. From the estimated results of the regression analysis, it appears that ex-ante uncertainty which is measured by reciprocal of gross proceeds significantly and positively (at 1% level) affects the underpricing of IPOs. Hence, it is documented that small IPOs are more speculative in nature and high risk is associated with these IPOs. Further, higher risk is associated with more underpriced issues, which supports the proposition that higher the risk higher will be level of underpricing of IPOs. In order to examine whether market timing (which is measured by pre-recession period and later phase of recession period) is associated with underpricing phenomenon, timing dummy is incorporated where in the pre-recession period it takes the value one, zero otherwise (reported in Panel-B).

From the estimated regression analysis, it appears that market timing dummy positively and significantly affects underpricing of IPOs at 1% level. Hence, from the estimated result of the regression analysis, it appears that during the pre-recession period IPOs are more underpriced than those IPOs listed in recession and its later phase. From the results of the estimated regression analyses, it also appears that the value of adjusted R square is very small (0.04). One may raise the question that the model does not give statistically good fit. But for a cross-section study this sort of result may occur (like, earlier studies) where F value is statistically significant. Further, Beatty and Ritter (1986) argue that higher value of adjusted R square would indicate that the actual return is predictable and then return on higher risky IPOs could be identified by a few investors that may create the problem of winner's curse. Therefore, low value of R square is reliable here with the stated hypotheses.

Table 2. Estimated results of the regression analysis of Underpricing of IPOs on uncertainty

Panel-A		
Variable	Coefficient	t
Constant	18.12 (3.55)	5.095*
Reciprocal of Gross proceeds	.205 (4.261E-8)	4.66*
Adjusted R square=0.040 F=27.40*		
Panel-B		
Variables	Coefficient	t
Intercept	4.60 (5.25)	0.87
Reciprocal of gross proceeds	0.175 (4.297E8)	3.95*
Timing Dummy	0.15 (6.50)	3.46*
Adjusted R square=0.06 F=17.12*		

5. Summary and Conclusion

This study examines the nature as well as quantitative magnitude of mispricing of IPOs and tries to provide systematic explanation of mispricing of IPOs in the context of the emerging market like India.

Firstly, it is documented that in India in the short run, IPOs are, on an average, underpriced over the study period. This degree of underpricing is higher in India compared to its emerging peers, except China.

Further, Information asymmetry among market players is one of the major characteristics of the Indian share market that leads to the prevalence of wide uncertainty in the Indian stock market. IPOs are one of the most risky instruments of the stock market. Our study establishes that there exists a positive monotonic relationship between *ex-ante* underpricing of IPOs and uncertainty among investors and timing dummy (i.e., timing of issuing IPOs) has significant impact in explaining underpricing of IPOs. Therefore, we can conclude that in order to reduce the level of underpricing it is necessary for IPO issuing firms to disclose relevant information more.

Unlike any study on developed primary market our study faces the problem of data inadequacy which forces us to restrict the depth of our analysis. Like any empirical study in this area our study also suffers from the limitation of relying much on the secondary level data whose limitations cannot be checked except their cross verifications we have made this in the study at the level best. However, more researches may be undertaken in future in the following areas like, information asymmetry, revaluation of promoters' wealth, structure of primary market and signaling effects while explaining underpricing of IPOs.

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