



Underpricing of initial public offerings: a study based on mega issues listed on national stock exchange

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The decade previous to the one we are presently in have witnessed several mega issues flooding the Indian primary market. Companies now raise resources in tens and hundreds of billions from the primary segment of our capital market through IPOs. This research paper examines the listing performance of mega IPOs issued and traded on NSE during the previous decade 2001 to 2010. Keeping this in mind the paper attempts to study a sample of twenty mega issues selecting nine from boom period and eleven from recession period during the previous decade under study and present a comparative analysis of the listing performance based on three parameters namely raw return on listing, simple underpricing and adjusted underpricing. A t-test is carried out between these two independent samples on these three parameters to assess whether listing performance significantly varies between boom or recession period. Results derived from sample companies could not establish any significant difference in listing performance between boom period minor IPOs and recession period mega IPOs. Moreover severity in underpricing of mega IPOs is also not observed for the decade under study. Underpricing is found to be moderate and the extent of abnormality in adjusted returns is not so prominent also.

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Introduction

The Indian Securities market is one of the leading stock markets of the world. The Primary segment of the Indian securities market which is also referred to as the New Issue market (NIM) or the Initial Public Offering (IPO) market is the cynosure of all retail investors since the abolition of Capital Issues (Control) Act, 1947 on May, 1992. IPOs are now being freely priced and it is altogether left to the judgment of the issuing companies to price their new securities. Primary market acts as a gateway for Companies to raise resources for their financial needs. Resource mobilisation through Primary market is not a recent phenomenon and both listed as well as unlisted companies use this route to generate funds for themselves. The following table highlights the importance of IPO for the Indian economy. As we can clearly see from the table below that during the decade under study how Indian Companies have procured resources for their needs through IPO route.

Table 1: Resources Mobilised from the Primary Market by way of IPOs

Year	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
No. of Issues	114	7	6	21	23	79	77	85	21	39

Amt. (Rs.Cr)	2,722	1,202	1,039	3,434	13,749	10,936	28,504	42,595	2,082	24,696
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Source: Handbook of Statistics on the Indian Securities Market, SEBI, 2010

Literature Review:

Shah (1995) conducted one of the early works on Indian IPOs where he identified the empirical regularities about India's IPO market for the period January 1991 to April 1995. He worked with a sample size of 2056 and found that on the average the price at first listing was 105.6% above the offer price. Madhusoodanan and Thiripalraju (1997) did extensive analysis on Indian IPOs during 1992-1995. They reported an average initial underpricing of 75.21%. They tested a number of hypotheses using data of 1922 IPOs. Madan (2003) studied the under pricing of IPOs and found a very high initial excess return on IPOs in the Indian primary capital market as compared to other countries. The study included 1,597 companies during 1989-1995 listed at the BSE. Ghosh (2004) attempted to depict a detailed investigation in respect of the boom and slump phases in the Indian primary capital market. His study concentrated on two key variables, namely IPO volume and initial returns and analyses their nature and interrelation during these two periods.

Several studies had been conducted in the Indian IPO market to assess the short term and long term performance of IPOs. In this research work the intention is to study the minor IPOs issued during the last decade and their listing performance with respect to their issue price.

Objective of the Study:

The primary objective of this research work is to assess the first day listing performance of selected minor IPOs issued during the study period between 2000 to 2009 comprising ten years and then to present a comparative analysis of those IPOs which are issued during the boom period vis-à-vis recession period of the IPO market. To achieve this purpose, the following objectives are set forth:

1. To compute the first day initial returns defined as raw return on listing (RL);
2. To examine the extent of Simple Underpricing (UPS) on listing day itself;
3. To test whether first day adjusted listing returns (UPA) significantly differ for mega issue IPOs during boom and recession season of New –Issue market (NIM).

Research Methodology adopted:

The raw data used for the entire study during the study period starting from 01.01.2000 to 31.12.2009 accounting for ten calendar years is mainly the stock prices of the companies which have gone public through IPO during this time period. The entire stock prices and stock indices are based on data from the data base of National Stock Exchange (NSE) of India Limited website. For the specific purpose of our study we need to categorise issue year as Boom (B) season or Recession (R) season of IPO Market based on the number of issues during that year in comparison to the average number of issues for the entire study period.

Mega issue IPOs are those IPOs whose issue sizes are Rs.100 Crores and above. So those issues which are below this cut-off size of Rs. 100 Crores are not considered for the purpose of this study as they are not categorised as Mega IPOs. Thereafter we have adopted purposive sampling technique to select our twenty (20) sample companies for the study. Purposive sampling being a non-probability sampling is done to solve the research problem with a specific purpose in mind

so as to include only those samples which will fulfill the purpose of the study. The entire list of sample companies selected and their issue details specifying the offer period, issue size, offer price, issue price and date of listing is given under appendix 1.

- (a) Models adopted for analysis: Let us discuss the models used to compute various returns to assess underpricing on the day of listing. For the purpose of measuring the extent of underpricing we have used the following model:

For Initial Return on Listing Day (Day 1): We compute three different types of initial return on the day of listing as stated below: Raw Return on Listing = $\ln(\text{Listing Price}/\text{Issue Price}) * 100$

This is intended to measure the listing gain to the allottees' who are being successfully allotted their shares at final price referred to as "issue price". Infact listing price is the very first price that is flashed on the ticker of the stock exchange on the listing date of IPO.

Simple Underpricing i.e. Unadjusted Return = $\ln(\text{Closing stock price on listing day}/\text{Issue Price}) * 100$. This expression measures the return to the IPO allottees' who are holding their allotment till the end of the first day trading session and Adjusted Underpricing (Initial Returns) on Listing = $\ln(\text{closing stock price on day of listing}/\text{Issue Price}) * 100 - \ln(\text{Closing Index on listing day}/\text{Closing Index on Offer Closing day}) * 100$

This measures the abnormal return arising to the investors after adjustment with the return arising from the relevant stock index on that day. Any excess return over and above the normal benchmark return arising from the relevant stock index is referred as abnormal return from IPO.

- (b) Framing of Hypothesis: To perform this research work several hypothesis needed to be framed and statistical test shall be conducted to give direction to the stated objectives. Accordingly we have framed the following set of Null Hypothesis which is stated below:

H10: There is no significant difference in mean raw listing return between Boom period and Recession period of Minor issue IPOs

H20: There is no significant difference in mean simple underpricing between Boom period and Recession period of Minor issue IPOs

H30: There is no significant difference in mean adjusted underpricing between Boom period and Recession period of Minor issue IPOs

- (c) Statistical tests used for analysis: Various returns computed from the series of stock prices belong to interval scale which refers to such a scale where the interval between successive positions is equal. Being interval scale of data, we would like to perform parametric test to derive results. For this the very first thing that needs to be done is to test the normality of data. There are several ways to tell whether a variable deviates significantly from normal. We will perform the Kolmogorov-Smirnov (K-S) test using SPSS statistical software package in support of our justification for adopting traditional transformation and accordingly substantiate using the statistical parametric test for our research study. Thereafter F-test, more specifically Levene's F-test will be carried out to establish if the two samples have same variance. Depending on the result of F-test, a t-test is carried out for independent samples to establish differences of mean. We want to carry out Levene's F-test as it is not dependent on the assumption of normality, even though we will be testing the normality of variables. All statistical tests are to be performed using SPSS statistical software package version 18.0.

Computation of Returns on Listing Day: In this Section we now reproduce the entire computation of RL, UPS and UPA of all the twenty sample companies segmented over boom and recession period in tabular form to provide an overall glimpse of the listing day performance as computed by us according to the methodology already stated.

In the next tables 2 and 3 we take up the computed results of mega issue IPOs during the boom period and recession period and then present a brief analysis of the computed results to understand the extent of underpricing and abnormality in returns for the mega issue companies.

Table 2: Computed Result of Listing Day Performance of Mega IPOs issued during Boom Period

Company	Raw Return on Listing (RL)	Simple Underpricing (UPS)	Adjusted Underpricing (UPA)
DLF	0.30	8.19	3.87
CAIRN INDIA	(5.13)	(15.23)	(41.02)
POWERGRID	54.63	65.99	52.45
IDEA	12.52	13.34	24.24
JETAIRWAYS	4.88	17.03	12.69
SUZLON	22.55	30.64	38.56
HDIL	7.44	11.22	5.35
IDFC	56.80	71.50	67.35
LANCO INFRA	11.78	0.58	(2.86)

Source: Self computation (Figures in parentheses indicate negative value.)

The results computed in the above table indicate that except Power Grid and IDFC none of the issuing companies could give a stellar performance on listing. To our surprise, Cairn India IPO even listed with a negative return thereby suggesting an overpricing of issued price. The adjusted underpricing of Cairn India is as low as -41.02 percent indicating that it performed so badly even in comparison to the benchmark index return. Out of the entire lot of mega issue IPOs Cairn India is the worst performer. Out of nine mega issue IPOs, two companies Power Grid and IDFC listed with a raw return on listing of above 50 percent, just one company Suzlon Energy listed with a raw return of above 20 percent, another two companies Idea Cellular and Lanco Infratech listed with a raw return of slightly above 10 percent and three companies DLF, Jet Airways and HDIL listed with a raw return of a single digit figure. So from these figures we can clearly say that listing performance of mega issue IPOs are not highly lucrative. In terms of abnormality of return also, as measured by UPA, seven IPOs were able to generate some abnormal returns in comparison to the benchmark index Nifty 50. Cairn India and Lanco Infratech were the only two companies which have failed to generate any abnormal return for its investors on the very first day of trading. So the overall picture of the listing performance of mega issue IPOs are not highly satisfactory in terms of the three parameters viz. RL, UPS and UPA. One important thing to observe is that none of the companies could generate return close to 100 percent or more as it was reported during the previous decade by various researches. So we can state that for the mega issue IPOs during the boom period, the extent of underpricing is not as severe as it was observed in the earlier studies conducted by Indian researches in the previous decade.

We now present in the next table similar computed results for the Mega IPOs issued during the recession period and then discuss briefly their listing performance.

Table 3: Computed Result of Listing Day Performance of Mega IPOs issued during Recession season

Company	Raw Return on Listing (RL)	Simple Underpricing (UPS)	Adjusted Underpricing (UPA)
RPOWER	16.36	(18.95)	(2.86)
NHPC	15.42	2.06	(1.63)
NTPC	35.02	19.77	16.61
TCS	34.38	15.04	18.69
DIVISLAB	10.18	23.03	29.26
ADANI POWER	7.70	0.10	4.13
OIL INDIA	4.29	8.33	2.99
JSWENERGY	5.83	0.85	(1.48)
RECLTD	21.28	14.43	19.21
IBPOW	0.11	(13.04)	(4.94)
MARUTI	27.70	27.34	22.99

Source: Self computation (Figures in parentheses indicate negative value.)

Eleven IPOs of mega issue sizes during recession period was considered for our study. Strangely eleven out of eleven IPOs gave positive raw return on listing for the recession period whereas in the immediately preceding table of the boom period mega issue IPOs cent percent positive return was not reported. Nine companies are underpriced in terms of UPS and seven issuing companies gave abnormal return over and above the benchmark Nifty 50 index. In terms of RL, the highest return was observed for NTPC followed by TCS of approximately 35 percent and 34 percent respectively. None of the issuing company could give a raw return on listing beyond this 35 percent. So even in case of recession period we observed that returns are not so dramatic. The highest abnormality in IPO return is observed for Divis Laboratories followed by Maruti Udyog in the second position and Rural Electrification in the third position measuring approximately 29 percent, 23 percent and 19 percent respectively. The worst performers are Reliance Power and India Bulls Power both generating a negatively underpriced return of approximately 19 percent and 13 percent respectively thereby indicating that the issue price of these two companies are highly overpriced in comparison to the listed market price of day 1 of the trading session. We now draw similar conclusion that none of the issuing companies have generated a return touching 100 percent or above both in terms of raw return on listing or in terms of abnormality of return. So in overall terms, the IPOs issued during recession period of mega issue sizes are not severely underpriced and does not fetch substantial abnormal return for its investors over and above the benchmark Nifty 50 index return.

So as a whole the twenty samples chosen for the purpose of our study under the mega issue category comprising both the boom period as well as recession period we can conclude based on the above tabulated computations that only two companies Power Grid and IDFC were able to generate substantial abnormal return for its investors ranging beyond 50 percent and six issuers failed to generate any abnormality at all for its investors on the first day of listing rather giving a negative return to them and none generated 100 percent return be in terms of RL or in terms of UPS and UPA.

Overview of Listing Day performance

In this section we present an overall analysis of the listing day performance of the twenty sample companies based on the previously computed RL, UPS and UPA values specified in the preceding section. It is a known fact that IPOs are severely underpriced which has been already documented both internationally as well as in our Indian context. The following tables 4 and 5 present the listing performance of the sample companies.

Table 4: Analysis of Listing Performance based on Raw Return on Listing (RL)

ISSUE TYPE	SEASON	NOS. OF COMPANIES WHOSE RAW RETURN ON LISTING (RL) VALUE IS					
		≤0%	>0% to 25%	>25% to 50%	>50% to 75%	>75% to 100%	>100%
MEGA (20)	BOOM (9)	1	6	0	2	0	0
	RECESSION (11)	0	8	3	0	0	0
TOTAL (20)		1	14	3	2	0	0

Source: Self Computation

The observation of the computed summarised results of the sample companies' performance on the day of listing in terms of raw listing return (RL) depicts that only one mega issue from boom period from a sample of twenty companies were overpriced with respect to the issue price generating a negative RL value.

Not a single issuing company in our sample of twenty could generate a RL beyond 75 percent so the extent of underpricing mega issues were not so severe in terms of RL computations. And obviously not a single company thus reported return in excess of 100 percent.

Out of 20 mega issues 17 companies comprising 85 percent of the sample generated positive RL not exceeding fifty percent and for minor issues the corresponding figure is 15 companies i.e. 75 percent. In a sample of 20 mega issues just only 2 companies managed to exceed the 50 percent mark. We observe that it was during the boom period that these 2 companies performed comparatively well to generate a return within >50 % to 75% range. If we interpret from the issuing season point of view then we can say that 25 percent of the sample of the mega period could generate return in the range of >50 percent to 75 percent. So overall in terms of RL listing return sample companies didn't generated whopping return at the very moment of listing on the stock exchange. In other words , successful allottees didn't earned phenomenal return with the immediate hammering of the bell.

Table 5: Listing Performance depicting the extent of Underpricing

ISSUE TYPE	SEASON	NOS. OF COMPANIES WHOSE SIMPLE AND ADJUSTED UNDERPRICING (UPS AND UPA) VALUE IS											
		≤0%		>0% to 25%		>25% to 50%		>50% to 75%		>75% to 100%		>100%	
		UP S	UP A	UP S	UP A	UP S	UP A	UP S	UP A	UP S	UP A	UP S	UP A

MEG A (20)	BOOM (9)	1	2	5	4	1	1	2	2	0	0	0	0
	RECESSION (11)	2	4	8	6	1	1	0	0	0	0	0	0
TOTAL (20)		3	6	13	10	2	2	2	2	0	0	0	0

Source: Self computation

In comparison to the RL computations, the UPS and UPA measures give a far better picture of the extent of underpricing of the IPOs. The above table presents the detailed picture of the distribution of our forty sample companies for various range of return computed and documented in the previous chapter. A closer look into the above table of computations based on UPS figures clearly indicate that mega issue IPOs are mostly underpriced within the range of 0 percent to 25 percent comprising of 13 sample companies representing 65 percent of the relevant sample size.

The above picture of underpricing gets slightly affected when analysis is done based on UPA computed figures. We notice that the overpricing of IPOs based on UPA figures throw a surprise findings. We observe that the previous conclusion regarding overpricing of issue price got completely overwritten and we find that 6 mega issue companies are overpriced

Now let us delve into the seasonal variation aspect of underpricing of the mega IPOs. Out of 20 Mega issues 9 companies are representing the Boom period and the remaining 11 representing the recession period. 4 companies during recession period are overpriced based on UPA computations in comparison to 2 companies based on UPS computations. For boom period the similar data show 2 companies overpriced based on UPA in comparison to only 1 company based on UPS computations. 5 companies out of 9 companies during boom period generated a return within a range of 0 to 25 percent based on UPS computations whereas the similar result for recession period stood at 8 companies out of 11 companies. On the basis of UPA computations, the observed companies were 4 and 6 for the similar category. The 2 companies, both in terms of UPS and UPA computations, which generated a return in excess of 50 percent were issued during the boom period and none managed to generate similar return during the recessionary period.

Hypothesis Testing:

Keeping in mind the objectives set forth earlier and the three null hypothesis framed H10, H20 and H30 we now have performed the Levene's F- test to establish whether the samples have equal variances. If the variances of the two samples do not differ significantly then we can comfortably carry out the t-test and safely interpret the results so that logical conclusions can be drawn. Table 6: Independent Samples Test for Mega Issues IPO issued during Boom and Recession season.

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
	Lower	Upper	Lower	Upper	Lower	Upper	Lower

Listing Return	Equal variances assumed	3.087	.096	.281	18	.782	2.2133	7.8762
	Equal variances not assumed			.265	11.686	.796	2.2133	8.3524
Simple UnderPricing	Equal variances assumed	3.467	.079	1.546	18	.139	15.4065	9.9650
	Equal variances not assumed			1.452	11.295	.174	15.4065	10.6122
Adjusted UnderPricing	Equal variances assumed	5.543	.030	.806	18	.430	8.4874	10.5238
	Equal variances not assumed			.745	9.848	.474	8.4874	11.3999

Source: SPSS Output

The above table depicts the result of the mega issue samples to assess the impact of issue season on the raw listing return, simple underpricing and adjusted underpricing of the IPOs and accordingly the hypothesis framed are H1a0, H2a0 and H3a0 respectively. The results of Levene's F-test indicate whether to assume equal variances of the samples or not. We observe that for the listing return and simple underpricing we can assume that there is no significant variation in the sample variances as the 'p' values are 0.096 and 0.079 which are both greater than the cut-off value of 0.05. But for the adjusted underpricing the Levene's F-test have generated a 'p' value of 0.03 so in this case we cannot assume that there is no significant variation in the sample variances. Depending upon the results of F-test, we now accordingly consider the relevant 'p' value for the t-test which is 0.782 for H1a0, 0.139 for H2a0 and 0.474 for H3a0. Based on these 'p' values we can opine that the null hypotheses are not rejected and now we interpret briefly about these hypotheses.

Interpretation of Results of Hypothesis Testing:

For H10: The mean raw listing return (RL) for both the independent sample categories of boom period and recession period of Mega issue IPOs shows no significant difference as the 'p' value resulted from the t-test is 0.782 which is greater than the cut-off value of 0.05. So we do not reject the null hypothesis.

For H20: The Levene's F-Test indicates that we can assume the equality of sample variances and as such the 'p' value for the t-test is 0.139. So from the result of the test of equality of sample means we do not reject the null hypothesis that the simple underpricing (UPS) not varies significantly statistically during boom or recession season of mega issue.

For H30: The Levene's F-test indicates that we cannot assume that the sample variances do not differ significantly and as such the relevant 'p' value for the t-test is 0.474. Accordingly we do

not reject the null hypothesis that the mean adjusted underpricing (UPA) do not differ significantly during the boom and recession season of mega issue IPOs.

Conclusion:

From the research work carried out with the twenty IPO issuing companies of mega sizes we cannot conclude that boom period IPOs are more underpriced in comparison to recession period. There was an apprehension that seasonality of the IPO market at the time of issue is an important determinant in assessing whether IPOs are underpriced or not. But from this study carried out the same cannot be concluded. Even the adjusted underpricing results show no significant impact due to Boom or Recession season of IPO market. So again we cannot conclude that issuers of mega IPOs is able to generate higher return on listing day for its investors during boom period rather than recession period. It can be finally stated that mega IPOs as a whole are not severely underpriced as not a single issuing company is found to be underpriced to the extent of 100 percent and above in comparison to the research findings of the previous decade of this study.

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Appendix 1: Issue Details of Sample companies

Companies	Issue Size (Rs.Cr.)	Offer Period	Offer price (Rs.)	Issue Price (Rs.)	Date of Listing
RELIANCE POWER	10,260	15-18 Jan 2008	405-450	450	11 Feb 2008
DLF	9,188	11-14 Jun 2007	500-550	525	5 July 2007
NHPC	6,038.55	7-12 Aug 2009	30-36	36	1 Sep 2009
NTPC	5,368	7-14 Oct 2004	52-62	62	5 Nov 2004
CAIRN INDIA	5,261	11-15 Dec 2006	160-190	160	9 Jan 2007
TCS	4,713	29 July- 5 Aug 2004	775-900	850	25 Aug 2004
DIVIS LAB	4,486.56	17 -21 Feb 2003	130	140	12 Mar 2003
ADANI POWER	3,016.52	28-31 July 2009	90-100	100	20 Aug 2009
POWER GRID	2,984	10-13 Sep 2007	44-52	52	5 Oct 2007
OIL INDIA	2,777.25	7-10 Sep 2009	950-1050	1050	30 Sep 2009
JSW ENERGY	2,698.21	7-9 Dec 2009	100-115	100	4 Jan 2010
IDEA CELLULAR	2,125	12-15 Feb 2007	65-75	75	9 Mar 2007
JET AIRWAYS	1,899	18-24 Feb 2005	950-1125	1100	14 Mar 2005
RURAL ELECTRIFICATION CORPORATION	1,639	19-22 Feb 2008	90-105	105	12 Mar 2008
IBULL POWER	1,529.1	12 -15 Oct 2009	40-45	45	30 Oct 2009
SUZLON ENERGY	1,496	23-29 Sep 2005	425-510	510	19 Oct 2005
Companies	Issue Size	Offer Period	Offer price	Issue Price	Date of

	(Rs.Cr.)		(Rs.)	(Rs.)	Listing
HOUSING DEVELOPMENT AND INFRASTRUCTURE	1,485	28 Jun-3 July 2007	430-500	500	24 July 2007
IDFC	1,372	15-22 July 2005	29-34	34	12 Aug 2005
LANCO INFRA TECH	1,067	6 -10 Nov 2006	200-240	240	27 Nov 2006
MARUTI UDYOG	830.798	12-19 Jun 2003	115	125	9 July 2003