

A STUDY ON THE PERFORMANCE OF INITIAL PUBLIC OFFERINGS IN INDIAN STOCK MARKET

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ABSTRACT

Initial public offering is becoming popular source of raising money by all the companies in different sectors, it also provides an opportunity to small investors to make profit by analysing IPO and their listing day performance. This study analyses the listing performance (specifically underpriced) of IPO post listing over the period of one year in various intervals. For doing this annualised average return, market adjusted return, cumulative market adjusted returns and t valued were calculated for the sample. It was found that underpriced initial public offering gives negative return in both short and long term but it was clear from the t values that this relation was only significant in long term and not short term.

Introduction

Countries development depends upon some key factors and availability of finance is one such important key factor. The financial system forms the backbone of an economy which helps in the mobilization of funds between the different participants of the market. It develops a habit of investing and saving in the individuals which indirectly drives the flow of funds in the economy. The flow of funds helps in the capital formation which results in the growth of the country if a country which is not able to mobilize their fund may face issues like unemployment, poverty, and accelerating inflation.

One of the prominent tool used by the companies for mobilization of fund in India was initial public offering after the formation of SEBI which made the investment safe and secured for the investors but after that also the investors should analysis the share in terms of different factor and one of those factor is pricing of the share, further in the study a detailed analysis is done to understand that is there any relation ship of pricing and performance of the share.

Literature review

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(**Bakke, 2015**) studied that when the market is in normal condition then medium runs abnormal return for the cold IPO's generally gives large returns in the long run. The main finding which was done was regarding the medium-term outperformance because the final offer is below their minimum price in the initial filing range of book building.

(**Ljungqvist & Wilhelm Jr., 2002**) had found a very interesting relationship between IPO allocation per market information and initial underpricing and has discovered some important structural relationships and also came up with a result that there is an indirect issuance cost for IPO's which can be reduced by allocation promoted price discovery in the market.

(**Steib & Mohan, 1997**) had analysed 103 German IPOs after German reunification. the result showed him that in the short term returns of the companies were very normal but in long run, their performance was very poor and it was found out that there is affect in the market sediments because of the after trading of IPO's in the market and relation between the risk and initial return.

(**Loughran and Ritter, 1995**) documented severe underperformance of initial public offerings (IPOs) during the past 20 years. In discussing these results, they suggest that investors may systematically be too optimistic about the prospects of firms that are issuing equity for the first time. Their results have inspired countless articles in the popular press about the danger of investing in IPOs, as well as academic research that has shown that underperformance extends to other countries as well as to seasoned equity offerings.

Statement of problem

The performance of IPOs is driven by many factors in the market which may occur due to the external or internal environment. Identification of the relationship between the factors may help in making a profit and avoid any losses. External factors may be related to the industry profile, the market in which the IPO is going to happen or the operation of the company in a specific country. While talking about the internal factors, they are mostly related to the functionality of the company and what are the policies and rules they are following and how they are carrying out the IPO. One of the most important concepts in this internal factor is whether the IPOs are priced correctly. The researcher has tried to find out that is there any significant relationship between the pricing of the IPO and there return in the short and long

run and which will help the investor to protect themselves from any future losses due to under-priced IPOs.

Objectives of the study

- To analyse the listing day performance of IPOs
- To analyse the relationship between under-priced IPOs with returns in short and long term

Hypotheses

Hypotheses

The study examines the initial and post-listing performance of IPOs. Therefore, the hypotheses being tested are:

H₀: There is no significant relationship between the underpriced IPO's and their performance in the short run

H₁: There is a significant relationship between the underpriced IPO's and their performance in the short run

H₀: There is no significant relationship between the underpriced IPO's and their performance in the long run

H₁: There is a significant relationship between the underpriced IPO's and their performance in the long run

Research Methodology:

To study the performance of the IPO the Researcher has studied the return variable. Traditionally the returns are calculated with the formula of

$$\text{Return} = \frac{\{(\text{closing price of the listing day} - \text{issue price of the share}) / \text{issue price of the share}\} * 100}$$

But the difficulty in using this formula is that it ignores a very important factor which is the time gap between the issue day and the listing day price. to avoid this problem of time lag market-adjusted excess return approach is adopted and the formula under this approach is

$$\text{MAERs} = \frac{\{(\text{closing price of the listing day} - \text{issue price of the share}) / \text{issue price of the share}\} - \{(\text{market index of the closing price of the listing day} - \text{market index of the issue price of the share}) / \text{market index of the issue price of the share}\} * 100}$$

Then comes the problem of compatibility, due to the difference in the listing day of the various IPOs the return calculate would not be normalized so to overcome this problem the researcher has taken into consideration of annualizing factor with MAER. Calculation of annualizing factor is as followed

$$\text{Annualizing actor} = 365 / \text{aftermarket trading lead time}$$

Till now the researcher was talking about the return in the short term, to calculate the long term return the same MAER approach can be used. The only difference will be in the prices will be taken for different time dimensions like 15-day, 1 month, 3 months, 6 months and 1 year.

1.9.1 Parametric significance test

When assessing the long-term success of aftermarket IPOs, the CAAR provides information on securities' average price activity during the post-listing period. The AARs and CAARs should be close to zero if the markets are successful. Parametric "t-test" is used to determine the sense of AARs and CAARs. The 5 percent meaning point with a sufficient degree of freedom is used to test the null hypothesis of no substantial irregular post-listing returns. The findings are based on the results of the post-listing time t-values for the AARs and CAARs. T-test statistics for AAR are determined as below for each day during the post-listing period.

$$t(\text{AAR}_t) = \text{AAR}_t / \text{SE}(\text{AAR}_t)$$

Where AAR_t is the average day t abnormal return and $\text{SE}(\text{AAR}_t)$ is the regular day t abnormal return err or estimated as below:

$$\text{SE}(\text{AAR}_t) = \text{SD}(\text{AAR}_t) / \sqrt{n}$$

Where, $\text{SD}(\text{AAR}_t)$ is the standard deviation of the day t, and n is the number of portfolio p stocks at day t.

The t-test statistics for CAAR are calculated for each day during the post-listing period

$$t(\text{CAAR}_t) = \text{CAAR}_t / \text{SE}(\text{CAAR}_t)$$

Where $\text{SE}(\text{CAAR}_t)$ is the normal day t CAAR error which is measured as below:

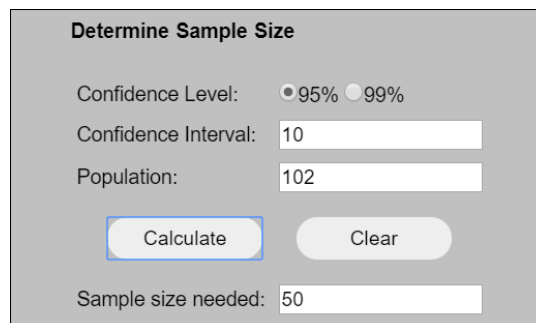
$$SE(CAAR_t) = SD(CAAR_t) / \sqrt{n}$$

SD(CAAR_t) is CAAR's standard deviation on day t, measured as below: where N is the total number of days for which AAR is cumulated.

$$SD(CAAR_t) = SD(AAR_t) * \sqrt{N}$$

1.9.2 Sample and data

FIG 1.1
CALCULATION OF SAMPLE SIZE



Determine Sample Size

Confidence Level: 95% 99%

Confidence Interval:

Population:

Sample size needed:

Data is collected from the last four years, from 2014 to 2018. The total number of IPO in the last four years is 102. after performing the sample survey test it has been finding out that the sample size with a confidence level of 95%, confidence interval of 10 and a population of 102 is 50. In the sample of 50 companies, the selection of the companies is done according to the percentage of its share in the total population of 102 companies IPO's. formula to calculate the number of companies in the sample is (Total number of sample/total number of companies in the sample) *number of companies in the particular sector.

TABLE 1.1
SAMPLE COMPANY FROM EACH SECTOR

Sector	Number of IPOs in the study period	Number of IPOs in the Sample
Consumer Staples	12	6
Basic Material	12	6
Industrial	22	10
Financial	19	9
Utility	5	2
Health Care	8	4
Information Tech	12	7
Communication	3	1
Consumer Discretionary	8	4
Energy	1	1
Total	102	50

In the sample of 50 companies, the selection of the companies is done according to the percentage of its share in the total population of 102 companies IPO's. formula to calculate the number of companies in the sample is (Total number of sample/total number of companies in the population) *number of companies in the particular sector

Following is the allocation of the number of companies from different sectors of companies which are taken the sample.

the market return is calculated on the base of NSE (National stock exchange) nifty, NSE is one of the oldest stock exchanges of India and all the IPO were listed in it.

1.9.3 Limitations of the study

1. The study is limited to the companies listed on the National Stock Exchange (NSE).
2. The data collected for the study includes nominal values, which are not free from the effect of inflation.
3. Long term is considered to be 6 months and 1 year in the study because after a one-year market take over the IPOs.

ANALYSIS AND INTERPRETATION

This chapter documents the analysis of the performance of under-priced IPOs out of a sample of 50 companies which are mention below in table 4.1 by calculating abnormal average return and cumulative abnormal average return with their respective t-values.

TABLE 4.1
LIST OF SAMPLES IPOS

S.NO	IPO	S.NO	IPO
1	Credit Access Gr	26	L&T Technology
2	Fine Organics	27	S P Apparels
3	Indostar Capita	28	Advanced Enzyme
4	Mishra Dhatu Ni	29	L&T Infotech
5	Bandhan Bank	30	Quess Corp
6	HG Infra Engg	31	Mahanagar Gas
7	Galaxy Surfacta	32	Parag Milk Food
8	Astron Paper &	33	Ujjivan Financial Services
9	HDFC Life	34	Thyrocare Techn
10	General Insurance	35	Bharat Wire Rop
11	Godrej Agrovet	36	TeamLease Ser.
12	SBI Life Insurance	37	Narayana Hruda
13	Capacite Infra	38	Alkem Lab
14	Bharat Road Net	39	Interglobe Avi
15	Apex Frozen	40	Prabhat Dairy
16	SIS	41	Navkar Corp
17	AU Small Finance	42	Syngene Intl
18	PSP Projects	43	PNC Infratech
19	S Chand and Co	44	MEP Infra
20	CL Educate	45	Inox Wind

21	Music Broadcast	46	Ortel Comm
22	Laurus Labs	47	Shemaroo Ent
23	Varun Beverages	48	Snowman Logistics
24	Endurance Techn	49	Sharda Crop
25	ICICI Prudentia	50	Wonderla

Source- https://www.chittorgarh.com/ipo/ipo_list.asp

4.1 Pricing of the IPO

Out of 102 IPO in the study period, a sample of 50 companies was taken to study the performance of the underpriced IPOs. Table 4.2 shows that out of 50 sample companies 38 were underpriced, 14 overpriced and none of them were correctly priced. An IPO is said to be underpriced when an initial public offering (IPO) at a price below its real value in the stock market, in case of overpriced an initial public offering (IPO) at a price above its real value in the stock market and in case of correctly priced overpriced an initial public offering (IPO) at a price equal to its real value in the stock market.

TABLE 4.2
NUMBER OF COMPANIES OVERPRICED AND UNDERPRICED

Total number of IPO's	Sample number of IPO's	Correctly priced IPO's	Under-priced IPO's		Over-priced IPO'S
102	50	0	36		14

Source- collected and calculated

4.2 Annualised Return and Market Adjusted Return

Before the calculation of average return for various time intervals which is based on 15 days return, 1-month return, 3 months return, 6 months return and 1-year return. Initial day returns were annualized to remove the effect of lag time between the listing day and the closing of the offer day When the average returns of the other periods are calculated they were adjusted according to the market return to remove the effect of market return in the average return calculation. In table 4.3 companies and their listing dates are mentioned for which the returns are calculated.

TABLE 4.3
SAMPLE COMPANIES AND LISTING DATE

S.NO	Date	IPO	S.NO	Date	IPO
1	23-08-2018	Credit Access Gr	26	23-09-2016	L&T Technology
2	02-07-2018	Fine Organics	27	12-08-2016	S P Apparels
3	21-05-2018	Indostar Capita	28	01-08-2016	Advanced Enzyme
4	04-04-2018	Mishra Dhatu Ni	29	21-07-2016	L&T Infotech
5	27-03-2018	Bandhan Bank	30	12-07-2016	Quess Corp
6	09-03-2018	HG Infra Engg	31	01-07-2016	Mahanagar Gas
7	08-02-2018	Galaxy Surfacta	32	19-05-2016	Parag Milk Food
8	29-12-2017	Astron Paper &	33	10-05-2016	Ujjivan Financial services
9	17-11-2017	HDFC Life	34	10-05-2016	Thyrocare Techn
10	25-10-2017	General Insuran	35	01-04-2016	Bharat Wire Rop
11	16-10-2017	Godrej Agrovet	36	12-02-2016	TeamLease Ser.
12	03-10-2017	SBI Life Insura	37	06-01-2016	Narayana Hruda
13	25-09-2017	Capacite Infra	38	23-12-2015	Alkem Lab
14	18-09-2017	Bharat Road Net	39	10-11-2015	Interglobe Avi
15	04-09-2017	Apex Frozen	40	21-09-2015	Prabhat Dairy
16	10-08-2017	SIS	41	09-09-2015	Navkar Corp
17	10-07-2017	AU Small Financ	42	11-08-2015	Syngene Intl
18	29-05-2017	PSP Projects	43	26-05-2015	PNC Infratech
19	09-05-2017	S Chand and Co	44	06-05-2015	MEP Infra
20	31-03-2017	CL Educate	45	09-04-2015	Inox Wind
21	17-03-2017	Music Broadcast	46	19-03-2015	Ortel Comm
22	19-12-2016	Laurus Labs	47	01-10-2014	Shemaroo Ent
23	08-11-2016	Varun Beverages	48	12-09-2014	Snowman Logist
24	19-10-2016	Endurance Techn	49	23-09-2014	Sharda Crop
25	29-09-2016	ICICI Prudentia	50	09-05-2014	Wonderla

Source- https://www.chittorgarh.com/ipo/ipo_list.asp

TABLE 4.4
AVERAGE RETURN CALCULATION FOR SAMPLE

Types	average return on listing day	15 th -day average return	1-month average return	3-month average return	6-month average return	1-year average return
under-priced	8.80%	-32.83%	-30.98%	-42.10%	-44.84%	-37.62%
over-priced	-8.58%	17.75%	16.92%	11.57%	5.68%	10.03%

Source- compiled and calculated

After the calculation of the average return of over-priced and under-priced IPO's respectively, it was found that under-priced IPO's performed negative return of -32.8 % for 15 days, -30.98% for 1 month, -42.10% on 3 months, -44.84% on 6 months and -37.62% for 1-year return. The same goes for the return of overpriced IPO's. An inverse relationship is found between the under-priced IPO's and their return in the short and long run, same goes for the case with over-priced IPO's was also seen.

4.3 Parametric Test

After the listing of the under-priced IPO post 60day performance analysis is to be done by doing a parametric t-statistic, for doing this average abnormal return and cumulative average abnormal return is calculated for 60 days and respective significant level using t-test. To asses, the performance of the IPO's it is very important to determine the average price behaviour of the shares post listing and this average price behaviour is determined by the cumulative abnormal average return. When both abnormal average return and cumulative abnormal average return are near to zero it means that the market is efficient.

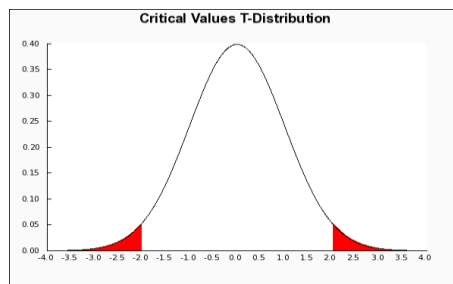
4.3.1 t-test

A t-test is a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which may be related to certain features. It is mostly used when the data sets, like the data set recorded as the outcome from flipping a coin 100 times, would follow a normal distribution and may have unknown variances. A t-test is used as a hypothesis testing tool, which allows testing of

an assumption applicable to a population. A t-test looks at the t-statistic, the t-distribution values, and the degrees of freedom to determine the probability of difference between two sets of data. To conduct a test with three or more variables, one must use an analysis of variance.

Critical value -A critical value is a point on the test distribution in the hypothesis test, compared to the test statistics, to determine whether the null hypothesis should be rejected. If your test statistical absolute value reaches the critical value, the statistical significance can be claimed and the null hypothesis dismissed. Critical values are α , so their values are fixed when selecting α for the test.

FIG 4.1



TWO TAILED T-DISTRIBUTION WHEN DF IS 35

Critical value at the significance level of .05 and df 35 is 2.03

TABLE 4.14

CALCULATION OF ABNORMAL AVERAGE RETURN & CUMMULATED AVERAGE ABNORMAL RETURN WITH RESPECTIVE T-VALUES

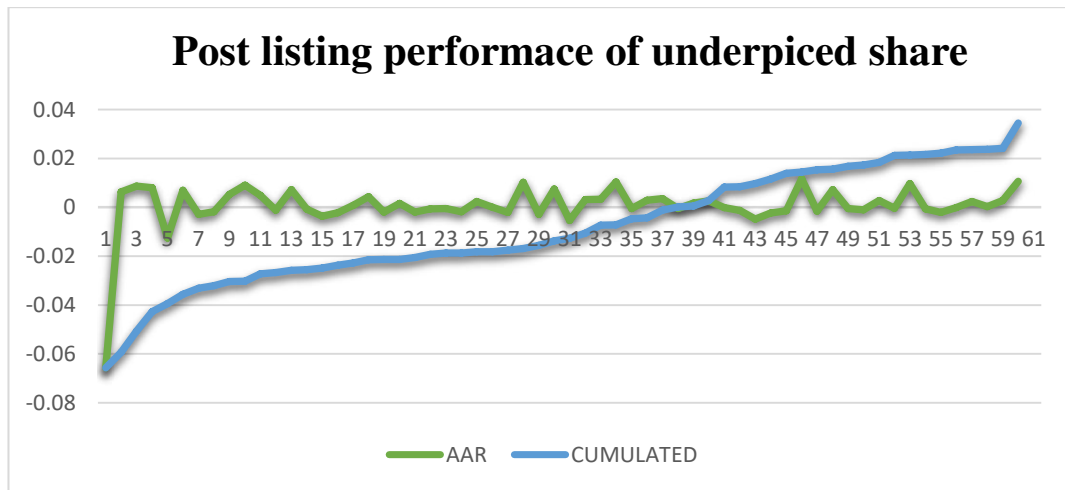
Post listing days	AAR	CAAR	t(AAR)	t(CAAR)
1	-0.06566	-0.06566	-0.42416	-0.42416
2	0.006319	-0.05934	0.158751	-1.05402
3	0.008658	-0.05068	0.42989	-1.45286
4	0.008066	-0.04261	0.510119	-1.34739
5	0.006964	-0.03565	0.389589	-0.89179
6	0.005347	-0.0303	0.446927	-1.03387
7	-0.00176	-0.03206	-0.18899	-1.30307
8	0.004847	-0.02721	0.338417	-0.67167
9	0.010329	-0.01688	0.722365	-0.39355
10	-0.00179	-0.01867	-0.25206	-0.83012
11	-0.00191	-0.02059	-0.22103	-0.71788
12	0.002414	-0.01817	0.289246	-0.62855
13	7.3E-07	-0.01817	7.32E-05	-0.5057

14	-0.00053	-0.0187	-0.04944	-0.47051
15	-0.00058	-0.01928	-0.05414	-0.46481
16	-0.00198	-0.02125	-0.33424	-0.89786
17	-0.00358	-0.02483	-0.53483	-0.90052
18	-0.00073	-0.02556	-0.11623	-0.95694
19	-0.00118	-0.02674	-0.16435	-0.85591
20	-0.01259	-0.03933	-1.89696	-1.32539
21	0.009095	-0.03023	1.068119	-0.7748
22	-0.00284	-0.03307	-0.43571	-1.081
23	0.007314	-0.02576	0.852666	-0.6262
24	0.004355	-0.0214	0.924636	-0.92764
25	-0.00223	-0.02363	-0.3675	-0.78004
26	0.00083	-0.0228	0.113551	-0.61185
27	0.001554	-0.02125	0.258211	-0.67957
28	0.007487	-0.01376	1.284703	-0.44625
29	0.003155	-0.01061	0.788886	-0.49242
30	0.003318	-0.00729	0.620403	-0.24882
31	-0.00534	-0.01263	-1.51845	-0.64461
32	-0.00285	-0.01548	-0.86442	-0.82966
33	-0.00209	-0.01757	-0.48845	-0.71543
34	0.010416	-0.00716	1.85214	-0.21826
35	0.002875	-0.00428	0.507955	-0.1279
36	-0.00043	-0.00471	-0.11573	-0.21057
37	0.003557	-0.00116	0.712269	-0.03811
38	0.001792	0.000635	0.411676	0.023648
39	-0.00051	0.000124	-0.13286	0.005156
40	0.002645	0.002769	0.506153	0.083775
41	0.011724	0.014493	2.894262	0.558763
42	-0.00476	0.00973	-1.54843	0.488121
43	-0.00128	0.008449	-0.34074	0.342548
44	-9.905	0.00835	-0.02247	0.286975
45	0.007287	0.015637	1.87107	0.598537

46	0.002754	0.018391	0.579113	0.570235
47	-0.00104	0.017348	-0.34085	0.82724
48	-0.00049	0.016854	-0.16971	0.835431
49	-0.00151	0.015341	-0.48754	0.70646
50	-0.00143	0.013907	-0.27482	0.376911
51	-0.0023	0.011612	-0.74545	0.528042
52	0.009732	0.021344	2.903061	0.882941
53	0.002826	0.02417	0.740249	0.869533
54	-0.00199	0.022178	-0.70336	1.065384
55	-0.00057	0.021605	-0.17851	0.907558
56	-0.00036	0.021249	-0.13786	1.10111
57	0.002421	0.02367	0.725986	0.940186
58	-0.00013	0.023545	-0.03771	0.930632
59	0.000258	0.023803	0.083063	0.996035
60	0.010659	0.034462	2.420832	1.010454

Source – compiled and calculated

FIG 4.2



Out of 60 sample days only 29 days showed a positive abnormal average return and in that sample of only 3 abnormal average return are being above 5% significant level critical value of 2.03. Among the rest, 31 negative abnormal average return and none of the abnormal average returns are above 5% significant level critical value.

Cumulative abnormal average return has 60 days sample in which 38 days sample have a negative cumulative average abnormal return and in that 38 negative cumulative abnormal average return none of them are above 5% significant level critical value, rest 22 positive cumulative abnormal average return are also not above the critical value of 5% significant level. This makes evident to come to the conclusion that the null hypothesis cannot be rejected.

From the graph, it can be identified that the market was performing badly comparatively till 40-days post listing.

TABLE 4.15
CALCULATION OF ARR & CAAR WITH RESPECTIVE T-VALUES

Post listing days	AAR	CAAR	T(AAR)	T(CAAR)
15	-0.17657	-0.17657	-1.54744	-0.39955
30	-0.16611	-0.34268	-2.12881	-0.80181
90	-0.25996	-0.60264	-3.68931	-0.90151
180	-0.29688	-0.89952	-6.42102	-1.4501
365	-0.23323	-1.13274	-7.2999	-1.85576

Source – compiled and calculated

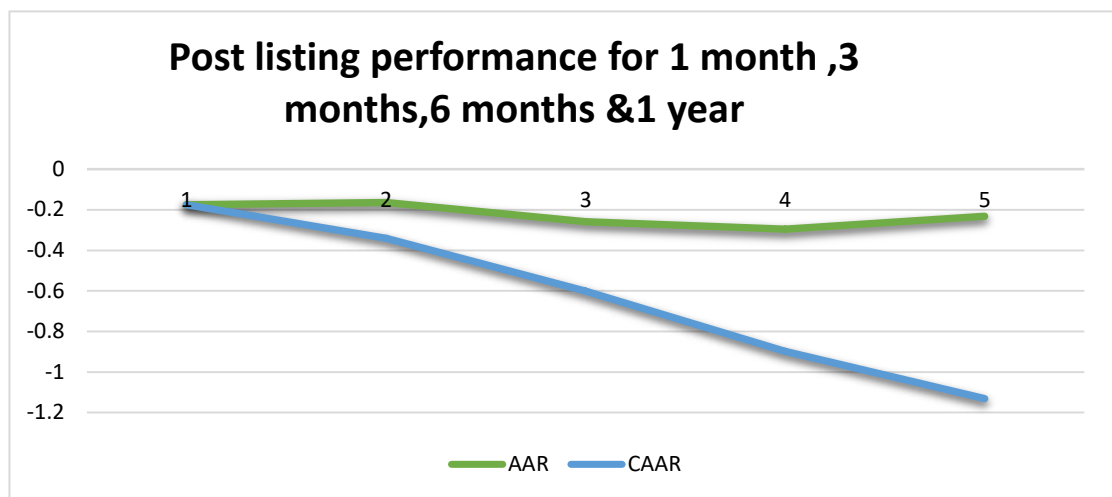


FIG 4.3

Post listing after some significant period, the performance was analysed using the same tool which was used to analyse short period analysis that is abnormal average return and cumulated abnormal average return. It can be seen from the table ... that the t value of 90 days, 180-days and 365-days abnormal

return are -3.68931, -6.42102 and -7.2999 respectively, which is less than the critical value of -2.03, so the null hypothesis can be rejected.

SUMMARY, FINDINGS AND CONCLUSION

5.1 SUMMARY

A sample of 50 companies was taken to analyze the performance of the Indian stock market IPOs (specific to underpriced IPOs). For analysing Indian stock market IPOs from the time period of 2014 to 2018, for this their periodic market-adjusted returns were computed to understand the behaviour of IPO as a whole and sector-wise also. The researcher also calculated the average return cumulated average return which helped to understand the behaviour of the market and particular IPOs.

T-values were also found out the significant relationship listing day performance (underpriced) and return in short and long run. After the study it was observed that all the underpriced IPOs across all the sectors mentioned in the study gives a negative return in short and long run. It was also proved by the T-values that there is no significant relation in short run returns but have a significant relation in long run returns.

5.2 FINDINGS OF THE STUDY

- It was found that all the IPO which was under-priced gives a negative return in the short and long run.
- The basic materials sector also works in the same way as the market and the low-priced IPO yields negative short- and long-term returns.
- The consumer product sector also works in the same way as the market and the low-priced IPO yields negative short- and long-term returns.
- The financial sector also works in the same way as the market and the low-priced IPO yields negative short- and long-term returns.
- The healthcare sector also works in the same way as the market and the under-priced IPO yields negative short- and long-term returns.
- The electricity and communication sector also work in the same way as the market and the under-priced IPO yields negative short- and long-term returns.
- The industrial sector also works in the same way as the market and the under-priced IPO yields negative short- and long-term returns.

- The utility sector also works in the same way as the market and low-priced IPO yields negative short- and long-term returns.
- The information technology sector also works in the same way as the market and low-priced IPO yields negative short- and long-term returns.
- Consumer Discretionary sector also works in the same way as the market and low-priced IPO yields negative short- and long-term returns.
- It has been found from the T-test there is no significant relationship in their return of the short-run and also some the same test that there is a significant relationship in the return of the long run.

5.3 CONCLUSION

After analysing 38 underpriced IPO's out of 50 samples of IPOs it was found that there is an inverse relationship between the under-priced IPOs and their return. It was also found that across all the seven sectors of the market the same relationship was determined. To test the significance of this result t-statistic value was found out for 60 days post listing, and also for 15 days, 1 month, 3 months 6 months and 1 year.

From the result, it was determined that there is no significant relationship between the performance of post 60 days return, 15th-day return, 1-month return and 3 months return but it was then found that there was a significant relationship between the under-priced IPO's and there 6 months and one-year performance post the listing.

It can be said that there is a significant inverse relationship between the under-priced IPOs and their long-term performance.

Bibliography

- Bakke, E. (2015). "Cold" IPOs or hidden gems? On the medium-run performance of IPOs. Retrieved from ssrn.com
- Ljungqvist, A., & Wilhelm Jr., W. (2002). IPO allocations: discriminatory or. *Journal of Financial Economics*. doi:[https://doi.org/10.1016/S0304-405X\(02\)00138-1](https://doi.org/10.1016/S0304-405X(02)00138-1)
- Loughran, T., & Ritter, J. (1995, march). The New Issues Puzzle. *The Journal of Finance*, vol-50, Issue 1.
- Steib, S., & Mohan, N. (1997). The German Reunification, Changing Capital Market Conditions, and the Performance of German Initial Public Offerings. *The Quarterly Review of Economics and Finance*, Vol. 37, No. 1, Spring, 115-137.