A STUDY ON THE LISTING DAY AND SHORT-TERM PERFORMANCE OF INDIAN IPOs DURING THE COVID-19 CRISES

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Abstract: This research project aims to analyse the underperformance of the Book Build IPOs launched into the Indian stock market during the COVID-19 pandemic, on the day of listing and the subsequent underperformance in the short-run period individually as well as with respect to two major indices- NIFTY50 and NIFTY500. The paper also aims to understand the factors affecting the listing day underpricing of the IPOs. The factors taken under consideration for this purpose include- Issue size, Issue Price, Oversubscription, Absolute Market (Nifty50) returns, Proportion of fresh issue. The paper uses a t-test including several variables to study the listing day and post-listing performance of the IPOs. In order to study the factors affecting the listing day underpricing, the OLS regression model has been employed.

Index Terms – **IPO underpricing, Raw returns. Nifty50 adjusted returns, Nifty500 adjusted returns, listing day underpricing, IPO short-term underpricing.**

I. INTRODUCTION

The listing day underpricing of IPOs is a global phenomenon which has been historically prevailing in the primary markets and has also been a topic of discussion and study for a long time now. However, 2020 was an extraordinary year and the stock markets gave exemplary positive returns accompanied with high volatility primarily because of the rapidly changing macroeconomic conditions caused due to the COVID-19 pandemic and the cycle of changing outlooks from dismal to hopeful to even euphoric. These sentiments were promptly reflected in the markets as well, with the stock market rallying down to extreme low levels to move upwards and touch their all-time high levels globally with improving conditions and investor sentiments and expectations. Thus, with these uncertain times amid a strong bull market, it becomes all the more important and interesting to study the IPOs that were launched during the year calendar year 2020 and also compare it with the benchmark returns like NIFTY50 and NIFTY500.

For the purpose of this study, 14 out of the 15 Book build IPOs are taken under consideration that were listed on the National Stock Exchange, India's most liquid stock exchange during the calendar year 2020. Indian markets need to be studied because most if not all the IPOs that were launched in the markets during last year were small-cap in size, with the combined issue size of all the 15 Book Build IPOs at Rs.26,628 crores. The primary effect of the pandemic was seen on the SME and MSME sector as well as a lot of the small cap listed stocks due to their relatively higher sensitivity to market movements. This research article analyses of IPO performance on listing day and post-listing short term period (60-days) launched during the covid-19 crises, and the factors that potentially affect the listing day gains of an IPO and how strongly they are correlated using multiple regression analysis.

II. LITERATURE REVIEW

(Hawaldar et al., 2018) The article aims to study the listing day performance of the IPOs, and the post listing performance of IPOs both short and long-term in the Indian Stock market. The pricing and long run performance of more than 400 IPOs in ten years was examined and it was found that compared to IPOs that have a fixed price, book-built IPOs are underpriced by lesser magnitude. The study has used the cumulative average abnormal return (CAAR) to examine the long-run performance of the IPOs. The parametric t-test was used to test the significance of AARs and CAARs. It was concluded that the Indian IPOs are underpriced on their first trading day.

(Smith, 2011) The aim of this research was to find the best-specified and most effective method of abnormal performance detection and apply it to the price performance of initial public offerings (IPOs). This study looked at which of the seven portfolios and matched-firm methods of abnormal performance detection provided the best test statistic when they were matched by scale, industry, and book-to-market ratios. In addition, this analysis examines IPO price efficiency to see whether IPOs produce abnormal results. The buy and hold abnormal return (BHAR) method of calculating abnormal returns was used in this review, which was done using the event study approach for the research design. The findings were that (a) all of the matched-firm methods of abnormal

performance detection were well defined and powerful (matching by industry affiliation produced the best power and specification results), and (b) the IPOs provided statistically significant abnormal price performances in (a) short-term analyses, (b) longer-term analyses, and (c) lockup period analyses.

(Shah & Harshadbhai Mehta, 2018) Through this paper, it was discovered that the average return on the listing day is substantially positive. All the sample IPO companies had market adjusted abnormal returns of 7.19 percent. It has been found that initial public offerings (IPOs) are initially underpriced. A t-test was used to validate the returns, and the average initial return of 7.19 percent showed that average returns are slightly lower than historical IPO returns. The relationship between degree of underpricing and independent variables such as issue price, issue size, issue oversubscription, and market index return were investigated using a regression model. Except for problem of oversubscription, regression analysis showed no important association between the degree of underpricing and explanatory variables. According to the report, investors should invest in new issues because IPOs are underpriced in their early days.

(Ellul & Pagano, 2006) According to the paper, asymmetric knowledge and vulnerability are often used to describe the underpricing of initial public offerings (IPOs). These conventional theories have been supplemented with a new theory in which investors are concerned about post-IPO illiquidity caused by asymmetric details. The higher the IPO underpricing, the less liquid the aftermarket is supposed to be and the less predictable is its liquidity. As motivations for underpricing, the model combines liquidity considerations with adverse selection and risk. The model's forecasts are backed up by data from 337 British initial public offerings (IPOs) that took place between 1998 and 2000. It has been found that projected after-market liquidity and liquidity risk are significant determinants of IPO underpricing using a variety of liquidity steps.

(Boulton et al., 2010) This research considers the relationship between a country's legal system and the size, liquidity, and valuation of its capital markets. In addition, a detailed review is undertaken into how governance inequalities at the country level affect the underpricing of initial public offerings (IPOs). When 4462 IPOs from 29 countries were analysed from 2000 to 2004, it was discovered that underpricing is higher in countries with strong corporate governance. According to the writers, as countries give outsiders more leverage, IPO issuers would underprice their offerings in order to generate excess demand, resulting in greater ownership dispersion and reducing outsiders' incentives to monitor corporate insider behaviour. In other words, underpricing is a cost that insiders pay to preserve dominance in countries with legal systems designed to empower outsiders. We find that underpricing has a negative relationship with post-IPO outside blockholdings and a positive relationship with private control benefits, which is consistent with the control incentive for underpricing. Furthermore, businesses with entrenched insiders do not underprice more in countries with stronger governance, whether by majority control or dual-class structures.

(Banerjee et al., 2011)The paper examines in 36 countries across the world the implications of country-level knowledge asymmetry, investor home country prejudice, contract compliance efficiency, and legal redress accessibility on IPO underpricing. All four of the hypotheses are supported by proof. First, it was found that country-level knowledge asymmetry has a positive and important impact on IPO underpricing and second, the empirical evidence is consistent with the agency-cost-based explanation of IPO underpricing. It was discovered that reducing the cost of enticing block holders, as determined by domestic investors' home-country bias, reduces IPO underpricing. Finally, a successful contract compliance mechanism, aids in the reduction of IPO underpricing. Finally, there was a constructive relationship between legal redress accessibility and IPO underpricing.

(Su & Fleisher, 1999)In this paper, using data from 308 firm commitment new problems, the underpricing of Chinese IPOs has been examined. Underpricing is explained in terms of a separating equilibrium under asymmetric knowledge, in which underpricing is a strategy for firms to signal their value to investors. It has been shown that bribery is an unlikely cause of the high IPO underpricing observed in the Chinese data. The author has also looked into the possibility that different lottery processes for IPO share allocation have exacerbated underpricing. Finally, it was found that differences in initial returns between A and B shares can be explained by differences in investment opportunities and sentiments between domestic and foreign investors.

(Alhammadi et al., 2015) The pricing of IPOs on the National Stock Exchange (NSE) is the subject of this research. It aims to empirically explain first-day underpricing in terms of demand created during the issue's book building, the listing delay between the closing of the book building and the issue's first-day listing, and the money spent by the firms on IPO marketing. It also seeks to locate the NSE's post-IPO returns for a month. The findings indicate that demand created during book building and the listing delay have a positive impact on the first day underpricing, while the impact of money spent on the IPO's marketing is negligible. It was also discovered that, in line with previous research, the firms under study have a negative post-IPO performance one month after their initial public offering.

III. RESEARCH OBJECTIVES

This study analyses both initial pricing and long run performance of IPOs. Therefore, the objectives of the study are:
1. To ascertain the listing day performance (under-pricing) of IPOs in India during the year 2020
2. To assess the impact of various factors (independent variables) like Issue size, oversubscription, absolute market return, offer price, proportion of Fresh issue on the listing day under-pricing of IPOs
3. To ascertain post-listing short-term performance of IPOs of 2020 for a period of 60 trading days
4. To analyse post-listing aftermarket performance of the IPOs with respect to NIFTY50 and NIFTY500

IV. PROBLEM STATEMENT

Historically, IPOs have, on average given stellar returns on listing day and this phenomenon has also been studied widely by numerous research articles as well. One anomaly found here is that, most often than not, during the post-listing short-term to medium-term period IPOs perform rather poorly (underperform) and underperform with respect to the broader markets.

However, 2020 was an extraordinary year for the stock markets with terrific returns, immense volatility and the sharp revival from the covid driven slump during the first quarter of the year to the all-time highs, in both the domestic and the global markets at large. Also, there were quite a large number of IPOs that were launched into the markets in India last year. Therefore, it becomes imperative to study the trends in the performance of these IPOs during such times of excess volatility and liquidity as well as extreme uncertainty and if they're in line with the historically observed movements. A more detailed analysis can be done to analyse the impact of various factors like Issue size, offer price, proportion of Fresh Issue, Oversubscription, and absolute market returns on the listing day under-pricing of the IPO stocks.

V. SCOPE OF THE STUDY

The study focusses on the listing day and post-listing short-term 60-days daily performance of the 14 IPOs during the calendar year 2020. Historical research has established many theories on the underpricing of the IPOs and the major factors affecting the same. There were five major factors related to the IPOs that were studied in this paper, namely- Issue size, Issue Price, Absolute Market returns (NIFTY50), Oversubscription and Proportion of Fresh issue. This study, focusses on the how the IPOs have fared in the last year, one of the most turbulent times that the markets had ever witnessed. The study also compares these IPOs' performances with the two major benchmark indices i.e., NIFTY50 and NIFTY500 with the aim at establishing a better understanding of these IPOs with respect to the broader domestic markets.

VI. VARIABLES

A sample of 14 IPOs out of the 15 IPOs that went public during 2020 are taken under consideration. Daily share prices have been taken from the official NSE website of each of the sample companies.

▪ **Methodology to evaluate initial return / listing day underpricing:**
- Initial Raw Return (IR)

$IR_i = (P_{i1} - P_{i0}) / P_{i0}$

where, $IR_{i=}$ Initial Raw return / Listing day Raw return
P_{i1}= Listing day closing price of the stock
P_{i0}= Offer price/Issue Price of the stock

- Benchmark Adjusted underpricing or Abnormal Initial Return (AIR)

$AIR_i = [(P_{i1} - P_{i0}) / P_{i0}] - [(P_{m1} - P_{m0}) / P_{m0}]$

Where, AIR_i= Abnormal Initial return i.e., the Benchmark adjusted return
P_{m1}= Closing level of the benchmark index on the listing day of the IPO scrip
P_{m0}= Closing level of the benchmark index on the IPO offering day

In this study, I have also considered opening, high and low prices (all unadjusted) on the listing day and the contemporaneous market indices to compute underpricing, both raw and market-adjusted. Also, I have considered two market indices to compute market-adjusted under-pricing- NIFTY50 and NIFTY500.

- Average Raw underpricing (R_t):

$R_t = \sum_{t=1 to n} (IR_{it} / n)$

Where, $IR_{i=}$ Initial Raw return / Listing day raw return
n= Total number of observations in the sample (14 in our case)

- Average Market Adjusted Underpricing (AR_t):

$AR_t = \sum_{t=1 to n} (AIR_{it} / n)$

Where, $AIR_{i=}$ Abnormal Initial return on the IPO scrip i.e., the Benchmark adjusted return
n= Total number of observations in the sample (14 in our case)

▪ **Methodology to evaluate the impact of various independent variables on listing day underpricing:**
- Dependent variable- Listing day underpricing of each sample stocks
- Independent variables- Issue size, Issue Price, Absolute NIFTY50 Returns, Oversubscription, and Proportion of fresh issue

Explanation of Independent variables:
▪ Issue Price: Issue price is the final offer price offered by the company determined after book building process or fixed price process to the public for subscription of the Initial Public Offer.
▪ Issue Size: Issue size is the total amount that the issuing company wants to raise from Initial Public Offer (IPO). The total issue size is total number of shares offered multiplied with the final offer price of the IPO decided by merchant bank
▪ Oversubscription of IPO: Oversubscription is the number of times the IPO has been subscribed by the various investor categories during the issue offer period
▪ Market Index Return (Mi): Index return is the absolute change in the Nifty50 index on the listing day of the IPO and last day of the Issue offer.

▪ Proportion of Fresh Issue: Fresh issue is calculated as the percentage of the total Issue size and. The Issue size consists of Fresh Issue and Follow-on Public Offer (FPO), which is the proportion of shares that that promoters of the company are interested to sell.

▪ **Methodology to evaluate post listing performance:**
The study analyses the post listing short-term 60 days performance based on the daily average returns of the sample IPOs both raw and market adjusted and excludes the initial day returns which is based on the offer price and the listing day closing price.

- The daily raw returns for security "i" are computed as under:
$$R_{it} = (P_{it} - P_{it-1}) / P_{it-1}$$
Where, R_{it} = Raw return on security i on day t
P_{it} = Prie of security i on day t
P_{it-1} = Price of security i on day t-1 (previous trading day)

- The market (benchmark) return for the same period is computed as under:
$$R_{mt} = (I_t - I_{t-1}) / I_{t-1}$$
Where, R_{mt} = Market index return (Nifty50 and Nifty500 in our case) on day t
I_t = Closing index level on day t
I_{t-1} = Closing index level on day t-1 (previous trading day)

- The Daily Market Adjusted Returns are computed by subtracting the daily market returns from the daily raw returns for the same period, as shown under:
$$MAR_{it} = R_{it} - R_{mt}$$
Where, MAR_{it} = Market adjusted return on security i on day t
R_{it} = Raw return on security i on day t
R_{mt} = Market return on day t

- Average Raw Return on day t:
$$AR_t = (1/n) \sum_{i=1 \text{ to } n} (R_{it})$$
i.e., Average raw return of all the sample securities on day t is the equally weighted arithmetic average of the raw returns of all the securities.
Where, R_{it} = Raw return on security i on day t
n = number of securities in the sample portfolio

- Average Market adjusted return on day t:
$$AAR_t = (1/n) \sum_{i=1 \text{ to } n} (MAR_{it})$$
The average Market-adjusted return on all the sample securities on day t is the equally weighted arithmetic average of the market adjusted returns of all the securities on day t
Where, MAR_{it} = Market adjusted return on security i on day t
n = number of securities in the sample portfolio

VII. HYPOTHESIS

Hypotheses 1:
H0: The IPOs are not underpriced based on the listing day performance
H1: The IPOs are underpriced based on the listing day performance

Hypotheses 2:
H0: There is no significant relationship between several independent variables with the level of underpricing.
H1: There is a significant relationship between several independent variables with the level of underpricing.

Hypotheses 3:
H0: Investors cannot earn positive returns from IPOs in the post-listing short-term period performance
H1: Investors can earn positive returns from IPOs in the post-listing short-term period performance

Hypotheses 4:
H0: Investors cannot earn abnormal returns from IPOs in the post-listing period performance in comparison to benchmark index
H1: Investors can earn abnormal returns from IPOs in the post-listing period performance in comparison to benchmark index

VIII. METHOD OF DATA COLLECTION

The data for the purpose of this study was completely taken from secondary sources. The daily price data of all the 14 sample IPOs along with the daily benchmark performance-Nifty50 and Nifty500 was taken from the official NSE website and the other details of the IPOs such Issue size, issue Price, Oversubscription, proportion of fresh issue, etc. was taken from different websites like Chittorgarh.com, etc.

IX. SAMPLING TYPE AND STATISTICAL DESIGN

The sample size consists of 14 IPOs that launched into the markets during 2020 and also contains the time-series data of the 60 days performance of prize movements of each of these 14 IPOs post listing and also the Nifty50 and Nifty500 performance daily performance over the period under consideration.

T-Test:

▪ Parametric t-test calculation for Initial day returns (Both Raw and Market adjusted):

To test the significance of the average underpricing of the sample, the following parametric t-test is employed at a significance level of 5%

$t(R_t) = R_t / S.E. (R_t)$

where, R_t = Average Raw underpricing of all the 14 sample IPOs

$\quad\quad$ $S.E.(R_t)$ = Standard Error of the Average raw underpricing

Standard Error is calculated in the following manner:

$S.E. (R_t) = S.D. (R_t) / \sqrt{n}$

Where, $S.D. (R_t)$ = Standard Deviation of the Average raw underpricing of the sample IPO scrips

n = Number of observations in the sample (14 in this case)

The same methodology is followed out for calculating the parametric t-test values for the "Average Market Adjusted Underpricing (AR_t)". The t-values are calculated for all the open, high, low and close values for both the Raw returns and the Benchmark Adjusted Returns.

▪ Parametric significance t-test for daily 60-day performance:

In testing the aftermarket short-run performance of the IPOs, Average daily raw returns and average daily benchmark adjusted returns of the sample securities are employed to calculate the t-statistic

$t(AR_t) = AR_t / SE(AR_t)$

where, AR_t = Average raw returns on sample securities on day t

$\quad\quad$ $SE(AR_t)$ = Standard Error of average raw returns on day t

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

Where, $SD(AR_t)$ = Standard Deviation of raw returns of sample security on day t

$\quad\quad$ n = number of securities in the sample

Similarly, the t-statistic is also calculated for the market adjusted returns on a particular day t

$t(AAR_t) = AAR_t / SE(AAR_t)$

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

The t-statistic values were evaluated at a significance level of 5% and 2% and the index

Regression:

In this study, the factors that could explain the underpricing performance of Indian IPOs on listing day were investigated using multiple regression analysis. This method aids in determining the magnitude and direction of the relationship between the dependent variable and a number of independent variables. The following OLS regression model has been established based on existing literature to find the determinants of IPO success on listing day in India:

Listing day underpricing (Y) = α + β1(Nifty50 return) + β2(Issue Size) + β3(Issue Price) + β4(Oversubscription) + β5(Proportion of fresh issue)

Where, α is the intercept coefficient, and βi is the coefficient for each of the independent variables "i"

X. METHOD OF DATA COLLECTION

▪ The study is restricted to the performance of the Book built IPOs and does not include the Fixed Price IPOs.
▪ The study tests only the short-run 60-day performance of the IPOs and excludes the long-term performance of these IPOs due to non-availability of data at the time of writing this paper.
▪ The study is conducted for only a year's time period i.e. the calendar year 2020.
▪ This study is based on the Indian context only

XI. ANALYSIS AND INTERPRETATION

t-test for listing day performance:

Type of Return	Return and t-statistic values			
	Open	**High**	**Low**	**Close**
Raw return	44.79%	58.50%	34.64%	45.68%
	3.52	**4.08**	**3.03**	**3.36**
Nifty50 Adjusted Return	44.11%	57.82%	33.95%	45.00%
	3.54	**4.10**	**3.02**	**3.37**
Nifty500 Adjusted Return	44.16%	57.87%	34.01%	45.05%
	3.56	**4.12**	**3.04**	**3.38**

The result presented in table-1 shows that the listing day returns, when computed using the closing prices vary a little over 45% in both raw and market-adjusted returns. Investors who are lucky enough to sell their allotted securities at the high price can earn a listing day return of over 57%. Even if investors sell their securities at the open price of the security as soon as the markets open on the listing day, can on average earn a listing day return in the range of 44-45% under both the scenarios of raw and market adjusted returns. Selling the allotted securities at the low prices on the listing day will fetch investors a listing day return of approximately 34%. All these measures of underpricing on the listing day of both- raw and market adjusted are found to be significant at 2% levels. One noteworthy observation found here is that there is not much difference between the raw underpricing measures and the market-adjusted underpricing measures. This is primarily because post 2000, SEBI tightened its rules pertaining to the listing delays between the period of IPO subscription and IPO listing days. Thus, the market returns during that period becomes insignificant. Another significant observation to note here is that the difference between the high and low measures of underpricing is approximately 24%.

Since, all these underpricing measures are found to be significant at even 2% levels, we can thus reject the null hypotheses and accept the alternate hypotheses that IPOs are underpriced based on the listing day performance.

Regression to study the impact of various independent variables on the listing day Returns:

Regression Statistics	
Multiple R	0.8075
R Square	0.6520
Adjusted R Square	0.4346
Standard Error	0.3820
Observations	14

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	5	2.1876	0.4375	2.9982	0.0813
Residual	8	1.1674	0.1459		
Total	13	3.3550			

The table presents the regression analysis on the data collected. Here, the dependent variable Y is the listing day underpricing of the IPO scrips and the independent variables are Nifty50 returns, Issue size, Issue Price, Oversubscription and proportion of fresh issue. The equation of the multiple OLS regression becomes:

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.1470	0.2694	0.5458	0.6001	-0.4741	0.7682	-0.4741	0.7682
Nifty50 Return	-2.6796	3.9139	-0.6846	0.5129	-11.7050	6.3458	-11.7050	6.3458
Issue Size	-0.0001	0.0001	-0.8207	0.4356	-0.0004	0.0002	-0.0004	0.0002
Issue Price	0.0003	0.0005	0.5494	0.5977	-0.0009	0.0015	-0.0009	0.0015
Oversubscription	0.0051	0.0016	3.1648	0.0133	0.0014	0.0089	0.0014	0.0089
% Fresh issue	-0.0424	0.4291	-0.0988	0.9238	-1.0320	0.9472	-1.0320	0.9472

Listing day underpricing (Y) = 0.1470 + (-2.6796)(Nifty50 return) + (-0.0001)(Issue Size) + (0.0003)(Issue Price) + 0.0051(Oversubscription) + (-0.0424)(Proportion of fresh issue)

From the above table, we can observe that there is only one variable with a p-value of less than 0.05 that is, "oversubscription" (with a p-value of 0.0133). In other words, out of the 5 independent variables which have been taken into consideration to assess their impact on the listing day returns of the IPOs, only the oversubscription variable is found to have a significant impact on the listing day returns at a 5% level of significance. The coefficient value for oversubscription is +0.0051 which indicates that if oversubscription increase by 0.0051 units, the listing day returns will increase by 1 unit.

Apart from oversubscription, no other independent variable has any tangible impact or relationship with the listing day returns from an IPO. Thus, with respect to the second hypotheses, we cannot reject the null hypotheses for the independent variables like Nifty50 return, Issue Size, Issue Price, and proportion of Fresh Issue. However, since the independent variable- oversubscription is significant at 5% level, we reject the null hypotheses in this case and can accept the alternate hypotheses that there is significant relationship between oversubscription and listing day underpricing.

t-test to analyse post-listing 60-day raw-returns performance:

Day	Mean Raw Return (AR$_t$)	Cumulative Average Raw Return	T-statistic (AR$_t$)	Day	Mean Raw Return (AR$_t$)	Cumulative Average Raw Return	T-statistic (AR$_t$)
1	2.38%	2.38%	1.0449	31	0.12%	5.16%	0.1549
2	1.11%	3.49%	0.5193	32	-0.67%	4.49%	-1.4918
3	-0.77%	2.72%	-0.6602	33	0.42%	4.91%	1.0508
4	-0.05%	2.67%	-0.0529	34	-1.22%	3.69%	-1.6417
5	-2.37%	0.30%	-1.5728	35	0.02%	3.71%	0.0443
6	0.36%	0.66%	0.2242	36	-1.01%	2.71%	-1.8955
7	1.21%	1.87%	1.4215	37	1.13%	3.84%	2.0404
8	-0.84%	1.04%	-1.0592	38	0.90%	4.75%	1.5197
9	-0.10%	0.93%	-0.1362	39	0.80%	5.54%	1.6605
10	-1.17%	-0.24%	-1.3519	40	-0.45%	5.09%	-1.2423
11	-0.47%	-0.71%	-1.0097	41	1.03%	6.12%	2.1482
12	0.19%	-0.53%	0.3027	42	-0.96%	5.16%	-1.9293
13	-0.43%	-0.95%	-0.7256	43	0.55%	5.71%	1.0149
14	0.03%	-0.92%	0.0722	44	1.40%	7.11%	0.9283
15	1.23%	0.31%	1.2455	45	-0.94%	6.17%	-1.8235
16	0.06%	0.38%	0.0397	46	1.91%	8.08%	1.5010
17	-1.24%	-0.86%	-1.0286	47	0.17%	8.25%	0.2502
18	0.36%	-0.50%	0.4384	48	0.67%	8.92%	0.8727
19	-0.68%	-1.18%	-0.5592	49	-0.27%	8.65%	-0.3612
20	-0.36%	-1.54%	-0.3384	50	0.39%	9.04%	0.8198
21	-0.24%	-1.79%	-0.3224	51	1.32%	10.36%	2.1826
22	0.86%	-0.92%	1.1581	52	1.02%	11.38%	1.3812
23	0.10%	-0.82%	0.2873	53	0.03%	11.41%	0.0467
24	0.34%	-0.47%	0.5630	54	-0.38%	11.03%	-0.6701
25	1.33%	0.86%	2.0719	55	-0.17%	10.86%	-0.2545
26	1.34%	2.20%	1.1044	56	-0.76%	10.10%	-1.3522
27	-0.92%	1.28%	-1.4975	57	-0.18%	9.92%	-0.3042
28	1.42%	2.70%	2.5174	58	-0.52%	9.40%	-1.1230
29	2.57%	5.27%	2.2479	59	0.17%	9.56%	0.2880
30	-0.23%	5.04%	-0.2625	60	-0.08%	9.49%	-0.1247

The above table reveals that there are no significant positive daily movements during the short-run 60-days performance of the 14 sample IPOs during the post listing period. Out of the 60 days, only 3 days have exhibited a positive significant t-statistic vale for a 5% significance level i.e., on days 28, 29 and day 51. Rest all the days have insignificant t-test values indicating no strong drivers of positive or negative returns during the post-listing period and more or less stagnant returns throughout the period under consideration. Thus, we cannot reject the null hypotheses and accept that an investor cannot earn raw returns from an IPO during the post listing short term period.

t-test to analyse post-listing 60-day Nifty50 adjusted-returns performance:

Day	Mean Nifty50 adjusted Return (AAR$_t$)	Cumulative Average Abnormal returns	T-statistic (AAR$_t$)	Day	Mean Nifty50 adjusted Return (AAR$_t$)	Cumulative Average Abnormal returns	T-statistic (AAR$_t$)
1	2.20%	2.20%	0.9298	31	-0.03%	-3.17%	-0.0381
2	1.25%	3.45%	0.6012	32	-0.79%	-3.96%	-1.4437
3	-0.41%	3.04%	-0.3053	33	-0.19%	-4.15%	-0.2844
4	-1.03%	2.01%	-1.2740	34	-1.52%	-5.66%	-2.3605
5	-1.51%	0.50%	-1.8891	35	-0.80%	-6.46%	-1.4721
6	-0.39%	0.11%	-0.2625	36	-1.25%	-7.71%	-2.8281
7	0.34%	0.44%	0.3663	37	0.93%	-6.78%	1.3909
8	-1.10%	-0.66%	-1.4117	38	0.68%	-6.10%	1.0370
9	-0.37%	-1.03%	-0.5307	39	0.63%	-5.47%	1.4157
10	-1.31%	-2.34%	-1.6416	40	-0.47%	-5.94%	-1.1705
11	-1.28%	-3.62%	-2.6647	41	0.56%	-5.38%	1.1787
12	0.23%	-3.40%	0.3506	42	-1.03%	-6.41%	-2.3450
13	-0.26%	-3.66%	-0.4828	43	0.23%	-6.18%	0.3879
14	-0.81%	-4.47%	-1.0230	44	1.58%	-4.59%	1.1200
15	1.44%	-3.03%	1.4355	45	-0.91%	-5.50%	-1.8798
16	-0.44%	-3.47%	-0.2899	46	1.32%	-4.18%	1.0866
17	-1.12%	-4.59%	-0.9595	47	-0.38%	-4.56%	-0.5611
18	-0.17%	-4.76%	-0.2056	48	0.51%	-4.05%	0.5775
19	-0.67%	-5.43%	-0.5598	49	-0.51%	-4.56%	-0.8855
20	-0.68%	-6.12%	-0.5992	50	-0.28%	-4.84%	-0.6014
21	-0.76%	-6.88%	-0.8978	51	0.63%	-4.22%	0.9945
22	0.65%	-6.22%	0.8812	52	0.89%	-3.32%	1.2445
23	-0.35%	-6.57%	-1.0925	53	-0.52%	-3.85%	-0.8786
24	0.03%	-6.54%	0.0587	54	-0.32%	-4.17%	-0.4364
25	0.39%	-6.14%	0.6007	55	-0.41%	-4.57%	-0.7839
26	0.57%	-5.57%	0.4439	56	-1.11%	-5.69%	-2.2114
27	-1.21%	-6.78%	-2.0742	57	-0.30%	-5.99%	-0.5071
28	1.47%	-5.31%	2.4558	58	-0.94%	-6.93%	-2.4301
29	2.22%	-3.08%	1.9836	59	0.38%	-6.55%	0.6665
30	-0.06%	-3.14%	-0.0635	60	-0.19%	-6.75%	-0.2784

The above table reveals that soon after listing, the 2020 IPOs have underperformed the markets. 22 of the 60-daily average Nifty50 adjusted returns (AAR$_t$) are positive, out of which only one of them is significant at 5% significance level i.e., on day 28 with AAR and t-test values of 1.47% and 2.456 respectively. 38 of the remaining negative AAR$_t$ have 6 significant t-statistic values, with two of them exhibiting significance at 2% levels. The Cumulative Abnormal returns have been negative for 53 days out of the total 60 days.

t-test to analyse post-listing 60-day Nifty500 adjusted-returns performance:

Day	Mean Nifty500 adjusted Return (AAR$_t$)	Cumulative Average Abnormal returns	T-statistic (AAR$_t$)	Day	Mean Nifty500 adjusted Return (AAR$_t$)	Cumulative Average Abnormal returns	T-statistic (AAR$_t$)
1	2.26%	2.26%	0.9612	31	-0.04%	-3.03%	-0.0585
2	1.38%	3.64%	0.6675	32	-0.81%	-3.84%	-1.4836
3	-0.31%	3.33%	-0.2372	33	-0.14%	-3.98%	-0.2232
4	-0.95%	2.38%	-1.1730	34	-1.53%	-5.51%	-2.5247
5	-1.53%	0.84%	-1.8936	35	-0.78%	-6.29%	-1.5064
6	-0.32%	0.52%	-0.2138	36	-1.28%	-7.57%	-3.0048
7	0.35%	0.87%	0.3954	37	0.88%	-6.69%	1.4443
8	-1.14%	-0.27%	-1.5339	38	0.59%	-6.09%	0.9348
9	-0.43%	-0.69%	-0.5990	39	0.57%	-5.52%	1.3011
10	-1.34%	-2.03%	-1.7052	40	-0.56%	-6.08%	-1.3959
11	-1.25%	-3.27%	-2.6653	41	0.54%	-5.53%	1.1141
12	0.19%	-3.08%	0.3002	42	-1.04%	-6.57%	-2.5842
13	-0.29%	-3.37%	-0.5259	43	0.19%	-6.38%	0.3281
14	-0.79%	-4.16%	-1.0775	44	1.46%	-4.92%	1.0323
15	1.36%	-2.80%	1.3624	45	-0.99%	-5.91%	-2.0949
16	-0.38%	-3.18%	-0.2520	46	1.31%	-4.60%	1.0879
17	-1.19%	-4.37%	-1.0185	47	-0.33%	-4.93%	-0.5021

18	-0.20%	-4.57%	-0.2406	48	0.45%	-4.48%	0.5402
19	-0.71%	-5.28%	-0.6017	49	-0.44%	-4.92%	-0.7774
20	-0.65%	-5.92%	-0.5614	50	-0.26%	-5.18%	-0.5963
21	-0.70%	-6.62%	-0.8521	51	0.59%	-4.59%	0.9625
22	0.61%	-6.01%	0.8408	52	0.93%	-3.66%	1.3151
23	-0.35%	-6.36%	-1.1259	53	-0.51%	-4.17%	-0.8560
24	0.02%	-6.34%	0.0361	54	-0.23%	-4.40%	-0.3144
25	0.49%	-5.85%	0.7694	55	-0.35%	-4.76%	-0.6919
26	0.65%	-5.20%	0.5129	56	-1.19%	-5.95%	-2.4799
27	-1.13%	-6.33%	-2.0119	57	-0.33%	-6.27%	-0.5560
28	1.36%	-4.97%	2.3228	58	-0.96%	-7.23%	-2.4762
29	2.17%	-2.80%	1.9515	59	0.33%	-6.91%	0.5839
30	-0.19%	-2.99%	-0.2151	60	-0.25%	-7.16%	-0.3628

The above t-statistic table shows that the IPOs launched during the year 2020 have underperformed the markets and the results are very much similar to that of the Nifty50 adjusted daily price returns. 22 out of the 60 days under consideration had positive average Nifty500 adjusted return with only two days giving a significant return at 5% level. The remaining 38 days had a negative AAR_t, out of which three days exhibited significant returns at a 5% level and on two days exhibited significant returns at a 2% level. Hence, with regard to Hypotheses 4, we cannot reject the null hypotheses and can infer that investors cannot earn abnormal returns from IPOs in the post-listing period performance in comparison to benchmark indices like NIFTY50 and NIFTY500

XII. SUMMARY OF FINDINGS

Listing day Underpricing:
- This study finds that the IPOs in India during the Covid-19 crises were underpriced on their listing day. Out of the 14 IPOs chosen and measured based on their Open, high low and closing prices, all of the return values were found to be significant at even 2% levels.
- The average listing day gains in India were found to be around 45%, 59%, 35%, and 46% when computed using Open, High, low and closing prices respectively.
- Out of the 5 independent variables taken under consideration to assess their impact on the listing day underpricing, only oversubscription is found to have a tangible impact on the dependent variable. The rest of the independent variables, namely- Issue size, Issue Price, Nifty50 returns during the period, and proportion of fresh issue are found to have no tangible relationship with the Listing day underpricing of the Indian IPOs during the covid crises.

Short-run 60 days performance:
- The three months 60-day post listing period performance of the IPOs reveals that out of the 60 daily average raw returns of the sample IPOs, only 3 of them had significant t-test values at a 5% significance level.
- The study finds most of the daily returns insignificant, thus indicating that the population raw mean returns during the 60 days post-listing period are more or less stagnant.
- The 60-days post listing period market adjusted daily average performance, reveals that out of the 60 AAR_t hardly around 7 days's average returns were significant and rest all were insignificant. Even out of those which were significant, majority of the values were significant for negative returns at a 5% significance level. None of the returns were positively significant.
- Hence, this shows that the IPOs have underperformed markets since most of the t-statistic values were insignificant. We thus, cannot reject the null hypotheses which states that investors cannot positive abnormal returns with respect to the markets

XIII. CONCLUSIONS AND RECOMMENDATIONS

The paper aims at studying the listing day underpricing of the IPOs and the factors affecting the same. The study also tries to understand the post listing short-term performance of the 14 IPOs that entered the markets in 2020. The listing day underpricing of the 14 sample IPOs when computed using the closing prices was found to be around 45%, both raw and market adjusted. The listing day analysis shows that the Indian IPOs were underpriced and the explanatory variable like oversubscription has an impact on it. As the variables like Issue size, issue price, market return, and proportion of fresh issue did not have an impact on the listing day underpricing, the investors should not base their listing day investing decision in an IPO based on these factors. They should however consider oversubscription as a determinant of listing day gains.

The post listing t-test reveals that the IPOs have underperformed the markets, when compared with benchmark indices such as Nifty50 and Nifty500 and have rather stayed stagnant for the most part. These IPOs have first given stellar returns on the listing day and have subsequently underperformed the markets in the short-run period (60 days in this case). This behaviour, although in line with the previous studies, is however a bit different in terms of the degree of underperformance. Historically, it has been found that the market adjusted average return t-statistic values were rather negatively significant instead of insignificant as in our case. This differing observation noted here can be attributed to two main reasons:

1. The sample taken under consideration for the purpose of this study was too small to reach a satisfactory conclusion
2. The markets overall were accompanied with immense volatility and strong growth which would have also helped the IPO stocks to stay buoyant during the short term if not plummet.

The key takeaway from this research is that, like many other capital markets, companies in India time their issuances. They launch their initial public offerings (IPOs) at a time when the market sentiment is strong. In the post listing period, the same IPOs that initially provided a positive return, underperform. Given the presence of such windows of opportunity for issuers, policymakers must devise policies to safeguard investors' short as well as long-term interests. Retail investors should consider the fundamentals and prospects of IPO companies rather than current market sentiments when investing in IPO shares to avoid losing money due to the post listing underperformance of the IPOs.

XIV. ACKNOWLEDGMENT

Listing-day underpricing t-test calculation:

Sr. No.	Company	Raw return				Nifty500 Adjusted Return				Nifty50 Adjusted Return			
		Open	High	Low	Close	Open	High	Low	Close	Open	High	Low	Close
1	SBI Cards and Payment Services	-12.45%	0.00%	-13.11%	-9.75%	5.74%	18.19%	5.08%	8.44%	5.93%	18.38%	5.27%	8.63%
2	Rossari Biotech	57.47%	88.96%	56.24%	74.51%	52.59%	84.08%	51.35%	69.62%	51.85%	83.34%	50.61%	68.88%
3	Happiest Minds Technologies	110.84%	137.92%	110.84%	123.46%	107.87%	134.94%	107.87%	120.49%	108.73%	135.81%	108.73%	121.35%
4	Route Mobile	104.86%	110.00%	78.57%	86.09%	106.27%	111.41%	79.98%	87.50%	106.72%	111.87%	80.44%	87.95%
5	Computer Age Management Services	15.45%	21.06%	11.46%	13.93%	11.95%	17.56%	7.96%	10.43%	12.11%	17.72%	8.13%	10.60%
6	Chemcon Speciality Chemicals	115.00%	115.07%	72.00%	72.00%	112.09%	112.17%	69.09%	69.09%	112.44%	112.51%	69.44%	69.44%
7	Angel Broking	-10.13%	-3.04%	-16.01%	-9.87%	-16.52%	-9.43%	-22.40%	-16.26%	-16.59%	-9.50%	-22.47%	-16.33%
8	Mazagon Dock Shipbuilders	48.21%	49.62%	18.59%	18.59%	45.21%	46.62%	15.59%	15.59%	43.70%	45.12%	14.08%	14.08%
9	Likhitha Infrastructure	38.25%	46.67%	22.63%	32.58%	38.88%	47.30%	23.26%	33.22%	38.83%	47.25%	23.20%	33.16%
10	UTI Asset Management Company	-9.75%	-4.34%	-14.96%	-14.04%	-12.75%	-7.34%	-17.96%	-17.04%	-14.25%	-8.84%	-19.47%	-18.55%
11	Equitas Small Finance Bank	-5.76%	0.45%	-8.94%	-0.61%	-4.23%	1.98%	-7.41%	0.92%	-3.85%	2.37%	-7.03%	1.30%
12	Gland Pharma	14.00%	23.33%	13.33%	21.30%	12.03%	21.36%	11.36%	19.33%	13.14%	22.47%	12.47%	20.44%
13	Burger King India	87.50%	125.00%	80.67%	125.00%	85.35%	122.85%	78.51%	122.85%	85.24%	122.74%	78.41%	122.74%
14	Mrs. Bectors Food Specialities Ltd.	73.61%	108.33%	73.61%	106.32%	73.80%	108.52%	73.80%	106.51%	73.55%	108.27%	73.55%	106.26%
	Average Return	**44.79%**	**58.50%**	**34.64%**	**45.68%**	**44.16%**	**57.87%**	**34.01%**	**45.05%**	**44.11%**	**57.82%**	**33.95%**	**45.00%**
	Standard Deviation	**47.56%**	**53.62%**	**42.82%**	50.80%	46.42%	52.55%	41.83%	49.82%	46.61%	52.73%	42.07%	50.04%
	Standard Error (Std. Dev/ sqrt n)	0.1271	0.1433	0.1144	0.1358	0.1241	0.1405	0.1118	0.1332	0.1246	0.1409	0.1124	0.1337
	t-statistic	**3.5242**	**4.0822**	**3.0266**	**3.3644**	**3.5597**	**4.1204**	**3.0419**	**3.3830**	**3.5411**	**4.1031**	**3.0197**	**3.3647**

All t-statistic values are significant at 2% significance level

Regression table to assess the impact of various factors on listing day underpricing:

Sr. No.	Issuer Company	Issue Close	Listing Day	DEPENDENT VARIABLE	INDEPENDENT VARIABLES				
				Listing Day Under-pricing	Nifty50 Return	Issue Size (Crore Rs)	Issue Price (Rs)	Oversubscription	Proportion of fresh Issue
1	SBI Cards and Payment Services	05-Mar-20	16-Mar-20	-9.75%	-18.38%	10,354.77	755	26.22	4.83%
2	Rossari Biotech	15-Jul-20	23-Jul-20	74.51%	5.62%	496.49	425	79.37	10.07%
3	Happiest Minds Technologies	09-Sep-20	17-Sep-20	123.46%	2.11%	702.02	166	150.98	15.67%
4	Route Mobile	11-Sep-20	21-Sep-20	86.09%	-1.87%	600	350	73.3	40.00%
5	Computer Age Management Services	23-Sep-20	05-Oct-20	13.93%	3.34%	2,244.33	1230	46.99	100.00%
6	Chemcon Speciality Chemicals	23-Sep-20	01-Oct-20	72.00%	2.56%	318	340	149.3	51.89%
7	Angel Broking	24-Sep-20	05-Oct-20	-9.87%	6.46%	600	306	3.94	50.00%
8	Mazagon Dock Shipbuilders	01-Oct-20	12-Oct-20	18.59%	4.50%	443.69	145	157.41	0.00%
9	Likhitha Infrastructure	07-Oct-20	29-Oct-20	32.58%	-0.58%	61.2	120	9.51	8.33%
10	UTI Asset Management Company	01-Oct-20	12-Oct-20	-14.04%	4.50%	2,159.88	554	2.31	0.00%
11	Equitas Small Finance Bank	22-Oct-20	02-Nov-20	-0.61%	-1.91%	517.6	33	1.95	54.10%
12	Gland Pharma	11-Nov-20	20-Nov-20	21.30%	0.86%	6,479.55	1500	2.06	19.29%
13	Burger King India	04-Dec-20	14-Dec-20	125.00%	2.26%	810	60	156.65	55.56%
14	Mrs. Bectors Food Specialities Limited IPO	17-Dec-20	24-Dec-20	106.32%	0.06%	540.54	288	198.02	7.50%

Apart from these, there were multiple tables of secondary data used to calculate the t-statistic and perform the required analysis.

Those tables include:

▪ 60-day price performance of each of the 14 sample IPOs along with their daily returns- both raw and market adjusted

▪ 300-day daily price movements including open, high, low and close prices for the chosen benchmark indices- NIFTY50 and NIFTY500.

▪ Table to calculate t-statistic values for the 60-days raw returns

▪ Table to calculate market-adjusted t-statistic values for 60-days' returns

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