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Exploring Underpricing of Select NSE-listed IPOs in India with Respect to Differences in Age at the Time of Listing

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Abstract
The primary capital market plays a vital role in money mobilisation in the capital formation in an economy using Initial Public Offerings (IPOs) mode. The IPOs are subscribed by the interested investors at the offer price or issue price. After the issuance of IPOs, their listing day performance may show underpricing or overpricing. There are many factors to influence the price performance of IPOs. In this backdrop, the current study analyses the first day price performance of IPOs on the basis of the age of the IPOs. The study examines the various measures of first day returns on the basis of the different groups formed considering differences in age for the sample 224 IPOs companies. Such measures of average returns are tested for statistical significance with the help of one-sample t-test. The study ultimately finds that underpricing exists when studied on the basis of different categories of age of the IPOs.
Keywords: Capital formation, Initial Public Offerings (IPOs), Initial Returns, MAAR, Underpricing, Age of the company, one-sample t-test.
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1. Introduction

The primary capital market plays a pivotal role in shaping the economic growth of a nation. Economic growth takes place with the help of capital formation through money mobilisation (Tadesse, 2004). The primary capital market offers an array of avenues through which money mobilisation and eventually capital formation takes place in an economy. One such mode of money mobilisation is the process of issuance of IPOs. Companies get the opportunity to become listed in a recognised stock exchange, for the first time, through the IPO process (Ritter, 1998). The entire IPO process takes place for a considerable period of time, for any company. After listing trading begins in the secondary market (Mayur, 2018). The most important segment of this entire issue process is probably the pricing of the IPOs. The price of the IPOs is on the basis of public demand in case of book-building method. However, decision regarding the price-band or the cut-off price of the issue is determined by the merchant bankers. It is observed that the prices start fluctuation once the IPOs are listed and they start generating positive or negative returns. Positive returns generated by IPOs are called underpricing, whereas, negative returns are called overpricing (Madhusoodanan and Thiripalraju, 1997). Huge amount of significant listing day returns is earned by investors from underpriced IPOs. It is difficult to tell how the IPOs will perform before they are listed and trading begins. However, the IPOs are priced on the basis of many factors. Some factors are qualitative and some are quantitative (Hedau, 2016). Such factor may be the age of the firm. Many times, with age experience of the company becomes enriched. It certainly can influence the price of the IPOs and in turn the returns earned from the IPOs. In this backdrop, this article seeks to analyse the different measurements of the first day returns of the sample IPOs considered for the study, when they are studied on the basis of the age of the IPOs at the time of listing.

2. Past Studies

The past literature provides a rich understanding of the IPOs listing day performance, especially, with respect to underpricing of IPOs. Clark (2002) revealed a significant correlation between firm-age at IPO and post-IPO excess returns. A study by Strottner (2017) revealed that Internet firms with low at-age-IPO and high-age-at-IPO perform better in the long run, than their medium age counterparts. Singh and Shrivastav (2017) studied underpricing of 152 IPOs in NSE and found that there was a clear occurrence of listing day gain. Middi (2018) examined and found that factors such as beta, firm's age, firm's size, IPO process, etc. are insignificant in affecting under-pricing. Singh and Kalra (2019), implied about the importance of offer size on the stock

performance during normal conditions. Shenoy et. al. (2019) concluded that mean age of firms having under-priced IPOs have been found to be more than the mean age of firms having over-priced IPOs. Ahmed (2021) found that the post-IPO performance of the select IPOs deteriorated over time following the listing. Babu and Dsouza (2021) found that most IPOs outperform the market on the first trading day. Pandey et. al. (2021) studied the performance determinants of IPOs in India and concluded that variables like issue size, subscription rate and timing of IPO influences listing day performance of an IPO. Kumar and Katewa (2021) examined IPO price behaviour and found that the regulatory framework plays an essential role in determining initial returns to the investors. The study also found that knowledge asymmetry to be one the most important reasons for IPO underpricing.

Research gap

(i) Very few studies have considered the parameter of age of IPOs to see the different measures of initial returns.

(ii) Very few studies have shown the analysis of various measures of the first day returns taken together on the basis of listing delay for getting the IPOs listed.

3. Research Objectives

The objectives of the current study are as follows:

(i) To analyse the distribution of the sample IPOs into the various categories of age of IPOs at the time of the listing *(Refer to section 5.1);*

(ii) To explore the average initial returns of the sample IPOs of age of IPOs at the time of the listing *(Refer to section 5.2);*

(iii) To examine the average MAARs of the sample IPOs on the basis of age of IPOs at the time of the listing *(Refer to section 5.3);*

(iv) To investigate the average annualised initial returns of the sample IPOs with respect to age of IPOs at the time of the listing *(Refer to section 5.4);*

(v) To study the average annualised MAARs of the sample IPOs of age of IPOs at the time of the listing *(Refer to section 5.5);*

(vi) To test the statistical significance of the average initial returns, average MAARs, average annualised initial returns, average annualised MAARs of each category of age of IPOs at the time of the listing *(Refer to section 5.6).*

4. Data and Research Methods

Data

The data is exploratory in nature and is based on secondary data. The necessary data is collected from the respective websites of National Stock Exchange, SEBI and the websites of the respective companies. The methodology is decided after a thorough review of literature.

Sample Design

The study period for each IPO is basically the first day after getting listed. The study is based on the initial returns or the listing day returns of the sample IPOs. A total of 224 IPOs are selected for the purpose of the study. The IPOs are considered for the dataset got listed on the National Stock Exchange (NSE) in India during 1st April, 2000 to 31st March, 2017. The sample of 224 IPOs is selected through a non-probabilistic sampling technique called judgement sampling.

Consideration of Age of the IPOs

The age of the IPOs is considered at the time of listing for the purpose of the study. As per the SEBI (ICDR) Regulations, 2018, unlisted companies having minimum 3 years track record usually can come to raise money through primary capital market using IPO mode.

Statistical Measures, Tools and Package used

Initial return is computed as $(P_1 – P_0) \div P_0 \times 100$; where P_1 is the closing price of the IPO as on listing day and P_0 is the offer price. MAAR is computed as $[(P_1 – P_0) \div P_0 — (M_1 – M_0) \div M_0] \times 100$; where M_1 is the closing NIFTY 50 as on listing day and M_0 is the closing NIFTY 50 on the last day of the offer period. Annualised return is computed as Initial Return × 365/ No. of days taken for listing Annualised MAAR is computed as MAAR x 365÷ No. of days taken for listing. One-sample t-test is used to test the statistical significance of the average returns under every category of the parameter at 5% level of significance. Package used for the analysis of the data are MS Excel 2016 and SPSS 21.

5. Results and Analysis

The objectives of the study are addressed here for exploring the research findings.

5.1 Analysing of the distribution of the sample IPOs into the various categories of issue price of IPOs

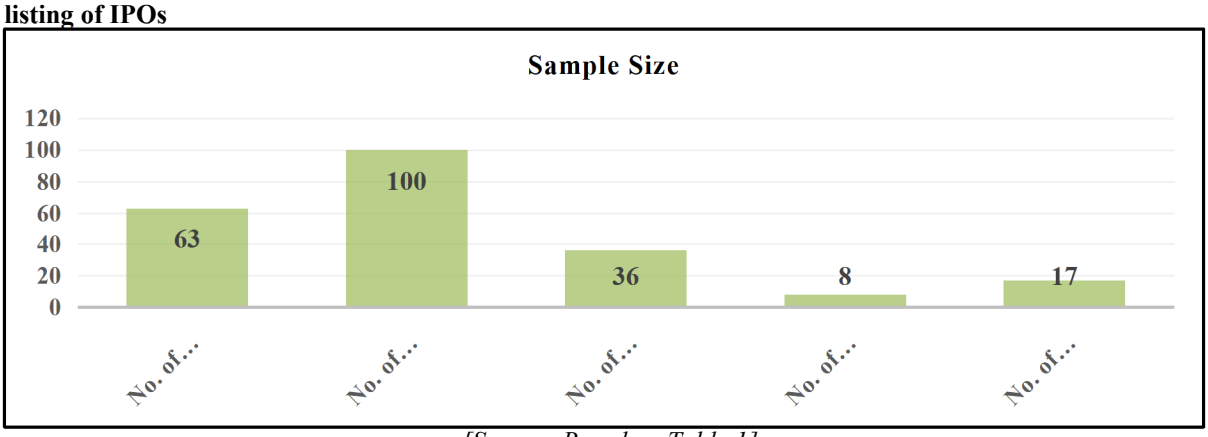
Five categories of age groups are considered here: (a) companies having age more than 3 years and less than 10 years at the time of listing, (b) age greater than 10 and less than or equal to 20 years at the time of listing, (c) age greater than 20 and less than or equal to 30 years at the time of listing, (d) age greater than 30 and less than or equal to 40 years at the time of listing, and (e) age greater than 40 years at the time of listing.

Table 1: Sample size of companies segregated on the basis of age of the IPOs companies at the time of listing of the IPOs

Categories of Age Groups	**Sample Size**
No. of companies having age more than 3 years and less than or equal to 10 years at the time of listing	63
No. of companies having age greater than 10 and less than or equal to 20 years at the time of listing	100
No. of companies having age greater than 20 and less than or equal to 30 years at the time of listing	36
No. of companies having age greater than 30 and less than or equal to 40 years at the time of listing	8
No. of companies having age greater than 40 years at the time of listing	17
Total	**224**

[Source: Compilation of secondary data using MS Excel 2016]

Figure 1: Sample size of companies segregated on the basis of age of the IPOs companies at the time of listing of IPOs



[Source: Based on Table 1]

Findings

It is observed from the above table 1 and figure 1 that the maximum number of companies have an age more than 11 years and less than or equal to 20 years, followed by companies having age less than 10 years. Companies having age within the 20 years and 30 years bracket come next followed by companies having age at the time of IPOs more than 40 years. The least number of companies in the sample fall in the age bracket of 30years and 40 years.

5.2 Exploring the average initial returns of the sample IPOs from each of the categories on the basis of age of the IPOs

The average initial returns are computed for each of the categories on the basis of the categories on the basis of age of the IPOs.

Table 2 : Average initial returns on the basis of age of the IPOs companies at the time of listing of IPOs

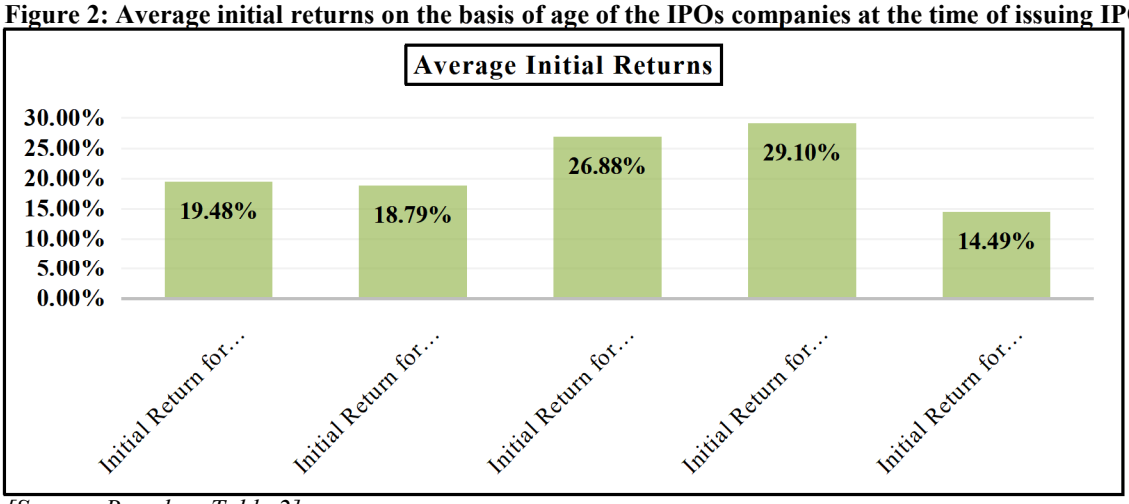
Categories of Age Groups	**Sample Size**	**Average Initial Returns**
No. of companies having age more than 3 years and less than or equal to 10 years at the time of listing	63	19.48%
No. of companies having age greater than 10 and less than or equal to 20 years at the time of listing	100	18.79%
No. of companies having age greater than 20 and less than or equal to 30 years at the time of listing	36	26.88%
No. of companies having age greater than 30 and less than or equal to 40 years at the time of listing	8	29.10%
No. of companies having age greater than 40 years at the time of listing	17	14.49%

[Source: Compilation of secondary data using MS Excel 2016]

Findings

The average initial returns under all the categories of age brackets at the time if listing of IPOs, are within 14% and 30%. The highest average returns of 29.10% and 26.88% respectively are for the age brackets of 20 years to 30 years and 30 years to 40 years. It can be seen that the average initial returns do not follow a pattern that with increasing age or experience of the companies at the time of IPOs, the average initial returns are also higher.

Figure 2: Average initial returns on the basis of age of the IPOs companies at the time of issuing IPOs



[Source: Based on Table 2]

5.3 Examining the average MAARs of the sample IPOs from each of the categories on the basis of age of the IPOs

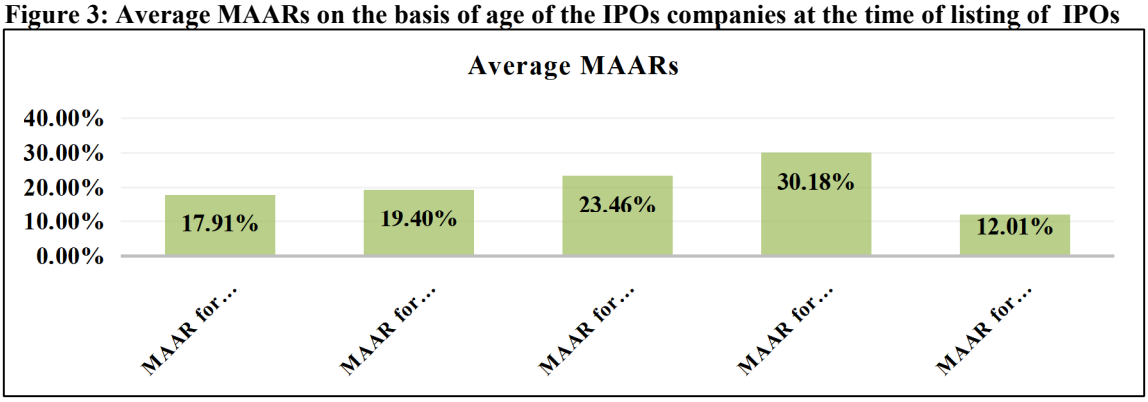
The average MAARs are computed for the sample IPOs on the basis of the categorical division of the IPOs on the basis of age of the IPOs.

Table 3: Average MAARs on the basis of age of the IPOs companies at the time of listing of IPOs

Categories of Age Groups	Sample Size	Average MAARs
No. of companies having age more than 3 years and less than or equal to 10 years at the time of listing	63	17.91%
No. of companies having age greater than 10 and less than or equal to 20 years at the time of listing	100	19.40%
No. of companies having age greater than 20 and less than or equal to 30 years at the time of listing	36	23.46%
No. of companies having age greater than 30 and less than or equal to 40 years at the time of listing	8	30.18%
No. of companies having age greater than 40 years at the time of listing	17	12.01%

[Source: Compilation of secondary data using MS Excel 2016]

Figure 3: Average MAARs on the basis of age of the IPOs companies at the time of listing of IPOs



[Source: Based on Table 3]

Findings

The average MAARs are the listing day returns adjusted for the market changes. The average MAARs across all

the age brackets rage within 12% to a little more than 30%. The highest average MAAR is for the age bracket of 30years and 40years followed by the age bracket of 20 years and 30years. This is quite similar to the classification of average initial returns as per the different age brackets. However, the value of the average MAAR in each case varies due to the adjustment of the market changes.

5.4 Investigating the average annualised initial returns of the sample IPOs from each of the categories on the basis of age of the IPOs at the time of listing

The average annualised initial returns are computed for each of the categories on the basis of age of the IPOs, from which the sample IPOs belong.

Table 4: Average annualised initial returns on the basis of age of the IPOs companies at the time of listing of IPOs

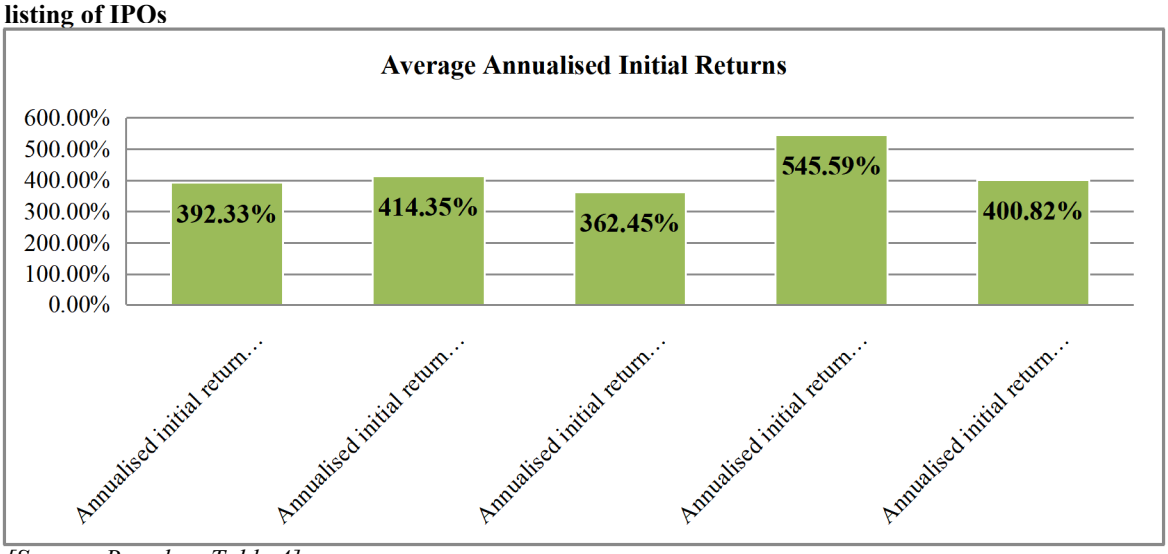
Categories of Age Groups	**Sample Size**	**Average Annualised Initial Returns**
No. of companies having age more than 3 years and less than or equal to 10 years at the time of issue	63	392.33%
No. of companies having age greater than 10 and less than or equal to 20 years at the time of issue	100	414.35%
No. of companies having age greater than 20 and less than or equal to 30 years at the time of issue	36	362.45%
No. of companies having age greater than 30 and less than or equal to 40 years at the time of issue	8	545.59%
No. of companies having age greater than 40 years at the time of issue	17	400.82%

[Source: Compilation of secondary data using MS Excel 2016]

Findings

The average annualised returns for all categories of age of the companies at the time of issuing IPOs falls within 360% to 550%. The highest average annualised return is generated for the age group 30 years to 40 years. However, unlike the average initial returns and average MAARs, the second highest average for annualised initial return is the age group of 11years to 20 years. Apart from the 4th category, all other categories show similar average annualised return earned.

Figure 4: Average annualised initial returns on the basis of age of the IPOs companies at the time of listing of IPOs



[Source: Based on Table 4]

5.5 Studying the average annualised MAARs of the sample IPOs from each of the categories on the basis of age of the IPOs at the time of listing

Finally, the average annualised MAARs are computed for the sample IPOs. On the basis of issue price of the IPOs, the sample IPOs are grouped.

Table 5: Average annualised MAARs on the basis of different categories

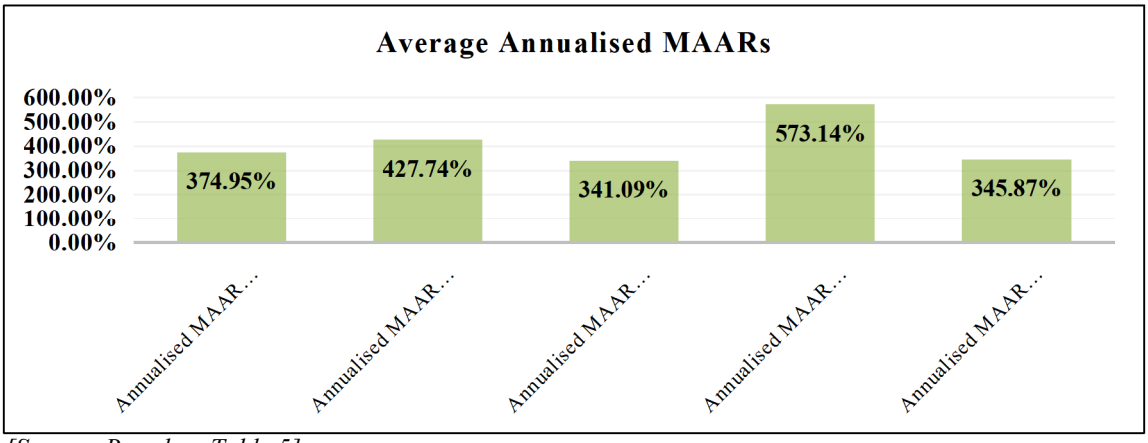
Categories of Age Groups	Sample Size	Average Annualised MAARs
No. of companies having age more than 3 years and less than or equal to 10 years at the time of listing	63	374.95%
No. of companies having age greater than 10 and less than or equal to 20 years at the time of listing	100	427.74%
No. of companies having age greater than 20 and less than or equal to 30 years at the time of listing	36	341.09%
No. of companies having age greater than 30 and less than or equal to 40 years at the time of listing	8	573.14%
No. of companies having age greater than 40 years at the time of listing	17	345.87%

[Source: Compilation of secondary data using MS Excel 2016]

Findings

Similar to the previous discussion, the average annualised MAAR is highest for the age bracket of 30 years and 40 years, followed by the age bracket of more 10 years and less than or equal to 20 years. In this case too, the average annualised MAAR did not follow the average MAAR. This happens because the MAARs are adjusted with the annualising factor to get the annualised MAARs and hence the difference.

Figure 5: Average annualised MAARs on the basis of age of the IPOs companies at the time of listing of IPOs



[Source: Based on Table 5]

5.6 Testing the statistical significance of the average initial returns, average MAARs, average annualised initial returns, average annualised MAARs of each category of age of the IPOs at the time of issue

Under this section, the four measures of average returns considered, namely, average initial returns, average MAARs, average annualised initial returns, average annualised MAARs, are tested for statistical significance using one-sample t-test.

Table – 6: Result of One-Sample t-test of Average Initial Return

Categories of Age Groups	**Average Initial Return for 1st Day (in %)**	**Statistic**	**P-Value**	**Decision Rule** *(At 5% level of significance)*	**Decision on H_0:(**H_0:*The average initial return as on 1st Day after listing is equal to 0)*
No. of companies having age more than 3 years and less than or equal to 10 years at the time of listing	19.48%	3.951	0.000	P-Value < 0.05	Rejected
No. of companies having age greater than 10 and less than or equal to 20 years at the time of listing	18.79%	5.654	0.000	P-Value < 0.05	Rejected
No. of companies having age greater than 20 and less than or equal to 30 years at the time of listing	26.88%	2.709	0.010	P-Value < 0.05	Rejected
No. of companies having age greater than 30 and less than or equal to 40 years at the time of listing	29.10%	2.254	0.059	P-Value > 0.05	Accepted
No. of companies having age greater than 40 years at the time of listing	14.49%	2.679	0.016	P-Value < 0.05	Rejected

[Source: Compilation of secondary data using SPSS 21.0]

Findings

The above table (refer to table 6) shows that the null hypothesis is rejected at 5% level of significance for all the categories except one category. This implies that the average initial returns as on 1st Day after listing of IPOs are significantly different from 0 for all the categories except the 4th category. Under the fourth category where the age bracket is 30 years to 40years, the average initial returns are not statically significant. This is interesting as the magnitude of the average initial return was highest under this category. The average initial returns earned under the other different categories of age of the companies at the time of listing of IPOs, have resulted in statistically significant average initial returns, implying the existence of underpricing in all other cases. Therefore, it can be concluded that underpricing exists for all the average initial returns, apart from the age bracket of 30years to 40years.

Table – 7: Result of One-Sample t-test of average MAARs

Categories of Age Groups	**Average MAAR for 1st Day (in %)**	**Statistic**	**P-Value**	**Decision Rule** *(At 5% level of significance)*	**Decision on H_0:(**H_0:*The average MAAR as on 1st Day after listing is equal to 0)*
No. of companies having age more than 3 years and less than or equal to 10 years at the time of listing	17.91%	3.607	0.001	P-Value < 0.05	Rejected
No. of companies having age greater than 10 and less than or equal to 20 years at the time of listing	19.40%	5.979	0.000	P-Value < 0.05	Rejected
No. of companies having age greater than 20 and less than or equal to 30 years at the time of listing	23.46%	2.578	0.014	P-Value < 0.05	Rejected
No. of companies having age greater than 30 and less than or equal to 40 years at the time of listing	30.18%	2.233	0.061	P-Value > 0.05	Accepted
No. of companies having age greater than 40 years at the time of listing	12.01%	1.587	0.132	P-Value > 0.05	Accepted

[Source: Compilation of secondary data using SPSS 21.0]

Findings

From the above table (refer to table 7) it is seen that, the null hypothesis is rejected at 5% level of significance for all the categories except the last two categories. This means that the average MAARs as on 1st Day after listing of IPOs are significantly different from 0 for all the categories except the 4th and 5th category. Under the fourth category where the age bracket is 30 years to 40years, the average initial returns are not statically significant. The same thing is observed for the age bracket where age is more than 40years. It is interesting to note that the magnitude of the average MAAR was highest under the 30 years to 40 years category. The average MAAR under the other different categories of age of the companies at the time of listing of IPOs, have resulted in statistically significant average MAARs, implying the existence of underpricing in all other cases. Hence, it can be concluded that underpricing exists for all the average MAARs, apart from the age bracket of 30years to 40years and greater than 40 years.

Table – 8: Result of One-Sample t-test of average annualised initial return

Categories of Age Groups	**Average annualised initial return for 1st Day (in %)**	**Statistic**	**P-Value**	**Decision Rule** *(At 5% level of significance)*	**Decision on H_0:** *(H_0: The average annualised initial return as on 1st Day after listing is equal to 0)*
No. of companies having age more than 3 years and less than or equal to 10 years at the time of listing	392.33%	4.127	0.000	P-Value < 0.05	Rejected
No. of companies having age greater than 10 and less than or equal to 20 years at the time of listing	414.35%	5.772	0.000	P-Value < 0.05	Rejected
No. of companies having age greater than 20 and less than or equal to 30 years at the time of listing	362.45%	2.808	0.008	P-Value < 0.05	Rejected
No. of companies having age greater than 30 and less than or equal to 40 years at the time of listing	545.59%	2.416	0.046	P-Value < 0.05	Rejected
No. of companies having age greater than 40 years at the time of listing	400.82%	2.782	0.013	P-Value < 0.05	Rejected

[Source: Compilation of secondary data using SPSS 21.0]

Findings

It is clear from the above table (refer to table 8) that the null hypothesis is rejected at 5% level of significance for all the categories. Therefore, the average annualised initial return as on the listing day of IPOs are significantly different from 0 for all the categories. The annualised initial returns are the initial returns adjusted for the listing delay with the help of an annualising factor. The average annualised initial returns earned under the different categories of age of the companies at the time of listing of IPOs shows statistically significant average annualised initial returns. It must be noted that for the fourth category of age, that is 30years to 40years, unlike the average initial return an average MAAR, the average annualised initial return is statistically significant.

Table – 9: Result of One-Sample t-test of average annualised MAAR

Categories of Age Groups	**Average annualised MAAR for 1st Day (in %)**	**Statistic**	**P-Value**	**Decision Rule** *(At 5% level of significance)*	**Decision on H_0:** *(H_0: The average annualised MAAR as on 1st Day after listing is equal to 0)*
No. of companies having age more than 3 years and less than or equal to 10 years at the time of listing	346.05%	4.034	0.000	P-Value < 0.05	Rejected
No. of companies having age greater than 10 and less than or equal to 20 years at the time of listing	464.47%	6.041	0.000	P-Value < 0.05	Rejected
No. of companies having age greater than 20 and less than or equal to 30 years at the time of listing	351.89%	2.646	0.012	P-Value < 0.05	Rejected
No. of companies having age greater than 30 and less than or equal to 40 years at the time of listing	426.46%	2.366	0.050	P-Value = 0.05	Rejected
No. of companies having age greater than 40 years at the time of listing	859.97%	2.013	0.061	P-Value > 0.05	Accepted

[Source: Compilation of secondary data using SPSS 21.0]

Findings

From the above table (refer to table 9) it is evident that the null hypothesis is rejected at 5% level of significance for the first four categories. Therefore, the average annualised initial return as on the listing day of IPOs are significantly different from 0 for the first four categories. The last category where the age of the companies is more than 40 years, shows the average annualised MAAR as statistically not significant. It is interesting to note that the average annualised MAAR for the fourth category where, age of the companies is 30years to 40 years, shows the p value exactly equal to 0.05.

Conclusion

It is evident that the maximum number of companies on the basis of age was found under the age group of 11 years to 20 years. The first day average returns were positive for all the categories of age of the IPOs. However, the first three categories of age, that is, below 10 years, 10 years to 20 years and 20 years to 30 years showed significant underpricing under all the four measures of average returns. The other two age groups show disparity among the four measures of average return in terms of significant underpricing.

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