



IPO Underpricing and Long-Run Stock Performance in the Indian Capital Market: An Empirical Study of 115 Mainboard IPOs (2020–2023)

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Abstract

This study examines initial IPO underpricing and subsequent long-run abnormal performance using a dataset of 115 Indian mainboard IPOs. The empirical framework focuses on market-entry underpricing and buy-and-hold abnormal returns (BHAR) over 12-, 24-, and 36-month horizons. The analysis combines descriptive statistics, one-sample t-tests, Wilcoxon signed-rank tests, and cross-sectional ordinary least squares (OLS) regressions estimated with HC3 heteroskedasticity-robust standard errors (MacKinnon & White, 1985). The results provide strong evidence of initial underpricing: the mean underpricing is 25.67%, with a one-sample t-statistic of 6.03 ($p < 0.001$) and a significant Wilcoxon test statistic ($p < 0.001$). The long-run results are more complex. The mean BHAR is positive at 13.81%, 23.10%, and 35.99% over 12, 24, and 36 months, respectively, and the corresponding t-tests are significant at the 5% level, respectively. However, the medians are negative at all three horizons, and the Wilcoxon tests are not significant. Therefore, the evidence indicates a strongly right-skewed long-run return distribution in which a relatively small group of extreme winners raises the arithmetic mean, while the median IPO remains negative. In HC3-robust regressions, initial underpricing is not significant for BHAR12 and is negative and only marginally significant for BHAR24 and BHAR36. The log issue size is negatively associated with BHAR12 and BHAR24, respectively. The subscription ratio, promoter shareholding, firm age, and included sector indicators are not statistically significant in the robust specifications. Therefore, this study rejects a simple narrative of universal long-run IPO underperformance or outperformance and highlights distributional asymmetry and issuer-size effects as central features of the sample.

Keywords: IPO underpricing; BHAR; long-run performance; Indian IPO market; issue size; investor returns; mainboard IPOs.

JEL Classification: G10; G14; G24; G32.

1. Introduction

Initial public offerings are an important mechanism for mobilizing equity capital and transferring private firms to the public market. A persistent issue in IPO research is the difference between the offer price and the price at which security starts trading. When the listing price exceeds the offer price, investors who receive shares at the offer price earn an initial return, commonly described as IPO underpricing (Rock 1986). The second question is whether the initial listing gain translates into sustained abnormal performance after a firm becomes publicly traded. This question has historically produced evidence of long-run underperformance in several markets (Ritter 1991).

This study draws on a dataset of 115 Indian mainboard IPOs listed between 2020 and 2023 and the variables recorded for each issue: offer price, listing price, underpricing, BHAR12, BHAR24, BHAR36, issue size, subscription ratio, promoter shareholding, firm age, log of issue size, issue date and sector indicators. The analysis was confined strictly to the observations and variables present in this dataset, and no additional observations or explanatory variables were introduced beyond what the underlying data supported. The central research problem is framed around three questions: (1) Is the initial underpricing statistically significant? (2) Do IPOs exhibit statistically different long-run abnormal performance over 12-, 24-, and 36-month horizons? (3) Which observable issuer characteristics are associated with long-run BHAR?

2. Research Objectives

- To estimate the magnitude and statistical significance of initial IPO underpricing.
- To examine 12-, 24-, and 36-month BHAR using both mean-based and median/non-parametric evidence.
- To examine whether initial underpricing is associated with subsequent long-run BHAR.
- To examine whether issue size, subscription ratio, promoter shareholding, and firm age are associated with long-run BHAR.
- To assess whether sector differences explain the variation in long-run IPO performance.

3. Literature Review and Theoretical Foundation

3.1 IPO Underpricing: The IPO underpricing literature identifies information asymmetry, adverse selection, signalling, and underwriter certification as central explanations for positive initial returns. Rock (1986) formalizes the winner's-curse argument: because informed investors selectively participate in attractive issues, uninformed investors face a higher probability of allocation in unattractive offerings; therefore, issuers must underprice on average to keep uninformed investors participating in the market. Related certification-based explanations emphasize the signalling roles of underwriters and issuers. Beatty and Ritter (1986) show that underwriter reputation is systematically related to the degree of underpricing, while Carter and Manaster (1990) demonstrate that offerings led by more prestigious underwriters are, on average, less underpriced, consistent with the idea that underwriter reputation reduces ex-ante uncertainty about firm value. Therefore, underpricing can be interpreted as compensation for information asymmetry and as a certification mechanism operating through underwriter and issuer reputation.

3.2 Long-Run IPO Performance: Long-run IPO research distinguishes the initial listing phenomenon from subsequent investment performances. A high listing return does not necessarily imply a persistent abnormal performance. Ibbotson (1975) was among the first to document that new issues can underperform in the years following listing, and Ritter (1991) provides systematic evidence that U.S. IPOs underperform matched non-issuing firms over a three-year post-listing window, a pattern echoed in the “new issues puzzle” documented by Loughran and Ritter (1995). Loughran and Ritter (2004) further show that the magnitude of underpricing, and by implication, the relationship between short-run and long-run performance, varies materially across market cycles. Because long-run abnormal return measures, such as the BHAR, are sensitive to benchmark choice and are typically right-skewed, Barber and Lyon (1997) caution that mean-based test statistics can be poorly specified in long-horizon event studies and recommend that median-based and non-parametric evidence be reported alongside parametric tests.

3.3 Research Gap: In the Indian context, Madhusoodanan and Thiripalraju (1997) provide early evidence that short-run underpricing in Indian IPOs exceeds that documented in several developed markets, while Mishra (2010) compares underpricing between book-building and fixed-price mechanisms in India. Ritter and Welch (2002) review the broader IPO literature and note that the relationship between initial underpricing and long-run performance remains unsettled, even in well-studied markets. The present study contributes by placing short-run underpricing and long-run BHAR within one empirical framework for a recent sample of Indian mainboard IPOs and by explicitly addressing the distributional problem — highlighted by Barber and Lyon (1997) — that is visible in the data: the divergence between the positive arithmetic mean BHAR and the negative median BHAR, which materially changes the interpretation of aggregate IPO performance.

4. Hypotheses

H1: Indian mainboard IPOs exhibit statistically significant positive initial underpricing.

H2: IPO long-run abnormal performance differs significantly from zero over the 12-, 24-, and 36-month horizons.

H3: Initial IPO underpricing is negatively associated with subsequent long-run BHAR.

H4: Larger IPOs, measured by log issue size, are negatively associated with long-run BHAR.

5. Data and Methodology

5.1 Sample

The dataset contains 115 IPO observations, including company name, sector, offer price, listing price, underpricing, BHAR12, BHAR24, BHAR36, issue size, subscription ratio, promoter shareholding, firm age, log issue size, issue date and four sector indicators.

5.2 Variables

Underpricing is measured as the percentage difference between the listing and the issue prices. BHAR12, BHAR24, and BHAR36 are used as long-run abnormal return measures, consistent with the buy-and-hold approach used in prior IPO research (Ritter, 1991; Barber & Lyon, 1997). The log of issue size is used instead of the raw issue size in the regression specifications. The subscription ratio, promoter shareholding, and firm age were included as controls. The sector dummy variables represent the sector classifications in the dataset.

5.3 Statistical Tests

Initial underpricing and BHAR are tested against zero using one-sample t-tests. Because the distributions are highly skewed, Wilcoxon signed-rank tests are reported as non-parametric complements, consistent with the recommendation of Barber and Lyon (1997) for long-horizon return distribution. Cross-sectional regressions use OLS with HC3 heteroskedasticity-robust standard errors (MacKinnon and White, 1985). This is preferable to relying on conventional (non-robust) standard errors because the regression residuals are strongly non-normal, particularly for BHAR24 and BHAR36.

5.4 Regression Specification

For each horizon $h \in \{12, 24, 36\}$, the estimated model is as follows.

$$BHAR_{h,i} = \alpha + \beta_1 Underpricing_i + \beta_2 \ln(Issue\ Size)_i + \beta_3 Subscription_i + \beta_4 Promoter\ Holding_i + \beta_5 Firm\ Age_i + Sector\ Controls_i + \varepsilon_i$$

The coefficients were interpreted as conditional associations, not causal effects, because the research design was observational.

6. Descriptive Statistics

Table 1. Descriptive Statistics of Key Variables (N = 115)

Variable	N	Mean	Median	SD	Min	Max	Skewness	Excess Kurtosis
Underpricing	115	25.66	14.41	45.61	-43.17	270.43	2.27	7.65
BHAR12	115	0.13	-0.02	0.68	-0.85	3.45	1.80	5.35
BHAR24	115	0.23	-0.14	1.17	-0.86	7.15	2.93	12.03
BHAR36	115	0.35	-0.23	1.77	-1.33	10.81	3.03	12.24
Ln_Issue_Size	115	6.82	6.70	1.08	4.09	9.95	0.27	0.68
Subscription Ratio	115	46.68	17.41	63.79	0.70	326.49	2.05	4.73
Promoter Shareholding	115	55.15	57.64	22.04	0.00	96.50	-0.85	0.51
Firm Age	115	22.46	19.00	14.97	3.00	101.00	2.30	8.29

The descriptive evidence reveals pronounced positive skewness in underpricing and all three BHAR measures' results. BHAR36 has a skewness of 3.03 and excess kurtosis of 12.24, whereas BHAR24 has a skewness of 2.93. This distribution shape is central to the interpretation of long-run results.

7. Hypothesis Testing

7.1 H1: Initial Underpricing

The mean underpricing is 25.67% (SD = 45.62%; median = 14.41). The one-sample t-test yielded $t = 6.034$ ($p < 0.001$). The Wilcoxon signed-rank test was also significant ($W = 1,225$, $p < 0.001$). Therefore, the null hypothesis of zero initial underpricing is rejected. H1 was strongly supported.

7.2 H2: Long-Run BHAR

At 12 months, the mean BHAR was 13.81%, and the one-sample t-test was significant ($t = 2.148$, $p = 0.034$); however, the median was -2.00%, and the Wilcoxon test was not significant ($p = 0.266$). At 24 months, the mean BHAR was 23.10% ($t = 2.114$, $p = 0.037$), whereas the median was -14.00%, and the Wilcoxon test was not significant ($p = 0.991$). At 36 months, the mean BHAR was 35.99% ($t = 2.171$, $p = 0.032$), while the median was -23.00%, and the Wilcoxon test result was not significant ($p = 0.913$). Therefore, the evidence does not justify the simple statement that a typical IPO outperforms or underperforms. The positive arithmetic means coexist with negative medians, indicating a strong right-tail influence, which is consistent with Barber and Lyon's (1997) caution about mean-based long-horizon tests. H2 is supported by parametric mean tests but not by non-parametric median-oriented tests. The appropriate conclusion is that long-run performance is distributionally asymmetric rather than uniformly positive or negative.

7.3 H3: Underpricing and Long-Run Performance

BHAR12: $\beta = -0.00042$, HC3 SE = 0.00295, $t = -0.143$, $p = 0.886$.

BHAR24: $\beta = -0.00628$, HC3 SE = 0.00359, $t = -1.748$, $p = 0.080$.

BHAR36: $\beta = -0.01046$, HC3 SE = 0.00582, $t = -1.796$, $p = 0.072$.

The relationship is negative at all three horizons, but statistical support is weak; it is not significant at 12 months and is only marginally significant at 24 and 36 months at the 10% level. H3 therefore receives partial/weak support.

7.4 H4: Issue Size and Long-Run Performance

Log issue size is negatively associated with BHAR12 ($\beta = -0.15963$, $p = 0.022$) and BHAR24 ($\beta = -0.25236$, $p = 0.009$). The coefficient remains negative but is not significant for BHAR36 ($\beta = -0.27715$, $p = 0.118$). Therefore, H4 is supported for the 12- and 24-month horizons but not for the 36-month horizon.

8. Robust Regression Results

BHAR12

Table 2. HC3-Robust OLS Regression Results — BHAR12

Variable	Coefficient	HC3 SE	t	p-value
const	1.37532	0.56123	2.45055	0.01426
Underpricing	-0.00042	0.00295	-0.14290	0.88637
Ln_Issue_Size	-0.15963	0.06971	-2.28980	0.02203
Subscription Ratio	-0.00122	0.00151	-0.80852	0.41879
Promoter Shareholding	0.00108	0.00270	0.39965	0.68941
Firm Age	-0.00185	0.00347	-0.53217	0.59461
Sector_Financial Services, Technology & Digital Services	-0.02966	0.18489	-0.16042	0.87255
Sector_Healthcare & Pharmaceuticals	-0.24371	0.24574	-0.99174	0.32133
Sector_Industral & Manufacturing	-0.12205	0.16396	-0.74443	0.45662
Sector_Infrastructure, Resources & Energy	-0.20901	0.20976	-0.99644	0.31904

Model fit: $R^2 = 0.070$; adjusted $R^2 = -0.010$; overall model p-value = 0.381.

BHAR24
Table 3. HC3-Robust OLS Regression Results — BHAR24

Variable	Coefficient	HC3 SE	t	p-value
const	2.14889	0.81018	2.65236	0.00799
Underpricing	-0.00628	0.00359	-1.74832	0.08041
Ln_Issue_Size	-0.25236	0.09694	-2.60326	0.00923
Subscription Ratio	0.00087	0.00237	0.36652	0.71398
Promoter Shareholding	0.00040	0.00381	0.10530	0.91614
Firm Age	-0.00372	0.00927	-0.40166	0.68793
Sector_Financial Services, Technology & Digital Services	0.05176	0.24562	0.21074	0.83309
Sector_Healthcare & Pharmaceutical	-0.17852	0.34552	-0.51668	0.60538
Sector_Industrial & Manufacturing	-0.03265	0.32640	-0.10002	0.92033
Sector_Infrastructure, Resources & Energy	-0.00499	0.36416	-0.01370	0.98907

Model fit: $R^2 = 0.086$; adjusted $R^2 = 0.008$; overall model p-value = 0.168.

BHAR36
Table 4. HC3-Robust OLS Regression Results — BHAR36

Variable	Coefficient	HC3 SE	t	p-value
const	1.38399	1.45428	0.95167	0.34127
Underpricing	-0.01046	0.00582	-1.79618	0.07247
Ln_Issue_Size	-0.27715	0.17730	-1.56315	0.11802
Subscription Ratio	0.00303	0.00474	0.64035	0.52194
Promoter Shareholding	0.00756	0.00852	0.88693	0.37512
Firm Age	0.02254	0.03062	0.73622	0.46159
Sector_Financial Services, Technology & Digital Services	0.27867	0.44387	0.62782	0.53012
Sector_Healthcare & Pharmaceuticals	-0.09790	0.43487	-0.22513	0.82188
Sector_Industrial & Manufacturing	-0.05860	0.45298	-0.12937	0.89707
Sector_Infrastructure, Resources & Energy	0.08811	0.45326	0.19440	0.84586

Model fit: $R^2 = 0.114$; adjusted $R^2 = 0.038$; overall model p-value = 0.314.

9. Interpretation and Discussion

The first and most robust finding is the existence of substantial initial underpricing. The mean initial return of 25.67% is statistically different from zero in both parametric and non-parametric tests, consistent with the magnitude of underpricing reported for the Indian market by Madhusoodanan and Thiripalraju (1997) relative to that of several developed markets. This provides clear evidence of an IPO pricing anomaly in our sample.

The second finding is more nuanced and complex. The mean BHAR is positive at every horizon, whereas the median is negative at every horizon. This is not a contradiction but evidence of an asymmetric return distribution, similar in spirit to the long-run underperformance documented by Ritter (1991) and Loughran and Ritter (1995), although the asymmetry is expressed through divergent mean and median outcomes rather than uniform underperformance. A limited number of very large winners can raise the mean substantially, even when more than half of the observations have negative BHAR. Therefore, researchers should avoid describing the sample simply as a long-run outperformer or underperformer.

The regression results show that issue size is a more consistent predictor than other available controls. Larger IPOs are associated with lower BHAR at 12 and 24 months. Initial underpricing has a negative coefficient at every horizon, but the evidence is marginal at longer horizons. The subscription ratio, promoter shareholding, firm age, and sector indicators do not show statistically reliable effects in the HC3 specifications.

10. Theoretical Implications

- Information asymmetry remains relevant because significant initial underpricing is observed in IPOs, consistent with the winner's curse framework of Rock (1986).
- The long-run results caution against interpreting average abnormal returns without examining distributional asymmetry, echoing the methodological concerns raised by Barber and Lyon (1997).
- The negative association between issue size and BHAR at shorter horizons suggests that the issuer scale may contain information about subsequent abnormal performance.
- The weak underpricing–BHAR relationship indicates that initial pricing and long-run performance should be treated as related but empirically distinct phenomena.

11. Practical Implications

For investors, a large listing premium should not be treated as sufficient evidence of long-term investment quality. Because the median BHAR is negative at all three horizons, the typical outcome differs significantly from that of the arithmetic mean. For issuers and intermediaries, the evidence indicates that IPO pricing outcomes should be evaluated beyond the listing day performance. For regulators and market researchers, the strong skewness of IPO returns supports reporting of median and distributional measures alongside average returns.

12. Limitations

- The sample of 115 mainboard IPOs from 2020 to 2023 is comparatively small, which limits the statistical power, particularly for sector-level subgroup comparisons.
- BHAR estimates are sensitive to the benchmark choice (Barber & Lyon, 1997). The present study relies on the benchmark embedded in the supplied BHAR series, and the results could differ under alternative matching-firm or style-adjusted benchmarks.
- The research design was cross-sectional. Regression coefficients should be interpreted as conditional associations rather than causal effects, given the possibility of omitted variables such as underwriter reputation or investor sentiment at the time of issuance.
- The findings are specific to mainboard IPOs listed in India during 2020–2023 and may not be generalized to SME-platform IPOs, other emerging markets, or different market cycles.
- The strong skewness of BHAR (Table 1) means that mean-based inference should always be interpreted alongside medians and non-parametric evidence.

13. Directions for Future Research

- We extend the sample to a longer time window and a larger number of IPOs to increase the statistical power for sector-level and sub-period analyses.
- Calendar-time portfolio methods alongside BHAR are applied to test the sensitivity of long-run performance conclusions to methodology (Barber & Lyon, 1997).
- SME-platform IPOs are examined separately from mainboard IPOs, given their differing regulatory and liquidity characteristics.
- Investigate macroeconomic and market cycle interactions (e.g., interest rate regime, institutional flows) with underpricing and long-run performance.
- We explore investor sentiment and behavioral variables, given the pronounced right-skewness documented in the sample.

14. Conclusion

Using a 115-IPO dataset, this study finds strong evidence of initial IPO underpricing, with a mean underpricing of 25.67%, and highly significant parametric and non-parametric tests results. The long-run performance is significantly more complex. The mean BHAR is positive at 12, 24, and 36 months, but the median is negative at all three horizons, and the corresponding Wilcoxon tests are insignificant. Therefore, the central empirical implication is distributional asymmetry: aggregate mean performance is lifted by a relatively small number of extreme winners, while the median IPO produces negative abnormal returns.

Robust regressions further indicate that larger IPOs are associated with lower BHAR at 12 and 24 months. Initial underpricing carries a negative coefficient at all horizons but only weak statistical support at 24 and 36 months. The subscription ratio, promoter shareholding, firm age, and included sector indicators are not statistically significant in the HC3 specifications. These results favor a cautious interpretation of IPO performance and reinforce the value of pairing mean-based and distributional evidence when evaluating IPO results.

15. Hypothesis Decision Summary

Table 5. Hypothesis Decision Summary

Hypothesis	Main Evidence	Decision	Interpretation
H1	Mean underpricing 25.67%; $t = 6.034$, $p < .001$; Wilcoxon $p < .001$	Supported	There is strong evidence of initial underpricing.
H2	Mean BHAR significant at all horizons, but medians negative and Wilcoxon tests insignificant	Mixed / Partial	The evidence is distributionally asymmetric, with no uniform long-run conclusion.
H3	Underpricing β negative at all horizons; $p = .886, .080, .072$	Weak / Partial	The negative association was marginal only at 24-36 months.
H4	Ln issue size β negative; $p = .022, .009, .118$	Supported at 12-24 months	However, this effect weakened at 36 months.

Declaration of Conflicting Interests

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