Looking Beyond Initial Boost : Examining the Long - Term Performance of Small Business IPOs

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Abstract

Purpose : The study aimed to analyze the long-run performance of 383 Indian SME IPOs offered from 2012 to 2020.

Methodology : The article used event time methods to examine company performance by creating equal and value-weighted portfolios. Furthermore, the study employed calendar time portfolios with the Fama-French three-factor model and Carhart four-factor model to have robust results. The study used cross-sectional regression to examine factors shaping IPO performance.

Findings : Using 12-month buy-and-hold abnormal returns, the results demonstrated IPO overperformance for both equally weighted and value-weighted portfolios, while the positive alpha of calendar-time portfolios validated these findings for the same period. However, regression outcomes revealed IPO underperformance for 36-month calendar-time portfolios. The findings indicated a significant impact of issue size, oversubscription, debt-to-asset ratio, profitability, hot market conditions, and listing gains.

Practical Implications : Practical implications suggested informed IPO decisions, cautious IPO assessment, and risk management for IPO investors and other stakeholders.

Originality : The study employed different approaches and investigated various significant aspects, providing valuable insights for investors and market players.

Keywords : **SMEs, underwriter reputation, performance, calendar-time portfolio, underpricing, emerging market**

JEL Classification Codes : G11, G14, M21

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Initial public offerings (IPOs) are significant for capital market participants because they allow them to examine strategic choices in business valuation and disclosures. Small and medium enterprises (SMEs) are the backbone of an economy due to their high contribution to gross domestic product, exports, and employment generation within the regions. IPOs play a pivotal role in the economic development of emerging markets by providing companies with access to public equity capital, which facilitates growth, innovation, and

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market visibility (Ahmad-Zaluki & Wan-Hussin, 2019; Siwach & Kumar, 2024). For small and medium enterprises (SMEs), accessing capital through IPOs is crucial, as it enables these firms to expand operations, invest in new technologies, and enhance their competitive positioning (Arora & Singh, 2020; Sivach et al., 2023). Despite their potential, SME IPOs are often overlooked in financial research compared to large-firm IPOs, which have received more attention due to their impact on market dynamics and investor behavior. Understanding the performance of SME IPOs is essential not only for investors but also for policymakers aiming to support the development of robust financial markets for smaller enterprises.

Previous studies have primarily focused on large-firm IPOs or IPO performance in developed markets, leaving a gap in understanding the dynamics of SME IPOs in emerging economies like India (Arora & Singh, 2020; Singh & Anand, 2020). Although some recent studies have explored short-term performance and initial returns, there is limited research on the determinants of long-term performance and the use of comprehensive methodologies that can capture the nuances of SME markets. The limitations in earlier research stemmed from methodological biases such as cross-sectional correlation in event-time studies and the exclusion of key variables like underwriter reputation and market conditions. This study fills the gap by using both event-time and calendar-time approaches, along with an expanded set of variables, to provide a holistic view of long-term IPO performance.

The demand for research on SME IPOs is growing due to the increasing role of small and medium enterprises in driving economic growth and innovation, especially in emerging markets like India. With the launch of dedicated SME platforms such as BSE SME and NSE Emerge, there has been a surge in the number of SME IPOs, yet their long-term performance remains underexplored. As investors seek higher returns and diversification, understanding the post-IPO success of these firms has become critical. Moreover, policymakers are focusing on developing supportive frameworks to ensure sustainable SME growth, making it essential to study the factors influencing their IPO outcomes. Bhattacharya (2017) analyzed the initial and post-issue performance of the Indian junior exchange with a sample of 106 firms listed from 2012 to 2015 and found that rightly timed IPOs and underwriter's reputations significantly impact the long-term performance of the IPOs. Apart from the small sample size, the study used the BSE small-cap as the market benchmark to calculate the underpricing of the IPOs in the sample. Arora and Singh (2020) filled this gap by using the final sample of 104 firms from 2012 to 2018 and the respective market benchmark to calculate the underpricing levels. They used event time methodology to calculate cumulative abnormal returns (CAR) and buy hold abnormal returns (BHAR) to analyze the long-run performance of SME IPOs.

Contrary to international evidence, the study finds the long-run overperformance of the Indian platform and a positive impact of underpricing, hot markets, and the underwriter's reputation on BHARs. As the event time methodology of calculating long-run performance suffers from methodological biases, the study states the need to use a calendar-time portfolio approach for robust results in future studies. While the performance of large-firm IPOs has been extensively studied, limited research is available on the long-term success of small and medium enterprises (SMEs) IPOs, especially in emerging markets like India (Arora & Singh, 2020). Hence, this study fills this gap and extends the literature by introducing the calendar time portfolio approach to analyze the long-run performance of SME IPOs. Additionally, the study creates equally weighted and value-weighted portfolios and uses the Fama-French three-factor (FF-3) and Carhart four-factor model (FF-4) to analyze the portfolios' value, growth, and momentum factor that has not been covered in the prior literature. Furthermore, the study also factors in the issue-specific, market-specific, and company-specific variables that significantly determine the long-run performance.

The primary aim of this study is to examine the long-term performance of Indian SME IPOs and to identify the key determinants that influence their success or failure. The study seeks to answer the following research questions (RQs):

↳ ***RQ1 :*** What are the main factors affecting the long-term performance of SME IPOs in India?

↳ ***RQ2 :*** How do issue-specific, market-specific, and firm-specific factors impact the post-IPO outcomes of these firms?

Literature Review

The long-run underperformance is widely documented in studies of mature markets and corporations listed on mainboards. The studies in Mauritius and China suggested long-run underperformance of IPOs using calendar time portfolios and BHARs for three years. Singla (2019) found long-run underperformance of construction firms where firm size and age were found to be positively impacting long-run performance. On the contrary, long-term aftermarket IPOs' overperformance was also observed in numerous capital markets. Thomadakis et al. (2012), while analyzing 253 Greek IPOs, indicated a long-run overperformance of the IPOs using a calendar time portfolio approach and cited the hot market period as a cause of IPO overperformance in the long run. Ahmad-Zaluki et al. (2007) analyzed IPOs issued on small boards and mainboards and suggested the positive significant impact of a listing year, initial returns, and IPO proceeds on long-run IPO performance. Similarly, Kim et al. (1995) reported the overperformance of 165 Korean IPOs from 1985 to 1989 and indicated the exception to the theory of divergence opinion (Miller, 1977). In the Indian context, Dhamija and Arora (2017a) analyzed 377 Indian mainboard IPOs and reported an IPO overperformance in one year of trading time; however, only 10% of the IPOs showed market overperformance in a 36-month trading time. Using the event study approach, Arora and Singh (2020) reported IPO overperformance for one year of trading time and stated a significant positive impact of a hot market, pre-issue profits, intermediaries' reputation, and underpricing on long-run performance.

Similarly, underpricing may be continuously seen in most capital markets; there are mixed results regarding the IPOs' long-term success. The literature states that the results of IPO performance may vary according to the countries' regulatory framework and economic conditions. However, there are conflicting results of IPO performance while investigating developing economies (Ahmad-Zaluki et al., 2007; Arora & Singh, 2020; Su et al., 2011). The researcher provided various theories to explain the long-run performance of IPOs, such as divergence of opinion (Miller, 1977), the window of opportunity (Ritter, 1991; Teoh et al., 1998), overreaction hypothesis (De Bondt & Thaler, 1987), and impresario hypothesis (Shiller, 1990). Similarly, the long-run underperformance can be justified through the contrarian hypothesis, which states that ex-ante uncertainty favors the underpricing of IPOs. Thus, a higher level of underpricing will lead to poor post-issue performance in the long run.

Research Methodology and Framework

The study uses the data of each firm listed on Indian SME platforms from 2012 to 2020. In the given time, 493 firms have been listed on BSE SME IPO and NSE SME Emerge platforms. Due to the delisting of firms and migration to the mainboard, the final sample consists of 383 listed SMEs on the Indian SME IPO platforms. The firm prospectuses and annual financial reports are being used to collect data. Similarly, the official websites of the Bombay Stock Exchange and National Stock Exchange collected share price data from 2012 to 2020. Furthermore, the ACE equity and Capitaline databases were utilized to collect additional information on issue-specific, market-specific, and company-specific data.

Due to the differences in opinions, the literature presents several methodologies adopted by the researchers to analyze the long-run performance of IPOs. Numerous authors claimed that statistical power, selection biases, regulatory framework, and sample size are some of the reasons for the variation in long-term performance

(Agathee et al., 2014; Lyon et al., 1999; Su & Bangassa, 2011). Following the given literature, the study calculates the long-run performance based on event time methodology and calendar time portfolio approach. The event time methodology is claimed to represent investors' experience and is commonly used in most IPO performance studies. However, due to the standard shocks in the IPO returns, event time methodology has a high degree of cross-sectional correlation that overstates the significance of average abnormal returns (Mitchell & Stafford, 2000). Thus, numerous research has advocated and used the calendar-time technique to reduce the possible issues of cross-sectional correlations among companies and to provide more reliable *t*-statistics (Czapiewski & Lizińska, 2019; Su & Bangassa, 2011). Although the use of a calendar time portfolio is suggested in several studies, this method of calculating long-run performance also suffers from the lack of power to capture abnormal performance due to the nature of overlooking the market condition in the approach and assessing the mean return for the whole sample (Mitchell & Stafford, 2000). Thus, based on both approaches' advantages and disadvantages, the literature suggests using both methodologies to present robust results (Gao & Jain, 2011).

The Event-Time Methodology

Following the literature based on event time methodology, the study uses the CARs and BHARs to evaluate the SME IPOs' long-run performance. The calculations of CARs and BHARs are given as follows:

Cumulative Average Abnormal Returns (CARs)

In CAR calculation, the first step is identifying the raw and benchmark returns on the same day. Thus, the formula to compute the raw return is presented in the equation (1). Equation (1) describes the raw returns (R_{it}) calculation of issuing firm *i* for the period *t*. Raw return is the percentage difference in the closing price of the present day to the previous day. Thus, Pr_1 indicates the closing price of day two of the issue, and Pr_0 indicates the closing price of the first day of the issue. Similarly, the benchmark returns are calculated in equation (2).

$$Raw\ Return\ (R_{it}) = \left(\frac{Pr_1 - Pr_0}{Pr_0}\right) \times 100 \qquad (1)$$

$$Benchmark\ Return\ (R_{mt}) = \left(\frac{B_1 - B_0}{B_0}\right) \times 100 \qquad (2)$$

$$Abnormal\ Returns\ (AR_{it}) = R_{it} - R_{mt} \qquad (3)$$

Equation (3) shows the calculation of abnormal returns, where (R_{it}) is the raw return of firm *i* for time *t* and $R_{m,t}$ is the benchmark return of index *m* for time *t*. Thus, the abnormal returns (AR_{it}) are the difference between the return (R_{it}) of issue *i* for *time t* and the benchmark return (R_{mt}) for the given period. Similarly, equation (4) presents the equally weighted mean abnormal return for the issue *i* and time *t* :

$$Average\ Abnormal\ Return\ (\overline{AR_{i,t}}) = \frac{1}{N_t} \sum_{i=1}^{N_t} AR_{i,t} \qquad (4)$$

$$Cumulative\ Abnormal\ Return\ (\overline{CAR_{i,t}}) = \sum_{t=p}^{i} \overline{AR_{i,t}} \qquad (5)$$

$$t(\overline{AR_{i,t}}) = \overline{AR_{i,t}} \times \frac{\sqrt{N_t}}{S_t} \qquad (6)$$

Equation (5) presents the cumulative function of MAER from the event month *i* to *t*. This indicates the addition of average abnormal returns from month one to the last period of the sample. Equation (6) shows the *t*-statistics, which are used to investigate the statistical validity of post-issue performance and test the null hypothesis (H_0) that there is unlikely any substantial abnormal return. Where *N* is the total number of firms that traded during period *t* and s_x indicates the standard deviation of mean returns for period *t*.

$$t(CAR_{i,t}) = (CAR_{i,t}) \times \frac{\sqrt{N_t}}{\sqrt{t(var) + 2(t-1) \times cov}} \qquad (7)$$

The equation (7) presents the *t*-statistics of CARs, where N_t indicates the traded stocks for time *t*, *cov* indicates first-order autocovariance, and *t*(*var*) is the mean-variance of the average abnormal return. The traditional *t*-stat is employed to check the null hypothesis that average abnormal returns are the same as zero for a set of issuing firms.

$$Average\ Abnormal\ Return\ (\overline{AR_t}) = w_i \sum_{i=1}^{n} AR_{i,t} \qquad (8)$$

$$(\overline{CAR_t}) = \sum_{t=p}^{i} \overline{AR_{i,t}} \qquad (9)$$

The value-weighted portfolios are created by dividing the post-listing market capitalization of the issuing firm by the market cap of the whole sample. Similarly, the value-weighted CARs can be calculated by summating value-weighted abnormal returns. The formula to create a value-weighted portfolio is presented in equation (8), and the subsequent formula for CAR is presented in equation (9).

Buy & Hold Abnormal Returns (BHARs)

BHARs include compounding returns over time, whereas CARs result in arithmetic returns. BHARs capture investor experience better than CARs. The research estimates 36-month benchmark-adjusted BHARs. Ritter (1991) defines one event month as 21 trade days and one year as 252. Thus, the event year consists of 252 trading days, and $BHAR_{i,t}$ for IPO *i* is described as follows:

$$R_{i,t} = \left[\prod_{t=1}^{T} (1 + R_{i,t}) - 1 \right] \qquad (10)$$

$$R_{m,t} = \left[\prod_{t=1}^{T} (1 + R_{m,t}) - 1 \right] \qquad (11)$$

$$BHAR_{i,t} = \left[\prod_{t=1}^{T} (1 + R_{i,t}) - 1 \right] - \left[\prod_{t=1}^{T} (1 + R_{m,t}) - 1 \right] \qquad (12)$$

Equation (10) presents the compounding return of issue *i* for time *t*, where *t* denotes the number of months, and *T* indicates the period of sample months. The equation (11) shows the holding period return of the market index for the given time *t*. Similarly, $R_{i,t}$ denotes compounding returns of the stock *i* and $R_{m,t}$ denotes the market return of the benchmark for time *t*, respectively. Thus, equation (12) considers the holding period return of issue *i* for time *t* and includes the compounding impact of returns. Similarly, the average $(\overline{BHAR_t})$ of the portfolio can be computed as follows:

$$\overline{BHAR_t} = \sum_{i=1}^{N_t} w_{it} BHAR_{i,t} \qquad (13)$$

Equation (13) shows the mean BHARs of the equally weighted and value-weighted portfolio. Similarly, in the case of value-weighted portfolios, the weights are assigned based on mv_i / Σmv_i, which shows mv as the firm's market value on listing day. The long-run returns can have a high potential to suffer from skewness bias. Therefore, to control this bias, Lyon et al. (1999) suggested favor of using bootstrapped skewness-adjusted test statistics, which can be computed as follows:

$$t(\overline{BHAR_t}) = \sqrt{N_t}\left(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6N_t}\hat{\gamma}\right) \quad (14)$$

where,

$$S = \frac{BHAR_{i,t}}{\sigma(BHAR)} \quad (15)$$

and,

$$\hat{\gamma} = \frac{\sum_{i=1}^{N_t}(BHAR_{i,t} - \overline{BHAR_t})^3}{N_t\,\sigma(BHAR_t)^3} \quad (16)$$

where, $\hat{\gamma}$ denotes the coefficient of skewness, N_t is the number of IPOs, and $\sigma(BHAR)$ denotes the cross-section variation of yields in a sample (Arora & Singh, 2020).

The Calendar Time Methodology

The conventional method proposed by Fama and French (1993) and Carhart (1997) is used to construct monthly portfolios' growth, value, and momentum factors. Following Wadhwa et al. (2019), the study uses 91-day treasury bill rates as a proxy for risk-free return, and momentum is calculated from the difference of the one-year winner stock portfolio minus loser stock portfolio. Similarly, following Fama and French (1993), the excess periodic return portfolio ($R_{p,t} - R_{f,t}$) regressed on the market premium ($R_{m,t} - R_{f,t}$), size premium ($s_i\,SMB_t$), and value premium ($h_i\,HML_t$) in the following equation:

$$R_{p,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t}) + s_i\,SMB_t + h_i\,HML_t + \varepsilon_{i,t} \quad (17)$$

In equation (17), $R_{p,t}$ denotes monthly portfolio gains and $R_{f,t}$ indicates a risk-free rate for the month t respectively. Similarly, $R_{m,t}$ is the market return of the BSE SME and NSE Emerge, and ($R_{m,t} - R_{f,t}$) signifies the market risk premium. Therefore, the multifactor model includes: $s_i\,SMB_t$ that is the difference in the monthly portfolio return between the portfolios of large-size stocks and small-size stocks, $h_i\,HML_t$ denotes the difference in monthly portfolio returns concerning high and low B/M (book to market) stock portfolios.

$$R_{p,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t}) + s_i\,SMB_t + h_i\,HML_t + m_i\,MOM_t + \varepsilon_{i,t} \quad (18)$$

In equation (18), $m_i\,MOM_t$ denotes the momentum factor, which is described as the difference in portfolio returns between low- and high-moment stocks, where momentum signifies the difference in portfolio returns of the winner and loser stock. Similarly, α_i is the intercept to capture long-run performance in the equation. Therefore, after controlling for ($R_{m,t} - R_{f,t}$), $s_i\,SMB_t$, $h_i\,HML_t$ and $m_i\,MOM_t$, if α_i is different from zero, then it shows abnormal returns and positive and negative α_i can be interpreted as overperformance and underperformance in the long run, respectively.

Data Analysis and Results

Estimating Long-Run Performance Using Cumulative Abnormal Returns

Table 1 presents the *t*-statistics of equally and value-weighted monthly abnormal returns and CARs. The research includes businesses traded in post-issue markets for 12 months to preserve sample strength. In panel 1 of equally weighted returns, the portfolios have adverse short- and long-term aftermarket returns. Despite negative anomalous returns, returns improved from the first month (–8%) to the seventh month (–3%). Negative returns increase over 12 months (–0.39%). First- and last-month anomalous returns are statistically significant (*t*-stat = 2.273) and 2.736, respectively. The research calculates CAR by adding anomalous returns over time and finds the same negative returns for the equally weighted portfolio. SME IPOs underperformed from the first month (–8%) to the final month (–39%). Monthly CAR returns are declining, but the negligible *t*-stats cannot explain the IPO underperformance over 12 months. Value weights show a similar pattern of better negative returns from month 1 (–4%) to month 9 (–0.12%), which becomes positive in months 10 (0.98%) and 11 (0.47%) before becoming negative in month 12 (–0.08%). IPOs underperform in value-weighted CARs from month 1 (–4%) through month 12 (–3%). Insignificant *t*-stat values cannot confirm IPO underperformance.

Estimating Long-Run Performance Using Buy and Hold Abnormal Returns

Numerous studies have suggested that the CAR approach should not be used when highly volatile returns (Barber & Lyon, 1997; Gupta, 2020; Kamaludin & Zakaria, 2019) are present. The research includes businesses trading in post-issue markets for 12 months to preserve sample strength. In Table 1, portfolios have negative aftermarket returns in panel 1 of evenly weighted returns. Despite negative anomalous returns, returns improved from the first month (–8%) to the seventh month (–3%). In twelve months (–0.39%), negative returns improved.

Table 1. ***Mean Monthly Returns of Indian SME IPOs***

Months	Equal weight							Value weight					
	N	AR	*t*	CAR	*t*	BHAR	*t*	AR	*t*	CAR	*t*	BHAR	*t*
1	240	–0.0862**	2.27	–0.0862**	2.8	–0.0094***	5.32	–0.0481***	3.18	–0.0481	1.31	–0.0027***	4.96
2	240	–0.0463	0.72	–0.1325**	2.94	0.1712***	2.71	–0.0091	1.63	–0.0572	0.05	0.0265***	3.12
3	240	–0.0455	0.28	–0.1779	1.25	0.6137***	4.69	–0.0005	0.96	–0.0577**	4.25	0.0620***	4.33
4	240	–0.061	0.52	–0.2389	1.13	0.7325*	1.99	–0.0033	0.76	–0.061	0.29	0.0710***	2.19
5	240	–0.0283	0.01	–0.2672	1.88	0.8294**	3.66	0.0044	0.13	–0.0566	0.76	0.0566***	2.65
6	240	–0.0272	0.81	–0.2944	1.63	0.9503***	7.76	0.0045	1.19	–0.0521	0.34	0.2122***	3.17
7	240	–0.0373	1.03	–0.3317	0.36	1.0621***	3.21	–0.0014	1.45	–0.0535	1.61	0.2741**	1.97
8	240	–0.0052	1.05	–0.3369	0.03	1.1136***	2.16	–0.0087	0.37	–0.0622	0.27	0.4133***	3.89
9	240	–0.0005	1.56	–0.3374	1.62	1.2571***	2.89	–0.0012	0.47	–0.0634	1.81	0.4597**	2.44
10	240	–0.0389	0.79	–0.3763	1.08	1.2988***	3.22	0.0098	1.48	–0.0536	0.96	0.5362	1.16
11	240	–0.0154	0.9	–0.3917	0.3	1.3195*	1.98	0.0047	1.62	–0.0489	0.18	0.7889	1.34
12	240	–0.0039**	2.73	–0.3955	1.45	1.3787**	5.2	–0.0008**	2.19	–0.0342	0.06	0.9041***	2.58

Note. *Significant at 10%, ** significant at 5%,*** significant at 1%.

Abbreviations : *N* (Number of firms), AR (Abnormal Return), CAR (Cumulative Abnormal Return), BHAR (Buy and Hold Abnormal Return), *t* (*t*-statistics).

The analysis reveals statistical significance for the first month's aberrant returns (*t*-stat = 2.273) and last month's (2.736). In calculating CAR, the research employs the cumulative total of anomalous returns across time and finds the same negative returns of the sample businesses' evenly weighted portfolio. From the first month (–8%) to the final month (–39%), Indian SME IPOs underperformed in the CAR. IPO underperformance over 12 months cannot be explained by the declining tendency of monthly CAR returns. While calculating anomalous returns using value weights, a similar pattern of better negative returns can be seen from month 1 (–4%) to month 9 (–0.12%) that gets positive in month 10 (0.98%) and month 11 (0.47%) before becoming negative in month 12 (–0.08%). Value-weighted CARs indicate IPOs' underperforming from month 1 (–4%) through month 12 (–3%).

Negligible *t*-stat results cannot confirm IPO underperformance. The results of IPO overperformance align with the multiple international studies of Ahmad-Zaluki et al. (2007) and Kamaludin and Zakaria (2019). Similar results of IPO overperformance are indicated in the Indian capital market by Arora and Singh (2020) and Dhamija and Arora (2017b). Moreover, since negative CARs are statistically insignificant and cannot validate the underperformance of SME IPOs, the IPO overperformance for 12 months is significantly validated through BHARs. Thus, the results indicate the phenomenon of IPO overperformance on the Indian SME IPO platforms.

Estimating Long-Run Performance Using Calendar Time Portfolios

In earlier studies, researchers used event studies to capture the IPOs' performance in the long run. The event time approach introduces listing bias, resampling bias, skewness bias, and cross-sectional reliance on returns for assessing long-term performance (Barber & Lyon, 1997; Su & Bangassa, 2011). Thus, the paper employs the calendar time portfolio strategy to reduce biases and provide more accurate findings.

The regression outcomes of FF-3 and FF-4 are shown in Table 2. A diverse portfolio is being created for firms trading between 2012 to 2020. The ordinary least squares method estimates the regressions of IPO portfolios classified as equally weighted and value-weighted. Furthermore, the study tests the calendar time returns with the

Table 2. ***The Regression Outcome of Calendar Time Portfolios Based on 12-Month Returns***

Variables	Equal-Weight		Value-Weight	
	Fama-French	Carhart	Fama-French	Carhart
Intercept	0.288***	0.853***	0.535***	0.556**
	(2.961)	(2.945)	(4.219)	(2.082)
$R_m - R_f$	0.135	0.396	0.169	0.168
	(0.295)	(0.843)	(0.406)	(0.376)
SMB	–3.881	–4.303	–11.974**	–10.747**
	(0.455)	(0.595)	(2.027)	(1.927)
HML	–0.381	–0.871	0.509	1.183
	(0.054)	(0.145)	(0.054)	(0.095)
Mom		–10.361**		–1.603**
		(2.033)		(1.924)
Adj.R^2	0.297	0.168	0.145	0.124

Note. *significant at 10%, ** significant at 5%, *** significant at 1%.

Abbreviations: R_m (Market Return), R_f (Risk-Free Rate), $R_m - R_f$ (Risk Premium), *SMB* (Small Minus Big Firms), *HML* (High Minus Low), *Mom* (Momentum).

Table 3. ***The Regression Outcome of Calendar Time Portfolios Based on 36-Month Returns***

Variables	Equal-Weight		Value-Weight	
	Fama-French	Carhart	Fama-French	Carhart
Intercept	–0.115***	–0.114***	–0.0987***	–0.788***
	(54.74)	(53.95)	(23.21)	(17.28)
$R_m - R_f$	0.135***	0.154***	0.061***	0.089***
	(13.05)	(14.21)	(6.321)	(4.27)
SMB	0.138***	0.160***	0.113***	0.121***
	(13.57)	(14.76)	(7.332)	(3.291)
HML	–0.030***	0.005	0.027	0.112
	(3.170)	(0.487)	(1.177)	(0.882)
Mom		0.078***		0.182
		(5.817)		(1.145)
Adj.R^2	0.051	0.053	0.092	0.084

Note. *significant at 10%, ** significant at 5%, *** significant at 1%.

Abbreviations: R_m (Market Return), R_f (Risk-Free Rate), $R_m - R_f$ (Risk Premium), *SMB* (Small Minus Big Firms), *HML* (High Minus Low), *Mom* (Momentum).

FF-3 model that includes factors such as market risk premium ($R_{m,t} - R_{f,t}$), size premium (SMB_t), value premium (HML_t), and FF-4 model with momentum MOM_t as an additional factor to the FF model, concerning the calendar time portfolio, our null hypothesis assumes that the mean monthly abnormal returns are equal to zero. Thus, a positive intercept states the overperformance of the portfolio, and a negative alpha indicates the underperformance in the long run. Therefore, a subsequent intercept from the multifactor regression is employed to test our null hypothesis.

Table 3 shows the equally weighted and value-weighted returns for 36 months of calendar time. However, the negative alpha with significant *t*-statistics of FF-3 and FF-4 models exhibit the long-run underperformance of both equally weighted and value-weight portfolios. Thomadakis et al. (2012), while analyzing Greek IPOs, found similar results, where the IPOs overperformed for 18 months and then indicated a reversal to underperformance in 36 months using a calendar time approach.

This presents the short-run overperformance of the IPO that converted into underperformance in 36 months. The outcome of the 36-month calendar time portfolio is consistent with numerous other international studies (Agathee et al., 2014; Su et al., 2011). The 36-month IPO underperformance can be justified with the impresario hypothesis, which states that investor overoptimism works as a fad in the IPO market and underwriters take advantage of information asymmetry in the market and deliberately underprice the issue to create more demand for the issue (Shiller, 1990). While SMEs play a vital role in the Indian economy, lacking information about these firms creates overoptimism for investors, resulting in higher 12 months of IPO overperformance.

However, this overperformance of IPOs faded in 36 months due to the lack of access to additional information for investors. Similarly, multiple issue-specific, market-specific, and firm-specific indicators may influence long-term performance. Therefore, the study uses cross-sectional OLS regression to find the determinants of long-run performance on the Indian SME IPO platform in Table 4.

Determinants of IPO Performance in the Long Run

Table 4 shows the cross-sectional OLS regression to evaluate the variables that influence the long-run performance of SME IPOs. The study used the 12, 9, 6, and 3-month BHARs as the dependent variables. Similarly, the study employs various issue-specific, market-specific, and firm-specific variables as independent variables to estimate the determinants of IPO performance in the long run. Thus, equation (19) determines the factors influencing the long-run performance of the Indian SME IPOs.

$$BHAR_{12m} = \alpha + \beta_1 Size_i + \beta_2 Size_f + \beta_3 TSUB + \beta_4 Age + \beta_5 DA + \beta_6 EPS + \beta_7 HOT + \beta_8 Listgains + \beta_9 Underwriter\ reputation + \beta_{10} underpricing + \varepsilon \quad (19)$$

In Table 4, issue size illustrates a statistically significant negative impact on the long-run performance in models 1, 2, and 3. This indicates that IPOs with large issue sizes fail to perform in the long run. The potential issue of excess cash and utilization of that cash with the objective of profit maximization rather than wealth maximization can cause a negative relationship with long-run returns (Arora & Singh, 2020). In international studies, there is

Table 4. ***Determinants of Long-Run Performance***

Variables	Model 1 BHAR 12m	Model 2 BHAR 9m	Model 3 BHAR 6m	Model 4 BHAR 3m
Constant	3.475***	2.821***	1.534	1.937
	(4.555)	(3.454)	(1.558)	(1.271)
Issue Size	–0.027***	–0.021***	–0.150***	–0.201
	(2.612)	(2.702)	(1.942)	(1.874)
Firm Size	0.019	0.017	0.089	0.143
	(0.136)	(0.857)	(0.951)	(1.326)
Subscription	–0.381***	–0.007***	–0.005***	–0.136***
	(3.078)	(3.881)	(2.417)	(2.422)
Firm Age	0.016	0.073	0.129	0.034
	(0.249)	(1.068)	(1.517)	(1.112)
Debt to Asset Ratio	1.188***	1.048***	1.097***	0.928***
	(2.951)	(3.231)	(2.781)	(2.125)
Profitability	0.682**	0.503**	0.565**	0.431
	(2.485)	(2.244)	(2.696)	(0.547)
Hot Market	–0.345***	–0.317***	–0.512***	–0.216***
	(2.067)	(1.915)	(2.339)	(1.961)
Listing Gains	–0.044**	–0.048**	–0.083	–0.037**
	(1.912)	(1.948)	(–1.069)	(1.922)
Underwriter Reputation	0.152***	0.361***	0.054	0.131
	(2.109)	(3.642)	(0.813)	(1.811)
Underpricing	0.028**	0.011**	0.003	0.039
	(2.135)	(1.991)	(0.178)	(0.722)
Adj. R^2	0.362	0.298	0.193	0.227

Note. *significant at 10%, ** significant at 5%, *** significant at 1%.

extensive evidence of a significant favorable influence of firm size on long-run performance due to the quality of top-level management, efficient resource utilization, and good reputation among various stakeholders (Barber & Lyon, 1997). Although the results indicate a positive coefficient of firm size, a lack of statistical significance prevents us from concluding the impact of company size and IPO performance in the Indian SME sector.

Similarly, the positive influence of firm age lacks statistical significance to validate the result of a regression model. The debt-to-asset ratio shows the association between firm leverage and the long-run performance of the issue. The result indicates a positive significant impact on the firm's performance in models 1, 2, 3, and 4. The results reflect an "IPO exuberance" in the market for newly listed SMEs that select the IPO platform to improve business growth. Therefore, the whole market rewards these SMEs and supports their potential growth, particularly within the first year post-listing. The results align with Giovannini's (2010) and Durukan's (2002) study. The article uses EBIDTA to asset ratio as a measure of profitability and finds a significant positive impact on the long-run performance of SME IPOs. This ratio provides a complete view of the company's financial health since it factors in its total revenue rather than just operating income. The result indicates that the firms with higher EBITDA to asset ratio perform better in the long run. A high $EBITDA_A$ margin indicates a more profitable position for a company, which should lead to improved long-term success. Thus, firm profitability can be the factor in determining the company's long-run success at the Indian SME exchange.

The windows of opportunity argument holds that a rising stock market is detrimental to a company's long-term profitability because it encourages businesses to take advantage of investors' excessive optimism by scheduling public offers at periods when investors are most prepared to pay high multiples. During this time, information asymmetry is crucial in validating investors' over-optimism. However, when more information is accessible to the investors, the firm's true value can be corroborated. This substantiates the negative impact of the hot market on the long-run performance of Indian SME IPOs. The results are consistent with the studies of Ritter (1991), Thomadakis et al. (2012), and Wadhwa et al. (2019). The positive listing of the company helps to bolster the investors' confidence over the public issue in the short term, but as more information becomes available, the performance in the long run often declines. These results validate the argument with a negative significant impact of the hot market period with the long-run performance in models 1, 2, and 4.

Similarly, in Table 4, models 1 and 2 show a significant positive impact of underpricing on the long-run performance. The results contradict the market overreaction hypothesis, which claims that IPOs with higher initial returns often lack long-term performance (Levis, 1993). Thus, the positive association of underpricing with BHARs defies the market overreaction hypothesis but is consistent with the signaling theory, which states that companies utilize initial returns as a signaling mechanism to transmit a firm's genuine worth to investors (Welch, 1989). Multiple researchers argue that only high-quality corporations can afford to underprice securities, reflected in favorable investor confidence and better long-term returns (Chi et al., 2015; Levis, 1993). These regression results align with the study of Arora and Singh (2020).

Corresponding to signaling theories, the reputed underwriter signals the IPO's quality, which results in higher initial and long-run returns. In the presence of information asymmetry in the Indian SME market, the underwriters play a significant role in reflecting quality IPO signals. Similarly, due to the reputation at stake, prestigious underwriters avoid undertaking risky issues that reflect better long-term performance in the post-issue market (Agathee et al., 2014; Arora & Singh, 2024; Carter et al., 1998). Thus, the underwriter's reputation positively impacts the long-run performance of listed SMEs in models 1 and 2, consistent with the literature.

Conclusion

The study examines the long-run performance of Indian SME IPOs and determines the factors that influence the performance of IPOs in the long run. Analysis of a 12-month BHAR sample shows that both equal and value-

weighted portfolios outperform the market immediately after IPO, and the positive alpha result of calendar-time portfolios validates these findings. The study offers valuable managerial insights by highlighting key factors such as underwriter reputation, issue size, and debt-to-asset ratio, which significantly influence SME IPO success, helping managers and investors make strategic decisions for long-term performance. Theoretically, this research extends existing IPO theories by integrating event-time and calendar-time approaches and employing multifactor models like the Fama-French and Carhart models, addressing prior methodological limitations. From a policy standpoint, the findings suggest stricter regulations on SME disclosures and enhanced corporate governance to protect investor interests and ensure market stability, thereby encouraging sustainable growth in the SME sector. This comprehensive approach provides a robust framework for both practitioners and academics to better understand and evaluate the dynamics of SME IPOs.

The latest findings offer essential information to potential investors about the peculiarities of the Indian SME IPO platform. In particular, the result presents the earning potential at the Indian SME IPO exchange. The research findings have significant implications for investors who want to buy and keep SME stocks in portfolios for one year. Buying at the issue stage and holding for one year would yield approximately 90% returns for the investors. Based on the study results, investors can scrutinize the SME IPOs based on the underwriter's reputation, issue size profitability debt to asset ratio, and market condition to gain abnormal returns in the long run. Similarly, the issuing firms may focus more on improving the significant variables under study to signal the IPO quality and gain better long-term returns. Overall, the Indian SME platform has been successful in attracting a good number of SMEs to list IPOs. Numerous SME IPOs have outperformed both at launch and afterward in the market. Despite modest volumes and sporadic trading, numerous IPOs have earned considerable aftermarket gains. This shows the investor's optimism towards this new kind of public issue. However, the long-term performance of these IPOs depends significantly on investors' IPO experience and access to additional information.

Research Implications

This research contributes to the literature by using novel methodologies to analyze long-term SME IPO performance in an emerging market context. By incorporating both event-time and calendar-time approaches, it addresses the methodological limitations of previous studies and provides a more comprehensive understanding of the determinants of IPO success (Agarwal & Patavardhan, 2024; Singh & Anand, 2020). The findings are expected to benefit multiple stakeholders, including investors, who can use these insights for better decision-making, and policymakers, who can develop supportive regulations to enhance the stability and growth of SME platforms (Kumar & Totla, 2023; Singh et al., 2018; Singh et al., 2023; Wadhwa et al., 2019).

Limitations of the Study and Scope for Further Research

This research examines SME IPOs and validates long-term performance using the calendar time method. Since the SME exchange is nascent, post-issue profits over three or five years may be examined in future studies to improve accuracy. Future research may examine how top management teams affect the long-term success of these public issues and the survival of SME exchange IPOs.

Authors' Contribution

The authors have contributed significantly to this work as follows: Parveen Siwach was responsible for framing the problem statement, conducting the literature review, data collection, performing data analysis, interpreting the results, drawing conclusions, and compiling the references. R. Prasanth Kumar played a key role in idea

formation, proofreading the manuscript, discussing the results, contributing to the conclusion, and refining the manuscript for improvements. Vikas Gupta contributed through proofreading, providing literature suggestions, and enhancing the manuscript's overall quality. Together, the authors ensured a comprehensive and rigorous approach to the study.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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