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Article

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Determinants of Book Built IPO underpricing – differential issue size and market momentum approach revisited

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Abstract: Pricing of an Initial public offering (IPO) is a complex phenomenon. Price anomalies are commonly observed in IPO markets, especially in emerging markets. Investors perceived underpricing creates undue market momentum during the offer period with an asymmetric effect across different issue sizes. This study examines the determinants of Book Built IPOs underpricing by considering a sample of 180 Book Built IPOs that went public in India between 2011 and 2020. The determinants were verified for differential issue size public offers. Listing day performance was

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PUBLIC INTEREST STATEMENT

The IPO market provides an opportunity for potential investors to buy shares directly from the company through the Book Building approach. Price discovery is a major factor when it comes to primary market investments. The issuing company decides on the price band and cut-off price. It is challenging for investors to confirm the fair value of the shares they bid for, and generally, it is believed to be reasonably priced or underpriced. Thus, short-term investors expect listing day gains. On the day of listing, market forces adjust the prices to reach their fair price and thus, there are chances of listing day gains. The key factors that determine the probable IPO under-pricing are not apparent though many researchers have attempted to study this. This study attempts to verify the factors affecting the IPO under-pricing phenomenon. The results of this study are helpful for IPO investment decision-making and policy framing.

measured using Listing Day-Absolute Return (LD-AR) and Listing Day-Market Adjusted Return (LD-MAR) models. Further, the data obtained was tested for the explanatory capabilities of firm-specific and market momentum factors for underpricing using OLS models. Concerning the differential issue size, the study found a direct relationship between the issue size and underpricing. Dominant underpricing was observed in the case of moderate to large issue size with a linear progressive return, confirming that there was over-optimism on the part of investors. The study's results also revealed that momentum-specific factors have a significant influence along with firm-specific factors such as firm size, cash flows, a subscription rate of QIBs and RIIs in the listing day return, and underpricing.

Subjects: Economics; Finance; Business, Management and Accounting

Keywords: differential issue size; firm size; listing day return; market momentum; underpricing

1. Introduction

The initial Public Offering (IPOs) market is a place for firms to raise long-term capital. In India, the IPO market is well-regulated by the Securities Exchange Board of India (SEBI). Due to liberalized policy and stronger investor confidence, there has been a growing trend concerning raising capital through the mainboard IPO route in India. On average, 35–40 firms' mainboard IPOs have raised an average annual capital worth $4 billion in the Indian primary market in the last two decades. Price anomalies due to information asymmetry are persistent in IPO markets. IPO is offered through a book-building or fixed-price approach in India. It is a mechanism through which firms raise capital directly from the public through offer documents. Prospective investors are informed through an offer document on the price bands and reservations for each class of investors. Most of the time, markets experience underpricing phenomena in Initial Public Offerings (IPOs). Short-term participants expect immediate listing day gain and others for capital gains over time. Principally, a primary market is envisioned for long-term capital raising for firms with an expectation that the investors realize a capital gain over time. In practice, people subscribe for IPOs shares expecting listing day gains. Increasingly, it is noticed that most IPOs are deliberately or accidentally underpriced. Firms sometimes resort to underpricing to boost the demand for their shares, granting extra money for taking a risk in the company. The underwriter's inability to find the fair value of shares contributes more money for investors on listing day.

Further, information asymmetry levels differ significantly across developed to emerging nations. Information beyond the offer document has a far more significant impact on valuation. It is one of the persistent issues causing price imperfections and differential returns for different categories of investors. Recently, some of the large issue-size public offerings have fared poorly on the day of listing, discouraging small investors as they lack the expertise to judge and are left with losses. Only prominent players dominate the issue right from allotment to profit booking on listing day. Underpricing is good as it passes wealth to the shareholders post-listing. However, there needs to be more consensus on its determinants.

Primarily, fundamental factors like the earnings of the company indicated by EPS, P/E ratio, Debt/Equity ratio, RoE ratio and P/B ratio, etc. are key drivers of the stock price. Market forces discount the firm's earnings potential in determining the value for shareholders in the long term. However, estimating earnings potential for early-stage firms is difficult. Further, the amount of capital to be raised via IPO as indicated by issue size is vital information for IPO pricing. Generally, large-size IPOs tend to keep a higher price band. Also, it is perceived that firms raising large capital indicate higher earning potential. It is perceived that the firm age, firm size, and issue offer size have high correlations. Asset managers, equity traders, investors, speculators and scholarly academicians such as Sinha & Madhusoodanan (2004) and Hawaldar et al. (2018) have attempted to verify these

relationships by studying the factors such as large versus small issues, age of the firm, and size of the firm, in determining the IPO pricing. Similarly, does the number of times shares are subscribed determine the listing day gain? This signifies the demand for the public offering, and the higher the subscription rate, the higher the probability of listing day gain. Phadke and Kamat (2018) found a positive relationship between subscription rate and listing day returns. Other macroeconomic factors like index return on the day of listing are vital determinants of the IPO performance. If the index sentiments are positive, the expected return of IPO shall be greater on listing day. Ross (1976) in the arbitrage pricing theory asserted that macroeconomic factors influence the asset's returns. These are primarily systematic risk factors. An imperfect market provides an opportunity for unusual returns. Company fundamental and future earnings potential are usually considered for book-built IPO pricing; sometimes, misprice the public issue. However, on the day of listing, the market eventually accounts for all other macroeconomic factors. It corrects the price to bring it back to the appropriate price levels and arbitrageurs expecting the price variations between primary and secondary markets would like to take advantage of any deviations from fair market value. Evidence shows that even oversubscribed shares have posted listing day losses indicating the overvaluation of shares (Roy & Gupta, 2022). Firm size, issue size and general market sentiments may factor in the pricing of IPO. However, there is no empirical evidence to prove it. Apart from these, specific factors such as the firm performance, issue size, and market momentum need to be thoroughly examined in the Indian market so that more informed decision can be drawn by the market participants. The studies in the preceding years dealt only with understanding about the determinants of the IPO underpricing. This study is unique in a way that it specifically examines the issue size, some of the firm-specific factors and market momentum factors that influence the IPO underpricing in Indian stock market.

The remaining of this paper is organized as follows: section 2 presents the literature review on the IPO underpricing and develops the hypotheses. Section 3 elucidates the methodology and describes the research models employed in this study, while section 4 exhibits the empirical results and discusses on the same elaborately. Section 5 concludes the paper followed by the limitations and future scope of the study.

2. Review of Literature and Hypotheses development

IPO underpricing is an expected phenomenon by traders and Investors especially in emerging markets like India. In the last two decades, there have been eventful years for the IPO market with nearly 65% of company listings posting a positive listing date gain. However, the trend in IPO underpricing is declining in recent years (Roy & Gupta, 2022). The listing day gain percentage has declined from 43.82% in 2020 to 10% in 2022 (The Economic Times, 2023). However, the dynamics of IPO markets are ever-changing, so as the factors that influence the IPO performance also change.

According to the arguments in behavioral finance over-optimism bias is quite prevalent among investors in primary market. Due to the lack of access to information and ability to quickly process information for investment decision-making, investors tend to over or under estimate the probable listing day gain or loss in secondary market. This eventually leads to miscalculation of the risks and returns involved in securities trading. This unrealistic view of the valuations of IPOs and over estimating the present and future values of the stock affects the investors sentiments (Guo et al., 2022; Harrison & Kreps, 1978; Paleari et al., 2007). The price shift from primary to secondary market is expected to be positive aspect as investors expect the offer price to be lesser than listing day price. It occurs due to lack of clarity on the understanding of the demand for the shares in both the markets. Money left on the table phenomenon is the returns earned on first day of listing an IPO. It is measured by taking difference between the share allotment price and listing day opening price of the stock in the secondary market (Perera & Kulendran, 2016). IPO pricing is a complex phenomenon as it fulfills the money left on the table expectations of the short run investors in the market.

In this section, the research findings on the determinants of IPO pricing were reviewed extensively so as to elucidate the gap of knowledge that can be filled up with newer attempts of studies. Hawaldar et al. (2018) examined the listing day performance of fixed price IPOs and book-built IPO's and found that book-built IPOs were underpriced by a lesser magnitude as compared to fixed price IPO's. Lee et al. (1999) ascertained that large investors in IPOs result in higher initial returns due to the quick and quality of information that they possess being informed investors. Kim et al. (2004) examined the relationship between firm ownership and IPO performance and found that the managerial ownership experience and a high level of ownership had a positive influence on the IPO performance. The signaling Hypothesis asserted that a higher promoter stake during the pre-IPO period signals confidence of promoters in the business, thus the expected return from the company should rise in near future. Banu Durukan (2002) examined the abnormal initial returns from IPOs and confirmed that the winner's curse hypothesis holds good in the market by posting an abnormal return on a listing day in Istanbul Stock Exchange (ISE). It further states that markets automatically correct itself the price imperfection of either overvaluation or underpricing of IPOs once shareholders realize the profits on a listing day. Underpricing leaves money on the table and profit booking persists in such imperfect markets. Sinha and Madhusoodanan (2004) investigated the role of book-built IPOs in Indian markets with respect to the IPO underpricing and found that the book-built IPOs had less probability of being underpriced than the conventional fixed price issues. Also, underpricing is more dominant in the case of smaller issue sizes. Peristiani and Hong (2004) verified the role of pre-IPO financial performance of firms and found that sound pre-IPO financials have a significant influence on the post-listing IPO performance of the firm. It also asserted that an increase in the firms with poor financial quality going for IPO are struggling to sustain financially during their post-listing period. Jaskiewicz et al. (2005) found a positive firm size effect on the IPO performance of family and non-family owned firms of the German and Spanish markets. Zheng and Stangeland (2007) determined that the IPO underpricing is positively impacted by the sales growth rate and EBIDTA were else it is not positively influenced by the growth in earnings. Pukthuanthong-Le and Varaiya (2007) found that the IPO underpricing was related to the block selling in the post IPO period. Information about the block selling rate had an influence impact on the listing day return as it benchmarks the price levels for listing day open price. Kenourgios et al. (2007) documented that the underwriters' reputation and the oversubscription times significantly affected the underpricing level of the IPOs in the Greek IPO markets. Kiran and Chopra (2012) ascertained the presence of a profound short-run IPO underpricing in Indian markets and confirmed that the initial return of IPO returns was largely influenced by the factors such as the subscription level, Issue size, Listing Lead time and firm age etc. In addition, Mishra (2010) found that there was a significant positive underpricing in the Indian IPO market irrespective of the method of public issue such as fixed and book built. Ghosh (2004) studied the underpricing and the post-listing volatility of stock returns and affirmed that the underpricing and volatility were negatively associated with each other. The study also demonstrated the presence of optimism during the pre-issue period, and high volumes of subscriptions were attributed to the hot market hypothesis. Van Heerden and Alagidede (2012) examined the short-run IPO performance in the financial sector stocks of the South African market and confirmed the presence of a significant short-run IPO underpricing. Chiraz (2013) found no evidence of IPO initial return and current discretionary accruals in French markets. The author also confirmed that those firms engaged in aggressive earnings management tend to post positive returns in their initial phase but failed to sustain in their short run. Eventually, such firms fail as a public company and undergoes for a delisting. Deb (2013) investigated the firm-specific characteristics during the IPO, signaling the firm quality and finds that underwriter reputation and patents are positively related to the post-listing performance of IPO. Rani (2014) found no influence of firm-specific characteristics such as the firm age, turnover, firm leverage and pre IPO period promoter's stake on the IPO pricing. Banerjee and Rangamani (2015) ascertained that the subscription level of an IPO is also influenced by some of the macro factors like the FII Inflow, Market P/E, Money supply, DE ratio and board size. Bhatia (2017) explored a correlation between the long-run performance and listing day returns. The author confirmed that the issue size and market conditions influence the post listing IPO performance. Hawaldar et al. (2018) documented that the rate of underpricing of book built IPOs in

India was relatively less when compared to the fixed price IPOs. Shenoy and Srinivasan (2018) studied the underpricing of IPOs in India and asserted that the listing day performance was well explained by the firm's P/E, RONW and NAV. Besides, there are a good number of studies that have been conducted in the most recent times examining various determinants of the IPOs underpricing. A brief review of them is presented as follows:

Gao et al. (2020) examined the price factor and determined that IPO issue price was positively related to the quantity-weighted average bid price, and the first-day closing price is positively related to the market-clearing bid price. Dang and Nguyen (2021) examined the role of internal corporate governance and external audit in preventing stock price crashes. The market momentum on the day of listing information is vital for primary market participants. The study results confirm that Information on issuing firm's corporate governance can prevent the stock price crash. In addition, this study provides evidence that an external audit quality enhances the audit committee's effectiveness in preventing crash risk. Thus, quality of corporate governance practices indicates the probable market price performance of issuing firm. In addition, Roy and Gupta (2022) investigated the determinants of book-built IPO underpricing and documented that the phenomenon has decreased in the Indian market. Their findings clearly attribute the listing days gains to the factors such as oversubscription ratio, offer size, general market conditions, and underwriter's reputation. Moreover, Ewens et al. (2020) examined the trade-off between going public with an IPO or staying private longer, especially among startups and old firms in the USA. Their findings asserted that going public does not necessarily drive expansion and hiring. The deregulation of private equity has supported being private for a long and able to raise more funds relentlessly. This is one of the causes of a decline in the number of IPOs in the USA since 1996. Füllbrunn et al. (2020) conducted an experimental study on the post listing behaviour of the investors and their reluctance to sell below the issue price. Study experimented under controlled conditions and confirmed the disposition bias among investors in IPO market. Aghamolla and Thakor (2022) examined how in a closely competitive environment an individual private firm's decision to go public influence its competitors. The findings confirm that close competitors are influenced by each other's IPO performance. Private firms are significantly influenced after their strong competitors going public. This is distinct from hot market and market shock propositions.

Most recently, Harasheh (2022a) empirically examined how IPO listing improves Italian firms' sustainability and financial performance indicators. The authors confirm a moderate negative effect of the listing on firms' financial and operating variables—also a positive impact of listing on sustainability and governance indicators. Furthermore, Harasheh (2022b) studied the relationship between underpricing and pre-IPO financial, sustainability ESG variables. The study documented that these variables had significant influence just a year before the IPO. However, the post-IPO stock return was not aligned to these variables.

From the literature survey, it is clear that the characteristics of IPOs are country-specific and change over time and predominantly, the underpricing of IPOs is due to the information asymmetry, underwriter's reputation, firm size, type of public issue, and age of the issuing firm. There is no conclusive evidence on the role of issue size and market momentum effect on the listing day performance of IPOs in the Indian market. Hence, this study attempts to identify those firm specific and market factors that influence the IPO pricing and thus support the decision-making of informed investors and policy makers in India. Furthermore, the study examines the following specific hypotheses to achieve the aims of the study:

H_{01}: Listing delay has no statistically significant impact on the listing day return.

Listing delay causes the value of stocks to change as per the trends in the market. The longer the delay more is the chance of adverse change in expected returns of the investors due to market volatility, cost of financing and other economic factors. Listing delay may be due to regulatory reasons or the company-related factors causing the delay. Most developed nations have reduced

the time to list as minimal as possible to minimize the price impact. However, emerging nations still have significant time delays, causing the return on a listing day. Countries with a high listing delay are likely to have a high probability of change in market sentiments. In India listing, a delay period is 7 days which was reduced from 13 days earlier to eliminate the risk of adverse market sentiments on the IPO listing. In the sample firms, it is found that the mean listing time for small and mid-size IPO is 13 days, and for large-cap, it is 10 days. It is above the global average of 3 days and hence becomes necessary to check its explanatory ability in influencing the listing day return. In this study, an attempt is made to verify the role of listing delay on listing day return.

H_{02}: Firm Size has no statistically significant impact on the listing day return.

Large firms have better stock price management and can influence merchant bankers in the market-making process of their new shares compared to small firms. Firm size significantly impacts profitability and market value (Mule et al., 2015). Due to economies of scale and market dominance, large firms can influence market factors. As shown by Berger and Bonaccorsi di Patti (2006) empirical evidence confirms that size is an essential determinant of a firm's performance. The larger firms with diversified product portfolios, managerial capabilities, and market influence power can influence market valuations compared to small firms (Berger & Bonaccorsi di Patti, 2006). In this study, the role of firm size on listing day return is verified by taking log naturals of the average of the previous three years' total assets as the proxy to measure the firm size. Total assets reflect the financial quality of the firm, and large asset-sized firms depict the ability to instill demand for its shares, creating the hot market scenario and expected to leave more money on the table on the day of listing.

H_{03}: The firm's cash flows have no statistically significant impact on the listing day return.

Fundamental factors such as the issuing firm's operating cash flows indicate the firm's revenue potential and liquidity. Firms with a sizeable cash-based revenue signal the market potential for future earnings, thus influencing the IPO pricing. Cashflows depend on the firm's commercialization strategy (Morricone et al., 2017). Perceived models of IPO pricing, such as DCF models, confirm linkages of valuations with cashflows. Underpricing or overpricing market reactions on listing day depend on the operating cashflows of the firm and the discount rate. Firms with considerable cash flow base influence can influence its valuations on listing day (Aggarwal et al., 2009). In this study, an attempt is made to verify the influence of cashflows on the listing day returns. Here, the firms' cash flows are measured by taking the average of the firm's total revenue for the previous 3 years.

H_{04}: The firm's earnings have no statistically significant impact on the listing day return.

Earning potential and earnings history is a fundamental information influencing stock pricing. Quality earnings can explain the underpricing phenomenon, and the possibility is less when firms produce higher-quality earnings (Boulton et al., 2011). Investors tend to look for earnings trends as a fundamental indicator of the firm's financial soundness. Proxies to earnings as ROCE, ROA and ROE are carefully examined while determining the IPO pricing. Earnings influence the market reaction (Zarowin, 1990). In this study, we examine the linkages of earnings with listing day return. The study considers the average earnings of the last 3 years as an explanatory variable.

H_{05}: Aggregate and Category wise investors' subscription rate has no statistically significant impact on the listing day return

Pre-listing information asymmetry on the number of times issue subscribe indicates the demand for the shares offered. In Indian markets, the retail and institutional subscription category information signals the stock's probable listing day open price. Subscription rate signals the market demand and potential for listing day gains. The larger subscription rate of institutional buyers

strongly indicates listing day underpricing. The subscription rate strongly signals the demand for the firm's shares, and the price is influenced when the shares are under or oversubscribed (Kenourgios et al., 2007). The rejected applicants of IPO tend to buy the shares on a listing day, adding the demand in the pre-issue period, causing the price to rise further from its listing day. This study attempts to verify the linkages between the category-wise subscription with the underpricing phenomenon.

H_{06}: There is no statistically significant difference in determinants of IPOs listing day performance for different issue sizes.

The issue size is the number of shares offered and the total funds proposed to be raised through a public offer. Investors' reactions vary from small to large-sized public offers (Van Heerden & Alagidede, 2012). Empirical evidence argues that the channel connecting offer size and underpricing is information-based and bidirectional (Boulton et al., 2011). Issue size signals the market about capital structure and free float of shares in the secondary market. Studies show that issue size is one of the potential factors when pricing the IPOs (Deng & Zhou, 2015). This study attempts to verify the effect when samples are differentiated based on the issue/offer size and its impact on listing day absolute return and market-adjusted return.

H_{07}: Market momentum has no statistically significant impact on the listing day return.

Market momentum shows the speed of change in stock price and indicates the strength or weakness of stock price. It affects the investors' short-run sentiments and helps traders time their trade, especially for retail investors (Dorn, 2009). The direction of the market as driven by its technical or some time fundamental factors such corporate governance information indicative to stock price crash or price momentum (Dang & Nguyen, 2021). The day of the trade sentiment hypothesis states that the listing day benchmark volatility significantly influences the IPOs performance. Market sentiments will likely change between offer close day and the listing day. The participant's attention and sentiments support for volatility predictions and price performance, although the magnitudes of the improvements are relatively small from an economic point of view (Audrino et al., 2020). When the market is gripped with persistent bear sentiments during the listing period, even fundamentally strong IPOs listing day expected return would get adversely affected. In this study, the market momentum is considered as an explanatory variable for determining the listing day return and underpricing. The proxies to market momentum taken are index volatility (*Vol*), index 10 days moving average return (*Iavgret*), listing day index trend (*trend*) and listing day index return.

3. Methodology and Models

This study verifies the effect of issue size and market momentum on listing day performance of IPOs considering the issue-specific, firm-specific and market-specific characteristics on listing day Absolute Return (AR) and Market Adjusted Return (MAR) of IPOs. It verifies for the differential issue size-specific variables such as total subscription rates, category-wise subscription rate, listing delay and firm-specific characteristics such as firm size, revenue and earnings capacity. Also, the study verifies the market momentum-specific characteristics such as Market Volatility, Average Market Return and Market Sentiment. There were 208 mainboard IPOs during the 2011 and 2020. Prior to 2011, due to persistent global market recession many IPOs failed or withdrawn in India. Also, post 2011 there were many policy changes with regard to the entry norms and listing guidelines conducive to the primary market in India. Hence, we consider IPOs issued post-global financial crisis recovery period i.e., 2011 to 2020. Among 208 mainboard IPOs, 28 IPOs were excluded due to the inadequate data. Finally, this study considered the data of 180 Book Built IPOs that went public between 2011 and 2020. The data was collected from the National Stock Exchange (NSE) IPOs database. The company financial information was collected from the CMIE PROWESS database as at 2020; only the

IPOs listed on NSE were considered and the Nifty has been taken as a benchmark market index. This study attempts to verify the validity of the over-optimism hypothesis on the part of investors, money left on the table and signaling hypothesis in the new issue market in the Indian context. The strong existence of undervaluation supports the hypothesis and factors that influence the undervaluation explains the degree of relationship between the explanatory variables and the listing day performance.

3.1. Variables of the Study

Acronym	Variable	Measurement
AR	*Absolute Return*	*Listing day return*
MAR	*Market Adjusted Return*	*Underpricing*
TSR	*Total Subscription Rate*	*Ratio of total shares offered and total number of shares demanded for by the applicants*
TA	*Total Assets*	*Natural logarithm of Total Assets as proxy to firm size*
TR	*Total Revenue*	*Natural logarithm of Total Revenue as proxy for firm cash flows*
EAR	*Earnings*	*Mean of Profit After Tax for previous three financial years before listing*
QIBs	*Qualified institutional Bidders*	*Percentage subscription by QIBs as proxy for Institutional demand*
NIIs	*Non Institutional investors*	*Percentage subscription by NIIs as proxy for Non institutional demand*
RIIs	*Retail Investors*	*Percentage subscription by RIIs as proxy for Small investors demand*
LD	*Listing Delay*	*Number of days between offer close day and listing day*
MM	*Market Momentum*	*Simple moving average of benchmark index for previous ten trading sessions before listing day, Index trend, Index closing return and index volatility*
IS	*Issue Size*	*Offer size of the IPO*

3.2. Listing Day-Absolute Return (LD-AR)

Listing day "t" stock return for the sample firm "i" is obtained by taking the difference of the offer price and listing day closing price of the stock' i'. It is computed as follows.

$$AR_{it} = \left(\frac{p_{it}}{p_{i0}}\right) - 1 \tag{1}$$

AR_{it} is the listing day return of the stock "i" on day "t". P_{it} is the closing price of stock "i" on the listing day and P_{i0} is the offer price of stock "i". The market return is benchmarked to the Nifty Index. Nifty is India's leading broad-based market index of the National Stock Exchange (NSE). Market Index return is obtained by considering the daily index return and the number of trading days between the IPO's offer last day and listing day. It is calculated as follows.

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$$ER_t = \frac{\sum_{i,t}^{n}\left(\frac{p_{it}}{p_{i0}}\right) - 1}{N} \quad (2)$$

ER_{it} is the market average listing day return on day "t". N is the number of trading days between the IPO's offer last day and the listing day.

3.3. Listing Day-Market Adjusted Return (LD-MAR)

Further to measure the underpricing of the sample IPO stock "i", the standard method of listing day return calculation is followed. Listing Day market-adjusted return is obtained by taking into account the listing day absolute return and market index return on a listing day "t".

$$MAR_{it} = \left(\left[\frac{1 + ER_{it}}{1 + AR_{it}}\right] - 1\right) \times 100$$

MAR_{it} is the market-adjusted return. ER_{it} is the listing day Nifty returns on day "t". AR_{it} is the listing day return of the stock "i" on day "t". The total subscription rate is the ratio between the number of shares offered and number of shares demanded for by the applicants. Category wise subscription rate is considered as per the classification of investors as per the SEBI norms. It includes Qualified Institutional Bidders (QIBs), Non-Institutional Investors (NIIs), and Retail Investors (RIIs). Firm size is measured by taking the assets of the firm. The average total assets are derived based on the immediate three previous year annual asset value. The average of annual revenue for three immediate previous years represents the firm's cash flows. The earnings capacity is measured through the average PAT for the last 3 years (Zheng & Stangeland, 2007). Listing delay is calculated by taking the number of days between offer close day and listing day. OLS models were used to verify the influence of Issue-Specific, Firm-Specific and Market-Specific factors on listing day Absolute Return (AR) and Market Adjusted Return (MAR) of IPOs based on the issue size criterion samples. The market-adjusted model of the underpricing phenomena is considered, and the initial return is computed based on the difference between the offer price and the listing day closing price. Different models have been developed to analyze the impact of firm and issue-specific characteristics on underpricing. The momentum effect is verified by taking the moving average return of the market for ten previous trading sessions. Data normality has been verified using the Augmented Dickey–Fuller test and confirmed that the sample data is normally distributed. To test the hypotheses, the following regression models were used considering firm and issue-specific characteristics effect on IPO underpricing.

Model: 1

$$AR_{i,t} = \alpha + \beta_1 LD_{it} + \beta_2 TA_{it} + \beta_3 TR_{it} + \beta_4 EAR_{it} + \beta_5 QIB_{it} + \beta_6 NII_{it} + \beta_7 RII_{it} + \varepsilon_{i,t} \quad (3)$$

Table 1. Variable wise descriptive Statistics

Variables	Mean	Max	Min	SD.	Obs
AR	*0.12*	*1.40*	*-0.70*	*0.34*	*178*
LD	*13.12*	*140.00*	*7.00*	*13.68*	*178*
IS	*1118.05*	*11175.84*	*23.00*	*1893.23*	*178*
FS	*8.65*	*13.84*	*0.00*	*2.47*	*178*
CF	*8.31*	*15.43*	*0.00*	*2.31*	*178*
MAR	*11.79*	*139.68*	*-69.93*	*33.43*	*178*
NII	*72.62*	*958.07*	*0.00*	*140.84*	*178*
EAR	*-6052.37*	*48039.43*	*-1422570.00*	*106916.80*	*178*
QIB	*24.58*	*192.26*	*0.00*	*38.79*	*178*
RII	*6.06*	*73.32*	*0.00*	*10.12*	*178*
TSR	*26.77*	*273.05*	*0.00*	*47.81*	*178*

$$AR_{i,t} = \alpha + \beta_1 LD_{it} + \beta_2 TA_{it} + \beta_3 TR_{it} + \beta_4 EAR_{it} + \beta_5 TSR_{it} + \varepsilon_{i,t} \quad (4)$$

Model: 2

$$MAR_{i,t} = \alpha + \beta_1 LD_{it} + \beta_2 TA_{it} + \beta_3 TR_{it} + \beta_4 EAR_{it} + \beta_5 QIB_{it} + \beta_6 NII_{it} + \beta_7 RII_{it} + \varepsilon_{i,t} \quad (5)$$

$$MAR_{i,t} = \alpha + \beta_1 LD_{it} + \beta_2 TA_{it} + \beta_3 TR_{it} + \beta_4 EAR_{it} + \beta_5 TSR_{it} + \varepsilon_{i,t} \quad (6)$$

4. Empirical results & discussions

Table 1 and 2 shows the variable-wise descriptives and regression results of two OLS models developed to test the IPO listing day performance on an aggregate sample basis, respectively. Under Model 1, two different equations were tested using multiple regression on listing day absolute return and specific factors such as firm size, cash flows, earnings, a subscription rate of various categories of investors and the aggregate subscription rate. In model 1 equations, we document that the listing day absolute returns are significantly influenced by the firm size (−.03), revenue (0.42), subscription rate of QIBs (.002) and RIIs (.012), confirming the findings of (Kenourgios et al., 2007). Interestingly, it was also found that there is a negative influence of firm size on absolute returns. It confirms that the firm-specific factors like firm size and revenue of the firm act as a determining factor for listing day performance. Firms with significant assets and strong revenue bases indeed attract institutional and retail investors too, and their subscription

Table 2. Estimation results of OLS regression

	Model 1		Model 2	
	1	***2***	***3***	***4***
Dependent Variable	***AR***	***AR***	***MAR***	***MAR***
Independent Variable	***Coef.***	***Coef.***	***Coef.***	***Coef.***
C	*-.090 (.273)*	*-.070 (.376)*	*-9.130 (0.264)*	*-6.987 (0.376)*
LD	*-.002 (.172)*	*-.002 (.108)*	*-0.198 (0.169)*	*-0.228 (0.107)*
LnTA	*-.030 (.078)**	*-.028 (.097)**	*-3.014 (0.079)**	*-2.805 (0.097)**
lnTR	*.042 (.027)***	*.041 (.025)***	*4.196 (0.026)***	*4.153 (0.025)***
EAR	*0.000 (0.647)*	*0.000 (0.833)*	*0.000 (0.673)*	*0.000 (0.838)*
QIB	*.002 (.004)****	-	*0.240 (0.004)****	-
NII	*.000 (.409)*	-	*0.023 (0.409)*	-
RII	*.012 (.000)****	-	*1.180 (0.000)****	-
TSR	-	*.004 (.000)****	-	*0.429 (0.000)****
R Square	*0.439*	*0.453*	*0.439*	*0.451*
F stat	*19.014 (.000)*	*23.925 (.000)*	*19.018 (.000)*	*23.692 (.000)*
Durbin-Watson	*1.985*	*2.028*	*1.989*	*2.027*
N	*180*	*180*	*180*	*180*
VIF Mean	*2.55*		*2.737*	

*Note: ***p < 0.01, **p < 0.05, *p < 0.1.*

rate can be an indicator for the listing day gain. However, in OLS equation 2, the aggregate subscription rate has a significant influence on the listing day performance as measured by its absolute returns. Therefore, the null hypothesis is rejected, confirming that the firm-specific factors influence the listing day performance of Indian listed IPOs.

Model 2 was framed to verify the impact of firm-specific factors on listing day underpricing as measured by the market-adjusted returns. Two different equations were tested, and we find no statistically significant evidence of listing delay and earnings of the firm influencing the underpricing. However, other explanatory variables have shown positive coefficients except for the firm size, which has a negative relationship and is statistically significant. Thus, we reject the null hypothesis and conclude that firm-specific factors can determine the underpricing of IPOs.

Table 3 shows the Robust OLS regressions that were performed in the same previous two models with two different equations to confirm the normal distribution of residuals of our OLS models and the validity of test results. It was found that the firm size and revenue have no significant impact on the listing day return. However, listing delay, category-wise subscription rate, firm earnings, and aggregate subscription rate have a statistically significant influence.

4.1. Issue size effect

The issue size is the offer volume of capital proposed to be raised through public issues. Investors' reactions vary from small to large public offers (Van Heerden & Alagidede, 2012). Studies show that issue size is one of the potential factors when pricing the IPOs (Deng & Zhou, 2015). Though there is no theoretical evidence to prove the phenomenon and categorize IPOs as what is called as

Table 3. Estimation results of robust OLS Regression

	Model 1		**Model 2**	
Dependent Variable	**1**	**2**	**3**	**4**
	AR	**AR**	**MAR**	**MAR**
Independent Variable	***Coef.***	***Coef.***	***Coef.***	***Coef.***
LD	*0.001708*** *(0.0386)*	*0.001123 (0.1895)*	*0.169817*** *(0.0377)*	*0.112037 (0.1906)*
LNTA	*-0.005788 (0.5552)*	*-0.00631 (0.5371)*	*-0.59627 (0.5391)*	*-0.6355 (0.5339)*
LNTR	*0.013229 (0.2181)*	*0.016685 (0.1345)*	*1.345119 (0.2056)*	*1.66935 (0.1342)*
QIB	*0.002843 (0.000)****	-	*0.283374 (0.000)****	-
NII	*0.000191 (0.2263)*	-	*0.01882 (0.2292)*	-
PAT	*-1.8407 (0.0929)**	*-1.3407 (0.2444)*	*-1.7705 (0.1017)*	*-1.3305 (0.2483)*
RII	*0.005585 (0.0003)****	-	*0.557389 (0.0002)****	
TSR	-	*0.004349 (0.000)****	-	*0.435528 (0.000)****
C	*-0.108731 (0.0204)***	*-0.11576 (0.006)****	*-10.8342 (0.0195)****	*-11.55238 (0.0158)****
R Square	*0.322*	*0.321535*	*0.321818*	*0.318583*
Adjusted R-squared	*0.294083*	*0.298004*	*0.293893*	*0.29495*
N	*178*	*180*	*178*	*180*

*Note: ***p < 0.01, **p < 0.05, *p < 0.1.*

small and large-sized public issues, considering the median issue size in Indian primary market, issue size of less than 500 crore rupees is termed as small size and above 1000 crore is a large size IPO. In this study, an attempt has been made to verify the effect when samples are differentiated based on the issue/offer size and verify the impact of the issue size on listing day absolute return and market-adjusted return. IPOs were categorized into small-cap, mid-cap and large-cap when the issue size is below ₹500 Cr, between ₹500 and ₹1000 Cr and ₹1000 Cr, respectively. The number of sample firms and the mean subscription rate of the category are as follows.

$$AR_{i,t} = \alpha + \beta_1 LD_{it} + \beta_2 TA_{it} + \beta_3 TR_{it} + \beta_4 EAR_{it} + \beta_5 QIB_{it} + \beta_6 NII_{it} + \beta_7 RII_{it} + \varepsilon_{i,t} \quad (7)$$

$$MAR_{i,t} = \alpha + \beta_1 LD_{it} + \beta_2 TA_{it} + \beta_3 TR_{it} + \beta_4 EAR_{it} + \beta_5 QIB_{it} + \beta_6 NII_{it} + \beta_7 RII_{it} + \varepsilon_{i,t} \quad (8)$$

Table 4 shows a higher listing day mean absolute return and underpricing for moderate issue size IPOs as compared to small and large size IPOs. However, it is statistically insignificant when verified for mean differences among the observed groups. It means that moderate issue size IPOs signal a high probability of underpricing and leave more money on the table. Qualified Institutional Bidders (QIBs) are large entities reserved with a minimum of 50% of the total issue size and include SEBI registered entities like Public Financial Institutions, Commercial Banks, Mutual Funds and Foreign Portfolio Investors. Among the sample firms, it is observed that an average QIBs subscription rate is higher when the issue size is more significant than ₹500 crores. Non-institutional investors (NIIs) or High Net Worth (HNIs) investors are vested with a minimum of 15% reservation in total issue size and include Resident Indian individuals, Eligible NRIs, HUFs, Companies, Corporate Bodies, Scientific Institutions, Societies and Trusts who subscribe with a minimum of ₹2 Lakhs and more shares in an IPO. Among the sample firms, it is observed that on average NIIs subscription rate is more when the issue size is greater when the issue size is between ₹500 crore to ₹1000 crore. NIIs play a dominant role in terms of subscription rate and their presence in IPO is highly significant across the issue size category. Retail individual investors (RIIs) are vested with a minimum of 35% reservation in total issue size. They apply for not more than ₹2 lakhs shares in an IPO and include Resident Indian Individuals, NRIs, and HUFs. Among the sample firms, it is observed that the average RIIs subscription rate is more when the issue size is less than ₹500 crore.

To verify the effect of issue size on the listing day return and underpricing, two different OLS equations were tested under varying levels of the issue size. For this purpose, the IPOs were grouped based on their volume of capital raised. Three models were developed as shown in table 5, where Model 1 is for an issue size of less than ₹500 Cr, Model 2 is for an issue size of more than ₹500 cr, but less than ₹1000 Cr and finally Model 3 is for above ₹1000 cr issue size. Listing day returns were measured at its Absolute Return (AR) and the underpricing using a Market Adjusted Return (MAR). The model 1 results reveal that when IPO issue size is small, the listing day returns both at absolute terms and market-adjusted terms (Underpricing) are significantly influenced by the firm size confirming the findings of Kiran and Chopra (2012) the total revenue, and the subscription rate of RIIs. It is observed that listing returns variations are explained 44.5% by the explanatory variables with the goodness of fit. However, in the case of Model 2 ($500 \geq 1000$), it is found that the listing day absolute returns (AR) are significantly influenced by listing delay, firm size, profitability, revenue and the subscription rate of all categories of investors with an explanatory strength of 63%. However, there was no evidence of model explanatory variables' impact of IPO underpricing (MAR).

Large IPOs attract different clusters of applicants compared to the small issue size IPOs. It is observed that institutional investors look for large size firms, and their subscription rate is higher than the normal compared to small-sized issues. In the case of Model 3 (1000>), the AR is influenced by listing delay, firm size, profitability, revenue, and the subscription rate of all categories of investors with an explanatory strength of 63%. However, there is a statistically significant influence on IPO underpricing (MAR) by the market momentum and the subscription rate of QIBs.

Table 4. Issue size, mean AR, MAR and category-wise subscription rate

Model	Issue Size (₹)	N	AR	MAR	Issue Size (₹)	(AR) t	(MAR) t	QIBs	NIIs	RIIs
1	<500	92	0.094	9.365	<500, 500≥1000	-.902 (.373)	-.907 (.370)	16.42	72.20	7.71
2	500≥1000	37	0.162	16.276	500≥1000, >1000	.068 (.946)	.090 (.929)	34.25	93.08	6.59
3	>1000	51	0.121	12.126	<500, >1000	-.403 (.689)	-.441 (.661)	33.22	59.82	2.52

Table 5. Estimation results of OLS regressions

Issue Size (Cr.)	<500		500≥1000		>1000	
Model	*1*		*2*		*3*	
Dependent Variable	*AR*	*MAR*	*AR*	*MAR*	*AR*	*MAR*
Independent Variable	*Coef.*	*Coef.*	*Coef.*	*Coef.*	*Coef.*	*Coef.*
C	-.147 (.248)	-14.761 (.248)	.090 (.516)	8.914 (.864)	-.173 (.176)	-17.242 (.332)
LD	-.002 (.211)	-.223 (.210)	.007 (.013)**	.670 (.597)	.011 (.009)***	1.081 (.246)
LnTA	-.057 (.094)*	-5.731 (.094)*	-.042 (.057)*	-4.227 (.463)	.000 (.019)**	-.058 (.976)
lnTR	.075 (.037)**	7.515 (.037)**	.024 (.034)**	2.378 (.492)	.008 (.021)**	.853 (.686)
EAR	5.283 (.835)	5.414 (.831)	2.308 (.000)***	.002 (.573)	-5.128 (.000)***	-5.023 (.858)
QIB	.000 (.895)	.025 (.893)	.004 (.003)***	.425 (.112)	.003 (.001)***	.301 (.002)***
NII	.000 (.435)	.032 (.436)	.000 (.001)*	.011 (.896)	.001 (.001)*	.080 (.231)
RII	.016 (.000)***	1.563 (.000)***	.002 (.005)***	.209 (.706)	-.014 (.019)**	-1.373 (.469)
R Square	.445	.443	.630	.628	.632	.626
F stat	8.324 (.000)	8.260 (.000)	5.743 (.000)	5.688 (.000)	8.577 (.000)	8.376 (0.00)
Durbin-Watson	2.132	2.133	1.599	1.600	1.758	1.761
N	92	92	36	36	49	49
VIF Mean	2.99	2.99	4.75	4.75	3.79	3.79

Note: ***p < 0.01, **p < 0.05, *p < 0.1.

From all sample observations in Table 6, it is found that predominantly IPOs are underpriced with a mean return of 28.16%. Underpricing is associated with the positive benchmark return. The overpricing is found with the mean negative returns of 14.77% and is considerably associated with the negative benchmark return. The relative strength of underpricing phenomena is greater, and it substantiates the investor's over-optimism and loss aversion biases in the market. At its segment-wise sample based on the issue size, it is found that price imperfections, i.e., underpricing or overpricing and issue size, have a negative correlation. As the issue size increases, the price imperfections decrease. It means a fair price is possible when a large volume of capital is raised as the merchant bankers' active interest in such IPOs is greater than the small IPOs.

Table 6. Underpricing and overpricing of IPOs

	*All sample**		*Sample Category issue size**					
	Under pricing	*Over pricing*	*Underpricing*			*Overpricing*		
			<500	*500≥1000*	*>1000*	*<500*	*500≥1000*	*>1000*
N	110	70	52	27	31	41	10	19
Mean MAR	28.16	-14.77	32.66	25.196	23.200	-20.570	-7.803	-5.942
*Nifty***	.0009	-.0012	0.0001	0.0026	0.0012	0.0001	0.0025	-0.0601

*Note: Underpricing is when the Listing Day MAR is Positive, and Overpricing is when the Listing Day MAR is Negative.
**Nifty benchmark mean return.

4.2. Market Momentum

Listing day and immediate previous week benchmark index volatility signal the listing day performance of IPOs. Irrespective of other fundamentals, volatility around the listing day can greatly affect the price movements. The participant's attention and sentiments support for volatility predictions and price performance, although the magnitudes of the improvements are relatively small from an economic point of view (Audrino et al., 2020). Market momentum shows the speed of change in stock price and indicates the strength or weakness of stock price. It affects the investors' short-run sentiments and helps traders time their trade, especially for retail investors (Dorn, 2009). The day of the trade sentiment hypothesis states that the listing day benchmark volatility significantly influences the IPOs performance. Market sentiments are likely to change between offer close day and the listing day. We notice when the market is gripped with persistent bear sentiments during this period, even fundamentally strong IPOs listing day expected return would get adversely affected.

In this study, the market momentum is considered as an explanatory variable for determining the listing day return and underpricing. The proxies to market momentum taken are index volatility (*Vol*), index 10 days moving average return (*Iavgret*), listing day index trend (*trend*) and listing day index return. Volatility is computed by taking the standard deviation of the immediate previous 10-day price changes. Index trend is the dummy variable created by assigning zero for negative closing price and one for a favourable closing price of Index. Listing day return is the percentage change in return as compared to the previous day (*ret*). Momentum effect on IPO listing day absolute return and underpricing are verified using Generalized Method of Moments (GMM) estimation. GMM estimation is used with two-stage least squares, standard errors, and covariance computed using the estimation weighting matrix. The benchmark index average returns for 10 previous trading sessions immediate to the listing day were calculated as follows.

$$Iavgret_{i,i}\frac{\sum_{i,t}^{n=10}\left(\frac{p_{it}}{p_{i0}}\right)-1}{N} \tag{9}$$

$Iavgret_{it}$ is the simple moving average of a benchmark index. N is the previous ten trading sessions immediately before listing day "t". The hypothesis tested here is $H_{07:}$ Market Momentum has no statistically significant impact on the listing day return.

The market momentum effect is verified in the following equation.

$$AR_{i,t} = \alpha + \beta_1 Iavgret_{it} + \beta_2 trend_{it} + \beta_3 vol_{it} + \beta_4 ret_{it} + \varepsilon_{i,t} \tag{10}$$

$$MAR_{i,t} = \alpha + \beta_1 Iavgret_{it} + \beta_2 trend_{it} + \beta_3 vol_{it} + \beta_4 ret_{it} + \varepsilon_{i,t} \tag{11}$$

The GMM estimation output in table 7 shows that the index moving average return and the Index volatility influence the absolute return and the IPO underpricing. The simple moving average has a significant favorable influence, whereas the Index volatility has a significant negative influence on the listing day gains and underpricing. The *day of the trade sentiment hypothesis* confirms that the day effect either on listing day or immediate previous week market trend or a sudden short-run persistent bull or bear momentum between offer close and listing day adversely affect the price movements as any sudden change in trend affects expected return and valuations of shares.

Technical analysts assert that the immediate previous 10 days market trends have more probability of influencing the stock prices. This study observed that irrespective of its fundamental factors, the market momentum as measured by the moving average has a strong positive influence on determining the IPOs listing day performance. It means a poor market trend

Table 7. Estimation results of Generalized Method of Moments

	1	2
Dependent Variable	**AR**	**MAR**
Independent Variable	**Coef.**	**Coef.**
Iavgret	*17.878* *(0.035)***	*1717.125* *(0.043)***
Trend	*0.026* *(0.703)*	*2.560* *(0.703)*
Vol	*-11.650* *(0.076)**	*-1175.280* *(0.073)**
Ret	*-3.729* *(0.247)*	*-382.540* *(0.235)*
C	*0.207* *(0.003)*	*20.772* *(0.003)*
R Square	*0.064*	*0.062*
Adjusted R-squared	*0.043*	*0.041*

Method: Generalized Method of Moments; Estimation weighting matrix: Two-Stage Least Squares, Standard errors & covariance computed using estimation weighting matrix, N=180; DW Stat: 2.0416; Note: ***p < 0.01, **p < 0.05, *p < 0.1.

persisting in the immediate 1 to 2 weeks before the listing day should signal that the expected returns may deviate on listing day. Also, it is observed that volatility is negatively correlated with the listing day gain and underpricing. The shift in volatility affects the return adversely, and an increase in average returns has a positive influence. This signals that the market momentum is a determining factor for evaluating the underpricing and listing day performance of a firm irrespective of company fundamentals. Interestingly, our study observed that there is no influence of listing day benchmark index performance. We used the Nifty trend taking the closing value of the index as positive or negative for the day, and found that it does not matter for the newly listed shares' performance. Similarly, the Nifty listing day return has no significant influence.

5. Conclusion

This study verifies the role of differential issue size and market momentum on IPO performance and documents that the firm size, cash flows, subscription rate of QIBs and RIIs have a statistically significant influence on the Listing Day absolute return and the underpricing. It verifies the signaling hypothesis confirming that offer size and market momentum signals IPO listing day performance. The study concludes that market momentum has a significant influence on IPO performance. Predominantly, the Book Built IPOs in India are underpriced, and the issue size determines the degree of listing day returns and underpricing. The study also found a direct relationship between the issue size and the underpricing wherein a moderate to large issue size have more underpricing with an increased return. Offer size and listing timing is critical as the market sentiment drives the valuations and any swing in the market sentiments on a listing day adversely influences the IPO returns. The probability of dramatic change in sentiments around the listing day affects the investors as they apply for shares based on the current market sentiment and any unusual movement in the benchmark index disrupts their expected return affecting the stock to react differently than expected on a listing day. It is observed that irrespective of company fundamentals, IPOs deliver an unexpected return on the day of listing due to momentum and issue size effect.

6. Recommendations

Through this study, we understand that there is a significant influence of differential issue size and market momentum on IPO performance. Investors and other participants should evaluate the proposals considering the listing day probable gain or loss based on the size of the issue. It also

necessities policy makers to understand the volatility around listing day and caution potential investors through awareness campaigns and guidelines. Participants shall also consider firm size, cash flows, subscription rate of QIBs and RIIs while evaluating IPO for short run investments.

7. Limitations and scope for further studies

The IPO underpricing phenomenon is caused by different factors which are specific to company fundamentals and market conditions. However, in emerging markets like India there are many other factors affecting this phenomenon. Limitation of this study is that it does not consider the month or week effect, competencies of investment bankers in valuing the IPO, regulatory requirements, price band, Industry specific factors, political stability, investors literacy and general market conditions. Further studies can be carried on verifying the effect of these variables on the underpricing phenomenon.

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References

Aggarwal, R., Bhagat, S., & Rangan, S. (2009). The impact of fundamentals on IPO valuation. *Financial Management*, *38*(2), 253–284. https://doi.org/10.1111/j.1755-053X.2009.01035.x

Aghamolla, C., & Thakor, R. T. (2022). IPO peer effects. *Journal of Financial Economics*, *144*(1), 206–226. https://doi.org/10.1016/j.jfineco.2021.05.055

Audrino, F., Sigrist, F., & Ballinari, D. (2020). The impact of sentiment and attention measures on stock market volatility. *International Journal of Forecasting*, *36*(2), 334–357. https://doi.org/10.1016/j.ijforecast.2019.05.010

Banerjee, S., & Rangamani, K. T. (2015). Determinants of investor's subscripton level of IPOs: Evidence from Indian capital market in post mandatory IPO grading regime. *DLSU Business & Economics Review*, *24*(2), 77–91.

Banu Durukan, M. (2002). The relationship between IPO returns and factors influencing IPO performance: Case of Istanbul stock Exchange. *Managerial Finance*, *28*(2), 18–38. https://doi.org/10.1108/03074350210767672

Berger, A. N., & Bonaccorsi di Patti, E. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking and Finance*, *30*(4), 1065–1102. https://doi.org/10.1016/j.jbankfin.2005.05.015

Bhatia, S. (2017). A study on the long-run performance of initial public offerings in India. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2926872

Boulton, T. J., Smart, S. B., & Zutter, C. J. (2011). Earnings quality and international IPO underpricing. *The Accounting Review*, *86*(2), 483–505. https://doi.org/10.2308/accr.00000018

Chiraz, D. (2013). Earnings management and performance of French IPO companies. *Journal of Accounting and Taxation*, *5*(1), 1–14. https://doi.org/10.5897/jat2013.0106

Dang, V. C., & Nguyen, Q. K. (2021). Internal corporate governance and stock price crash risk: Evidence from Vietnam. *Journal of Sustainable Finance & Investment*, 1–18. https://doi.org/10.1080/20430795.2021.2006128

Deb, P. (2013). Signaling type and post-IPO performance. *European Management Review*, *10*(2), 99–116. https://doi.org/10.1111/emre.12012

Deng, Q., & Zhou, Z. G. (2015). Offline oversubscription, issue size, and market momentum: The driving forces for ChiNext IPOs initial underpricing. *The Chinese Economy*, *48*(2), 114–129. https://doi.org/10.1080/10971475.2015.993217

Dorn, D. (2009). Does sentiment drive the retail demand for IPOs? *Journal of Financial and Quantitative Analysis*, *44*(1), 85–108. https://doi.org/10.1017/S0022109009090024

The Economic Times. (2023). *40 IPOs gave an average listing day gain of 10% in 2022: Report*. https://economictimes.indiatimes.com/markets/ipos/fpos/40-ipos-gave-an-average-listing-day-gain-of-10-in-2022-report/articleshow/96704540.cms?from=mdr

Ewens, M., Farre-Mensa, J., & Karolyi, A. (2020). The deregulation of the private equity markets and the decline in IPOs. *The Review of Financial Studies*, *33*(12), 5463–5509. https://doi.org/10.1093/rfs/hhaa053

Füllbrunn, S., Neugebauer, T., & Nicklisch, A. (2020). Underpricing of initial public offerings in experimental asset markets. *Experimental Economics*, *23*(4), 1002–1029. https://doi.org/10.1007/s10683-019-09638-7

Gao, S., Brockman, P., Meng, Q., & Yan, X. (2020). Differences of opinion, institutional bids, and IPO underpricing. *Journal of Corporate Finance*, *60*(September 2019), 1–19. https://doi.org/10.1016/j.jcorpfin.2019.101540

Ghosh, S. (2004). Revisiting IPO underpricing in India. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.703501

Guo, D., Zheng, Y., Wang, W., Hu, P. N., Yang, Z., & Chen, Z. (2022). The impact of different sentiment in investment decisions: Evidence from China's stock markets IPOs. *Economic Research-Ekonomska Istrazivanja*, 1–21. https://doi.org/10.1080/1331677X.2022.2113739

Harasheh, M. (2022a). Does it make you better off? Initial public offerings (IPOs) and corporate sustainability performance: Empirical evidence. *Global Business Review*, *23*(6), 1375–1387. https://doi.org/10.1177/09721509221126851

Harasheh, M. (2022b). Freshen up before going public: Do environmental, social, and governance factors affect firms' appearance during the initial public offering? *Business Strategy and the Environment*, *September*, 1–13. https://doi.org/10.1002/bse.3261

Harrison, J. M., & Kreps, D. M. (1978). Speculative investor behavior in a stock market with heterogeneous expectations. *The Quarterly Journal of Economics*, *92*(2), 323–336. https://doi.org/10.2307/1884166

Hawaldar, I. T., Naveen Kumar, K. R., Mallikarjunappa, T., & Baur, D. (2018). Pricing and performance of IPOs: Evidence from Indian stock market. *Cogent Economics & Finance*, *6*(1), 1420350. https://doi.org/10.1080/23322039.2017.1420350

Jaskiewicz, P., González, V. M., Menéndez, S., & Schiereck, D. (2005). Long-run IPO performance analysis of German and Spanish family-owned businesses. *Family Business Review*, *18*(3), 179–202. https://doi.org/10.1111/j.1741-6248.2005.00041.x

Kenourgios, D. F., Papathanasiou, S., & Rafail Melas, E. (2007). Initial performance of Greek IPOs, underwriter's reputation and oversubscription. *Managerial Finance*, *33*(5), 332–343. https://doi.org/10.1108/03074350710739614

Kim, K. A., Kitsabunnarat, P., & Nofsinger, J. R. (2004). Ownership and operating performance in an emerging market: Evidence from Thai IPO firms. *Journal of Corporate Finance*, *10*(3), 355–381. https://doi.org/10.1016/S0929-1199(02)00019-6

Kiran, R., & Chopra, R. I. (2012). Price performance of IPOS in Indian stock market. *Euro Economica*, *30*(4), 73–97.

Lee, P. J., Taylor, S. L., & Walter, T. (1999). IPO underpricing explanations: Implications from investor application and allocation schedules. *The Journal of Financial and Quantitative Analysis*, *34*(4), 425–444. https://doi.org/10.2307/2676228

Mishra, A. K. (2010). Underpricing of initial public offerings in India: A comparison of the book-build- ing and fixed-price offerings. *Indore Management Journal*, *2*(2), 37–54.

Morricone, S., Munari, F., Oriani, R., & de Rassenfosse, G. (2017). Commercialization strategy and IPO underpricing. *Research Policy*, *46*(6), 1133–1141. https://doi.org/10.1016/j.respol.2017.04.006

Mule, R. K., Mukras, M. S., & Mutunga, N. O. (2015). Corporate size, profitability and market value: An econometric panel analysis of listed firms in Kenya. *European Scientific Journal*, *11*(13), 376–396.

Paleari, S., Vismara, S., & Khurshed, A. (2007). Over-optimism when pricing IPOs. *Managerial Finance*, *33*(6), 352–367. https://doi.org/10.1108/03074350710748722

Perera, W., & Kulendran, N. (2016). Why do IPOs leave money on the table for investors on the first day of trading? A theoretical review. *International Journal of Accounting & Business Finance*, *2*(1), 1–13.

Peristiani, S., & Hong, G. (2004). C urrent I ssues pre-IPO financial performance and aftermarket survival. *Federal Reserve Bank of New York*, *10*(2), 1–8.

Phadke, K. M., & Kamat, M. S. (2018). Impacts of macro-economic and IPO factors on under-pricing of initial public offerings on the National stock Exchange (NSE) in India. *International Journal of Management Studies*, *5*(1(4), 46. https://doi.org/10.18843/ijms/v5i1(4)/07

Pukthuanthong-Le, K., & Varaiya, N. (2007). IPO pricing, block sales, and long-term performance. *Financial Review*, *42*(3), 319–348. https://doi.org/10.1111/j.1540-6288.2007.00174.x

Rani, P. (2014). An empirical Examination of firm characteristics and its impact on listing day return. *International Journal of Finance and Accounting*, *3*(5), 277–285. https://doi.org/10.5923/j.ijfa.20140305.01

Ross, S. A. (1976). The arbitrage theory of capital asset pricing. *Journal of Economic Theory*, *13*(3), 341–360. https://doi.org/10.1016/0022-0531(76)90046-6

Roy, P., & Gupta, A. (2022). A study into determinants of underpricing of initial public offerings in India during 2015-2020. *International Journal of Economics and Accounting*, *11*(3), 271. https://doi.org/10.1504/ijea.2022.126284

Shenoy, S. V., & Srinivasan, K. (2018). Relationship of IPO issue price and listing day returns with IPO pricing parameters. *International Journal of Management Studies*, *V*(4(1), 11. https://doi.org/10.18843/ijms/v5i4(1)/02

Sinha, N. R., & Madhusoodanan, T. P. (2004). IPO underpricing, issue mechanisms, and size. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.520744

Van Heerden, G., & Alagidede, P. (2012). Short run underpricing of initial public offerings (IPOs) in the Johannesburg stock Exchange (JSE). *Review of Development Finance*, *2*(3–4), 130–138. https://doi.org/10.1016/j.rdf.2012.10.001

Zarowin, P. (1990). Size, seasonality, and stock market overreaction. *The Journal of Financial and Quantitative Analysis*, *25*(1), 113–125. https://doi.org/10.2307/2330891

Zheng, S. X., & Stangeland, D. A. (2007). IPO underpricing, firm quality, and Analyst forecasts. *Financial Management*, *36*(2), 1–20. https://doi.org/10.1111/j.1755-053X.2007.tb00086.x