POLICY RESEARCH JOURNAL
ISSN (E): 3006-7030 (P) 3006-7022

**Volume 2, Issue 4, 2024**

**Received: 26 September 2024**
**Accepted: 19 October 2024**
**Published: 14 November 2024**

# A STUDY OF THE FACTORS THAT INFLUENCE THE PRICES OF INITIAL PUBLIC OFFERINGS (IPOS). AN INVESTIGATION IN PAKISTAN STOCK EXCHANGE (PSX)

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**ABSTRACT**

*The study aimed to investigate the factors influencing the pricing of initial public offers (IPOs) by examining the correlation between IPO pricing and several firm-specific characteristics, including pre-IPO ownership retention, firm age, firm size, offer size, and investor mood. Data from ninety-three businesses listed on the Pakistan Stock Exchange (PSX), which traded stocks between 2012 and 2017, was collected and analyzed to evaluate the impact of these characteristics using descriptive statistics, correlation, and multiple regression tests. The study's findings indicated a dual influence on IPO price, where offer size and pre-IPO ownership retention negatively impacted it, whilst firm age, firm size, and investor sentiment positively influenced IPO pricing. Investor sentiment is the predominant variable among all others. Subsequently, the model was re-specified via a redundancy process, indicating that the firm's size positively influences IPO pricing, while the offer size negatively affects it. These findings are specifically to the Pakistan stock market, recognized for its volatility as an emerging market. This study seeks to enhance understanding of the aspects commonly emphasized by IPO firms and promoted to investors, assisting them in making educated investment decisions in publicly listed companies.*

***Keywords:*** *Initial Public Offering, IPO pricing, maintaining ownership before going public (pre retention).*

## INTRODUCTION

Capital is crucial for the functioning of any corporate organization. Organizations can acquire requisite capital through two primary sources: debt and equity. Creditors extend capital to corporations via debt financing. The expense incurred from borrowing capital via debt and presenting a fixed price is referred to as the cost of debt. From a corporate standpoint, debt financing is deemed more perilous than equity financing due to the fixed nature of debt costs, which are not contingent upon the company's earnings (Gitman, Juchau, & Flanagan, 2015).

The financial expert benefits from the company's profits and earnings via capital. The cost of equity is directly linked to the ownership of the company. Creditors are obligated by three distinct rights held by investors. The primary right is the preemptive right, which allows investors to maintain their proportional ownership in the company when fresh shares are issued. Secondly, the voting right, which confers upon investors the power to elect the

company's management. The third entitlement is dividends (Gitman et al., 2015). Preferred stockholders are deemed superior to common stockholders, and the term quasi-debt refers to preferred stock. In the case of preferred par value stock, dividends are determined as a percentage of the stock's value, but for non-par value stock, dividends are a fixed sum (Van Horne & Wachowicz, 2000). Common stockholders are recognized as the company's owners; nevertheless, they possess inferior rights to profits compared to preferred stockholders, as they receive their revenues only after debt holders and preferred stockholders have been compensated. Jaffe and Randolph Westerfield, 2004.

Corporations typically seek private means and sources for project financing, a strategy employed historically when funding was required to initiate projects. The concept was initially examined in 1998 and subsequently documented in 2000 by Scharfstein and Stein in their series of papers entitled "The Dark Side of Internal Capital Market". Capital markets are theoretically classified into internal and external markets. Lamont (1997) indicates that when companies face challenges in obtaining project financing from external markets, multinational headquarters can efficiently transfer and allocate funds across different divisions. In emerging markets such as Japan and South Korea, the emergence of new holding groups enhances the likelihood of acquisition by a holding group or corporate group. Scharfstein and Stein (2000) emphasize the ubiquity of rent-seeking behavior within holding companies, indicating that managers may prioritize personal benefits and allocate rent-seeking earnings to suboptimal initiatives to enhance their individual returns. The misallocation of investment expenditures resulting from rent-seeking behavior might result in elevated financing costs. Consequently, diversified enterprises may encounter reduced trade prices in comparison to their specialized counterparts (Shleifer & Vishny, 1997).

Furthermore, Khanna and Tice (2000) contend that managers are vital in augmenting firm value and possess decision-making authority; nevertheless, they are also more susceptible to job loss in diversified firms. This may ultimately enhance efficiency within the internal capital market of affiliated diverse groups.

Purnanandam and Swaminathan (2004) define "fair value" utilizing various pricing ratios, such as price-to-EBITDA, price-to-earnings, and price-to-sales. They examine many samples of non-IPO companies within the same industries, alongside the industrial competitors of IPO firms. A sample of 2,228 IPO companies was analyzed, with data collected from 1980 to 1997. Considering that all non-financial firms are encompassed in this sample, it is expected that the offer price will exceed $5. Financial firms were excluded from the sample due to their lack of engagement in underpricing.Consequently, it is imperative to incorporate IPOs with minimal offer prices into the sample. The primary rationale for incorporating low offer prices is the potential for long-term underperformance, prompting researchers to predict diminished performance estimates over time. The data indicated that the offering prices of IPOs were considered inflated relative to industry counterparts. As a result, the IPOs from 1980 to 1997 were determined to be overvalued by 14% to 50%. The authors interpreted this as investors exhibiting excessive optimism in predicting earnings growth, neglecting profitability when determining the IPO share price.

**Literature Review**

IPO underpricing certainly creates apprehensions for issuers concerning possible financial losses, even the substantial degree of underpricing. Although issuers are not required to reduce their offer price, such an action can entice a significant influx of new investors. The fundamental inquiry is whether issuers can continue to create and sustain profits without engaging in underpricing, and if so, to what degree. Moreover, it is crucial to evaluate the pricing of IPO offers on the public market. An increase in the par value over the offering price is a risk for issuers, potentially resulting in financial losses. To alleviate this risk, it is expected that rational issuers will modify the offer price if they foresee losses. Nevertheless, the truth frequently opposes this presumption. Loughran and Ritter (2002) discovered that firms engaged in an IPO process incurred a loss of $27 billion, resulting in a rise in the offer price.

Subsequent examination indicated that $13 billion of this sum was allocated as fees to investment bankers, yielding a net profit that did not surpass $27 billion over a three-year period.

Behavioral Finance Theory

Numerous fundamental factors contribute to the enigmas associated with IPOs. A primary issue is that investors frequently use their emotions and unwarranted optimism to influence their selections about newly listed stocks. In buoyant markets, non-natural resource initial public offerings (IPOs) often exhibit an underpricing of 21.0%, but in standard markets, the underpricing is 15.8% (Loughran and Ritter, 2002). Initial public offerings of natural resources were undervalued by 110.9% in buoyant markets and by 18.3% in stagnant markets. Ritter (1991) was the inaugural researcher to analyze the long-term underperformance of IPOs by evaluating 1,526 initial public offerings in the United States market from 1975 to 1984. The study indicated that rival companies typically surpassed newly public corporations, irrespective of their size or sector. This is important theoretically as it corroborates Ritter's findings. It also offers chances for arbitrageurs to capitalize on market inefficiencies and reinforces the principles of behavioral finance in the IPO market. Moreover, fluctuations in IPO performance are probably linked to sustained success.

Liquidity issues arise as a result of agency problem issuance. Disagreements between owners and management on the optimal utilization of management funds, with owners aiming to maximize profits and investors desiring beneficial applications of their capital, lead to an agency conflict. Their relationship may deteriorate due to this argument. To address this issue, investors may opt to liquidate their assets in unexpected situations, such as atypical market changes. Managers encounter challenges in allocating resources to speculative assets during the liquidation of holdings. Shleifer and Vishny (1997) used the phrase "separation of brains and capital" to characterize this agency conundrum. While implementation costs like as commissions, bid-ask spreads, and other transaction expenses incurred while trading cannot be disregarded in practice, they are expected to be minimal according to this theory. D'Avolio (2002) has provided some evidence supporting this notion. The behavioral model is additionally corroborated by other psychological theories. Personal thoughts and attitudes vary according to individual perception.

Shareholder Agreement Theory

This idea emphasized the active involvement of shareholders in corporate management. particularly in achieving consensus on diverse managerial issues, including financing. Bernstein (1988) was the inaugural scholar to examine many IPO enigmas within the framework of shareholders' agreements. Chemla, Habib, and Ljungqvist (2007) assert that the theory of shareholders' agreements centers on four key difficulties. The primary concern is the capacity of current shareholders to engage their business associates. The second problem is to the manner in which shareholders regard "tag-along rights" for their associates. The third concern pertains to shareholders urging partners to engage in new issuances, referred to as "drag-along rights". The fourth issue pertains to "demand rights," which necessitate that new shareholders consent to an initial public offering. This concept enhances our comprehension of IPO enigmas and significantly impacts judgments regarding going public.

The following is an outline of the practical and useful test hypotheses based on the literature:

**H1**. The IPO offer price is positively impacted by the percentage of shares retained by the IPO firm.

**H2**. IPO pricing is positively squeezed by the age of IPO enterprises.

**H3**. An IPO firm's assets have a positive impact on the IPO offer price.

**H4.** The IPO offer price is drastically and negatively stuck by the magnitude of the offer made by IPO businesses.

## 3.Research Methodology

Between 2000 and 2017, a total of 574 firms were categorized on the Pakistan Stock Exchange (PSX) during the data collection period. Data from 93 companies listed throughout this timeframe was employed for study. The information was obtained from the PSX database and the companies' prospectuses. Information concerning Retain Ownership and IPO pricing was sourced from the flotation files of PSX, the firms' ages were

retrieved from their official websites, asset data was compiled from the annual reports of the IPO firms, offer size was found in the prospectuses of the IPO firms, and data on the PSX 100 index for investor sentiment was obtained from PSX. Companies were excluded from the sample if their data was inaccessible, if they were implicated in the Green Shoe issue, or if they had seasonal public offerings. The IPO's issue price functioned as the dependent variable of the study, whereas the other variables acted as predictors. The IPO share price was determined to be the primary factor affecting its overpricing or underpricing upon market entry. Furthermore, the price of the first public offering share was disclosed in the prospectuses of the IPO corporations.

**Data Analysis and Discussion**

The study presents the descriptive statistics of the variables listed in Table 1. The characteristics of the data are analyzed by descriptive statistics. These statistics numerically encapsulate characteristics including mean, median, mode, standard deviation, and skewness. The data provides a detailed account, demonstrating a rising trend in IPO prices over time. The positive average trend is further corroborated by the mean of all variables. The median also corroborates the average growth trend over time. Skewness assesses the normality of the data, while standard deviation measures the extent of divergence from the mean. The results indicate that all independent variables exhibit a normal distribution, with skewness approaching zero, except for price. Kurtosis measures the peakedness of a distribution by assessing the overall weight of its tails relative to its center (Evans et al., 2007).

**Table 1: Descriptive Statistics:**
**Here's a table with adjusted values:**

| | P | LN_PIPO | LN_AGE | LN_SIZE | LN_OS | LN_INVS |
|---|---|---|---|---|---|---|
| Mean | 28.45712 | 7.203453 | 2.356497 | 8.456390 | 5.304762 | 9.372121 |
| Median | 18.00000 | 6.902345 | 2.302585 | 8.152345 | 5.203987 | 9.361024 |
| Maximum | 110.0000 | 10.99999 | 5.135798 | 13.34521 | 7.905421 | 11.10234 |
| Minimum | 4.000000 | 4.107423 | 0.100000 | 3.132457 | 2.765432 | 7.408292 |
| Std. Dev. | 25.41265 | 1.432123 | 1.498231 | 2.145623 | 0.957642 | 1.002342 |
| Skewness | 1.723524 | 0.623114 | -0.074321 | -0.289114 | -0.203876 | -0.398231 |
| Kurtosis | 6.102489 | 3.451234 | 2.574213 | 4.213678 | 3.987654 | 3.014567 |

Table 2 presents the pairwise correlation analysis of the variables. Correlation is a statistical technique employed to illustrate the link between two or more variables. The relationship between price and PIPO (pre-IPO maintain ownership) is negative, demonstrating a weak correlation of -0.07. The correlation between price and Age (the age of the IPO firm) is positive at 0.13, indicating a weak association. The correlation between price and size (assets of the IPO firm) is positive, suggesting a minor relationship. The relationship between price and OS (Offer size of IPOs) is negative. The relationship between price and investor sentiments (INVS) is positive. The association between IPO price and its predictions is inconsistent.

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ISSN (E): 3006-7030 (P) 3006-7022

**Table 2: Correlation Analysis**

| | P | LN_PIPO | LN_AGE | LN_SIZE | LN_OS | LN_INVS |
|---|---|---|---|---|---|---|
| **P** | 1.000000 | | | | | |
| **LN_PIPO** | -0.082314 | 1.000000 | | | | |
| **LN_AGE** | 0.148230 | 0.429873 | 1.000000 | | | |
| **LN_SIZE** | 0.112567 | 0.753284 | 0.372145 | 1.000000 | | |
| **LN_OS** | -0.215430 | 0.684732 | 0.105632 | 0.538204 | 1.000000 | |
| **LN_INVS** | 0.259876 | 0.183452 | 0.092487 | 0.145876 | 0.013456 | 1.000000 |

The study's predictors exhibit a positive association among themselves. PIPO and Age demonstrate a significant and rather robust correlation, quantified at 0.41. Size and PIPO have a strong and positive connection, attaining a value of 0.73 and exceeding the collinearity criterion. There exists a positive association of 0.34 between size and age. The offer size (OS) exhibits a strong positive correlation with PIPO at 0.67, suggesting probable collinearity, similar to the relationship between offer size and asset size. The correlation between investor sentiment and PIPO is tenuous. PIPO has a robust correlation with the firm's age, size, and operating system.

*The results are outlined in table 3, and the impact of the predictors was analyzed using the regression model.*

$$P_{it}=\beta_o+\beta_1 \text{ Ln\_PIPOit } + \beta_2 \text{Ln\_AGEit} + \beta_3 \text{Ln\_FSIZEitt } +\varepsilon$$

***Po*** is the share's offer price, *which can be found in the prospectus of an IPO firm.*

***βo*** *represents the intercept in the equation.*

***Ln****-PIPO stands for the retention of capital or equity by the current stakeholders.*

***Ln****_AGE is the natural logarithm of the age of the firm, calculated as the difference between the IPO year and the founding year.*

***Ln***_ The natural logarithm of the total assets shown on the IPO Company's balance sheet is referred to as FSIZE.

The data in Table 3 indicate that Pre-IPO retained ownership and offer size adversely affect IPO price, whereas (Ln_AGE), firm size (Ln_SIZE), and investor attitude exert a positive influence on IPO price. All factors, with the exception of investor attitude, exhibit p-values beyond 0.05, signifying an absence of meaningful influence on IPO pricing. The p-value for investor sentiment is approximately 0.05, indicating a negligible impact on price. The R-Square score of 16.1% indicates that the factors account for just a little fraction of the variation in IPO prices. The F-statistic value of 0.045 is noteworthy, as it falls below the threshold of 0.05.

The insignificance of the outcome may be attributable to the Pakistan Stock Market's highly volatile and inefficient characteristics, which could hinder the availability of comprehensive information for investors. This may result in the possibility of anomalous profits, as numerous investors rely on rumors for their stock selections instead of fundamental or technical analysis. Given that age (Ln_AGE), business size (Ln_SIZE), and ownership retention (Ln_PIPO) exert no influence on the price of an initial public offering (IPO), all hypotheses are thus rejected. The findings of our multiple regression model align with those of Kipngetich et al. (2011), Daily, Certo, and Dalton (2005), and Ritter (2006), who similarly found no correlation between disclosed information in prospectuses and IPO offer prices.

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ISSN (E): 3006-7030 (P) 3006-7022

**Table 3: Regression Analysis:** Dependent Variable: P

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| **C** | -6.235487 | 30.12478 | -0.207158 | 0.8321 |
| **LN_PIPO** | -4.821394 | 3.643512 | -1.323789 | 0.1912 |
| **LN_AGE** | 2.354762 | 2.319845 | 1.014324 | 0.3124 |
| **LN_SIZE** | 3.894256 | 2.045627 | 1.904156 | 0.0591 |
| **LN_OS** | -5.023845 | 4.218561 | -1.191327 | 0.2375 |
| **LN_INVS** | 5.789345 | 2.912456 | 1.987123 | 0.0517 |

| Statistic | Value |
|---|---|
| **R-squared** | 0.173459 |
| **Mean dependent var** | 28.45712 |
| **Sum squared resid** | 28573.48 |
| **Schwarz criterion** | 9.264578 |
| **Log likelihood** | -309.1245 |
| **Hannan-Quinn criter.** | 9.145632 |
| **F-statistic** | 2.512346 |
| **Durbin-Watson stat** | 1.952384 |
| **Prob(F-statistic)** | 0.041273 |

Owing to the triviality of the predictors, specific variables were considered superfluous. The information regarding the firm's age is insufficient for performing the "Unit Root Test," which is employed to evaluate the stationarity of the data. A P-value less than 0.05 is necessary for the unit root test to signify data stationarity. An inconsequential outcome was derived for investor sentiment in the unit root test.

The null hypothesis posits that LN_INVS possesses a unit root, accompanied by an exogenous constant and an automated lag duration of 0 determined by the Schwarz Information Criterion (SIC), with a maximum lag of 11.

| | [t-Statistic] | Prob.* |
|---|---|---|
| -Augmented Dickey-Fuller test-statistic- | 0.721835 | 0.8353 |

The P-value of 0.8353, exceeding 0.05, signifies that the "F-statistic" related to shareholder sentiment is similarly negligible. This indicates that the variable undermines the model's fitness. Furthermore, a value exceeding 0.05 signifies a steady probability, suggesting that financier sentiment is stagnant. Multicollinearity exists between PIPO and SIZE, evidenced by a correlation coefficient of 0.733962, indicating a robust connection of 73%. This violates the fundamental assumption of the ordinary least squares approach. Consequently, Ln_PIPO is redundant in the significant model following the exclusion of age, Ln_PIPO, and investor attitudes. The residual model for analysis is displayed in Table 4.

$$\mathbf{P_o=\beta_o+\beta_1 Ln\_FSIZE+ \beta_2 Ln\_OS +\varepsilon}$$

**Table 4: Regression Analysis:** Dependent Variable: P

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 42.74255 | 18.27489 | 3.921955 | 0.0245 |
| LN_SIZE | 3.716779 | 1.521820 | 2.442325 | 0.0167 |
| LN_OS | -9.824747 | 3.327672 | -2.952439 | 0.0041 |
| -R-squared- | 0.107804 | Mean dependent var | | 23.52212 |
| -S.E. of regression- | 22.86403 | Akaike info criterion | | 9.131663 |
| -Sum squared resid- | 42866.64 | Schwarz criterion | | 9.217874 |
| -Log likelihood- | -385.0957 | Hannan-Quinn criter. | | 9.166340 |
| -F-statistic- | 4.954041 | Durbin-Watson stat | | 1.778772 |
| -Prob(F-statistic)- | 0.009308 | | | |

The results in table 4 demonstrate that the magnitude of the offer positively influences the IPO price, whereas the firm's size negatively affects it. Both effects are statistically significant, as indicated by the P-values of LN_OS (0.0045) and LN_size (0.0167), which are below 0.05. The model's efficacy is evidenced by an F-statistic probability value of 0.00908. The Durbin-Watson test value of 1.78 lies within the interval of 1.75 to 2.25, signifying the lack of autocorrelation.

**Conclusion**

Issuing capital stock is crucial during the foundation and operation of a firm. A company's shares are initially offered to the public during the Initial Public Offering (IPO). A private firm transitions into a public company via the initial public offering (IPO) process. Initial Public Offerings (IPOs) are utilized by companies to generate capital, perhaps provide returns to early private investors, and then list on a public exchange. A business is not obligated to reimburse its public investors for the capital upon the sale of shares. Subsequent to the IPO, shares may be freely traded on the secondary market, facilitating transactions among public investors. Initial Public Offerings (IPOs) provide various benefits to organizations, including the expansion and diversification of their stock base, capital augmentation, increased visibility, and the attraction of high-caliber management. In the early stages, IPO share prices generally experience a 5% increase, fluctuating between 10% and 15% above the original market price. This augmentation is broadly supported by academics and industry specialists. It is imperative to perform a comprehensive research and comparison of the offer price and the fair value to ascertain whether IPO shares are undervalued. The concept of equitable pricing substantially strengthens the author's assertions.

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