Journal of Research in Economics and Finance Management
ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

INVESTIGATING THE UNDERPRICING PHENOMENON OF INITIAL PUBLIC OFFERINGS IN PAKISTAN

Hafisa Mehboob
Research scholar
Business Administration Department
Iqra University
hafisa2910@yahoo.com

Abstract

This research presents a novel exploration of the issue of underpricing of initial public offering (IPO) in Pakistan. It aims to determine the impact of four independent variables (Issue Price, Offer Size, Age, and Market Capitalization) on the dependent variable, Market-adjusted Abnormal Return. The research employs statistical analysis to observe the relationship between these variables for IPO underpricing in Pakistan. The outcomes of the study indicate that the independent variables did not have a substantial influence on the dependent variable, as the p-values associated with the independent variables were all above the threshold of 0.05. This research underscores the need for further investigation in this area to gain a more comprehensive understanding of the underpricing phenomenon of IPOs in Pakistan. This could involve the collection of more data and information, as well as the examination of additional variables and factors that may play a role in the underpricing of IPOs. By delving into these topics in greater detail, future research can help deepen our understanding of the complexities and nuances of IPO underpricing from the perspective of the Pakistani stock market. This research provides a unique starting point for further exploration of the issue of IPO underpricing in Pakistan and emphasizes the importance of continued examination of this phenomenon.

Keywords: Initial Public Offering, Issue Price, Offer Size, Market Capitalization and Market-adjusted Abnormal Return

Introduction

In recent years, there has been a growing trend of businesses choosing to go public by issuing initial public offerings (IPOs). This has led to a significant amount of research and discussion surrounding the phenomenon of underpricing in the IPO market. Underpricing, in this context, refers to the situation where a company's initial public offering (IPO) stock price is lower than its final price at the end of the first day of trading. This discrepancy can be a source of confusion and frustration for investors and has been the subject of extensive examination by researchers.

One critical area of interest in the study of underpricing has been the examination of the various factors that influence the phenomenon in different regions around the world. This is especially relevant in the case of Pakistan, where both financial and non-financial enterprises have chosen to go public in recent years. Examining the factors influencing the underpricing of IPOs in Pakistan is of great importance to better understand the underlying mechanisms driving the IPO market.

This work is licensed under a Creative Commons Attribution 4.0 International License.

A large body of theoretical literature has been produced to shed light on this subject. This literature seeks to explain the oddities in the IPO market. It has analyzed various factors, such as market conditions, company characteristics, and investor behavior, that may impact the level of underpricing in IPOs.

Examining the factors influencing underpricing in Pakistan is an essential step in gaining a deeper understanding of the underlying mechanisms driving the IPO market and how these factors can be better managed to minimize the occurrence of underpricing in future IPOs.

The level of underpricing in an initial public offering (IPO) is a complex phenomenon that is subjective due to a multitude of factors. To understand these factors, researchers have conducted extensive studies and produced a significant body of literature that sheds light on the critical determinants of underpricing in IPOs. In this discussion, The study examine the significant factors that have been identified as impacting the level of underpricing in IPOs and how they may apply to the specific context of Pakistan.

Company Characteristics: One key factor that can impact the level of underpricing in an IPO is the company's size, profitability, and growth prospects. Research has shown that more extensive and more profitable companies tend to experience less underpricing in their IPOs. This is due to the higher level of investor confidence and interest that these companies generate, which leads to greater demand for their shares and a higher price at the time of the IPO.

Market Conditions: The state of the economy and the broader market sentiment can also impact the level of underpricing in an IPO. In general, strong market conditions and favorable economic conditions, such as low-interest rates, are associated with lower levels of underpricing. Conversely, when the market is uncertain, or the economy is facing challenges, there may be less demand for new shares, which can result in higher levels of underpricing.

Industry: Another factor that can impact the level of underpricing in an IPO is the industry in which the company operates. Different industries have varying levels of underpricing, with some, such as technology and biotechnology, experiencing higher levels than others, such as utilities and consumer goods. This is due to factors such as the level of competition and innovation within the industry, as well as the level of risk associated with the business.

Underwriter Reputation: The reputation of the underwriter, or the investment bank that is responsible for issuing the shares, can also impact the level of underpricing. Investment banks with solid reputations and extensive networks are able to secure higher prices for the shares they are selling, which can lead to lower levels of underpricing. On the other hand, underwriters with weaker reputations may have a more challenging time selling shares, which can result in higher levels of underpricing.

Legal and Regulatory Environment: Finally, the legal and regulatory environment in which the IPO takes place can also influence the level of underpricing. Countries with well-developed legal and regulatory frameworks, such as those that provide vital protection for investors and are transparent in their operations, tend to

ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

have lower levels of underpricing. Conversely, countries with weaker legal and regulatory frameworks may experience higher levels of underpricing due to more significant uncertainty and risk.

Background

An initial public offering (IPO) is when the first or foremost share is made available to investors or speculators in exchange for financial returns on their investments. Most businesses and sectors that are just getting started, have limited resources, or want to increase their sales, capital, and production offer initial public offerings (IPOs) to investors. Companies and manufacturing facilities can use the IPO offerings to raise capital, invest, switch over to more contemporary technologies, and boost labor and capital efficiency by recruiting qualified workers. The most popular method of funding, particularly for private enterprises, is an initial public offering (IPO), in which investors put their money into a company with the expectation of receiving significant financial returns (Saboo, Kumar & Anand, 2017). Underpriced initial public offerings (IPOs) are crucial in luring new investors into open-market businesses that support deficit financing by providing them with incentives for potential future returns on their initial investment.

The term "IPO underpricing" describes a company's attempt to raise money from investors through a public stock offering for the first time. The business may apply for the stock exchange or trading quotation system to become a listed company when the IPO price is complete. The company wants to give investors some financial returns while reducing the cost of its capital, starting with its IPO. Additionally, underpricing initial public offerings (IPOs) enables investors to hold a sizeable position in a company that, otherwise, would be more expensive and take a long time to perform on the secondary market (Bakar & Uzaki, 2013). A few observational studies have looked at the performance of IPO underpricing on the Pakistan Stock Exchange with regard to IPOs in Pakistan. However, the majority of this research has only utilized the Pakistan Stock Exchange as a benchmark.

Therefore, thorough empirical research that carefully examines the factors that influence IPO underpricing in Pakistani equities is required. In order to do this, the research study's objective is to empirically analyze the economic analysis of the elements that affect IPO underpricing on the Pakistani stock exchange. Similar to this, the "continuous exposure index" is anticipated to be utilized to measure the amount of transparency and to make direct connections between the influencing elements of institutional speculators' and nonnatives' participation rates in underpriced initial public offerings (IPOs). In particular, the closeness of investment businesses among the IPO underpricing unique investors, which may impact the amount of underpricing, is examined in many publications as one of the elements that may contribute to the underpricing of IPOs on different stock exchanges throughout the world. A coordinated model of the risk corporate governance improvement process in an IPO underpricing partnership and its influence on returns for IPO underpricing stock exchange responses in Pakistan is, however, lacking from empirical study.

Despite advancements, the financial investor is protected by the usage rules. The underpricing impacts of IPOs, however, may hurt investors who lack knowledge

or have limited ability to evaluate information. In light of this, this study examines the variables that affect the fundamental underpricing of IPOs. By utilizing the information that is now available on the Pakistan stock market, this study analyses data that is related to the introduction of underpriced IPOs and is noteworthy in their connections. The underlying expectation IPO underpricing model, which we construct in this study, is helpful to novice investors in making investment selections.

Rationale of the Study

Initial Public Offerings (IPOs) play a significant role in the financial markets, acting as a crucial mechanism for companies to raise capital. However, one prevalent phenomenon observed in IPOs is underpricing, where the IPO price is set lower than the market value of shares on the first day of trading. This underpricing phenomenon has caught the attention of researchers and practitioners due to its potential implications for the efficiency and effectiveness of capital markets. Investigating underpricing in the context of Pakistan's IPO market is particularly pertinent due to the unique characteristics and dynamics of its financial market.

Problem Statement

Despite its importance, the underpricing phenomenon in Pakistan's IPO market remains relatively underexplored. Understanding the factors contributing to underpricing and its implications is crucial for investors, regulators, and policymakers. However, the reasons behind underpricing and its consequences have not been thoroughly studied within the Pakistani context, leaving a gap in our understanding of IPO dynamics and market efficiency.

Research Question

What are the factors contributing to the underpricing of Initial Public Offerings in Pakistan, and what are their implications for investors and the financial market?

Research Objective

The main objective of this study is to investigate the underpricing phenomenon of Initial Public Offerings in Pakistan. Specifically, the study aims to identify the factors influencing underpricing and to analyze its impact on investors and the financial market.

Theoretical Framework

Theories of market efficiency, asymmetric information, and investor behavior have guided this study. The Efficient Market Hypothesis (EMH) and Information Asymmetry Theory provided insights into the pricing mechanism of IPOs, while Behavioral Finance theories helped to understand investor behavior and market anomalies.

Researchers in the field of finance have been intrigued by the study of IPOs and their associated underpricing. Many studies have been conducted to understand the underlying issues that contribute to underpricing in IPOs. Theoretically, underpricing is caused by various factors, including market imperfections, information asymmetry,

ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

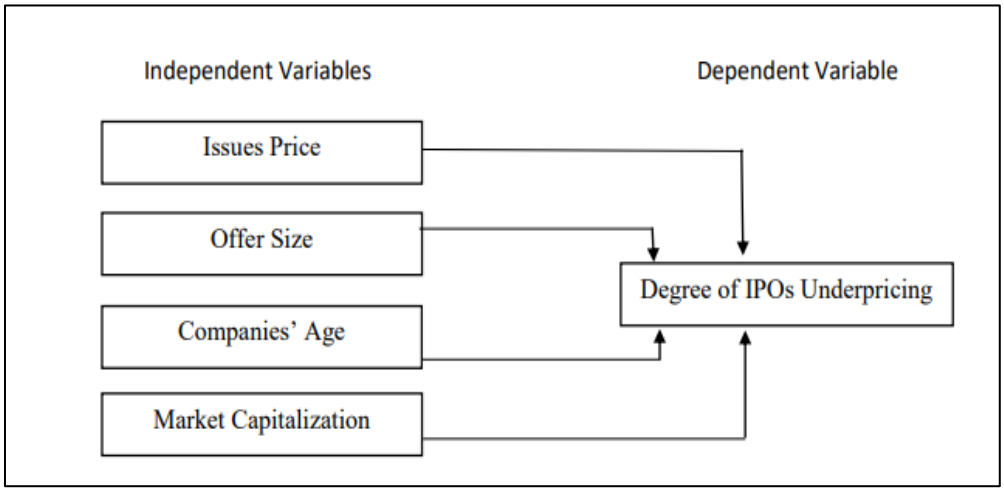
and behavioral biases, among others. Therefore, it is crucial to investigate the variables that contribute to underpricing in IPOs to gain a better understanding of the capital market and its workings.

Previous research in this area has employed different proxies to explain underpricing in IPOs. Researchers have focused on IPO features, such as the issue price, offer size, and flotation costs, to explain the phenomenon of underpricing. Other researchers have used firms' characteristics, such as company age, market capitalization, and size, to explain underpricing. These studies have used a variety of methods, including regression analysis, to test their hypotheses.

Conceptual Framework and Hypothesis Development

The conceptual framework include variables such as firm-specific characteristics, market conditions, and regulatory factors. Firm-specific characteristics may include size, profitability, and growth prospects, while market conditions encompass factors like overall market sentiment and investor demand. Regulatory factors could involve legal frameworks, listing requirements, and regulatory oversight.

The current study seeks to discover the relationship between four selected variables: issue price, offer size, company age, market capitalization, and underpricing in the Pakistan stock market. This study aims to contribute to the existing literature by examining the influence of these variables on underpricing and providing a better understanding of the capital market and its workings in Pakistan. The consequences of this study deliver insights into the factors that contribute to underpricing in IPOs in the Pakistan stock market and help investors, regulators, and firms to make informed decisions.



This study determines to test the significant relationship between variables by conducting hypothesis testing. To achieve this objective, the following hypotheses have been proposed based on a thorough review of the relevant literature. These hypotheses serve as the foundation of this study, providing a clear and concise direction for the investigation of the research problem. By establishing these hypotheses, we aim to further advance our understanding of the relationship between the variables under

investigation and to make meaningful contributions to the field. The results of this study provide valuable insights and support for future research efforts in this area.

H_1: There is a relationship between the degree of IPO underpricing and the issue price on the Pakistan Stock Exchange.

H_2: There is a connection between the level of underpricing in an IPO and the offering size on the Pakistan Stock Exchange.

H_3: The age of the company has an impact on the extent of underpricing in an IPO on the Pakistan Stock Exchange.

H_4: A company's market capitalization is related to the degree of underpricing in its IPO on the Pakistan Stock Exchange.

Significance of the Study

This study's findings contribute to the existing body of knowledge on IPO underpricing, particularly in the context of Pakistan's financial market. Understanding the factors influencing underpricing and its implications assist investors in making informed decisions and provide valuable insights for regulators and policymakers to enhance market efficiency and investor protection.

Limitation of Research

One limitation of this study could be the availability and reliability of data, especially in emerging markets like Pakistan. Additionally, due to data constraints, the study's scope may be limited to certain industries or periods. Moreover, the findings of this research may be subject to the assumptions and limitations of the methodologies employed.

Literature Review

If the offer price for a share at the IPO is less than the closing price on the first trading day, the share is considered underpriced. Any IPO's primary goal is to maximize value for the issuer company and provide good long-term performance. Underpricing is a topic that has been thoroughly studied and is definitely associated with some loss of value to the issuer. Underperformance in the aftermarket, on the other hand, have an impact on the company's capacity to raise further capital and may thus be a more critical concern than underpricing. The following research articles are included because they were pertinent to our paper:

In Pakistan, numerous studies have been conducted on the issue of underpricing of IPOs. A study by Khan, Qadri, Gul, and Saeed (2022) found that the underpricing of IPOs in Pakistan was around 27% on average and that this was mainly due to the lack of information available to investors about the companies that were going public. Another study by Wahid, Khan & Mumtaz (2019) found that underpricing was also due to the lack of investor demand, as well as a lack of investor confidence in the companies that were going public.

ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

One study by Khan, Qadri, Gul & Saeed (2022) found that IPOs in Pakistan's stock exchange are generally underpriced, with an average underpricing of around 19.6%. The study also found that the level of underpricing is negatively associated with the level of financial disclosure and positively correlated with the level of ownership by the promoters.

Another study by Rasheed, Khalid Sohail, Din & Ijaz (2018) looked at the determinants of underpricing in IPOs on Pakistan's stock exchange. The study found that the size of the issue, the level of the underwriter's reputation, and the level of ownership by the promoters are all positively associated with underpricing.

A study by Latif (2020) examined the long-run performance of IPOs in Pakistan's stock exchange. The study found that IPOs tend to be underpriced in the short run but achieve well in the long run, with an average abnormal return of about 15.4% in the first year after the IPO.

One study by Qureshi, Kutan, Ghafoor, Khan & Qureshi (2019) found that IPOs in the PSX were generally underpriced, with an average first-day return of 8.5%. The study also found that underpricing was more significant for small and less profitable companies, as well as for IPOs underwritten by multiple banks.

Another study by Khan and Anjum (2018) found that IPOs in the PSX were underpriced by an average of 7.5%. The underpricing was more significant for companies with lower profitability and higher levels of debt. The study also found that the underpricing was more significant for IPOs underwritten by multiple banks and companies that had not previously issued debt.

A study by Boulton, Smart, and Zutter (2017) found that IPOs in the PSX were significantly underpriced from 2000 to 2012. The authors attributed this to a lack of investor protection and information asymmetry in the market. They also found that IPOs with higher book-to-market ratios, higher market capitalization, and higher levels of institutional ownership were more likely to be underpriced.

Another study by Ahmed and Raza (2016) examined the determinants of underpricing in the PSX. They found that underpricing was positively related to the size of the IPO, the degree of underwriters' involvement, and the level of institutional ownership. On the other hand, they found that underpricing was negatively connected to the level of information asymmetry and the degree of market competition.

A more recent study by Said, Rehman & Raza (2022) found that IPOs were underpriced by an average of 8.41%. They also found that IPOs with higher levels of institutional ownership and higher market capitalization were more likely to be underpriced. The authors also noted that the level of underpricing has decreased over time, likely due to increased market competition and improved investor protection.

A study by Shaikh, Shah & Ashraf (2017) revealed that IPOs in the PSX were underpriced by an average of 8.5%, with the underpricing being more significant for

companies with lower profitability, higher levels of debt and for companies that had not previously issued debt.

It is also observed that in Pakistan, the issue price is determined by the companies and the underwriters. The underwriters play an important role in determining the issue price, which may lead to underpricing. The study by Islam, Ali, and Ahmad (2010) found that underwriters in Pakistan tend to underprice IPOs to confirm that the shares are fully contributed and the companies are able to raise the desired amount of capital.

From 2000 to 2010, there was an average initial underpricing of 39.87 percent, according to Kayani and Amjad's (2011) analysis of 59 IPOs. Aslam & Ullah (2017) examined 55 initial public offerings (IPOs) between 2000 and 2011 and found that 28.03 percent of them were underpriced. Mumtaz & Ahmed (2014) used 75 initial public offerings (IPOs) from 2000 to 2011 to analyze short-run underpricing and discover an initial underpricing of 30 percent on average.

A study conducted in 2014 by Mumtaz and Ahmed (2014) found that several factors, including the size and profitability of the company, market conditions, and the reputation of the underwriter, influence the level of underpricing in Pakistani IPOs. The study also found that companies in the banking and financial sector experienced higher levels of underpricing compared to companies in other sectors.

Another study conducted by Sohail and Nasr (2007) inspected the performance of Pakistani IPOs and found that the level of underpricing is positively linked to the size of the company, the number of shares offered, and the reputation of the lead underwriter. The study also found that companies that offer a higher percentage of shares to the public tend to experience lower levels of underpricing.

A more recent study by Sohail, Bilal, Rukh, and Fatima (2018) suggests that the level of underpricing in IPOs in Pakistan is affected by factors such as the issuer's financial performance, industry, reputation of the lead manager, and listing exchange. The study also found that listing on the Lahore Stock Exchange is positively associated with underpricing.

A study conducted by Sohail & Nasr (2007) found that IPOs in Pakistan are generally overpriced, with an average first-day return of 20%. The study found that company size, industry, and underwriter reputation are positively associated with overpricing.

Another study by Rizwan & Khan (2007) found that IPOs in Pakistan are overpriced, with an average first-day return of 24%. The study also found that company size, industry, and underwriter reputation are positively associated with overpricing.

A study conducted by Mumtaz (2016) found that IPOs in Pakistan are overpriced, with an average first-day return of 23%. The study also found that company size, industry, and underwriter reputation are positively associated with overpricing.

One study by Ben Ahmed, Salhi & Jarboui, A. (2021) analyzed the performance of IPOs in Pakistan from 2000 to 2017 and found that the majority of IPOs were

ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

overpriced. The study found that the average first-day return for IPOs in Pakistan was -6.2%, indicating that investors who purchased shares at the initial offering price lost money. The study also found that the overpricing of IPOs in Pakistan was positively correlated with the size of the company and the number of shares offered.

Another study by Shafique, Hussain & Taimoor Hassan (2013) examined the underpricing and overpricing of IPOs in Pakistan from 2000 to 2016. The study found that IPOs in Pakistan were overpriced by an average of 14.6%, indicating that investors who purchased shares at the initial offering price paid more than the actual value of the shares. The study also found that the overpricing of IPOs in Pakistan was positively correlated with the size of the company and the number of shares offered.

A study by Gulzar, Khan, and Rafiq (2020) examined the reasons behind the overpricing of IPOs in Pakistan. The study found that the overpricing of IPOs in Pakistan was primarily caused by the lack of transparency and disclosure in the IPO process. The study also found that the overpricing of IPOs in Pakistan was positively correlated with the size of the company and the number of shares offered.

Overall, the literature suggests that underpricing of IPOs in the PSX is common and is influenced by factors such as the size of the IPO, the degree of underwriters' involvement, and the level of institutional ownership. Additionally, it has been found that the level of underpricing has decreased over time.

Methodology

To analyze the extent of underpricing in Initial Public Offerings (IPOs) on the first day of trading at the Pakistan Stock Exchange, the following equation is used:

$$R_{i_1} = \frac{CP_{i_1} - OF_{i_0}}{OF_{i_0}} \times 100\%$$

Where $Ri1$ represents the raw first-day return on the IPO or the underpricing degree of the IPO for firm i. $CPi1$ represents the closing price for firm i, and $OFi0$ represents the offering price for firm i.

The underpricing degree of the IPO can be determined by subtracting the offering price from the first trading day's closing price and then dividing that result by the offering price. This calculation provides a measure of the IPO's return on the first day of listing and can help analyze patterns in the data to better understand the extent of underpricing.

To assess changes in market return during the same period as the IPO, the following calculation is used to determine the return on the market index:

$$R_{m_1} = \frac{P_{m_1} - P_{m_0}}{P_{m_0}} \times 100\%$$

Where $Pm1$ represents the closing market index value on the first trading day, $Pm0$ represents the closing market index value on the last day of the IPO's subscription period, and $Rm1$ represents the first day's comparable market return.

To better understand the impact of the significant delay between pricing and listing on the degree of underpricing, the market-adjusted abnormal return (MAR) is calculated for each IPO on the first listing day. The MAR calculation takes into account both the underpricing degree of the IPO and the return on the market index, providing a comprehensive analysis of the IPO's performance in the context of the broader market.

$$MAR_{m_1} = R_{i_1} - R_{m_1}$$

Data collection

The research focused on understanding the influence of numerous aspects on the level of underpricing in IPOs in Pakistan. To gather data for this study, the Pakistan Stock Exchange's website was utilized, and information was collected from 30 different companies that conducted IPOs between 2013 and 2022. The companies selected for this study were those that had gone public during this specified period and represented a diverse range of industries.

The data collected from each of the 30 companies included vital information such as their industry classification, age, formal listing date, issue price, opening and closing price on the day of the IPO, offer size, market capitalization, and KSE-100 opening and closing price on the day of the IPO. The collected data was then used to support the study's hypotheses and findings.

Explanatory Variables and Model

This research aims to inspect the relationship between various explanatory variables and the level of underpricing in IPOs in the Pakistan stock market. Investigating this topic is crucial as it sheds light on the factors of underpricing in IPOs, which can have a substantial influence on the performance of the stock market and the economy as a whole.

The dependent variable of this study, underpricing in IPOs, nalyzed based on four explanatory variables. The first explanatory variable is the issue price, which refers to the first price offered for the IPO shares during the first trading period. The issue price plays a significant role in determining the degree of underpricing in an IPO and analyzed in this study.

ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

The second explanatory variable is the offered size, which is calculated as the number of shares offered multiplied by the offer price. Offer size can provide insight into the level of underpricing as it reflects the demand for the IPO shares, which in turn affects the pricing of the shares.

The third explanatory variable is company age, calculated from the year of integration to the year of listing on the Pakistan Stock Exchange. This variable is essential as it reflects the company's maturity level, which may impact the level of underpricing in an IPO.

Finally, market capitalization also be analyzed as an explanatory variable. Market capitalization is a proxy for company size and is calculated as the total number of shares multiplied by the closing market price per share on the listing date. This variable is significant as it reflects the overall size of the company, which can impact the level of underpricing in an IPO.

Multiple regression analysis used to examine the impact of these variables on underpricing in IPOs. This statistical technique help to govern the association between the explanatory variables and the dependent variable. The results of this analysis provide a valuable understanding of the determinants of underpricing in IPOs in the Pakistan stock market, which can inform investment decisions and contribute to the development of the stock market and the economy.

$$MAR_i = \beta_0 + \beta_1 (IP_i) + \beta_2 (OS_i) + \beta_3 (AGE_i) + \beta_4 (MCAP_i) + \varepsilon_i$$

where,

MAR_i : Market-adjusted abnormal return
IP_i : Issues price
OS_i : Offer size
AGE_i : Company age
$MCAP_i$: Market capitalization
ε_i : Error terms

Empirical Results and Findings

Table 01: Descriptive statistics for variables, 2013-2022

	Mean	Standard Deviation	Minimum	Maximum	Count
IP	36.84	20.66	10	86.25	30
OS (In millions)	0.24	0.32	0.01	1.60	30
Age	4.13	2.83	0	9	30
MCAP (In Billion)	0.008	0.00	0.00	0.04	30
MAR=Ri-Rm	0.03	0.06	-0.07	0.22	30

Notes: MAR = Market-adjusted abnormal return, IP = Issue price, OS = Offer size, AGE = Company age, and MCAP = Market capitalization.

In Table 1, the data set contains information about five different variables for 30 observations.

IP (Independent variable) has an average of 36.85 and a standard deviation of 20.67. The minimum value is 10, and the maximum value is 86.25.

OS (In millions) (Dependent variable) has an average of 0.24 and a standard deviation of 0.32. The minimum value is 0.014, and the maximum value is 1.60.

Age has an average of 4.13 years and a standard deviation of 2.837. The minimum value is 0 years, and the maximum value is 9 years.

MCAP (In Billion) has an average of 0.008 and a standard deviation of 0.009. The minimum value is 0.00014, and the maximum value is 0.0448.

MAR (Ri - Rm) has an average of 0.0367 and a standard deviation of 0.061. The minimum value is -0.0756, and the maximum value is 0.2206.

Based on the data, it can be concluded that the IP and Age variables have relatively higher values compared to the other variables. The results indicate that a lower issue price leads to a more extensive offering of shares in the market. The average underpricing in Pakistan's IPO market, as measured by market-adjusted abnormal returns, is 3.67%, with a standard deviation of 6.1% from the mean. The average age of the companies included in the sample is 4.13 years, with the youngest company being 0 years old and the oldest being 9 years old at the time of listing on the Pakistan Stock Exchange during the research period. MCAP and MAR have relatively lower values with a small range. The standard deviation values suggest that there is a significant spread in the data for IP and Age, while the spread is relatively minor for MCAP and MAR.

Table 02: Pearson's Correlation between Dependent Variable and Independent Variables

	MAR=Ri-RM	IP	OS (in Millions)	Age	MCAP (In Billions)
MAR=Ri-RM	1				
IP	-0.15	1			
OS (in Millions)	-0.39	-0.12	1		
Age	-0.15	-0.07	0.48	1	
MCAP (In Billions)	-0.46	0.22	0.88	0.46	1

This data represents the correlation matrix of 5 variables: IP, OS (In millions), Age, MCAP (In Billion), and MAR (Ri - Rm).

ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

A correlation matrix is a table showing the relationship between each pair of variables. The values in the matrix are correlation coefficients that range from -1 to 1. A correlation coefficient of 1 indicates a perfect positive correlation, meaning as one variable increases, the other also increases. A correlation coefficient of -1 indicates a perfect negative correlation, meaning as one variable increases, the other decreases. A correlation coefficient of 0 indicates no correlation.

First, we look at the relationship between MAR and IP. The correlation coefficient between MAR and IP is -0.159, which suggests a weak negative relationship. This means that as the IP value increases, the MAR value decreases, but the relationship is not very strong.

Next, we consider the relationship between MAR and OS. The correlation coefficient between MAR and OS is -0.396, which suggests a moderate negative relationship. This means that as the OS value increases, the MAR value decreases, and there is a stronger relationship than the one between MAR and IP.

The relationship between MAR and Age is analyzed next. The correlation coefficient between MAR and Age is -0.1557, which suggests a weak negative relationship. This means that as the Age value increases, the MAR value decreases, but the relationship is not very strong.

Finally, we look at the relationship between MAR and MCAP. The correlation coefficient between MAR and MCAP is -0.466, which suggests a moderate negative relationship. This means that as the MCAP value increases, the MAR value decreases, and there is a stronger relationship than the one between MAR and IP and Age.

The results show that the association between MAR and OS is the strongest among the independent variables, followed by the relationship between MAR and MCAP. Finally, the relationships between MAR and IP and Age are the weakest. These results can be used as a starting point to build a prediction model for MAR, where the independent variables with the most vital relationships included in the model.

Table 04: Multiple Regression Analysis of the Model

	Coefficient	Standard Error	T Stat	P-Value	Lower 95%	Upper 95%
Intercept	0.06	0.033	1.77	0.08	-0.00	0.12
IP	-0.00	0.00	-0.16	0.87	-0.00	0.00
OS Millions	-5.25	0.10	-0.00	0.99	-0.22	0.22
Age	0.00	0.00	0.31	0.75	-0.00	0.01
MCAP (In Billion)	-2.99	3.57	-0.83	0.40	-10.36	4.36

This is a multiple regression analysis with the market-adjusted abnormal return (MAR) as the dependent variable and IP, OS (in millions), Age, and MCAP (in billions) as the independent variables.

The "Intercept" row represents the constant term in the regression equation, while the other rows represent the coefficients for each independent variable. The coefficients represent the change in the dependent variable (MAR) associated with a one-unit change in the corresponding independent variable while holding all other independent variables constant.

A positive coefficient implies a positive relationship between the dependent variable and the independent variable, while a negative coefficient suggests an inverse relationship. The "t Stat" column provides the t-statistic, which measures the significance of the coefficient. The "P-value" column indicates the likelihood that the coefficient is not significantly different from zero. A low p-value (typically less than 0.05) suggests that the coefficient is significantly different from zero. In contrast, a high p-value (typically greater than 0.05) suggests that the coefficient is not significantly different from zero.

The "Lower 95%" and "Upper 95%" columns provide the 95% confidence interval for each coefficient, indicating the range of values that is likely to contain the true coefficient value with a confidence of 95%.

After conducting a statistical analysis, it appears that the independent variables of Issue Price, Offer Size, Age, and Market Capitalization do not significantly relate to the dependent variable, Market-adjusted Abnormal Return. This conclusion is drawn from the fact that the p-values associated with these independent variables are all above the threshold of 0.05. This indicates that these variables do not provide a reliable or effective prediction of the Market-adjusted Abnormal Return.

Overall, the final regression model for this study is presented below:

$MARi$ = -0.0001(IPi) − 0.000052(OSi) + 0.00139($AGEi$) - 2.997($MCAPi$) + 0.0601

In other words, the data collected does not support the notion that these independent variables can significantly influence the dependent variable. As a result, the relationship between these variables and the Market-adjusted Abnormal Return is weak or non-existent. This conclusion highlights the importance of considering multiple factors and variables when analyzing the stock market and financial investments, as one-dimensional approaches may not provide a complete understanding of the relationships involved.

Conclusion

This research was focused on examining the issue of IPO underpricing in Pakistan and determining whether the independent variables of Issue Price, Offer Size, Age, and Market Capitalization significantly relate to the dependent variable, Market-adjusted Abnormal Return. The results of the analysis revealed that these independent variables do not substantially affect the Market-adjusted Abnormal Return, as the p-values associated with them are all above the threshold of 0.05.

One reason for this lack of significance could be the limited amount of data available on IPO underpricing in Pakistan. Pakistan's stock market is still developing,

ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

and more data and information are needed to better understand the complex relationships between various variables and factors that influence IPO underpricing. Furthermore, the limited data may not accurately reflect the reality of the Pakistani stock market and the phenomenon of IPO underpricing.

Therefore, it is recommended that future research in this area be conducted to gain a more comprehensive understanding of the IPO underpricing phenomenon in Pakistan. This could include collecting more data and information and examining additional variables and factors that may play a role in the underpricing of IPOs. By exploring these topics in greater detail, future research can help deepen our understanding of the complexities and nuances of IPO underpricing in the context of the Pakistani stock market.

Recommendations

Regulatory authorities should enhance transparency and disclosure requirements for companies going public, ensuring that investors have access to accurate and timely information. This can help mitigate information asymmetry and reduce the likelihood of underpricing. Secondly, regulators should consider implementing measures to discourage excessive underpricing, such as stricter price-setting mechanisms or penalties for underwriters who consistently underprice IPOs. Moreover, efforts should be made to improve investor education and awareness regarding IPO investing, empowering them to make more informed decisions. Additionally, policymakers should focus on improving the overall regulatory environment and market infrastructure to foster investor confidence and attract more IPO issuances. Lastly, further research into the specific drivers of underpricing in Pakistan's IPO market is necessary to develop targeted interventions and regulatory reforms. By implementing these recommendations, Pakistan can work towards creating a more efficient and transparent IPO market, benefiting both investors and the broader economy.

References

Ahmad, M., & Raza, M. Y. (2016). Determinants of Stock Returns: A Comparison of Distress and Non-Distressed Firms: Cement, Chemical and Pharmaceutical Companies Listed In Pakistan Stock Exchange. *Research Journal of Innovative Ideas and Thoughts*, *4*(2), 75-88.

Bakar, N. B. A., & Uzaki, K. (2013). An empirical study of Initial Public Offerings underpricing for Shariah-compliant companies: The case of the Malaysian market. *International Journal of Economics, Business and Finance*, *1*(9), 262-274.

Ben Ahmed, F., Salhi, B., & Jarboui, A. (2021). Corporate governance and earnings forecast accuracy in IPO prospectuses: an empirical analysis. *Journal of Financial Reporting and Accounting*, *19*(1), 109-132.

Boulton, T. J., Smart, S. B., & Zutter, C. J. (2017). Conservatism and international IPO underpricing. *Journal of International Business Studies*, *48*, 763-785.

Gulzar, A., Khan, A. J., & Rafiq, S. (2020). Economic Analysis of Initial Public Offering Underpricing in the Stock Market of Pakistan. *International Journal Of Economics And Financial Issues*, *10*(4), 198.

Islam, M. A., Ali, R., & Ahmad, Z. (2010). An empirical investigation of the underpricing of initial public offerings in the Chittagong stock exchange. *International Journal of Economics and Finance*, *2*(4), 36-46.

Islam, M. A., Ali, R., & Ahmad, Z. (2010). Underpricing of IPOs: the case of Bangladesh. *Global Economy and Finance Journal*, *3*(1), 44-61.

Kayani, S., & Amjad, S. (2011). Investor interest, under-pricing, and trading volume in Pakistan's secondary market. *Business and Economics Journal*.

Khan, M. M. A., Qadri, S. U., Gul, R., & Saeed, U. (2022). Impact of Contribution of Brand Marketing in a Successful IPO. *Competitive Social Science Research Journal*, *3*(1), 140-146.

Khan, M. N., & Anjum, R. (2018). Determinants of underpricing of IPOs regarding financial & non-financial firms in Pakistan. Researchgate.net. https://www.researchgate.net/publication/237567195

Latif, M. (2020). *Determinants of Capital Structure and Influence of 2008 Financial Crisis: Evidence from Pakistani Non-Financial Firms* (Doctoral dissertation, Capital University).

Mumtaz, M. Z. (2016). The Aftermarket Performance of Initial Public Offerings in Pakistan Muhammad Zubair Mumtaz, Zachary A. Smith and Ather Maqsood Ahmed. *Lahore Journal of Economics*, *21*(1), 23-68.

Mumtaz, M. Z., & Ahmed, A. M. (2014). Determinants of underpricing of initial public offerings: Evidence from Pakistan. *Journal of Business & Economics*, *6*(1), 47.

Qureshi, F., Kutan, A. M., Ghafoor, A., Khan, H. H., & Qureshi, Z. (2019). Dynamics of mutual funds and stock markets in Asian developing economies. *Journal of Asian Economics*, *65*, 101135.

Rasheed, A., Khalid Sohail, M., Din, S. U., & Ijaz, M. (2018). How do investment banks price initial public offerings? An empirical analysis of the emerging market. *International Journal of Financial Studies*, *6*(3), 77.

Rizwan, M. F., & Khan, S. U. (2007). Long-run performance of public vs. private sector initial public offerings in Pakistan. *The Pakistan Development Review*, 421-433.

Said, B., Rehman, S. U., & Raza, M. W. (2022). Three Major Crises and Asian Emerging Market Informational Efficiency: A Case of Pakistan Stock Exchange-100 Index. *Journal of Risk and Financial Management*, *15*(12), 619.

ISSN (Print): 2959-099X ISSN (Online): 2959-1007
Volume 2, Issue 1, Page 61-77, June 30, 2023

Saboo, A. R., Kumar, V., & Anand, A. (2017). Assessing the impact of customer concentration on initial public offering and balance sheet–based outcomes. *Journal of Marketing*, *81*(6), 42-61.

Shaikh, S., Shah, A. B., & Ashraf, F. (2017). Credit Obtaining Challenges Faced by Micro and Small and Medium Enterprises SMEs. *KASBIT Business Journal*, *10*(2), 57-80.

Shafique, O., Hussain, N., & Taimoor Hassan, M. (2013). Differences in the risk management practices of Islamic versus conventional financial institutions in Pakistan: An empirical study. *The Journal of Risk Finance*, *14*(2), 179-196.

Sohail, M. K., & Nasr, M. (2007). Performance of initial public offerings in Pakistan. *International Review of Business Research Papers*, *3*(2), 420-441.

Sohail, M., Bilal, H., Rukh, L., & Fatima, S. (2018). Determinants of underpricing of initial public offerings and its long-run performance in Pakistan. *Pakistan Journal of Social Sciences*, *38*(2), 747-755.

Wahid, A., Khan, S. A., & Mumtaz, M. Z. (2019). Pricing performance of cross-listed and local IPOs: evidence from the alternative investment market. *Business and Economic Review*, *11*(3), 1-28