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Research Article

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Unveiling the Pricing Anomaly: A Detailed Examination of Initial Public Offerings in Borsa Istanbul in 2023

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Abstract This study investigates the short-term pricing anomalies observed in the initial public offerings in Borsa Istanbul during 2023. The raw returns of 39 newly listed firms were initially calculated and benchmarked against the Borsa Istanbul-100 index. To determine abnormal returns, these raw returns were adjusted for market performance over periods of one, three, and seven days post-offering. The statistical significance of these abnormal returns was evaluated using t-statistics at a 5% significance level. The results demonstrate statistically significant pricing anomalies, thereby challenging the market efficiency hypothesis. The presence of these anomalies shows that market participants do not immediately incorporate all available information into IPO pricing. This research contributes to the literature by highlighting the unique dynamics of an emerging market and provides empirical evidence of persistent short-term anomalies in initial public offering pricing in Borsa Istanbul. It underscores the need for enhanced regulatory frameworks to improve market efficiency and offers strategic insights for investors navigating the Turkish IPO market.

Keywords IPO · Pricing anomalies · Short-term analysis · Borsa Istanbul Stock Exchange · Abnormal returns

Jel Codes G12, G14, G32

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Unveiling the Pricing Anomaly: A Detailed Examination of Initial Public Offerings in Borsa Istanbul in 2023

The efficient market hypothesis posits that stock prices fully reflect all available information, making it impossible for investors to consistently achieve returns that outperform the market (Fama, 1970). However, empirical evidence often demonstrates deviations from this theoretical model, particularly in the context of initial public offerings (IPOs). This study focuses on the Borsa Istanbul, where recent IPOs have presented opportunities to evaluate market efficiency in short-term price behaviours.

In 2023, a comprehensive analysis was conducted on 39 firms that were publicly listed for the first time. These firms' performance was meticulously tracked from their IPOs, providing a unique dataset for examining potential short-term pricing anomalies. The methodology involved calculating raw returns and adjusting these figures to isolate abnormal returns over subsequent days, which were then statistically analysed.

Previous research has frequently highlighted that IPOs tend to exhibit significant abnormal returns shortly after the market debut, showing a temporary market inefficiency (Ritter, 1991; Loughran & Ritter, 2004). This phenomenon is often attributed to factors such as investor sentiment, underpricing by underwriters, and informational asymmetries between insiders and the general investor population.

Additionally, studies focusing on emerging markets, such as Borsa Istanbul, indicate that these anomalies can be more pronounced due to less stringent regulatory environments and varying levels of investor sophistication (Akyol et al., 2005). Therefore, the analysis of the Istanbul market not only contributes to the broader discourse on IPOs but also highlights specific regional dynamics that may influence pricing behaviours.

As the study progresses, the flow of the paper will explore the hypothesis that short-term pricing anomalies exist within the IPOs conducted in Borsa Istanbul. The subsequent sections will detail the methodology, present the empirical findings, and discuss the implications of these results on our understanding of market dynamics and IPO strategies. This introduction sets the stage for a rigorous examination of IPO performance, challenging prevailing financial theories with empirical data from a unique market setting.

Contribution to the Literature

This study contributes to the existing literature by providing an in-depth analysis of IPO pricing anomalies within an emerging market context, specifically focusing on the Borsa Istanbul during the year 2023. The inclusion of data from this particular market adds to the comprehensiveness of global IPO studies, which are often dominated by data from more developed markets. By employing a rigorous methodological framework that adjusts raw returns for market performance, a nuanced understanding of the extent and nature of pricing anomalies in IPOs is offered. Furthermore, the implications of these findings are discussed, highlighting the potential for regulatory improvements and strategic adjustments by market participants. Thus, this research not only enhances our understanding of IPO dynamics in emerging markets but also indicates practical implications for policymakers and investors aiming to mitigate the risks associated with IPO investments.

Literature Review

The Efficient Market Hypothesis (EMH), first articulated by Fama (1970), posits that financial markets are "informationally efficient," meaning that stock prices at any given time reflect all available information. This foundational theory has been a central theme in financial economics, influencing how researchers and practitioners view market behaviour and pricing mechanisms. However, the presence of anomalies, particularly around Initial Public Offerings (IPOs), has spurred a significant body of research questioning the universal applicability of the EMH.

Initial Public Offerings have been a rich area of study due to the frequent occurrence of underpricing, where IPOs are often priced below their market value at launch, leading to significant first-day returns for investors. Ritter (1991) and Loughran and Ritter (2004) have extensively documented these phenomena in developed markets, suggesting that underpricing serves as an incentive mechanism to mitigate investor uncertainty about the value of newly listed companies.

Further extending the discussion, Ibbotson and Jaffe (1975) and Rock (1986) examined the role of information asymmetry in IPO pricing. They argue that underpricing compensates investors for the risk of investing in new issues without adequate information. This perspective is particularly relevant in emerging markets, where information asymmetries are more pronounced due to less stringent disclosure requirements and regulatory oversight.

Research specific to emerging markets like Akyol et al. (2005) and Aggarwal, Leal, and Hernandez (1993) emphasises how local economic conditions, investor sentiment, and institutional frameworks play critical roles in shaping IPO outcomes. These studies highlight that emerging markets often display greater volatility and pricing anomalies compared to their developed counterparts, which can be attributed to the evolving nature of their financial and regulatory environments.

In addition to underpricing, scholars have explored the long-term performance of IPOs. Ritter (1991) and subsequent studies by Jegadeesh, Weinstein, and Welch (1993) found that while IPOs may initially outperform, their long-term market performance often fails to sustain the early momentum. This observation raises questions about the long-term value of IPOs and the rationality of investors during the IPO process.

McDonald and Fisher (1972) conducted a study examining 142 initial public offerings (IPOs) from the first quarter of 1969, each involving the sale of a minimum of 150,000 shares and exceeding $1 million in total. Their research aimed to provide insights into IPO underpricing, in line with the efficient market hypothesis. In addition, they explored pricing disparities among investment banks, attributing these differences to variations in investment bank behaviour during the pricing process. This study contributes to the literature by shedding light on the phenomenon of IPO underpricing and its relationship with investment bank practices. The dataset used likely comprises IPO data, including pricing details and investment bank involvement, allowing for a comprehensive analysis. The methodology employed may involve statistical analyses to assess the extent of underpricing and compare pricing strategies across investment banks. The findings support the efficient market hypothesis and show that differences in investment bank behaviour influence IPO pricing outcomes.

Logue (1973) examines the behaviour of investment banks in the pricing process of initial public offerings (IPOs), highlighting the implications of underpricing on both the investment bank and the issuing firm. The study finds that when an investment bank underprices an IPO, it minimises its own costs and risks while providing short-term gains to investors. However, this also signifies a loss in IPO proceeds for the issuing firm. Conversely, pricing the IPO at or above its true value results in losses for investors and increases the investment bank's costs and the risk of IPO failure. Consequently, other firms considering IPOs may hesitate to choose the investment bank associated with a failed offering. The literature review aims to investigate the impact of investment bank behaviour on IPO pricing dynamics. The dataset used in this study likely includes IPO data and investment bank actions, enabling a comprehensive analysis of their interactions. The methodology may involve statistical modelling or case studies to assess the relationship between investment bank behaviour and IPO outcomes. The findings underscore the importance of investment bank pricing decisions in determining IPO success and subsequent market reputation.

Rock (1986) proposed the adverse selection model as a prominent explanation for the low pricing anomaly observed in initial public offerings (IPOs). This model categorises investors into two groups: informed investors who seek to purchase shares when the IPO is underpriced and uninformed investors who are willing to purchase shares regardless of pricing. The model suggests that in instances of underpricing, even if there is demand from both informed and uninformed investors, the distribution to uninformed investors will be minimal. Conversely, in cases of overpricing, uninformed investors will end up acquiring all issued shares, leading to the winner's curse phenomenon. The purpose of this literature is to investigate the implications of the adverse selection model on IPO pricing dynamics. The dataset used in this study comprises IPO data from various markets, allowing for a comprehensive analysis of pricing patterns. The methodology involves examining the distribution of shares to different investor groups under various pricing scenarios. The findings indicate that the adverse selection model provides valuable insights into understanding IPO underpricing phenomena, highlighting the importance of considering information asymmetry in IPO pricing mechanisms.

Muscarella and Vetsuypens (1989), in their study, rigorously tested the validity of Baron's 1982 model on IPO underpricing, which attributes lower offer prices to information asymmetries between issuers and underwriters. The research specifically focuses on a unique dataset comprising 38 investment banks that went public between 1970 and 1987 and undertook the distribution of their own securities, representing an unusual case of self-marketing during IPOs. The methodology involves a comparative analysis of these self-marketed IPOs against traditionally underwritten IPOs, assessing the levels of underpricing in both scenarios. Contrary to the predictions of Baron's model, the findings reveal that even when investment banks market their own IPOs—presumably reducing information asymmetries—the level of underpricing does not significantly differ from that observed in IPOs involving external underwriters.

Loughran and Ritter (2004), in their study investigation of IPO first-day returns, a longitudinal dataset spanning the 1980s to the early 2000s is scrutinised to elucidate the dynamic nature of underpricing trends. It is observed that a stark escalation in average first-day returns occurred, with an initial 7% in the 1980s, a rise to nearly 15% in the 1990s, a surge to 65% during the dot-com bubble, and a reversion to 12% post-bubble. The methodology applied likely encompasses a comparative statistical analysis across different time periods, aiming to uncover underlying patterns. The findings indicate that shifts in issuer objectives were significantly impacted by the market milieu, with less emphasis on maximising proceeds and a greater focus on obtaining research coverage in the later periods. Allocations of high-demand IPOs to executives' brokerage accounts are postulated to have incentivized a preference for underwriters known for pronounced underpricing.

Ellul and Pagano (2006), the purpose of their study is to expand upon traditional explanations for the underpricing of initial public offerings (IPOs) by introducing a novel theory that incorporates investor concerns regarding after-market illiquidity resulting from asymmetric information post-IPO. The researchers use a dataset comprising 337 British IPOs conducted between 1998 and 2000 to investigate this phenomenon. Employing various measures of liquidity, the study finds empirical support for their model's predictions, indicating that expected after-market liquidity and liquidity risk significantly influences IPO underpricing. The methodology involves blending liquidity concerns with adverse selection and risk as motives for underpricing, offering a more comprehensive understanding of IPO pricing dynamics.

Ljungqvist (2007) examined the extensive phenomenon of IPO underpricing in his chapter, which seeks to elucidate the reasons behind the significant first-day price jumps observed in the U.S. markets during the 1990s, where the average discount exceeded 20%. The study is grounded in a review of diverse theoretical frameworks categorised under asymmetric information, institutional, control, and behavioural headings. Data encompassing various IPOs over a decade serve as the basis for the analysis, with a methodology that likely involves both qualitative and quantitative assessment of the empirical evidence related to these theories. Asymmetric information models are posited as having a primary influence on underpricing due to the information disparities among the issuing firms, underwriting banks, and new investors. However, the substantial variance in underpricing rates, particularly during peak periods such as the late 1990s dot-com bubble, shows that no single information-based explanation fully accounts for the observed outcomes. Consequently, the chapter also explores behavioural theories, institutional differences across countries, potential conflicts of interest within investment banks, and the implications of using auction methods for IPO pricing.

Chambers and Dimson (2009) delves into the historical underpricing of Initial Public Offerings (IPOs) in the UK, presenting an extensive analysis of IPO market efficiency from the post-World War I era to the modern deregulated market environment. The study encompasses a comprehensive dataset of British IPOs spanning from 1917 through 1986, with a subsequent examination of the period following the 1986 deregulation of the UK stock market. The methodology likely includes historical data analysis, comparing underpricing across different regulatory and economic contexts. The results indicate a distinct increase in the average underpricing from 3.80% during the interwar and World War II periods (1917-1945) to 9.15% in the post-war period up to 1986, with even higher rates subsequent to market deregulation. These findings are significant as they demonstrate that the increase in underpricing occurred despite advancements in regulatory and disclosure standards and irrespective of the changing composition of firms or the prestige of IPO underwriters.

Zou et al. (2020) conducted a study focusing on 10-year IPO initial returns in China's small and medium-sized enterprise (SME) board from 2006 to 2016, analysing a sample of 755 IPOs. The aim of their research was to examine the impact of policy changes in IPO pricing and trading mechanisms on first-day initial returns. Employing the stochastic frontier approach, the authors estimate the fair value of IPOs and decompose the components of deliberate underpricing and mis-valuation factors. They then use linear regressions to investigate the correlation between first-day initial returns and deliberate underpricing or misvaluation factors. The study finds that misvaluation factors, particularly the irrational behaviour of individual investors, primarily contribute to IPO underpricing in China's SME market, rather than deliberate underpricing. Additionally, the characteristics of IPO pricing vary across different periods, influenced by changes in IPO pricing policies.

Duong et al. (2021) investigated the impact of trading rules on market manipulation on initial public offering (IPO) underpricing using a large sample of 13,459 IPOs from 37 countries. Their study aims to assess how exchange regulations affect IPO underpricing and subsequent market outcomes. The authors find that stringent trading rules on market manipulation decrease IPO underpricing. This effect is moderated by factors such as the certification of IPOs by reputable intermediaries, the level of shareholder rights protection in the country, the quality of financial reporting, and the adoption of International Financial Reporting Standards (IFRS). Additionally, better trading rules on market manipulation are associated with higher IPO proceeds, subscription levels, and trading volume, as well as lower IPO listing fees and better long-term post-IPO performance.

Mehmood, Mohd Rashid, and Tajuddin (2021) conducted a comprehensive review of underpricing research in initial public offerings (IPOs) across developed, developing, and emerging markets over the past three decades. The study aims to explore the extent of underpricing in different market segments and identify the key factors influencing initial returns. Through a thorough examination of existing literature, the authors find that underpricing tends to be higher in emerging markets compared to developing and developed markets, with issuers in emerging markets often perceiving underpricing as a signal of quality IPOs due to significant information asymmetry. The review identifies several significant factors that influence the level of underpricing, including country-specific environments, micro- and macroeconomic conditions, the quality of legal frameworks governing listing regulations, socio-political factors, and IPO marketing strategies. In addition, the authors discuss various theories and propositions developed to explain underpricing phenomena across the three market segments. They indicate that these factors could serve as primary determinants of IPO underpricing in future research, highlighting the importance of considering the diverse contextual factors influencing underpricing dynamics in different markets.

Gupta, Singh, and Yadav (2022) conducted a study focusing on the impact of media coverage on initial public offering (IPO) underpricing in the Indian market. Recognising the pivotal role of the media in disseminating information to investors, particularly those lacking the expertise to interpret prospectus information, the authors aim to disaggregate traditional IPO underpricing into three categories: voluntary, pre-market, and post-market, and assess the comparative influence of media sentiments on each category. Employing sentiment analysis on 2,891 media articles and using robust regression techniques, the study analyzes a sample of 222 Indian IPOs from 2009 to 2018. The findings indicate a positive relationship between media sentiment and traditional underpricing, with a particularly significant association observed between sentiment and pre-market underpricing. Surprisingly, the study reveals that the number of media articles does not significantly impact IPO underpricing. The research contributes to the literature by shedding light on the role of the media in IPO performance in the context of a developing market like India, where IPO laws and transparency levels differ from those in developed countries. By disaggregating IPO underpricing and evaluating media influence on primary and secondary markets separately, the study offers insights to investors for making effective investment strategies based on media sentiments.

Salerno, Sampagnaro, and Verdoliva (2022) conducted a study examining the relationship between FinTech IPOs (venture capital and equity crowdfunding-backed) and short-run performance, focusing on the level of underpricing. Utilising an international sample, the authors aim to assess whether FinTech IPOs exhibit higher levels of underpricing compared to non-FinTech IPOs and to provide insights into the implications of the FinTech industry on stock underpricing for managers and entrepreneurs. After correcting for selection bias, the study finds that FinTech IPOs are indeed more underpriced than similar non-FinTech IPOs. This result remains robust after addressing issues related to unobserved factors, confirming a positive relationship between being a FinTech IPO and a higher level of underpricing. The analysis contributes to a better understanding of the impact of the FinTech industry on IPO underpricing dynamics, offering implications for stakeholders in the FinTech sector.

Liu et al. (2023) present a study focusing on the relationship between investor attention and initial public offering (IPO) underpricing, aiming to provide insights into how firms attract attention and its subsequent impact on IPO outcomes. Building on earlier research indicating the long-term benefits of pre-offering investor attention, the authors propose a model wherein firms utilise underpricing as a strategy to attract investor attention and encourage participation in the IPO process. The model generates predictions regarding the relationship between initial returns and attention, retention, expansion, and the benefits of attention, considering the asymmetry of this relationship. Empirical findings support the model's predictions, indicating a positive relationship between investor attention and both initial returns and the magnitude of price revision. Furthermore, the study reveals an asymmetric relationship between attention and underpricing, which is stronger under conditions of greater ex ante uncertainty. The implications of these findings extend to direct listings, public information adjustment, the popularity of grey market/when-issued trading, and the potential impact of the JOBS Act on pre-IPO trading. Overall, the research contributes to our understanding of IPO underpricing dynamics and sheds light on the mechanisms through which firms attract investor attention in the pre-offer phase.

Katsafados et al. (2023) explored the predictive power of textual information extracted from S-1 filings in explaining initial public offering (IPO) underpricing, employing a novel approach by integrating machine learning algorithms into their analysis. Using a dataset comprising 2,481 US IPOs, the authors demonstrate that textual information complements financial variables in predicting both the likelihood and magnitude of underpricing, resulting in improved prediction accuracy compared to models utilising financial data alone. Their findings reveal that models incorporating both textual and financial data outperform those relying solely on financial variables, with the best-performing model achieving a substantial improvement in accuracy. Moreover, the authors highlight the superiority of sophisticated machine learning models over traditional logistic regression in predicting IPO underpricing. They attribute the enhanced predictive power of textual information to its ability to mitigate the ex ante valuation uncertainty of IPO firms. Additionally, the authors construct a portfolio based on out-of-sample machine learning predictions, which yields remarkable average returns and outperforms the benchmark in various time dimensions, underscoring the practical relevance of their findings for investors in IPO markets.

Ranganathan and Veeraraghavan (2023) investigated the impact of the specific use of proceeds disclosure on initial public offering (IPO) underpricing in India, leveraging a unique regulatory framework that allows for the estimation of voluntary and aftermarket underpricing. Their study aims to ascertain whether disclosure of the specific use of proceeds influences underpricing in the pre- and aftermarket phases. Analysing data from Indian IPOs, the authors find that disclosure of specific use of proceeds increases voluntary underpricing during the premarket phase while reducing aftermarket underpricing. Moreover, they observed that the effect of disclosure varies depending on the level of information asymmetry and investor sentiment, with a greater impact observed for firms facing higher information asymmetry in the premarket and those with higher investor sentiment in the aftermarket. These core findings remain robust even after addressing endogeneity concerns through various tests. Overall, the study highlights the differential impact of disclosure on underpricing in different stages of the IPO process, shedding light on the role of the specific use of proceeds disclosure in shaping investor perceptions and market outcomes.

Gao, Wang, and Liu (2024) investigated the relationship between board chair gender and IPO underpricing in China, examining the phenomenon through the lens of the glass ceiling theory. Utilising a large sample of Chinese IPOs, the study reveals that firms with female board chairs (FBCs) experience lower levels of underpricing compared to those led by male board chairs (MBCs), suggesting that investors interpret FBCs as a positive signal for IPO success. The authors employed instrumental variable regressions and propensity score matched sample tests to address potential endogeneity concerns, confirming the robustness of their findings. Further analyses indicate that this relationship is more pronounced in firms characterised by greater internal gender discrimination, higher risk-taking propensity, and CEO-chair duality. Moreover, firms led by FBC exhibit better operating performance post-IPO although there is no evidence indicating that they adopt more conservative financial reporting or risk-taking behaviours. This study extends existing research on IPO underpricing determinants and the influence of gender discrimination on corporate leadership, offering implications for optimising gender diversity in top management and enhancing IPO pricing efficiency.

Underpricing Anomaly in IPOs Performed in 2023 in Borsa İstanbul Stock Exchange

Dataset and Sample Structure

The dataset for this study comprises the initial public offerings (IPOs) of 39 firms that were first listed on Borsa Istanbul in 2023. Extensive data, including IPO prices, the revenue collected from the IPOs, and the dates of the offerings, were gathered from Borsa Istanbul. Post-IPO stock price information was obtained from the trading platform TradingView. This sample provides a comprehensive base for analysing the short-term pricing anomalies in the IPO market of an emerging financial market such as Turkey.

The following tables contain summarised statistics (frequency analysis) of IPOs on Borsa Istanbul in 2023. Table 1 shows the number of IPOs by type of sale and Table 2 shows the number of IPOs by market.

Table 1

Distribution of initial public offerings based on the sales type

Sale Method in an IPO	# of IPOs
Sales in the Exchange– Book Building at Fixed Price	5
Book Building at a Fixed Price	34
TOTAL	**39**

Source: https://spk.gov.tr/ihrac-verileri/ilk-halka-arz-verileri

The table presents two of the methods used for share allocation in Initial Public Offerings (IPOs) in 2023: book building at a fixed price and sales conducted within the exchange. While Borsa Istanbul (BIST) offers three methods for share allocation—book building, sales within the exchange, and sales without book building—only two of these methods were utilised in the IPOs examined for 2023. Specifically, five IPOs were executed on the exchange, showing that these entities might have sought the transparency and liquidity provided by the exchange environment. In contrast, the majority, 34 IPOs, were conducted using book building, reflecting a preference for a more controlled sale environment where issuers may negotiate directly with investors. This disparity could be attributed to several factors, such as cost considerations, speed of execution, and the desire for a more selective investor base. The table highlights a predominant trend of companies opting for IPOs through book building, possibly due to the perceived advantages this method offers over other available options.

Table 2

Distribution of initial public offerings based on the market

Market Type	# of IPOs
BIST–Main	3
BIST-Stars	36
TOTAL	**39**

Source: https://spk.gov.tr/ihrac-verileri/ilk-halka-arz-verileri

The table displays a division of Initial Public Offerings (IPOs) across two Borsa İstanbul (BIST) market segments, with only three IPOs listed on the Main market and a significant majority, thirty-six, opting for the Stars market. The inclination towards the BIST Stars segment may be due to its appeal to companies seeking enhanced visibility and credibility through stringent listing criteria related to financial transparency and corporate governance. This distribution suggests that during the period under review, the market conditions or strategic objectives favoured the Stars market, perhaps because of its potential to attract more discerning investors and possibly offer better trading liquidity for newly listed companies.

The amount of funds raised from the public offering for each company, the ratio of demand to the public offering, and the number of investors allocated are shown in Table 3 as follows:

Table 3

Amount of Funds Raised from Public Offering by Company, Demand Ratio to Public Offering, and Number of Investors Allocated

Firm Title	Amount of Funds Raised (USD)	Subscription Ratio in IPO	# of Investors Allocated
Akfen Renewable Energy Inc.	176.139.961	23	419.123
CW Energy Engineering Trade and Industry Inc.	167.577.938	4	2.243.594
Bien Building Products Industry Tourism and Trade Inc.	158.219.970	1	1.446.140
Astor Energy Inc.	139.864.984	34	690.734
Enerya Energy Inc.	127.886.331	3	2.637.008
Europower Energy and Automation Technologies Industry Trade Inc.	125.980.668	4	2.118.379
Kaleseramik Çanakkale Kalebodur Ceramics Industry	101.677.986	3	1.919.116
İzdemir Energy Electricity Production Inc.	97.203.476	4	2.648.584
Kayseri Sugar Factory Inc.	88.148.674	1	1.619.459
ASCE Real Estate Investment Partnership Inc.	77.173.211	2	1.320.135
Reeder Technology Industry and Trade Inc.	74.248.051	4	4.208.278
Ebebek Retail Inc.	69.719.585	8	3.804.835
Adra Real Estate Investment Partnership Inc.	62.014.185	1	2.536.304
Tatlıpınar Energy Production Inc.	58.487.219	4	2.233.460
Koza Polyester Industry and Trade Inc.	56.545.713	5	1.729.153
Eksun Food Agriculture Industry and Trade Inc.	51.538.314	15	1.210.861
Göknur Foodstuffs Energy Manufacturing Import Export Trade and Industry Inc.	46.225.350	8	862.805
CVK Mining Enterprises Industry and Trade Inc.	45.858.204	5	1.452.252

Firm Title	Amount of Funds Raised (USD)	Subscription Ratio in IPO	# of Investors Allocated
Great Chefs Food Tourism Textile Consulting Organisation Education Industry and Trade Inc.	42.747.770	5	1.800.881
Atakey Potato Food Industry and Trade Inc.	41.452.793	5	1.665.576
Kuzugrup Real Estate Investment Partnership Inc.	38.198.699	6	2.085.695
A1 Capital Investment Securities Inc.	37.343.052	2	753.645
Hat-San Ship Repair Maintenance Marine Transportation Industry and Trade Inc.	37.177.126	6	3.735.529
Pasifik Eurasia Logistics Foreign Trade Inc.	36.922.810	3	903.205
Katılımevim Savings Financing Inc.	35.002.824	1	474.210
Gıpta Office Stationery and Promotional Products Manufacturing Industry Inc.	31.183.907	7	3.364.933
Söke Milling Industry and Trade Inc.	31.000.331	118	787.164
Fuzul Real Estate Investment Partnership Inc.	30.396.523	3	1.326.874
DMR Bakery Products Production Food Wholesale Retail Export Inc.	28.335.406	7	2.974.287
Office Yem Food Industry Trade Inc.	22.913.511	3	1.425.001
Graınturk Agriculture Inc.	22.703.115	6	1.248.019
SDT Space and Defence Technologies Inc.	20.966.603	20	838.560
Tarkim Plant Protection Industry and Trade Inc.	20.078.371	4	2.675.408
Bülbüloğlu Crane Industry and Trade Inc.	18.975.282	131	373.600
Mackolik Internet Services Trade Inc.	17.201.804	31	678.726
Tapdi Oxygen Special Health and Education Services Industry Trade Inc.	15.247.096	2	743.501
Baydöner Restaurants	13.986.842	3	1.264.215
Forte Information Communication Technologies and Defence Industry Inc.	11.379.602	3	660.379
Oncosem Oncological Systems Industry and Trade Inc.	5.569.194	18	36.044
Grand Total	**2.283.292.481**	**13**	**64.915.672**

Source: https://spk.gov.tr/ihrac-verileri/ilk-halka-arz-verileri

In the table presented, a summary of IPOs is provided, delineating funds raised by various firms, the subscription ratios attained, and the number of investors allocated. Akfen Renewable Energy Inc. is observed to have raised the highest amount of funds, amounting to $176,139,961, with a subscription ratio of 23 and attracting 419,123 investors. In contrast, CW Energy Engineering Trade and Industry Inc. and Bien Building Products Industry Tourism and Trade Inc. also raised substantial funds but with lower subscription ratios and a higher number of investors, suggesting a broader distribution of their shares. A diversity in the level of investor interest is depicted, with the subscription ratios ranging widely, from as high as 118 for Söke Milling Industry and Trade Inc., indicating a possibly oversubscribed offering, to as low as 1 for several companies, which might reflect a targeted or more exclusive investor outreach. The total of approximately $2.28 billion raised across these IPOs, coupled with an average subscription ratio of 13 and a considerable aggregate of over 64.9 million investors, underscores a robust participation and capital acquisition in these market entries, which may be attributed to the prevailing economic sentiment and the strategic positioning of these firms within their respective sectors.

The number of initial public offerings by brokerage firms is shown below in Table 4.

Table 4

Number of Initial Public Offerings by the Brokerage Firm

Firm Title	# of IPOs
Garanti Investment Securities Inc.	4
Information Investment Securities Inc.	3
Halk Investment Securities Inc.	3
Information Investment MD	2
Tera Investment Securities Inc.	2
Yapı Kredi Investment Securities Inc.	2
Pyramid Securities Inc.	1
Consortium led by information Investment MD-Vakıf Investment	1
Consortium led by Deniz Investment - T. Development and Investment Bank	1
Deniz Investment MD	1
Information Investment Securities Inc.	1
A1 Capital Investment Securities Inc.	1
TEB Investment Securities Inc.	1
Garanti Investment Securities Inc.	1
Ak Investment MD	1
Consortium led by Gedik Investment MD	1
Ahlatcı Investment, Vakıf Investment Securities Inc.	1
Consortium led by Halk Investment MD	1
Consortium led by İş Investment MD and Ara Investment	1
Halk Investment MD.	1
QNB Finance Investment Securities Inc.	1
Tera Investment Securities Inc.	1
Ak Investment Securities Inc.	1
TSKB, Investment Financing and Ziraat Investment Securities Inc.	1
Consortium led by Ak Investment-Garanti Investment and Yapı Kredi Investment	1
Ünlü Securities Inc.	1
Consortium led by A1 Capital Investment MD	1
Information Investment MD	1
Consortium led by Halk Investment and Integral Investment MD	1
TOTAL	**39**

Source: https://spk.gov.tr/ihrac-verileri/ilk-halka-arz-verileri

The table provided enumerates the entities that have orchestrated IPOs, highlighting a range of investment security companies and various consortia that have facilitated these offerings. It is observed that Garanti Investment Securities Inc. took the lead in underwriting four IPOs, while information Investment Securities Inc. and Halk Investment Securities Inc. were each responsible for three. A consortium led by information Investment MD-Vakıf Investment and others engaged in singular IPOs, reflecting a strategy that perhaps leveraged combined expertise for specific market entries. This distribution across entities may indicate market perceptions of their respective proficiency and reputations. The cumulative number of 39 IPOs underscores a diverse and competitive field within the securities sector, with the involvement of consortia indicating collaborative approaches in some market debuts, possibly to mitigate risks or to capitalise on shared resources and networks. The varied participation of different firms and consortia in this process reflects the dynamic nature of the investment landscape, where strategic alliances and expertise specialisation play pivotal roles in the orchestration of IPOs.

Methodology

The methodology of this study centres around the calculation of raw and abnormal returns to identify short-term pricing anomalies following IPOs. Raw returns (R) for each firm were calculated for specific days post-IPO using the following formula:

R= (Price on day t – IPO price) / IPO price (1)

The market return (MR) is also calculated as follows:

MR = (BIST-100 Price on day t – BIST-100 Price on day t-1) / BIST-100 Price on day t-1) (2)

Abnormal returns were then calculated by adjusting these raw returns against the Borsa Istanbul-100 national equity index's percentage change, serving as the market return benchmark. The abnormal return, average abnormal return, cumulative abnormal return and average cumulative abnormal return are the focal points of the analysis, calculated as follows (Asquith and Mullins,1986):

Adjusted Return= Raw Return – Market Return (3)

$$\overline{\mathbf{AR_t}} = \frac{1}{N}\sum_{i=1}^{n} AR_{it}(4) \tag{1}$$

$$\mathbf{CAR_{t_1}^{t_2}} = \sum_{t=t_1}^{t_2} AR_t(5) \tag{2}$$

$$\overline{CAR}_t = \frac{1}{N}\sum_{i=1}^{N} CAR_{it}(6) \tag{3}$$

The hypothesis statements are as follows:

H_0: $\overline{AR}_t$, $\overline{CAR}_t$≤0 (No pricing anomaly is present)

H_1: $\overline{AR}_t$, $\overline{CAR}_t$≤0 (A pricing anomaly is present)

The statistical significance of the observed returns was assessed using t-statistics compared against critical values at a 5% significance level.

3. **Test Results**

The statistical analysis revealed that the abnormal returns post-IPO were significant, especially within the first three days following the offerings. The results for the one-day, three-day, and seven-day periods post-IPO are as follows:

The first-day price performances of stocks offered to the public for the first time in 2023 are shown in Table 5 below:

Table 5

First Daily Price Performances of Stocks Offered to the Public for the First Time in 2023

N	R	t-statistic	AR	t-statistic
39	0,08	1,58*	0,08	1,50*

Note: n is the number of observations. * indicates significance at the 5% significance level. The critical values required for the t-test were taken from Tarı (2012: 500) and is 1.645 for 5%.

Table 5 presents the first-day price performance of 39 IPOs listed on Borsa Istanbul in 2023. The table reports the raw return (R), abnormal return (AR), and corresponding t-statistics for each measure. The findings reveal that the first-day raw return and abnormal return are both positive, each registering a value of 0.08. The respective t-statistics for these returns are 1.58 and 1.50, with the abnormal return's t-statistic approaching the critical threshold for significance at the 5% level (t-critical = 1.645). These results indicate the presence of short-term underpricing, a phenomenon frequently observed in IPOs, where the offer price is set below the subsequent market price on the first trading day. This underpricing is often attributed to information asymmetry, issuer strategies to stimulate demand, or efforts to reduce the risk of listing failure. The marginal significance of the t-statistics implies that, while a clear positive return is observed, the anomaly is not overwhelmingly significant. Nonetheless, the positive first-day abnormal returns show that early investors may achieve excess profits. This finding supports previous literature on IPO underpricing and highlights the potential for short-term gains in the Turkish IPO market.

The first-3 days price performances of stocks offered to the public for the first time in 2023 are shown in Table 6 below:

Table 6

First 3 Days Price Performances of Stocks Offered to the Public for the First Time in 2023

Day	n	R	t-statistic	AR	t-statistic	CAR	t-statistic
1	39	0,08	1,58	0,08	1,50	0,27	2,48
2	39	0,08	1,47	0,08	1,35	0,16	1,66
3	39	0,06	0,06*	0,07	0,07*	0,15	0,14*

Note: n is the number of observations. * indicates significance at the 5% significance level. The critical values required for the t-test were taken from Tarı (2012: 500) and is 1.645 for 5%.

Table 6 extends the analysis of IPO performance to a 3-day period following the public offering. The raw returns (R), abnormal returns (AR), and cumulative abnormal returns (CAR) are reported for each of the three days, along with their corresponding t-statistics. The results reveal that positive returns persist beyond the initial trading day, with cumulative abnormal returns (CAR) reaching 0.27 by the end of Day 3. The t-statistic for the CAR (2.48) is statistically significant at the 5% level, indicating sustained abnormal returns over this period. While the abnormal returns for the first two days remain positive and significant, a decline is observed on the third day, where the abnormal returns are lower (0.07) and the associated t-statistic (0.07) is notably weak. The pattern observed in this table reflects a typical post-IPO trend where high initial investor enthusiasm and speculative activity drive returns upwards, only for the momentum to wane in subsequent days. This tapering effect may be due to profit-taking by early investors or the market's gradual incorporation of new information. The statistical significance of cumulative returns over the 3-day period highlights the persistence of IPO underpricing and indicates that market adjustments are not immediate. These results challenge the efficient market hypothesis, which assumes that prices fully and instantaneously reflect available information. For investors and policymakers, these findings underscore the importance of understanding the short-term dynamics of IPO pricing as well as the role of behavioural factors, such as investor sentiment and speculative trading.

The first-7 days price performances of stocks offered to the public for the first time in 2023 are shown in Table 7 below:

Table 7

First 7 Days Price Performances of Stocks Offered to the Public for the First Time in 2023

Day	n	R	t-statistic	AR	t-statistic	CAR	t-statistic
1	39	0,08	1,58	0,08	1,50	0,27	2,48
2	39	0,08	1,47	0,08	1,35	0,16	1,66
3	39	0,06	0,06*	0,07	0,07*	0,15	0,14*
4	39	0,05	0,79	0,06	0,75	0,12	0,97
5	39	0,06	0,85*	0,05	0,69*	0,10	0,85*
6	39	0,05	0,75	0,04	0,55	0,09	0,70
7	39	• 0,12	• 0,13*	• 0,10	• 0,10*	• 0,06	• 0,06*

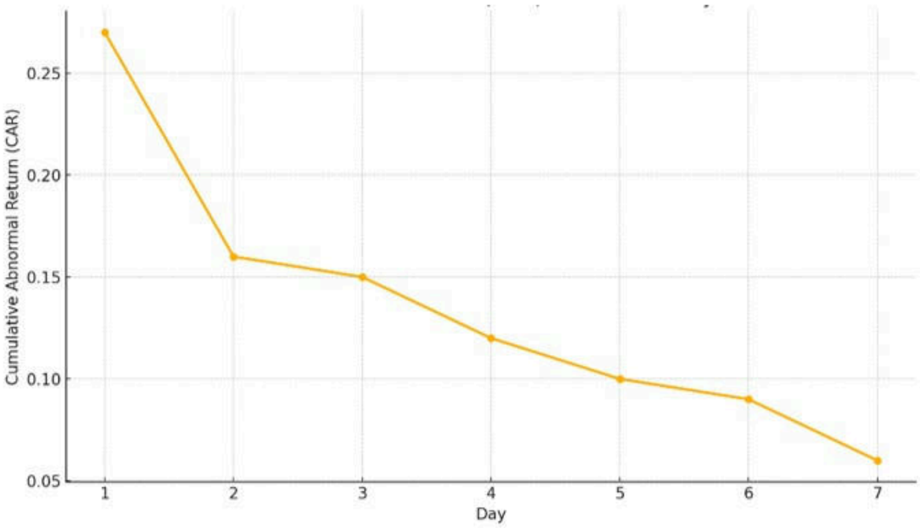
Note: n is the number of observations. * indicates significance at the 5% significance level. The critical values required for the t-test were taken from Tarı (2012: 500) and is 1.645 for 5%.

Table 7 provides a comprehensive view of the performance of IPOs on Borsa Istanbul over a 7-day period, highlighting daily raw returns (R), abnormal returns (AR), and cumulative abnormal returns (CAR), alongside their respective t-statistics. The data reveal that positive abnormal returns persist for the first five days, with the fifth day exhibiting a notable level of significance (t-statistic = 0.85*), suggesting that short-term gains remain achievable for investors. However, a shift in trend was observed on the sixth and seventh days, with abnormal returns turning negative. By the seventh day, the abnormal return declines to 0.10, with a corresponding t-statistic of 0.10*, indicating a potential correction in the market valuation of these newly listed shares.

The evolution of the cumulative abnormal returns (CAR) over this 7-day period is particularly noteworthy. The CAR steadily increased from 0.27 on Day 1 to a peak of 0.15 on Day 3, after which it began to taper off. By the end of Day 7, the CAR stood at 0.06, signaling a gradual convergence of IPO prices towards their fundamental values. This trend aligns with the "reversion to the mean" theory often discussed in the IPO literature, where the inflated initial returns are gradually corrected as market participants reassess the true value of the newly listed stocks. One possible explanation for this reversal in returns be early profit-taking by speculative investors who capitalise on the initial market euphoria. Additionally, as new information becomes available to the broader market, the initial price deviations caused by information asymmetry may diminish, leading to more rational pricing. This pattern is consistent with prior research on IPOs in emerging markets, where early price volatility is often more pronounced due to the higher degree of investor sentiment and limited market transparency.

A visual interpretation of short-term pricing dynamics following initial public offerings is presented through the cumulative abnormal returns (CAR) plotted over the first seven trading days, offering empirical insight into the temporal trajectory of market adjustments.

Figure 1
Cumulative Abnormal Returns over First 7 Days Post-IPO



The evolution of cumulative abnormal returns (CAR) within the first seven trading days stands out as illustrative of short-term market dynamics in Borsa Istanbul's 2023 IPOs. A notable upward progression occurs during the initial three days with CAR reaching a zenith of 0.27—showing signs of heightened investor excitement and speculation characteristic to underpriced IPOs. Following Day 3, this figure drops and stabilizes at 0.06 by Day 7. This drop further signals a market correction where previously frothy valuations are rationalized as fresh information gets integrated into the system. The pattern illustrates the fleeting nature of such inefficiencies in emerging markets which are dominated by hype due to speculative trading and minimal disclosure policies. All in all, the pattern is a challenge to instantaneous market efficiency hypotheses as some gains from trades can still be captured by precocious investors even though prices swiftly revert to underlying asset values just restore equilibrium post-adjustments. In any case these findings highlight for regulators the need for enhancing post-IPO transparency policies aimed at increasing confidence and reducing volatility surrounding newly listed companies.

These results underscore the presence of pricing anomalies in the short term, challenging the efficiency of market responses to new listings on Borsa Istanbul.

Discussion

This study's examination of short-term pricing anomalies in IPOs at Borsa Istanbul in 2023 has revealed significant insights that both align with and diverge from findings in the existing literature. Consistent with studies such as Ritter (1991) and Loughran & Ritter (2004), which report that IPOs frequently experience short-term abnormal returns due to factors like investor optimism and underpricing by underwriters, this study also identified similar anomalies within the first week of IPO listings.

However, where this study distinguishes itself is in its focus on an emerging market context. Unlike many studies that concentrated on developed markets, such as those in the United States or Western Europe, the findings here emphasise the unique dynamics of the Turkish financial market. For instance, while the literature often points to regulatory and institutional factors as critical determinants of IPO performance, this study suggests that in emerging markets like Turkey, other variables such as market sentiment and local economic conditions might play a more significant role. This agrees with Akyol et al. (2005), who show that emerging markets exhibit distinct behaviours due to their developmental stage and regulatory environment.

Moreover, this study extends the discourse by highlighting the persistence of anomalies beyond the immediate aftermath of IPOs, suggesting that market inefficiencies in Borsa Istanbul may be more pronounced and longer-lasting than those documented in more mature markets. This finding challenges the assumption commonly held in much of the existing literature that markets swiftly correct any mispricings, as posited by the efficient market hypothesis (Fama, 1970). The significant contribution of this research lies in its detailed analysis of an underexplored market, providing empirical evidence that extends our understanding of financial markets' geographical nuances. By focusing on a single emerging market with a limited sample size within a specific timeframe, this study offers a focused narrative that underscores the variability of IPO behaviours across different economic contexts.

In summary, while this study corroborates some established findings in the broader IPO literature, it also illuminates new aspects of market behaviour in emerging markets, providing a foundation for further inquiry into global financial market dynamics. This research, therefore, not only enriches the existing academic discourse by challenging some conventional norms but also opens new avenues for future investigations into the complexities of IPO markets worldwide.

In light of the t-statistical evaluations conducted for different post-IPO periods, the following table synthesizes the hypothesis test outcomes, summarizing the presence and significance of pricing anomalies across one-day, three-day, and seven-day intervals.

Table 8

Summary of Hypothesis Test Results on IPO Pricing Anomalies in Borsa Istanbul (2023)

Period	Observed AR	t-statistic (AR)	Observed CAR	t-statistic (CAR)	Critical t-value (5%)	Hypothesis Decision	Interpretation
Day 1	0.08	1.50	0.27	2.48	1.645	Fail to Reject H_0	Marginal anomaly; not statistically significant at 5%
Days 1–3 (Cumulative)	–	–	0.27	2.48	1.645	Reject H_0	Statistically significant anomaly observed
Days 1–7 (Cumulative)	–	–	0.06	0.06	1.645	Fail to Reject H_0	Anomaly dissipates; returns converge to normal

As per the test results, it was observed that significant statistically abnormal returns were detected within a window of three days post IPO listings on Borsa Istanbul during 2023. The cumulative abnormal return (CAR) for this period generated a t-statistic of 2.48 which is above the 5% critical value of 1.645. Hence, the null hypothesis claiming no pricing anomalies to be present (H_0: AR, CAR ≤ 0) is rejected for the three day window supporting the claim of short-term underpricing. On the contrary, first day abnormal return although positive (AR = 0.08), yielded a t-statistic of 1.50 which does not surpass the critical value. This indicates the anomaly may exist but is not strongly supported on just the first trading day only. In addition, in analyzing over a period of seven days, there clearly emerged a dissipation of abnormal returns such that CAR equaled to 0.06 and its t-statistic standing at (0.06) demonstrated no evidence towards persistent mispricing. These observations are in support with other literature revolving around IPO underpricing in emerging markets where it is observed to be strong but then quickly reverts back toward equilibrium as information flow increases and new data gets incorporated into markets mechanism over time demonstrating temporal irrational behavior or inefficiency within Turkish IPO market .

Conclusion

The phenomenon of initial public offerings (IPOs) has been a critical topic of investigation within the realm of financial markets, particularly in relation to market efficiency, information asymmetry, and investor behaviour. The Efficient Market Hypothesis (EMH) posits that all available information is fully reflected in stock prices, leaving no room for investors to achieve abnormal returns. However, empirical evidence has frequently contradicted this theoretical model, especially in IPO contexts, where short-term pricing anomalies have been well-documented. Such anomalies are often linked to investor sentiment, asymmetric information, and underwriter strategies, making IPOs a fertile ground for exploring deviations from market efficiency.

Emerging markets, unlike their developed counterparts, tend to display unique market characteristics that influence the pricing behaviour of IPOs. The relative immaturity of these markets, coupled with weaker regulatory oversight and heightened information asymmetry, amplifies the likelihood of pricing inefficiencies. Studies have demonstrated that IPOs in emerging markets such as those in Turkey are prone to higher levels of volatility and stronger underpricing effects. These characteristics present a unique opportunity to assess market efficiency within a non-traditional financial landscape. Accordingly, the Borsa Istanbul serves as an ideal setting for examining these phenomena, as it reflects the characteristics of an emerging market while providing access to sufficient data for empirical analysis.

This study investigates the short-term pricing anomalies observed in 39 IPOs conducted on Borsa Istanbul during 2023. The analysis focuses on the raw returns (R), abnormal returns (AR), and cumulative abnormal returns (CAR) within the one-day, three-day, and seven-day periods post-IPO. Through the use of t-statistics, the statistical significance of these returns is examined, providing insight into whether abnormal returns are sustained beyond the initial trading day. The findings reveal the existence of significant pricing anomalies, particularly within the first three days following an IPO. While raw returns are consistently positive across the one-day, three-day, and seven-day windows, abnormal returns begin to wane after the third day, suggesting a gradual alignment of market prices with fundamental values.

Moreover, the study highlights notable fluctuations in the cumulative abnormal returns (CAR) during the seven-day observation period. On the first day, CAR exhibited a significant positive increase, reaching a peak on the third day. However, in the days that follow, a decline in CAR is observed, with returns eventually approaching zero. This pattern is consistent with the "reversion to the mean" hypothesis, whereby inflated returns generated by market enthusiasm are progressively corrected as investor sentiment stabilises. The downward shift in CAR towards the end of the seven-day period may also reflect profit-taking behaviour by speculative investors, as well as the market's effort to integrate new information about the IPO's intrinsic value. These results support the argument that while short-term pricing anomalies exist, they are not persistent, as prices gradually adjust to reflect available information.

The overall findings of this study contribute to the existing literature on IPO pricing behaviour in emerging markets. Evidence of short-term pricing anomalies challenges the EMH's premise that markets operate with complete informational efficiency. The persistent underpricing effect seen in the first three days indicates that newly listed firms on Borsa Istanbul are subject to speculative trading and investor overreaction. However, the eventual convergence of prices towards fundamental values aligns with theoretical expectations, underscoring the self-correcting nature of financial markets. From a regulatory perspective, these findings highlight the importance of enhancing disclosure requirements and transparency during the IPO process to improve market efficiency. For investors, the presence of short-term pricing anomalies may signal lucrative trading opportunities, but it also underscores the need for caution, as profits from IPO speculation are not guaranteed to persist. Overall, the study sheds light on the dynamic nature of IPO pricing in emerging markets, offering valuable insights for policymakers, investors, and academics alike.

Implications

The implications of this study are manifold. For policymakers and regulatory bodies, the evidence of short-term pricing anomalies shows a need for more stringent disclosure requirements and possibly a review of the IPO processes to enhance market transparency and efficiency. For investors, the findings highlight the potential for gains from short-term investments in IPOs, although such strategies require careful analysis of market conditions and individual IPO characteristics. For academics, this study enriches the existing literature on market efficiency and provides a basis for further scholarly discussion on the unique aspects of emerging markets. Ultimately, these insights could guide the development of more sophisticated financial models and investment strategies that better reflect the realities of the IPO market.

Limitations

This study, while providing valuable insights into IPO pricing anomalies in Borsa Istanbul, is not without its limitations. First, the analysis was confined to a single year and a specific emerging market, which may limit the generalizability of the findings. Additionally, the sample size of 39 firms, although sufficient for initial observations, is relatively small and might not capture the full spectrum of market behaviours. Furthermore, the reliance on public data limits the ability to account for private negotiations and insider information that could significantly impact IPO pricing. These factors should be considered when interpreting the results of this study.

Further Research

Given the limitations noted, further research is essential to deepen and broaden the understanding of IPO pricing anomalies. Future studies could expand the timeframe of the analysis to include multiple years and different market conditions to test the consistency of the observed anomalies. Additionally, increasing the sample size and including different markets would enhance the robustness and applicability of the findings. Investigating the role of regulatory frameworks and their impact on IPO performance across various jurisdictions could also provide significant insights. Moreover, qualitative studies focusing on the decision-making processes of investors and underwriters during IPOs could complement the quantitative data, offering a more holistic view of the market dynamics.

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