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BIST Teknoloji (XUTEK) Endeksinde Halka Arz Edilen Firmaların Etkisinin Olay Çalışması Yöntemi ile İncelenmesi

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Özet

Bu çalışma, BIST Teknoloji sektöründe halka arz edilen firmaların endeks üzerindeki etkisinin tespiti amacıyla gerçekleştirilmiştir. Bu sayede yatırımcıların gelecekteki yatırım kararlarında daha bilinçli ve etkili stratejiler geliştirmelerine katkıda bulunulması hedeflenmiştir. 2021 ve 2022 yıllarında BIST Teknoloji endeksinde halka arz edilen 12 işletmeye odaklanılarak, halka arz tarihleri olay günü olarak kabul etmiştir. Endeks getirileri ile bu tarihler arasındaki ilişki Olay Çalışması yöntemiyle analiz edilerek değerlendirilmiştir. Analiz sonucunda, özellikle 2022 yılında halka arz edilen işletmelerin endeks getirileri üzerinde belirgin bir etkisi olduğu ve bu dönemde anormal getiri sayısının yüksek olduğu tespit edilmiştir. Bu durum, halka arz süreçlerinin ve teknoloji sektöründeki gelişmelerin sermaye piyasaları üzerindeki etkisinin daha iyi anlaşılmasına yardımcı olmaktadır.

Anahtar Kelimeler

Halka Arz
Pay Piyasası
Olay Çalışması
BIST Teknoloji Endeksi

Makale Hakkında

Geliş Tarihi: 10.05.2023
Yayın Tarihi: 28.12.2023
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Investigating the Impact of IPOs on the BIST Technology (XUTEK) Index Using the Event Study Method

Abstract

This study has been conducted to identify the impact of publicly offered companies in the BIST Technology sector on the index. The aim is to contribute to the development of more informed and effective strategies for investors in their future investment decisions. Focusing on 12 businesses that went public on the BIST Technology index in 2021 and 2022, their initial public offering (IPO) dates have been considered as event days. The relationship between index returns and these dates has been evaluated through an Event Study methodology. The analysis has revealed that, particularly in 2022, IPOs of businesses had a significant impact on index returns and the number of abnormal returns during this period was high. This finding helps to better understand the influence of IPO processes and developments in the technology sector on capital markets.

Keywords

Public Offering
Equity Market
Event Study
BIST Technology Index

About Article

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Introduction

The financial system involves units that supply and demand funds, assets, and institutions. The system facilitates the transformation of savings into investments and meets the needs for funds and money transfers (Korkmaz & Ceylan, 2017). Various classifications can be made in the markets within the financial system. These classifications include money-capital markets, primary-secondary markets, spot-futures markets, organized-unorganized markets, and debt-equity markets. Markets are classified based on different criteria, such as maturity, market type, institutional level, risk tolerance, and borrowing type (Ceylan & Korkmaz, 2017).

Numerous factors influence investors' decisions. Markowitz (1952) introduced the concepts of expected return and risk, which investors consider when making investment decisions. The expected return concept represents the amount targeted by investors. Risk is defined as the probability of adverse outcomes occurring. Financial risk is the likelihood of not achieving the expected return (Altay, 2015). Personal risk classifications, such as risk-averse, risk-neutral, and risk-loving investors, affect investors, leading to variations in asset purchasing. Another distinction was made by Fama (1970), who introduced the Efficient Market Hypothesis. Markets are classified according to their efficiency levels, and it is argued that there are three types: weak, semi-strong, and strong. In strong markets, it is impossible to achieve above-average returns.

Initial public offerings (IPOs) are a company selling its shares to investors and trading them in securities markets. Companies that go public can do so for various reasons. The most common reasons for IPOs include raising funds for large investment expenditures, improving the health of the existing financing structure by increasing working capital, meeting liquidity needs, and benefiting from the perceived prestige of trading in securities markets. In addition to these objectives, the increasing number and size of publicly-traded companies contribute to the capital market's main benefits, such as capital dispersion and financial inclusion, which are considered highly significant for national economies.

Academic literature increasingly features studies investigating the impact of IPOs on the stock performance of companies operating in the same sector and already trading in securities markets. The primary reason for this impact may be the competitive effects of newly publicly-traded companies on existing companies. Furthermore, the newly included company may affect other firms' market shares and performances in the sector. This effect will likely be more pronounced in domestic goods and services production sectors.

This study aims to determine the effects of newly publicly-traded companies in the Borsa Istanbul Technology sector on the BIST Technology Index. In this context, 12 IPOs that occurred in the BIST Technology sector in 2021 and 2022, when IPOs were prevalent in Borsa Istanbul, were included in the study. The event window method was used to investigate the impact of these sector firms on the index.

In this study, the findings on the effects of publicly offered firms on the index will assist investors, companies, and policymakers in their analyses and strategic decision-making processes. The event window method employed in this study permits an analysis of the effect of public offerings on the BIST Technology Index. The event window method analyzes the performance of a stock over a specific time frame. It allows for the evaluation of changes in the index's performance prior to and after the initial public offering, taking into account the relevant event. This method is thus a practical method for measuring the speed and magnitude

of the impact of initial public offerings on sector and index performance. This study ultimately aims to contribute to a better understanding of the impact of initial public offerings on index performance. The analyses conducted using the event window method will aid in revealing the evolution of the effects of public offerings on sector firms over time and the sector-specific variation of these effects. Introduction, literature review, data, methodology, findings, discussion, and conclusion are included in the study. The introduction describes finance, the financial system, and public offerings. In the literature review part, national and international studies conducted with public offerings and event studies are listed, and information about the studies' objectives, methods, and results is provided. The event study method is described in the data, methodology, and findings section, and the data obtained from the analysis are reported and evaluated. In the discussion and conclusion section, inferences and recommendations are made.

Literature Review

In a study investigating the efficiency of public offerings (Ritter & Welch, 2002), the increasing popularity and development of public offerings over time were examined, and the effects of public offering pricing and allocation policies on stock demand were investigated. Additionally, the study included an analysis of the stock performance of publicly offered firms and investor reactions. Similarly, a study examining the changes in the pricing of public offerings (Loughran & Ritter, 2004) determined that public offerings were priced significantly lower from the 1980s to the early 2000s. It was emphasized that the changes in the rules and regulations governing the public offering process had significant effects on the high-risk and uncertainty-prone technology sector firms.

Pastor and Veronesi (2005), in their study on the United States, investigated the factors affecting the cyclical fluctuations of public offerings. According to their results, economic growth, technological advancements, and industrial innovations influenced cyclical movements in public offerings. Both investors and firms made information-based decisions according to their future expectations.

Braun and Larrain (2009) investigated the effects of IPOs on other stocks in a study conducted in 22 developing countries involving 254 IPOs. The authors tested the limited information theory, portfolio effect theory, and market expansion theories, respectively, for this purpose. The results showed that an IPO positively affected other stock prices in emerging markets. Investors took advantage of this opportunity to increase the prices of other stocks in their portfolios. In addition, the success of an IPO led to market expansion, which also affected the prices of other stocks.

Küçükkocaoğlu and Alagöz (2009) conducted a study to determine which of the public offering methods is effective. In the study, analyzes were carried out with the data between 1993 and 2005. As a result of the study, the results were obtained according to the public offering methods and evaluations were made.

Tükel (2011) aimed to test the relationship between the underpricing of stocks and their long-term performance on companies going public on the Istanbul Stock Exchange. Forty-two

stocks between 2000-2007 were tested. The study found that the increase in cumulative abnormal returns continued the advantage gained through underpricing in the long term.

Kaderli (2016) conducted a study to test the performance of returns on shares issued due to medium- and long-term IPOs. The event study method was applied, and data from 2010-2014 were obtained. The study concluded that the IPO return performance was poor.

Shi, Sun, and Zhang (2018) examined the effect of IPOs on market prices in the Chinese market in their study. They analyzed data from 1,754 IPOs conducted between 2000-2014, and their findings indicated that new IPOs generally had a negative impact on existing stock prices. The reasons for this include an increase in supply. At the same time, the total number of investors in the capital market remains constant, investors selling their existing shares to create funds to participate in the IPO, and changes in investor risk perceptions due to increased information asymmetry.

Liv et al. (2018) found that IPO announcements for China between 2004-2014 had a negative impact on the relevant stock prices, in parallel with the expectation-based downward-sloping demand curve hypothesis. The authors also noted that IPO announcements shaped the expectation of changes in the supply-demand balance, thereby affecting stock prices without actual transactions.

Sezgin and Aytekin (2020) examined the effect of share sales, which were kept ready for sale after the initial public offering, on share returns. In the study, the companies whose shares were kept ready for sale between the years 2013-2020 were taken as a sample and the analysis was carried out with the Event Study method. As a result of the study, it was stated that the effect of the sales of ready-made shares is positive, but long-term positive returns will not be obtained.

Çömlekçi et al. (2021) conducted a study to analyze companies' short- and long-term performance going public. Data from 126 companies between 2010-2019 were analyzed using the event study method. The study found evidence that investing on the first trading day would generate abnormal returns.

Avcı (2021), in a study investigating the sectoral effects of IPOs in Turkey, used data from 76 IPOs conducted between 2010-2018. The results indicated that introducing a new company to the securities market did not significantly impact the stock returns of existing competitors.

Bayraktar, Yetim and Koy (2022) conducted a study to identify the volatility effect of IPOs on the BIST index before and during Covid-19. The study used 36 IPOs and conducted an analysis using the GARCH model. The study concluded by interpreting the increase and decrease in volatility before and after Covid-19.

Arslan and Göçmen Yağcılar (2022) conducted a study to evaluate the performance of energy companies' IPOs. The event study method analyzed data from 18 energy companies between

2010-2022. As a result, no generalization could be made based on the sector, and no evidence was found to guide investors toward sector-based investments.

In a study by Henry (2022), data from 5,875 IPOs between 1985 and 2011 were included in the analysis. The findings revealed no significant differentiation in the 2- and 3-year sales growth figures and Tobin's Q values of the respective competitor firms after the IPOs. It was also emphasized that the performance of the competitor firms was independent of the amount raised in the IPO.

Looking at a general assessment of the literature, it is observed that the majority of studies focus on the analysis of price movements after the IPOs. Research on the performance of companies operating in similar sectors after the IPO in different countries reveals quite different results due to both the different periods covered and the differentiation of country-specific financial regulations. Although it is mainly stated that a newly occurring IPO adversely affects the stock performance of competitor companies in the relevant sector, there are also studies in which it is reported that this effect is positive, and no significant relationship is detected. This situation indicates that the IPO process and its effects significantly differ between companies and sectors. However, other important factors, such as pre-IPO and approval processes, should also be examined. In particular, analyzing the effects on stock prices from the beginning of the IPO process and the potential information signals can help us reach more comprehensive and robust conclusions.

Data, Methodology, and Findings

The study measured the impact of businesses operating in the BIST Technology sector that went public between 2021 and 2022 on the index. In this context, whether abnormal returns were obtained by comparing the IPOs with the index was tested. As of May 2023, 31 businesses operate in the BIST Technology sector. During the period considered, 12 IPOs were carried out. The reason for selecting the period between 2021 and 2022 is the increase in equity investors and the market value of securities. The reason for choosing the BIST Technology sector is to observe the competition arising from both technological developments and the impact of globalization at the sectoral level.

In the study, the IPO start date of the 12 public enterprises was accepted as the event day, and the analysis was carried out using the Event Study Method. The reason for choosing the Event Study method as the analysis method is the detection of abnormal returns, which is the aim of the article, and the frequent use of the method in the literature. With the Event Study method, the selected day is handled independently of the events that occur and the effect of the relevant event is seen. In this study, since the effect of the public offering day was desired to be determined, this method was used and the effect of the public offerings in the sector was measured, and determinations were made.

The information about the businesses included in the analysis and the IPO dates is presented in Table 1.

Table 1. BIST Technology Sector Initial Public Offerings (2021-2022)

RANK	CURRENT CODE	CURRENT NAME	INITIAL PUBLIC OFFERING DATE
1	MTRKS	MATRIKS BILGI DAGITIM HIZMETLERI A.Ş.	30.03.2021
2	PENTA	PENTA TEKNOLOJI URUNLERI DAGITIM TICARET A.Ş.	06.05.2021
3	ATATP	ATP TICARI BILGISAYAR AGI VE ELEKTRIK GUC KAY.URT.PAZ.VE TIC. A.Ş.	27.05.2021
4	EDATA	E-DATA TEKNOLOJI PAZARLAMA A.Ş.	29.06.2021
5	VBTYZ	VBT YAZILIM A.Ş.	05.07.2021
6	MANAS	MANAS ENERJI YONETIMI SANAYI VE TICARET A.Ş.	13.07.2021
7	MIATK	MIA TEKNOLOJI A.Ş.	15.11.2021
8	MOBTL	MOBILTEL ILETISIM HIZMETLERI SANAYI VE TICARET A.Ş.	18.11.2021
9	HTTBT	HITIT BILGISAYAR HIZMETLERI A.Ş.	23.02.2022
10	OBASE	OBASE BILGISAYAR VE DANISMANLIK HIZMETLERI TIC. A.Ş.	28.07.2022
11	AZTEK	AZTEK TEKNOLOJI URUNLERI TICARET A.Ş.	10.08.2022
12	SDTTR	SDT UZAY VE SAVUNMA TEKNOLOJILERI A.Ş.	28.12.2022

Source: (Public Disclosure Platform, 2023)

The Event Study method used in this research is a method that emerged from the study conducted by Dolley (1933) and is based on the Efficient Market Hypothesis. The Event Study is applied to observe an event's impact on asset prices and returns on any given date. If the event that occurred causes abnormal returns on the index, sector, or asset, then comments are made on the market's efficiency based on this assumption. Observing the market movements based on the relevant event provides significant advantages for understanding the event's strength and the response of the assets.

There are three-time dimensions in the Event Study method. These dimensions are expressed as the estimation window, event window, and post-event window (Beninga, 2008). The method, which is used in many academic studies, is applied with data from 10 days before and ten days after the event day, and it is also applied by taking 252-day returns outside of this data. Within the scope of the study, each IPO in the BIST Technology sector was considered the event day, and the returns of the BIST 100 as the market portfolio were calculated and analyzed.

The hypotheses formed and tested within the scope of the research are as follows.

⇒ H_0: IPOs in the BIST Technology sector do not significantly affect the BIST Technology index.

⇒ H_1: IPOs in the BIST Technology sector significantly affect the BIST Technology index.

The Event Study method is carried out with the steps and equations below (Bartholdy et al., 2006; Seans & Sandoval, 2005; Tuominen, 2005; Sakarya, 2011; Çömlekçi et al., 2021).

Step 1

$$AR_{it} = R_{it} - R_{mt} \quad \textbf{(1)}$$

In Equation 1, actual returns for each business are subtracted from market returns, and abnormal returns are calculated. The values R_{it} and R_{mt} in the equation are calculated in Equations 2 and 3, respectively.

$$R_{it} = (P_{it} - P_{it-1})/P_{it-1} \quad \textbf{(2)}$$

$$R_{mt} = (I_t - I_{t-1})/I_{t-1} \quad \textbf{(3)}$$

In the equations, the indicator P_{it} represents the closing value of the stock, and I_t represents the closing value of the index.

Step 2

$$AAR_{it} = \sum_{i=1}^{N} (1/N)\, AR_{it} \quad \textbf{(4)}$$

In the second step of the Event Study, abnormal returns are divided by the number of companies to obtain the Average Abnormal Return (AAR). The Average Abnormal Return (AAR) calculation is in Equation 4.

Step 3

$$CAR_{it} = \sum_{i=1}^{N} AAR_{it} \quad \textbf{(5)}$$

Cumulative Abnormal Returns (CAR) are calculated in the final step of the method. The relevant formula is in Equation 5.

The Event Study method was applied by taking the IPO days of 12 companies operating in the BIST Technology sector as the event days. In the study, the returns of the BIST Technology sector and the BIST 100 Index were calculated and subjected to analysis. The obtained data were analyzed by calculating returns from the prices obtained separately for each company ten days after the IPO day and 262 days before. The data were obtained from Investing.com. The application results are shown separately. Reporting was conducted in the order of the IPO dates. Since each company's event day was different in the study, the analysis results were also presented on a company basis. The event days were given with the company names to clarify the presentation, aiming for a clear display. The company names represent the event day, and the abnormal returns indicate the index effect. Table 2 presents the analysis results related to the MTRKS IPO event.

Table 2. MTRKS-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	-0,00850	-0,00850	-0,64837	**1**	0,00890	-0,01050	0,67738
-9	-0,01260	-0,02110	-0,95888	**2**	0,00080	-0,00970	0,06306
-8	-0,00060	-0,02170	-0,04780	**3**	0,01190	0,00220	0,90237
-7	-0,00480	-0,02650	-0,36452	***4***	***0,02500***	***0,02710***	***1,89930******
-6	0,00560	-0,02090	0,42938	**5**	0,00470	0,03180	0,35719
-5	0,01570	-0,00520	1,19502	**6**	0,00350	0,03530	0,26696
-4	0,00180	-0,00340	0,13877	**7**	-0,01080	0,02450	-0,82304
-3	0,00580	0,00240	0,44063	**8**	-0,00300	0,02150	-0,22989
-2	-0,01140	-0,00900	-0,86923	**9**	-0,00570	0,01580	-0,43188
-1	0,00130	-0,00770	0,09773	**10**	-0,00980	0,00600	-0,74543
0	-0,01170	-0,01940	-0,89031				

The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels.

Table 2 includes the results of the Event Study analysis conducted as a result of the MTRKS company's IPO. Upon examining the results, a finding of positive abnormal return on the fourth day after the event is observed. The AR and CAR values can be seen in Figure 1.

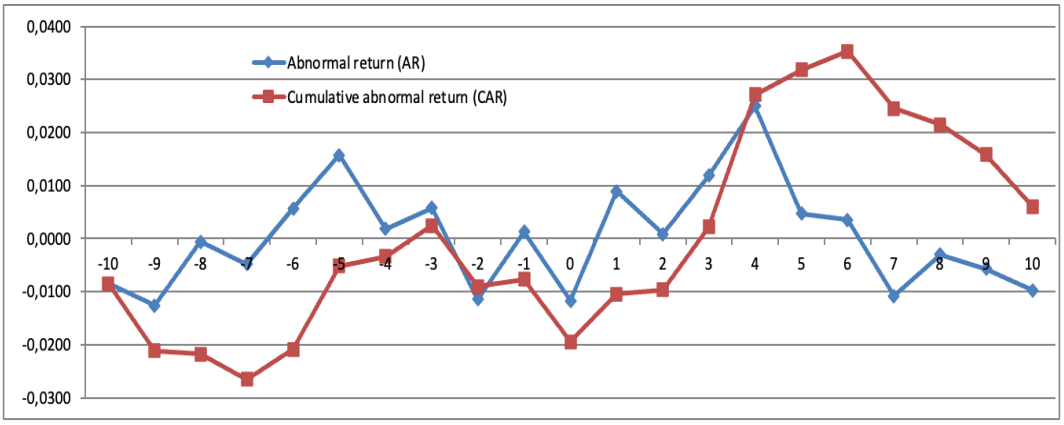

Figure 1. MTRKS-AR and CAR Values

The analysis results for PENTA IPO event are presented in Table 3.

Table 3. PENTA-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	-0,00620	-0,00620	-0,50321	**1**	-0,00190	-0,01600	-0,15717
-9	0,00470	-0,00150	0,37774	**2**	-0,01240	-0,02840	-1,00432
-8	-0,00030	-0,00180	-0,02159	**3**	-0,00710	-0,03550	-0,57744
-7	0,01860	0,01680	1,51197	**4**	-0,00170	-0,03720	-0,13826
-6	-0,01730	-0,00040	-1,39984	**5**	0,00740	-0,02980	0,60357
-5	0,00000	-0,00050	-0,00299	**6**	0,00000	-0,02980	-0,00404
-4	0,01040	0,01000	0,84669	**7**	-0,00170	-0,03150	-0,13739
-3	-0,00020	0,00970	-0,01847	**8**	-0,00240	-0,03400	-0,19849
-2	-0,00680	0,00300	-0,54775	**9**	0,00180	-0,03220	0,14244
-1	0,00380	0,00680	0,30664	**10**	-0,00610	-0,03830	-0,49394
0	***-0,02090***	***-0,01410***	***-1,692017******				

The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels.

The analysis results for the PENTA company are shown in Table 3. A conclusion of negative abnormal return on the event day is obtained upon examining the table. The AR and CAR values for the PENTA company can be found in Figure 2.

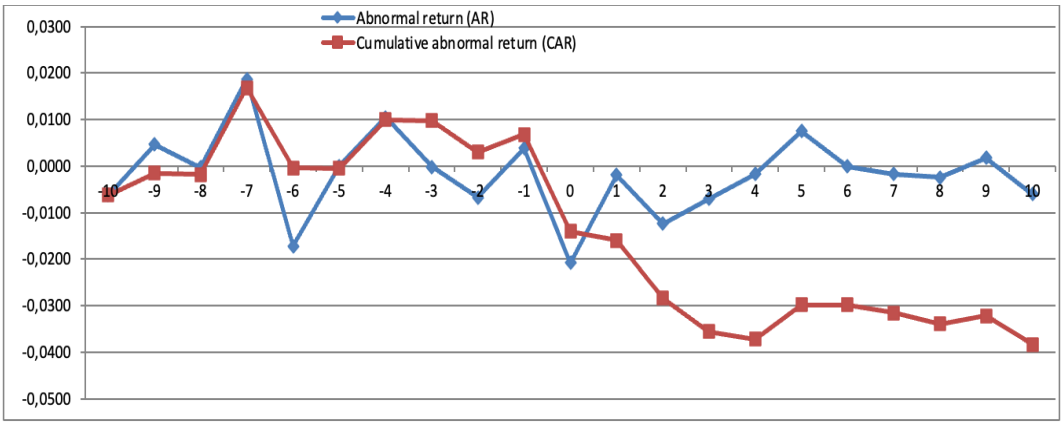

Figure 2. PENTA -AR and CAR Values

The analysis results for ATATP IPO event are presented in Table 4.

Table 4. ATATP-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	-0,01220	-0,01220	-1,00216	**1**	-0,01240	-0,03320	-1,01967
-9	-0,00690	-0,01900	-0,56491	**2**	-0,01320	-0,04640	-1,09105
-8	-0,00150	-0,02050	-0,11972	**3**	0,00330	-0,04310	0,27337
-7	0,00770	-0,01280	0,63269	**4**	0,00480	-0,03830	0,39597
-6	0,00020	-0,01260	0,01585	**5**	-0,00350	-0,04180	-0,29196
-5	-0,00140	-0,01400	-0,11826	**6**	0,00110	-0,04070	0,09208
-4	-0,00220	-0,01620	-0,18147	**7**	0,00160	-0,03910	0,13240
-3	0,00200	-0,01420	0,16520	**8**	0,00340	-0,03570	0,27860
-2	-0,00580	-0,02000	-0,47655	**9**	-0,00200	-0,03780	-0,16725
-1	-0,00300	-0,02300	-0,24580	**10**	0,01060	-0,02720	0,87221
0	0,00220	-0,02080	0,18044				

Table 4 presents the analysis results of the Event Study method conducted as a result of the ATATP company's IPO. The analysis results reveal no abnormal returns ten days before and after the event. The AR and CAR values for the ATATP company can be found in Figure 3.

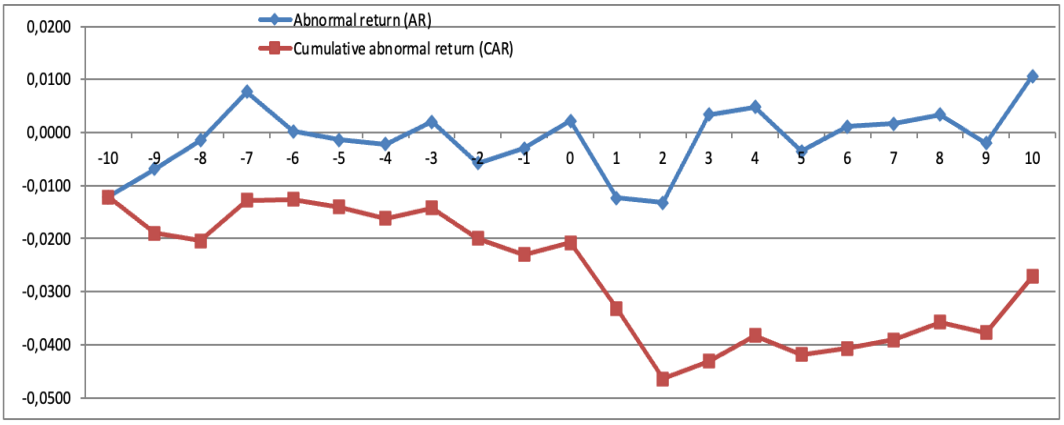

Figure 3. ATATP -AR and CAR Values

The analysis results for the EDATA IPO event are presented in Table 5.

Table 5. EDATA-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	-0,00160	-0,00160	-0,14008	**1**	-0,00790	0,00220	-0,67702
-9	-0,00450	-0,00620	-0,38812	**2**	0,00250	0,00470	0,21130
-8	-0,00170	-0,00790	-0,14654	**3**	0,00000	0,00480	0,00313
-7	0,01130	0,00340	0,96571	**4**	0,00490	0,00960	0,41829
-6	0,00090	0,00430	0,07487	**5**	-0,00230	0,00730	-0,20129
-5	-0,00200	0,00230	-0,17157	**6**	0,00570	0,01300	0,48924
-4	0,00430	0,00660	0,36991	**7**	0,01020	0,02320	0,87561
-3	0,00070	0,00730	0,05739	**8**	-0,00910	0,01410	-0,77812
-2	-0,00030	0,00690	-0,02871	**9**	-0,01170	0,00240	-1,00294
-1	-0,00120	0,00570	-0,10255	**10**	-0,00580	-0,00340	-0,49531
0	0,00440	0,01010	0,37957				

The EDATA company's IPO analysis results are shown in Table 5. Upon examining the table, no abnormal returns are observed. The AR and CAR values obtained from the analysis of the company's data can be found in Figure 4.

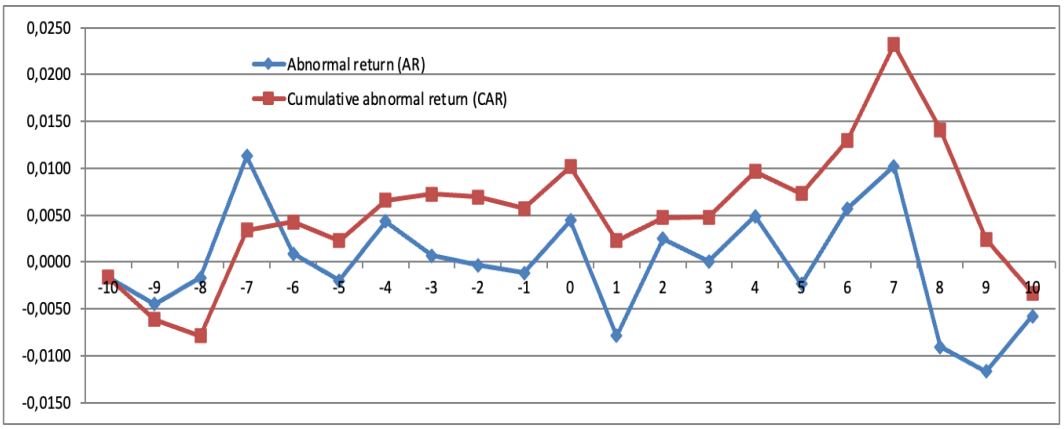

Figure 4. EDATA-AR and CAR Values

The analysis results for the VBTYZ IPO event are presented in Table 6.

Table 6. VBTYZ-Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	0,00080	0,00080	0,07228	**1**	-0,00240	0,00320	-0,20985
-9	-0,00200	-0,00120	-0,17354	**2**	0,00570	0,00880	0,48775
-8	0,00420	0,00310	0,36343	**3**	0,01010	0,01890	0,86710
-7	0,00060	0,00370	0,05505	**4**	-0,00910	0,00980	-0,78322
-6	-0,00050	0,00320	-0,03955	**5**	-0,01180	-0,00200	-1,01681
-5	-0,00130	0,00190	-0,11353	**6**	-0,00590	-0,00790	-0,50461
-4	0,00440	0,00630	0,37489	**7**	0,00510	-0,00280	0,43414
-3	-0,00800	-0,00170	-0,68832	**8**	0,01100	0,00810	0,94422
-2	0,00250	0,00070	0,21187	**9**	0,01530	0,02340	1,31309
-1	0,00000	0,00070	-0,00069	**10**	0,00250	0,02600	0,21858
0	0,00490	0,00560	0,41909				

Table 6 presents the analysis results related to the VBTYZ company's IPO event. Upon examining the results, a finding of no abnormal returns is obtained. The AR and CAR values for the company can be found in Figure 5.

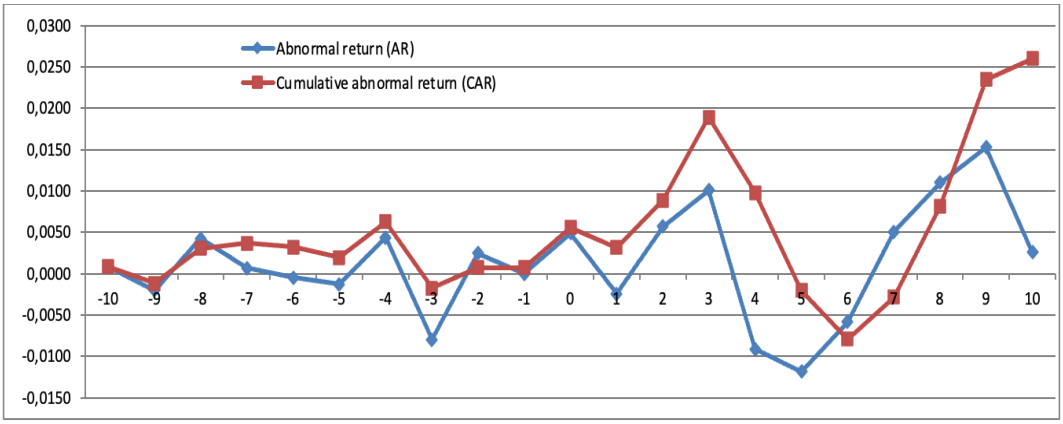

Figure 5. VBTYZ -AR and CAR Values

The analysis results for the MANAS IPO event are presented in Table 7.

Table 7. MANAS-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	0,00420	0,00420	0,36514	**1**	0,00480	-0,00670	0,41708
-9	-0,00810	-0,00390	-0,70512	**2**	0,01080	0,00410	0,94177
-8	0,00220	-0,00170	0,19376	**3**	0,01520	0,01930	1,31763
-7	-0,00020	-0,00190	-0,01665	**4**	0,00240	0,02160	0,20740
-6	0,00460	0,00280	0,40359	**5**	0,00070	0,02240	0,06163
-5	-0,00260	0,00020	-0,22321	**6**	0,00250	0,02490	0,22132
-4	0,00550	0,00570	0,47586	**7**	-0,00670	0,01820	-0,58024
-3	0,01000	0,01570	0,86862	**8**	0,00290	0,02110	0,25234
-2	-0,00930	0,00640	-0,80853	**9**	0,01550	0,03670	1,35099
-1	-0,01190	-0,00550	-1,03519	**10**	0,00230	0,03900	0,20277
0	-0,00600	-0,01150	-0,52119				

Table 7 displays the analysis results for the MANAS company. Upon examining the results, no abnormal return effect from the IPO is found. The AR and CAR values for the company can be found in Figure 6.

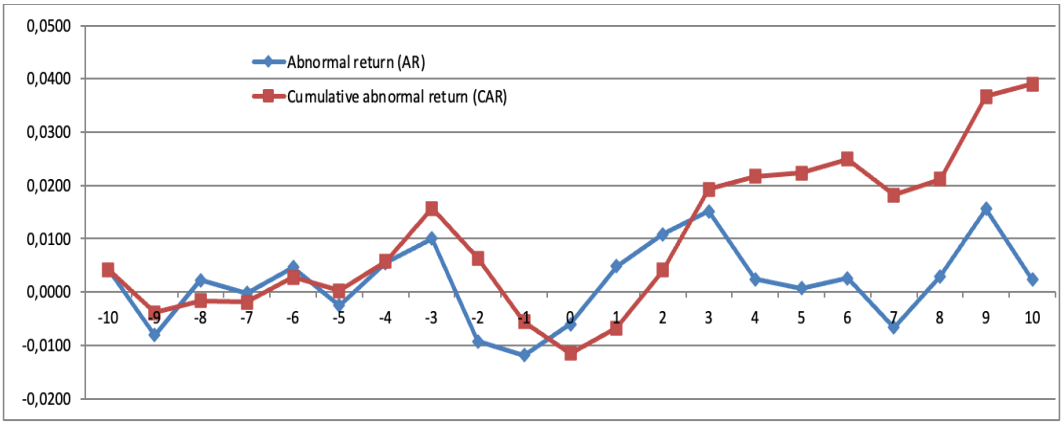

Figure 6. MANAS -AR and CAR Values

The analysis results for the MIATK IPO event are presented in Table 8.

Table 8. MIATK-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	-0,00220	-0,00220	-0,25993	**1**	-0,00590	-0,08070	-0,69472
-9	-0,00850	-0,01070	-1,00088	**2**	0,00110	-0,07950	0,13435
-8	-0,00900	-0,01970	-1,06934	**3**	0,00200	-0,07760	0,23252
-7	-0,00050	-0,02020	-0,06076	***4***	***0,01960***	***-0,05790***	***2,321079****
-6	-0,00660	-0,02680	-0,78474	**5**	0,00840	-0,04950	0,99821
-5	0,00150	-0,02530	0,18231	**6**	0,00980	-0,03970	1,15557
-4	-0,00200	-0,02730	-0,23955	***7***	***0,04470***	***0,00490***	***5,282509****
-3	***-0,01440***	***-0,04180***	***-1,708863******	***8***	***0,02100***	***0,02590***	***2,479564****
-2	-0,00390	-0,04570	-0,46713	***9***	***0,02640***	***0,05230***	***3,120665****
-1	-0,00920	-0,05490	-1,08618	***10***	***0,04060***	***0,09280***	***4,802562****
0	***-0,01990***	***-0,07480***	***-2,35345****				

The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels.

The MIATK company's IPO analysis results, considered the event day, are available in Table 8, and abnormal returns are observed on seven days due to the IPO. A finding of negative abnormal returns on the third day before the event and the event day and positive abnormal returns on the 4th, 7th, 8th, ninth, and 10th days after the event is obtained. The AR and CAR values can be found in Figure 7.

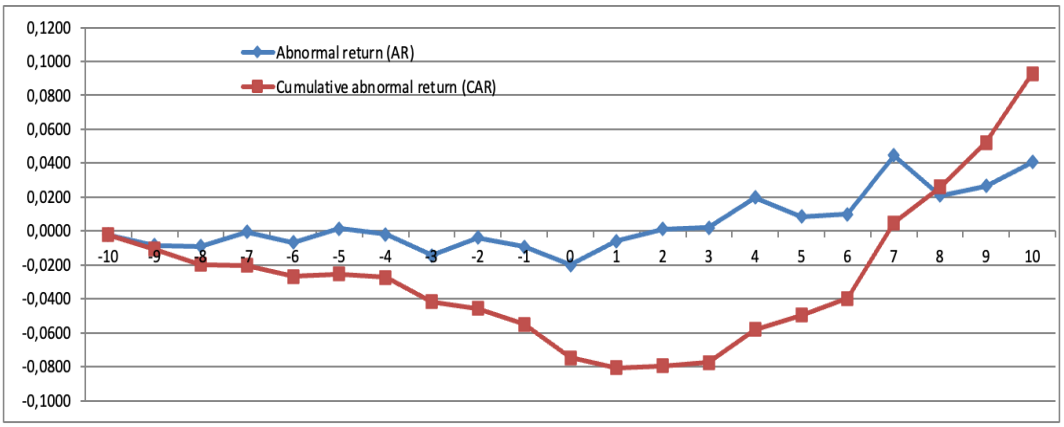

Figure 7. MIATK -AR and CAR Values

The analysis results for the MOBTL IPO event are presented in Table 9.

Table 9. MOBTL-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	-0,00020	-0,00020	-0,02403	***1***	***0,01970***	***-0,03580***	***2,364228****
-9	-0,00650	-0,00670	-0,77833	**2**	0,00870	-0,02710	1,03793
-8	0,00180	-0,00490	0,21839	**3**	0,01010	-0,01710	1,20662
-7	-0,00190	-0,00680	-0,22636	***4***	***0,04490***	***0,02780***	***5,39039****
-6	***-0,01430***	***-0,02110***	***-1,715221*****	***5***	***0,02110***	***0,04890***	***2,530316****
-5	-0,00390	-0,02490	-0,46289	***6***	***0,02620***	***0,07510***	***3,138825****
-4	-0,00900	-0,03390	-1,07919	***7***	***0,04090***	***0,11600***	***4,907635****
-3	***-0,01930***	***-0,05320***	***-2,319037****	**8**	-0,01360	0,10240	-1,63363
-2	-0,00590	-0,05920	-0,70964	***9***	***-0,01850***	***0,08390***	***-2,216139****
-1	0,00140	-0,05780	0,16524	**10**	0,00000	0,08390	-0,00529
0	0,00230	-0,05550	0,27187				

The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels.

The MOBTL company's Event Study analysis results can be found in Table 9. Upon examining the results, negative and positive abnormal returns are observed on eight days. Evaluating the obtained findings, negative abnormal returns are identified on the third and sixth days before the event, positive abnormal returns on the 1st, 4th, 5th, 6th, and seventh days after the event, and a negative abnormal return on the ninth day. The AR and CAR values for the company can be found in Figure 8.

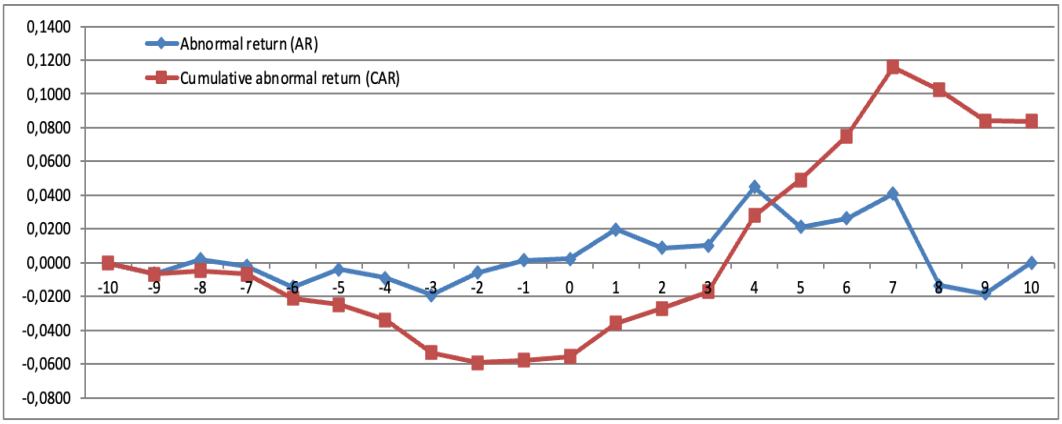

Figure 8. MOBTL-AR and CAR Values

The analysis results of the HTTBT IPO event are presented in Table 10.

Table 10. HTTBT-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	-0,01010	-0,01010	-1,06892	***1***	***-0,02050***	***-0,04920***	***-2,163626****
-9	-0,00940	-0,01950	-0,99115	***2***	***0,02170***	***-0,02740***	***2,299219****
-8	0,00670	-0,01270	0,71356	***3***	***0,03610***	***0,00870***	***3,819301****
-7	0,01030	-0,00250	1,08600	***4***	***0,03540***	***0,04410***	***3,745138****
-6	***-0,01600***	***-0,01850***	***-1,692252******	***5***	***-0,03250***	***0,01170***	***-3,430951****
-5	0,00830	-0,01020	0,87858	**6**	0,00580	0,01750	0,61630
-4	-0,00140	-0,01160	-0,14736	***7***	***0,02110***	***0,03860***	***2,231098****
-3	-0,00440	-0,01600	-0,46697	**8**	-0,00280	0,03580	-0,29955
-2	-0,00650	-0,02240	-0,68404	***9***	***0,02330***	***0,05910***	***2,463281****
-1	-0,00320	-0,02570	-0,34350	***10***	***-0,03480***	***0,02420***	***-3,680955****
0	-0,00300	-0,02870	-0,31979				

The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels.

The event study analysis results for the HTTBT company can be found in Table 10. Upon examining the table, abnormal returns are identified on nine days. Negative abnormal returns are observed on the sixth day before and on the 1st, 5th, and 10th days after the event; positive abnormal returns are found on the 2nd, 3rd, 4th, 7th, and ninth days after the event. The AR and CAR values for the company are shown in Figure 9.

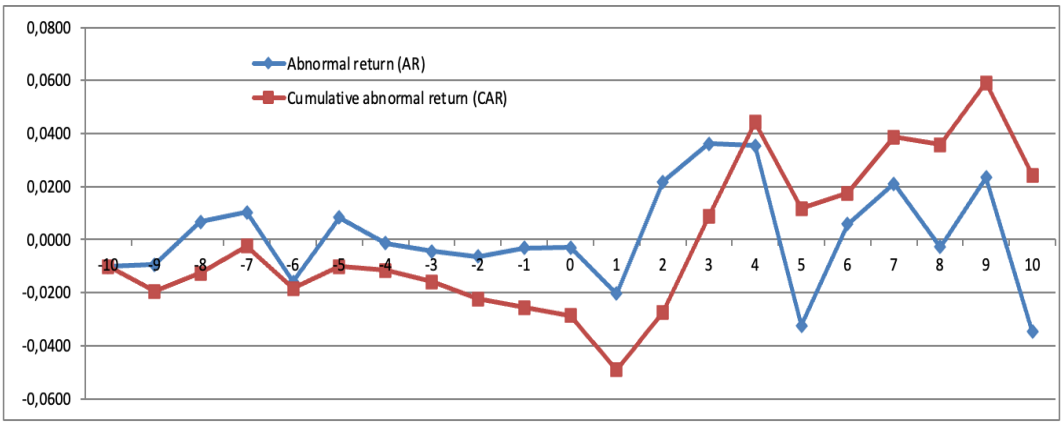

Figure 9. HTTBT-AR and CAR Values

The analysis results of the OBASE IPO event are presented in Table 11.

Table 11. OBASE-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	0,01580	0,01580	1,42537	**1**	-0,01390	-0,03180	-1,25268
-9	0,00210	0,01790	0,19240	**2**	-0,00250	-0,03430	-0,22923
-8	-0,01010	0,00780	-0,91060	**3**	-0,00980	-0,04410	-0,88194
-7	-0,01240	-0,00460	-1,11855	**4**	0,00100	-0,04310	0,08703
-6	-0,01140	-0,01590	-1,02616	**5**	-0,00510	-0,04820	-0,46084
-5	0,00840	-0,00750	0,75999	**6**	0,00030	-0,04790	0,02694
-4	0,00090	-0,00660	0,08293	**7**	0,00340	-0,04460	0,30329
-3	-0,00190	-0,00850	-0,16856	**8**	0,00540	-0,03910	0,49121
-2	-0,00250	-0,01090	-0,22429	**9**	-0,01360	-0,05280	-1,22924
-1	0,00010	-0,01090	0,00807	**10**	-0,01010	-0,06290	-0,91250
0	-0,00700	-0,01790	-0,63550				

Table 11 contains the event study analysis results for the OBASE company. Upon examining the analysis results, it is concluded that there are no abnormal returns on any day. The AR and CAR values for the OBASE company can be found in Figure 10.

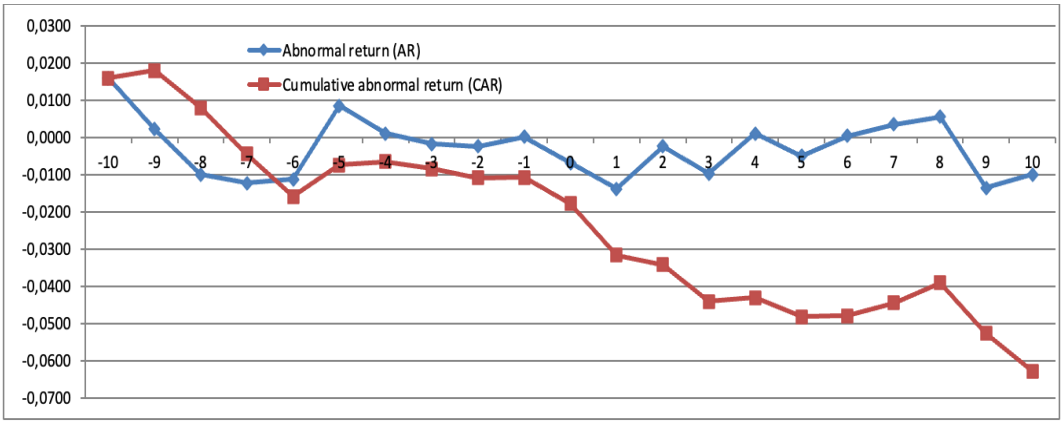

Figure 10. OBASE-AR and CAR Values

The analysis results of the AZTEK IPO event are presented in Table 12.

Table 12. AZTEK-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	0,00020	0,00020	0,02116	**1**	-0,00990	-0,04920	-0,89038
-9	-0,00690	-0,00670	-0,62621	**2**	0,01470	-0,03460	1,32462
-8	-0,01360	-0,02030	-1,22585	**3**	0,00210	-0,03250	0,18796
-7	-0,00220	-0,02240	-0,19600	***4***	***-0,03110***	***-0,06360***	***-2,81103*****
-6	-0,00970	-0,03210	-0,87581	**5**	-0,00860	-0,07220	-0,77500
-5	0,00120	-0,03090	0,11072	**6**	0,00880	-0,06340	0,79450
-4	-0,00480	-0,03570	-0,43727	**7**	-0,01060	-0,07400	-0,95910
-3	0,00050	-0,03520	0,04673	**8**	-0,00370	-0,07770	-0,33514
-2	0,00360	-0,03160	0,32940	**9**	-0,01240	-0,09010	-1,11943
-1	0,00550	-0,02610	0,49900	**10**	0,00770	-0,08240	0,69621
0	-0,01330	-0,03940	-1,20549				

The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels.

Table 12 presents the event study analysis results for the AZTEK company. The analysis results reveal a negative abnormal return on the fourth day after the event. The AR and CAR values for the company are shown in Figure 11.

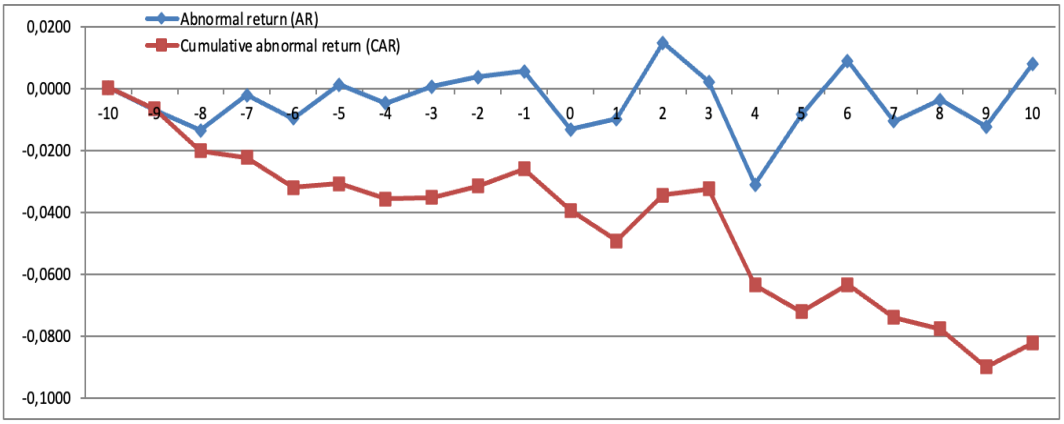

Figure 11. AZTEK-AR and CAR Values

The analysis results of the SDTTR IPO event are presented in Table 13.

Table 13. SDTTR-Event Study Analysis Results

Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test	Date	Abnormal Return (AR)	Cumulative Abnormal Return (CAR)	AR t-test
-10	0,00050	0,00050	0,03462	**1**	-0,00920	-0,04500	-0,67128
-9	-0,00280	-0,00230	-0,20545	***2***	***0,03190***	***-0,01310***	***2,32091*****
-8	-0,00230	-0,00460	-0,16403	**3**	0,00400	-0,00910	0,29070
-7	-0,01650	-0,02110	-1,20002	***4***	***0,03200***	***0,02280***	***2,323845*****
-6	0,01200	-0,00910	0,87391	***5***	***-0,02850***	***-0,00560***	***-2,072113*****
-5	-0,01880	-0,02790	-1,36963	**6**	-0,02210	-0,02780	-1,60779
-4	-0,01150	-0,03940	-0,83344	**7**	0,01210	-0,01570	0,87969
-3	-0,00810	-0,04750	-0,58823	**8**	-0,01720	-0,03290	-1,25062
-2	0,01670	-0,03080	1,21191	**9**	0,00710	-0,02570	0,51835
-1	-0,01030	-0,04110	-0,75117	***10***	***-0,03080***	***-0,05660***	***-2,242211*****
0	0,00530	-0,03580	0,38889				

The symbols *, **, and *** indicate statistical significance at the 1%, 5%, and 10% levels.

Table 13 contains the event study analysis results for the SDTTR company. Upon examining the table, abnormal returns are identified on four days. The table shows positive abnormal returns on the 2nd and 4th days after the event and negative abnormal returns on the 5th and 10th days after. The AR and CAR values for the SDTTR company can be found in Figure 12.

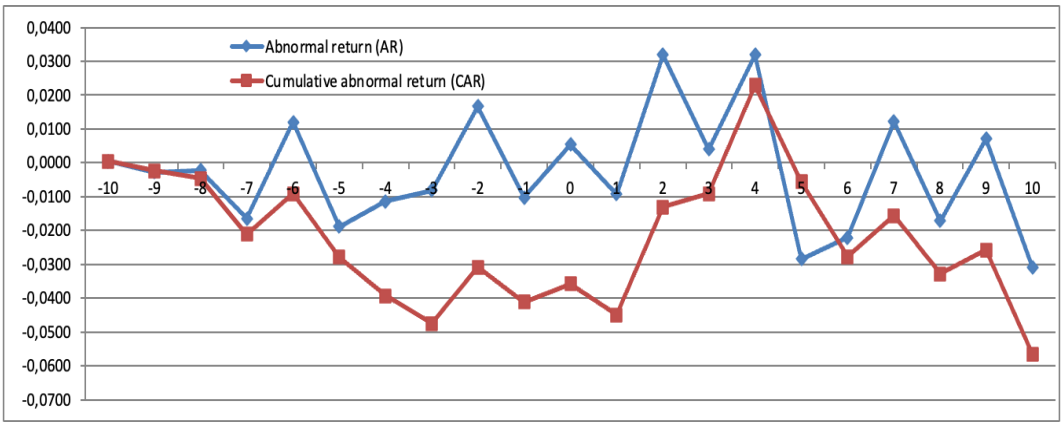

Figure 12. SDTTR -AR and CAR Values

Discussion and Conclusion

Financial investment instruments consist of assets that enable savings to be converted into investment opportunities. These assets are products that investors buy and sell as a result of evaluating the savings obtained with expected return and risk. Financial assets can be classified from various perspectives. Criteria such as maturity, amount, return, risk, and issuance form enable these classifications. Factors such as an individual's perception of risk, expected return rate, personality traits, psychological factors, and external influences are considered determinants of investment instruments preferences. A wide range of products can be found in the types of investment instruments, such as stocks, bonds, bills, warrants, real estate certificates, profit-loss partnership documents, derivative products, repos, reverse repos, deposits, and precious metals. Stocks traded in capital markets and have reached historically high numbers of investors and portfolio values, especially by the end of 2021 and 2022, bear risks due to their uncertain returns but possess a quality that can be preferred by investors aiming for high expected returns. Stocks serve as a company financing source and a return source for investors. Stocks traded in primary markets and offered to the public have maintained their preferable quality from the past to the present. Factors such as the desire for higher expected returns, easy trading in secondary markets, and the value guaranteed for a certain period increase the demand for publicly offered shares. Privileges such as becoming a partner in the company, receiving a share of the profit, voting and information rights, receiving a share from the liquidation balance, and preemptive rights are also considered privileges owned by stock investors. Stocks, considered securities preferred by risk-loving investors, are assets with uncertain returns. This return change appeals to investors' risk perceptions, thus increasing their preference. Additionally, whether the markets are weak, semi-strong, or strong form efficient also affects these returns.

This study examined the effect of the IPOs of companies operating in the BIST Technology sector on the same index. In this context, the IPO day of 12 companies that went public in 2021 and 2022 and operated in the BIST Technology sector was considered as the event day. This event day was taken separately for 12 companies, and the returns of the BIST Technology sector and the BIST 100 index, as the market portfolio, were obtained and analyzed. The Event Study method used in this analysis provides quantitative results by measuring abnormal returns. When evaluating the findings obtained, it was determined that the IPOs of 5 out of 12 companies did not generate abnormal returns, while the IPOs of 7 companies generated abnormal returns. IPOs with no abnormal returns are ATATP, EDATA, VBTYZ, MANAS, and OBASE. The IPOs generating abnormal returns are MTRKS, PENTA, MIATK, MOBTL, HTTBT, AZTEK, and SDTTR. Four of the eight companies that went public in 2021 and 3 of the four companies that went public in 2022 affected the BIST Technology index and generated abnormal returns.

Furthermore, the highest number of abnormal returns was observed in the analysis of the HTTBT company's IPO in 2022. Following HTTBT, the IPO with the highest abnormal returns is MOBTL, which went public at the end of 2021. Analyzing the results, the hypothesis "H0: IPOs in the BIST Technology sector do not significantly impact the BIST Technology index" was rejected. The hypothesis "H1: IPOs in the BIST Technology sector have a significant impact on the BIST Technology index" was accepted. In general, IPOs in the BIST Technology sector, especially at the end of 2021 and 2022, have affected the BIST Technology index and generated abnormal returns.

The study examined in detail the impact and importance of public offering in investment and capital markets, which play an important role in the functioning of financial processes and economic growth. In the study, while emphasizing the importance of the public offering in the capital markets, it provides a scientific basis for the impact of the companies offered to the public in the BIST Technology index on the market and assets. This study aims to contribute to improving the understanding of capital markets and public offering processes. In addition, it is a resource for investors, regulators and policy makers, evaluating the effects of public offerings in the technology sector on the index and the market, and providing important information in determining future public offering policies and strategies.

It is among the findings obtained from the study that the number of abnormal returns is higher in the companies that were offered to the public in the end of 2021 and 2022. This situation is thought to be related to the number of investors and portfolio value. According to Data Analysis Platform data, it is seen that there is a horizontal course in the number of investors in 2021 and it is stated that the number of investors exceeded the 3 million limits in November 2022. In addition, the increase in demand for public offerings and the trading volume of investors after the public offering affect abnormal returns. In the study, the determination of the abnormal returns of the companies offered to the public in the BIST Technology Index offers suggestions to both companies and investors for new public offerings. The importance of technological developments in almost every sector in globalizing conditions ensures that technology companies and their indices are at the forefront. For this reason, studies on companies with the index, which includes important developments, are important in terms of determining the efficiency of the market and investor perception. In future studies, it is offered as a suggestion to valuable researchers to carry out an analysis to determine the effect of public offerings on different indices and to evaluate the results in comparison with this study.

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