

IS IT POSSIBLE TO GET ABNORMAL RETURN UNDER THE ASSUMPTION OF CALENDAR ANOMALIES?**Assoc. Prof. Dr. Ersin Kanat, ersinkanat44@hotmail.com*****Abstract**

In this study, calendar anomalies, a topic that many researchers focus on, are examined. It is being investigated whether it is possible to obtain an abnormal return with the perception of anomaly in a market. For this reason, the Event Study method is used and the holiday effect anomaly is emphasized. Within the scope of the study, national and religious holidays in Turkey were discussed. In the study; daily data were used for the years 2017, 2018 and 2019. Thus, it has tried to determine whether there is a holiday anomaly could provide abnormal returns in Turkey. Sector-based research results do not reveal any important situation in other sectors except the service sector. In the service sector, it has been observed that abnormal returns are predominantly positive before national holidays and negative abnormal returns before religious holidays. Briefly, it is necessary to pay attention especially to the service sector around the holiday periods. In the near-holiday periods, there is an opportunity in order to obtain an extraordinary return from the service sector, as well as the sector risks more during these periods.

Keywords: Anomaly, Stock Market, Event Study, Abnormal Return, Holiday Effect.**TAKVİMSEL ANOMALİLERİN VARSAYIMI ALTINDA ANORMAL GETİRİ ELDE ETMEK MÜMKÜN MÜ?****Özet**

Bu çalışmada birçok araştırmacının üzerinde durduğu bir konu olan takvimsel anomaliler incelenmektedir. Bir piyasada anomali algısı ile normal üstü getiri sağlamanın mümkün olup olmayacağı araştırılmaktadır. Bu sebeple, Event Study yönteminden yararlanılmakta olup, tatil etkisi anomalisi üzerinde durulmaktadır. Araştırma kapsamında Türkiye'deki milli ve dini bayramlar ele alınmıştır. Çalışmada, 01.01.2017-31.12.2019 tarihlerini kapsayan günlük veriler kullanılmıştır. Böylelikle, Türkiye'de anormal getiri sağlayabilecek bir tatil anomalisi olup olmadığı tespit edilmeye çalışılmıştır. Sektör bazlı yapılan araştırma sonuçları, hizmet sektörü hariç diğer sektörlerde herhangi bir önemli durum ortaya koymamaktadır. Hizmet sektöründe ise milli bayramlar öncesi negatif, dini bayramlar öncesi ise pozitif anormal getirilerin meydana geldiği gözlenmiştir. Kısaca, dört ana sektörden birine yatırım yapılırken tatil dönemleri çevresinde özellikle hizmet sektörüne dikkat edilmesi gerekmektedir. Tatil dönemlerine yakın zamanlarda hizmet sektöründen normalüstü getiri elde etme imkânı olduğu gibi bu dönemlerde sektör, riski de daha fazla barındırmaktadır.

Anahtar Kelimeler: Anomali, Borsa, Event Study, Anormal Getiri, Tatil Etkisi.

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1. Introduction

Until recently, due to the Efficient market hypothesis put forward by Fama, it was thought that investors were acting rationally and that extraordinary earnings could not be obtained with accessible information (Fama, 1970). This view was the basis of traditional finance theories. However, over time, these methods have failed to explain some price movements. Therefore, modern financial theories have emerged. Modern financial theories include the assumption that, contrary to traditional theories, there may also be psychological effects on investment decisions and that not every investor can act rationally (Chandra, 2008). Today, such unexplained events in terms of price and returns can be interpreted especially with the help of behavioural finance.

Behavioral finance focuses on psychological and sociological factors that influence investors and claims that these factors will lead to different investor behavior. The aforementioned behavioral patterns consist of many patterns that can be observed in almost all people, such as overconfidence, avoidance of uncertainty, avoidance of harm, conservatism and herd behavior (Tetik at al., 2015: 37-40). The fact that these behavioral patterns can be observed by many investors occasionally causes irrational results in the markets.

Stock markets are sensitive markets that are affected by many issues such as economic, sociological and political. Therefore, risk and return should be taken into account when investing in these markets. In addition, the characteristics of the markets are also very important in investment decisions. In some markets, many irrational price movements can be observed, which can only be explained by investor psychologies. It can be seen that these difficult-to-explain events are constantly recurring in certain periods. In such cases, investors' pursuing an investment strategy opposite to the market character can cause great losses.

The efficient market hypothesis states that the information that reaches the market is immediately reflected in the prices. Therefore; according to the theory, it is not possible for investors to get abnormal return (Daver at al., 2013: 11). However, many studies have shown that there may be abnormal returns in the markets. Situations that contradict this theory and deviate from normal are expressed as anomalies. These anomalies, which constantly cause abnormal returns in certain situations and cannot be explained much theoretically, have made their presence felt in many studies. These anomalies are divided into various classifications in studies. For example; It is possible to list them as time-dependent (calendar, periodic), non-time-dependent (cross-sectional) and technical anomalies.

Researchers use many methods while examining the existence of anomalies. These methods are used to determine price movements or abnormal returns against certain situations or periods. In this study, the event study method, which is applied in order to detect the presence of abnormal returns in the face of a certain event, is used. The main purpose of this study is to determine calendar anomalies by event study method, as different from previous studies. It is thought that there is a deficiency in using the aforementioned method in studies on calendar anomalies. Generally, the method is used to measure abnormal returns around single-day events. However, it is also possible to use the method around certain periods (such as 2, 3, 4... days period). With this

approach, it is investigated whether there is a holiday effect in Turkey and shown that the method can be used effectively in measuring time-related anomalies.

In addition to the fact that prices are increasing or decreasing during certain periods, it is also important to see exactly how many days before or after the event that caused the anomaly. With this method, an answer can be found to the questions about whether abnormal returns can be observed around the holidays or if it can be observed, how many days before or after it can be observed. In short, the study investigates the possibilities of obtaining abnormal returns by sector during holiday periods. For this purpose, after the first part, which constitutes the introduction part of the study, the second part, which consists of literature review, which includes studies on the subject in the past, is included. In the third part, information about the method of the research is given. The fourth part is the part where the analysis is carried out and the findings are obtained. Finally, in the fifth chapter, results and interpretations are revealed with the help of the findings obtained.

2. Literature Review

Studies about the existence of calendar anomalies have always been in the focus of attention of researchers. In these studies, it is seen that different results can be obtained depending on the time and the methods used. In this section, information about important studies that have been done recently and is considered to be relevant is given. Subjects in these studies such as what was investigated, what methods were used and what kind of results were reached are tried to be shown.

The importance of the subject is understood from the intensity of the researches carried out. Research on anomalies has great importance not only for developed countries' markets but also for developing and undeveloped countries' markets. Seif et al. (2017) conducted a study on seasonal anomalies in advanced emerging stock markets. The markets of Brazil, the Czech Republic, Hungary, Malaysia, Mexico, Poland, South Africa, Taiwan and Turkey were used within the scope of the research. 5 seasonal anomalies were tested in the study. These anomalies are "the month of the year", "other January", "day-of-the-week", "holiday", and "week 44". Researchers have claimed the existence of all other anomalies except for "other January". Marisa (2017) investigated the calendar anomaly on the Indonesian stock market. The data set of the study covers the years 2009-2011. In the study in which the regression method was used, findings regarding the existence of holiday effect were obtained.

It can be said that this issue has been handled with different methods for many markets in the past. Qadan et al. (2019) examined seasonal patterns and calendar anomalies in commodity markets. In the study; daily, weekly and monthly data of 9 commodities were used. In the study in which unit root tests were used, they found evidence for the existence of most of the 25 anomalies tested. In addition, Al-Khazali and Mirzaei (2017) used stochastic dominance (SD) and mean-variance (MV) analyses in anomaly analysis. Researchers investigated the existence of calendar anomalies in terms of Islamic stock indices. As a result of the analysis, they obtained findings about anomalies such as Monday – Friday, seasonality and January effect in some indices. However, when the findings are examined, it is understood that the indices differ. Caporale and Zakirova (2017) have used OLS, GARCH, EGARCH and TGARCH methods as different methods. They investigated whether there

As a result, when the literature is examined; it is seen that many methods and approaches such as Garch, power ratio, machine learning, and OLS have been used in the past in order to provide evidence for the existence of calendar anomalies. Various findings with different importance can be obtained due to the methods used, the markets analysed and the periods subjected to analysis. The originality of this study is not limited to the issues of investigating the holiday impact in the Turkish market and conducting the research with current market data. It is thought that the event study method, which is a method closely related to the efficient market hypothesis and abnormal returns, is lacking in the use of calendar anomalies frequently investigated in financial markets. For this reason, unlike many past studies, event study method is used in the analysis and thus it is tried to reveal whether abnormal returns can be achieved before and after the holidays.

3. Research Methods and Materials

In this research, abnormal return opportunities before and after holidays are analyzed by the event study method. The method enables to investigate the effects of any event in certain periods (Serra, 2002: 3). It is generally used to support or oppose studies on efficient market hypothesis (Benninga, 2014: 331). Generally, Constant Mean Return Model and market model are used to calculate returns. In this study, the market model was preferred because the mostly market models were used in researches related to anomalies in Turkish markets and in past researches it was generally stated that this model performed superiorly (Baş, 2018: 254). This model assumes a linear relationship between securities returns and market portfolio returns. The main reason why this model is preferred is that it is more powerful in detecting abnormal returns than other models and it has been proven to give valid results (Salamudin et al., 1999: 413).

Certain steps must be followed for event study applications. Although there is no single standard for these steps; In general, steps such as defining the event, selecting the event window, determining the effects of the event and evaluating the results are used (Eppli ve Tu, 2005: 120). In this study; national and religious holidays in Turkey were examined for 2017, 2018 and 2019. With the idea that the holiday effect may have been felt more, holidays lasting 3 days and above were chosen. The reason why the analysis started as of 2017 is that a new national holiday was declared in 2016 with the prevention of the coup attempt in Turkey. Using the year 2016 in this study may present misleading results due to the effects of the coup attempt. The holidays used in the study are shown in Table 1.

Table 1: Holidays Used in the Study

A	Commemoration of Ataturk, Youth and Sports Day - 2017
B	Ramadan Feast – 2017
C	Feast of Sacrifice - 2017
D	National Sovereignty and Children's Day – 2018

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E	Ramadan Feast – 2018	
F	Feast of Sacrifice - 2018	
G	Republic Day – 2018	
H	Ramadan Feast – 2019	
I	Democracy and National Solidarity Day – 2019	
J	Feast of Sacrifice – 2019	
K	Victory Day – 2019	

Because of the holidays considered in the study lasted longer than one day, while determining the event windows, the $[-10, 0]$ event window was used for the effects before the holiday start dates. Here, the event day was determined as the last trading day before the holiday. Event window $[0, 10]$ was used for post-holiday effects. In this event window, the event day was determined as the first trading day after the holiday. In this way, it was investigated whether there was an abnormal return up to 10 days before the beginning of the holidays and up to 10 days after the end. Normally, there is no exact standard for determining these periods. It may differ according to the purpose and subject of the study. In the study; It is thought that the holiday effects will not have an effect more than 10-day periods and the reliability of the research will decrease with the extension of the period (Kothari & Warner, 2007: 8).

Briefly, the study reveals how many negative and positive abnormal returns there are around which holiday. Thus, it is examined whether holidays have an effect in Turkey and whether an abnormal return will be achieved with these effects, if there is any effect. For this purpose, abnormal returns (AR) and cumulative abnormal returns (CAR) around holidays were investigated using t-test. The average abnormal and average cumulative abnormal returns of the companies in each sector were interpreted in a table. The review was carried out on 4 main sectors in Borsa Istanbul. These sectors are; Service, Financial, Industrial and Technology indices. For each sector, companies were selected as specified in the Public Disclosure Platform (KAP) of the Republic of Turkey. In this context; There are 65 companies in the Service sector, 105 companies in the Financial sector, 163 companies in the Industrial sector and 19 companies in the Technology sector. The daily data of the companies were obtained from the "Thomson Reuters Data Stream".

4. Results

In the study, it is examined whether there is any abnormal return around the holidays. Average abnormal return and average cumulative abnormal return results by sectors were calculated and their significance was determined by t-test. Table 2 shows how many average abnormal returns are statistically significant in which sector within the pre and post-holiday event windows. The values of average abnormal returns are included in the appendixes

Table 2: Numbers of AARs and Values of CAARs

Holidays			A	B	C	D	E	F	G	H	I	J	K	
Service	AAR (#)	[-10]	2	1	-	1	1	3	1	1	1	-	2	
		[+10]	-	-	2	1	2	-	2	-	-	2	-	
	CAAR (t-test)	[-10]	0,3323	-0,603	1,1156	1,5481	-1,795	2,3878	1,8452	2,4886	1,8091	0,9088	1,2847	
		[+10]	1,6342	-0,802	-1,381	0,5162	0,6525	1,0164	0,6714	0,1685	0,4301	1,3008	-0,616	
Financial	AAR (#)	[-10]	-	-	1	-	2	4	1	-	2	-	-	
		[+10]	-	-	3	1	-	-	-	-	-	-	-	
	CAAR (t-test)	[-10]	-0,657	0,7861	-0,625	0,1893	0,5815	0,1675	1,0697	1,3747	0,0688	-0,022	-1,223	
		[+10]	-1,249	0,3123	0,2568	1,7086	0,4594	1,2116	1,1895	0,9505	-1,19	-1,156	0,0713	
Industrial	AAR (#)	[-10]	-	-	-	1	-	2	2	-	3	-	-	
		[+10]	-	1	1	2	1	-	2	-	-	-	-	
	CAAR (t-test)	[-10]	0,5025	-0,391	0,0309	1,3716	0,6201	1,0762	-	2,3306	0,1895	-1,48	-0,551	0,469
		[+10]	0,2087	0,7904	0,6726	2,2149	-1,058	0,5288	1,1572	-	0,7409	0,9324	0,3769	0,694
Technology	AAR (#)	[-10]	2	-	-	-	2	2	-	2	-	3	1	
		[+10]	1	-	-	-	3	-	-	-	2	1	-	
	CAAR (t-test)	[-10]	-0,207	-0,491	-1,102	0,3029	-0,7	0,6379	0,2561	1,1334	-1,264	0,1175	1,7627	
		[+10]	-0,2	-1,67	-0,963	0,3561	3,2083	0,5449	0,9255	0,1792	1,9491	1,8601	0,9129	

The AAR [-10] lines in Table 1 indicate the 10-day period backwards from the last trading day before the holiday, and the AAR [+10] lines specify the 10-day period forward from the first trading day after the holiday. These lines show how many times abnormal returns have been found. CAAR lines contain t statistics values of cumulative abnormal returns.

As can be seen from Table 2, abnormal returns occur before or after each holiday in the service sector. On the other hand, there have been times when abnormal returns were not seen in other sectors. For this reason, it cannot be said that there is a stable effect in sectors other than the service sector. Abnormal returns in the service sector are usually seen before the holidays. Only 2 out of 11 holidays showed no abnormal returns before the holidays. Abnormal returns have been encountered after the end of these holidays. The year in which abnormal returns are seen before the holiday without exception is 2018. When we look at the CAAR results, cumulative abnormal returns have occurred in only two events and their values are negative. Although there is no

cumulative return in other holiday times, it may be possible to obtain abnormal returns with very short time trading in 10-day periods.

When Appendix-1 is examined, it is observed that negative abnormal returns generally occur before religious holidays for the service sector. On the other hand, it can be said that positive abnormal returns prevail before national holidays. In short, it emerges that there are abnormal returns in the service sector and it is necessary to be more careful when investing in the service sector during these periods.

5. Conclusion & Discussion

Contrary to the efficient market hypothesis, many previous studies show that abnormal returns can be obtained. These studies reveal that information is not always effective in the markets and that people do not always act rationally according to the information they reach. It can be understood from the literature that the aforementioned studies are presented with different analysis types. Another analysis method used to measure the efficiency of the markets and the possibility of abnormal returns is the Event Study. However, when the previous studies are examined, it is noteworthy that the method is generally applied in events covering a certain day. However, it is also possible to use the method for events covering more than one day. For this reason, in the study, the effects of holidays lasting longer than a day were examined by the event study method. These holidays consist of national and religious holidays in Turkey. In the study, evidence of abnormal returns was sought before the beginning of each holiday and after the end of the holiday in the main sectors in Borsa Istanbul.

The results obtained from the research have not been found to prove the holiday effect anomaly in any sector other than the service sector. In the service sector, it has been observed that there is a negative or positive abnormal return within 10 days before or after the holidays. In addition, it has been observed that generally negative abnormal returns occur before religious holidays and positive abnormal returns before national holidays. However, no traces of cumulative abnormal returns were encountered in the service sector, either. This situation shows that abnormal returns are short-term and markets have recovered in 10 days.

Studies conducted on the subject and at different times in Turkey have produced different results. While some studies in the BIST100 index indicated that only Ramadan holidays is effective among religious holidays (Gürbüz & Şahbaz, 2019), some sector-based studies have suggested that the holiday effect is seen in all sectors (Karcıoğlu & Özer, 2017). When the subject is examined in terms of the periods discussed by this study and the four main sectors, it is very difficult to say that it is possible to profit from the sectors in Turkey before and after the holidays by taking advantage of the holiday anomaly only. However, it should be noted that it is possible to earn extraordinary profits with instant or very short trades in the service sector.

In general, it can be said that the reasons of the abnormal returns in the service sector is related to the uncertainty and risk perception of the investors for the holiday period. In addition, it is believed that the main reason why abnormal returns are found especially in the service sector is due to an investment approach connected to the culture in Turkey. In Turkey, people often change cities to visit relatives or vacation during holidays lasting more than a few days. For this reason, investors

may think that the tourism sector, which is a sub-branch of the service sector, is affected during long holiday periods. In short, it is thought that the tourism sector, which includes business lines such as accommodation, travel and restaurants, is the most effective on abnormal returns.

In summary, when investing in one of the four main sectors in Turkey, it is necessary to pay attention especially to the service sector around the holiday periods. In the near-holiday periods, there is an opportunity to obtain an extraordinary return from the service sector, as well as the sector risks more during these periods. In the future, the subject may be expanded by studies such as conducting company-based research, implementing event study in different markets for similar studies, or evaluating different anomalies. It is thought that expanding research on anomalies is very important for investors and researchers.

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APPENDIX-1 AAR Table of Service Sector (Ten days before the start of the holiday [-10, 0]; ten days after the end of the holiday [0, 10])

	A	B	C	D	E	F	G	H	I	J	K
-10	-2,5102	-0,16	-0,36	-0,9851	0,2258	0,0806	-0,0267	1,0299	1,6324	0,3429	2,6667
-9	-0,4082	-0,16	0,76	-0,1343	-0,2258	-0,6774	0,1467	0,5821	1,1324	-0,1286	2,2609
-8	1,5102	0,74	1,3	-0,3582	-0,8065	-0,9355	-0,12	0,7761	1,2059	1,4143	0,5942
-7	0,898	-0,6	-0,32	-2,1791	-0,7097	-0,129	-1,9067	1,9701	0,4265	-1,1571	-1,8696
-6	2,7959	-2,62	1,12	0,2836	-2,0645	-0,6613	0,2667	-1,791	0,9706	-0,2714	-1,0435
-5	1	-0,88	0,96	-0,7612	-0,9839	-0,0968	1,5733	0,4925	-1,5294	0,1286	1,7826
-4	0,3265	0,12	-1,46	0,9851	-1,4194	-3,2419	0,5333	1,3582	-1,1471	-0,0286	-0,4058
-3	1,2041	0,06	0,42	-0,4627	-0,3226	-3,7258	0,2267	1,5075	2,2941	0,0571	-0,4928
-2	-1,3265	-0,54	0,96	-0,7164	-1,0968	2,1774	2,2667	0,7612	0,3676	0,6286	-0,8986
-1	-1,7143	0,72	0,36	-0,0597	-0,4194	-1,5806	1,5467	-0,2687	1,3382	1,4714	0,8116
0	-0,6735	1,32	-0,04	-0,7463	1,871	0,871	1,6133	1,8358	-0,6912	0,5571	0,8551
0	1,18	-1,24	-0,24	-0,7727	-2,623	1,0968	-2,0267	1,3529	0,75	2,6286	-1,2676
1	-0,24	-0,88	0,6	1,9394	-0,6066	-0,629	-1,8267	-0,9265	-0,7647	2,2429	-1,4085
2	0,6	1,3	0,48	-0,1667	0,1148	-0,0968	0,6667	-1,3676	-0,1912	0,6	1,1972
3	1,46	-0,32	-0,68	-0,303	1,2459	-0,9355	-0,6133	0,6324	-0,0147	-1,8286	0,831
4	1,1	-0,54	1,38	0,0758	-0,2295	0,2097	-1,4533	-0,2794	0,5441	-1,0143	0,493
5	-0,28	0,5	0,92	-1,4848	1,4754	0,0323	0,68	1,6618	0,0147	1,7571	-0,662
6	1,36	0,38	-1,76	-0,1061	0,377	-0,1774	0,2933	-0,0147	0,1912	-0,3714	-0,2254
7	-0,12	-0,52	-2,32	-1,9848	2,5738	0,3548	-0,0667	0,4853	-0,8824	-0,4857	-0,0141
8	0,56	0,08	-3,16	0,4242	1,2131	1,1774	1,0267	-1,1176	0,3971	-0,8857	-1,4366
9	0,4	-1,86	-0,62	-0,4091	-1,1803	1,5645	2,1733	-0,5	-0,0882	0,8143	0,8169
10	-0,6	0,44	0,82	1,0758	-0,1967	0,7742	-1,08	-0,4853	1,4706	0,8571	-0,3662

APPENDIX-2 AAR Table of Financial Sector (Ten days before the start of the holiday [-10, 0]; ten days after the end of the holiday [0, 10])

	A	B	C	D	E	F	G	H	I	J	K
-10	1,2143	0,25	0,1481	-0,907	-1,881	-0,3704	-0,6849	-0,4237	-0,2105	-0,1667	-1,2222
-9	-0,8929	0,3571	-0,5556	1,1395	-1,0952	1,0926	0,8082	-0,0508	0,5439	-0,3519	-1,3148
-8	-1	0	-1,7778	-0,3721	0,5238	0,7963	0,4247	-0,0678	-0,3333	-0,7778	-0,9074
-7	-1,5714	0,2143	0,2963	-0,5349	-0,8333	-1,3333	1,9863	-1,4068	0,0526	1,0926	-0,5
-6	-1,5714	1,5714	-1,1481	-0,4419	2,9524	-2	0,3288	1,0508	0,1754	-0,9815	0,1852
-5	-0,25	1,1429	-0,7037	-0,0698	0,3571	-4,7593	-0,274	0,2712	2,7544	1,3333	-1,0556
-4	-0,2857	1,0714	2,1111	-0,5814	2,4762	2,3148	0,9041	-1,0339	0,2982	0,2407	1,1481
-3	-0,4643	-0,3571	0,4444	0,814	-1,2143	2,5556	-0,3151	-1,2034	-1,1404	0,1111	-0,4444
-2	0,5357	-0,4643	-0,2222	-0,093	1	1,7593	0,6438	-0,6949	0,4386	1	0,963
-1	1,2143	-0,9286	-0,5185	-0,3256	1,3571	-0,1852	-1,411	-0,3559	-2,4561	-1,2963	0,1667
0	0,8929	-0,25	-0,1481	0,7442	-1,7143	0,6852	1,137	-0,6441	0,1053	-0,2778	-1,0741
0	-1,75	-1,1071	-1,6296	0,7619	1,5476	-1,7222	1,3288	0,2542	-1,2105	-1,1481	1,2727
1	0,5714	0,5357	-2,3333	-0,2857	-0,5238	-0,2778	-1,5068	-0,1186	0,0175	-1,2778	0,4182
2	0,2143	-1,8214	-1,8148	-0,2381	1,1429	0,5556	1,3425	0,6102	-0,0175	-0,8889	-0,8364
3	-1,1786	0,6429	-0,4074	0,6905	-0,8333	-0,1481	-0,7945	-0,3051	-1,1053	-0,5	-0,4545
4	-0,6071	1,1786	-0,037	0,9524	0,1667	-1,4444	0,8356	0,4407	0,0526	0,2037	-0,5091
5	0,2857	-0,8571	0,6667	-0,9524	-1,8571	1,3519	0,4795	-0,4407	0,2632	-1,037	0,4727
6	-0,4643	0,4643	2,1481	-0,3571	-0,0952	-0,2407	0,3288	0,4068	-0,9123	1,1296	-0,4727
7	1,0357	1,0714	1,2222	3,881	1,7619	-0,5741	1,6164	-0,3898	0,1754	-0,4259	0,2182
8	-1,1071	-0,7143	2,0741	1,2143	-0,5714	0,7222	-0,0959	1,4915	-0,1579	1	1,0545
9	-1,3929	1,5357	1,1852	0,0238	0,619	-1	-0,137	0,661	-0,3333	0,1852	-0,5818
10	0,25	0,1071	-0,2222	-0,0238	0,1667	-1,2407	0,5479	0,5424	-0,7193	-1,0741	-0,3455

... (akademik, hakemli, indexli, uluslararası dergi)

APPENDIX-3 AAR Table of Industrial Sector (Ten days before the start of the holiday [-10, 0]; ten days after the end of the holiday [0, 10])

	A	B	C	D	E	F	G	H	I	J	K
-10	0,4615	-0,2162	-0,0513	2	1,5094	0,2462	0,4324	0,3571	-0,9538	-0,25	-0,9206
-9	0,8974	-0,1351	0,1795	-1,7255	0,9811	-0,7385	-1,0676	-0,4429	-1,9692	0,125	-0,381
-8	0,5641	-0,5676	1	0,0588	0,1132	0,0615	-0,0676	-0,4143	-0,5692	0,0156	0,5714
-7	1,3846	0,2703	0,359	1,7647	0,9811	1,0462	-0,527	-0,2	-0,2308	-0,2344	1,9524
-6	-0,4872	0,2973	0,4359	0,1765	-1,5283	1,3846	-0,5811	0,1571	-0,8923	1,0156	0,3651
-5	-0,5641	-0,7568	-0,3846	0,8235	0,8491	4,1077	-0,6757	-0,5714	-2,1231	-1,2656	-0,0794
-4	0,2564	-1,1892	-1,2308	0,2941	-1,6038	-0,2462	-1,0541	0,1429	0,6462	-0,1406	-0,746
-3	-0,1795	0,4324	-0,4872	-0,9804	0,8679	-0,2154	-0,027	0,1429	-0,4	-0,125	1,1429
-2	-0,1282	0,6486	-0,359	0,9412	0,0189	-2,5385	-2,0135	0,1714	-0,7692	-1,2969	-0,1429
-1	-0,1026	0,6216	0,3846	1,1569	-0,8491	1,4615	0,1622	0,5143	1,9692	0,4688	-0,5556
0	-0,4359	-0,7027	0,2564	0,0392	0,717	-1	-2,3108	-0,4857	0,3846	-0,1406	0,3492
0	1,4359	2,5135	1,5641	0,0385	0,9434	1,0154	-0,2838	-1,1857	0,7692	-0,9687	-0,4127
1	-0,359	0,1622	2,359	-1,2308	0,3019	0,5231	2,4595	0,9429	0,1231	-0,4062	1
2	-0,7179	1,3784	1,7949	0,5962	-1,3396	-0,2769	-2,2838	0,5143	0,2154	0,5312	-0,0159
3	0,3333	-0,2162	0,9744	-1,0769	-0,3774	0,9846	1,0541	-0,1429	1,3846	1,9062	-0,0476
4	-0,2308	-0,5676	-0,8205	-0,75	0,1509	0,9846	0,1622	-0,1571	-0,1385	0,3281	0,0007
5	0,0513	0,4324	-0,6923	1,4615	0,6038	-0,7846	-0,7703	-0,5714	-0,3846	-0,1094	0,4921
6	-0,4872	-1,1081	-1,1795	0,1346	-0,1698	0,3385	-0,5	-0,4714	0,7692	-0,7344	0,6508
7	-1,8974	-0,7297	0,3077	-2,6923	-3,4151	0,4	-1,7973	0,0571	0,5692	1,0938	-0,1587
8	0,8462	1,2432	0,6154	-2,0962	-0,3208	-1,2769	-0,7568	-0,7571	-0,2923	-0,1719	0,254
9	1,5641	-0,2162	-1,359	-0,4615	0,566	-0,4308	-1,1216	-0,2857	0,0769	-0,5625	-0,0635
10	0,1538	-0,2703	-1,3333	-1,2692	-0,4528	0,2769	0	-0,4	0	0,3438	0,6032

APPENDIX-4 AAR Table of Technology Sector (Ten days before the start of the holiday [-10, 0]; ten days after the end of the holiday [0, 10])

	A	B	C	D	E	F	G	H	I	J	K
-10	1,1043	0,5847	-1,1416	-0,0271	1,7323	-0,815	0,9785	-3,3285	-0,7857	1,6029	2,1329
-9	0,4957	-0,0085	-0,6018	-0,7104	0,8976	-0,4104	0,8656	0,6715	0,3714	2,6691	0,2168
-8	0,3478	0,322	-0,2124	-0,1041	-0,0079	-0,3699	-0,9086	-2,1314	0,0143	-0,4485	0,9301
-7	-2,0609	-0,4237	-0,6549	-0,2127	0,7323	0,3757	-0,9731	-0,2847	-0,7357	-0,3676	0,965
-6	0,0609	-0,3475	-0,8407	-0,2805	0,8898	0,3295	0,8333	0,4015	-0,5429	2,0662	1,4056
-5	-1,1217	-0,5932	0,7522	0,2217	-5,5354	-1,6879	-0,5215	0,1168	-0,6786	-0,1838	-1,1608
-4	-0,4174	-0,7373	-0,3628	0,3575	0,9213	3,2139	-0,7688	0,2993	0,2929	-0,0735	-0,993
-3	0,9913	-0,6441	-0,7611	-0,2896	0,378	-1,1561	0,0806	-0,0146	-1,1214	-0,7426	0,6084
-2	1,8609	0,678	-0,646	-0,0452	-0,0866	1,4971	-0,7903	-0,1241	-0,95	-2,3235	1,6294
-1	0,2	-0,2373	0,4513	-0,181	0,2992	-2,4624	0,3871	0,781	0,4071	-1,5074	-0,6713
0	-2,1478	-0,2203	0,3628	0,267	-2,5433	-0,6301	-0,0323	-0,146	-0,4643	-0,3015	0,7832
0	-1,2155	-0,5294	-0,4298	-0,2624	-2,1094	0,1747	0,5668	-0,5874	0,6643	2,2426	0,6621
1	0,3103	-0,4286	-0,2807	0,0181	1,625	1,2048	0,3904	1,1818	2,0357	0,2279	-0,5172
2	0,069	-0,5042	-0,4649	-0,3529	1,5703	-0,8855	0,5455	-0,6014	-0,1857	0,9779	0,8138
3	-0,2672	-0,7059	-0,0175	1,8643	1,1406	0,2048	0,8824	0,8042	-0,1571	1,0147	-0,1862
4	0,2759	-0,7647	0,3509	-0,6516	-0,8594	1,0482	-0,5615	-0,5315	0,2857	1,4779	1,2483
5	-0,6121	-0,8655	-0,2105	-0,5385	1,9922	-0,3976	-0,1123	-0,951	-0,0714	-1,2132	-0,4828
6		-0,2437	1,0965	0,3394	2,4141	0,1807	0,6845	0,4965	-0,1	-1,0368	1,3586
7	2,181	-0,1765	-0,6579	-0,3032	0,9453	0,1145	0,4439	-0,1608	0,25	0,6397	0,4138
8	-0,0776	-0,2269	0,0263	0,276	1,1328	-0,3133	0,5882	-1,1189	1,6071	1,7132	-1,0621
9	-1,0086	-0,3277	-1,4561	-1,4027	1,125	0,3795	0,0535	0,6224	2,6214	-0,7059	0,0828
10	-0,319	-0,7647	-1,1491	-0,1674	1,6641	0,0964	-0,4118	0,2517	-0,4857	0,8309	0,6966