ANADOLU ÜNİVERSİTESİ SOSYAL BİLİMLER DERGİSİ
ANADOLU UNIVERSITY JOURNAL OF SOCIAL SCIENCES
Cilt/Vol.:8- Sayı/No: 2 : 169–184 (2008)

IS THE TURKISH TOURISM SECTOR INDEX EFFICIENT?

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ABSTRACT

Investors who trade tourism companies' shares should take into consideration not just the technical and fundamental analyses but also the efficiency of the market in the meaning of the Efficient Market Hypothesis (EMH). In an inefficient market, investors can use an active trading strategy to beat the market. There is lots of evidence against EMH such as the Day of the Week Effect, the January Effect, and the Weather Effect etc. Hence, Day of the Week Effect anomaly has an important implication in finance. According to Day of the Week anomaly researchers, holding period returns are lower on Monday than on other days of the week.

This study investigates if the Turkish Tourism Index (TI) efficient in weak form of EMH. Briefly, it can be said that TI is influenced by days, not by months. This study proves that Turkish TI is inefficient in weak form.

Keywords: *Day of the Week Effects, Market Anomalies, Turkish Stock Market, Tourism Index, Probit Model, Logistic Regression*

TÜRK TURİZM SEKTÖR ENDEKSİ ETKİN Mİ?

ÖZ

Turizm şirketlerinin hisse senetlerini alıp satan yatırımcılar, karar verirken sadece teknik analiz ve temel analizi değil, aynı zamanda Etkin Piyasalar Hipotezi (EPH) anlamında piyasa etkinliğini de göz önüne almalıdırlar. Etkin olmayan bir piyasada, yatırımcılar aktif alım satım stratejilerinden yararlanarak piyasa getirisi üzerinde getiri elde edebilirler. Literatürde EPH' ne karşı, Haftanın Günleri Etkisi, Ocak Ayı Etkisi, Hava Durumu Etkisi gibi çok sayıda kanıt sunulmuştur. Bu yüzden, Haftanın Günleri Etkisi anomalisi finansta önemli bir yere sahiptir. Haftanın Günleri Etkisi anomalisini konu edinen araştırmacılar, bir yatırım döneminde Pazartesi günlerinin getirilerinin haftanın diğer günlerine göre daha düşük olduğu sonucu bulmuşlardır.

Bu çalışma, Türk Turizm Sektör Endeksi'nin (TI), EPH bağlamında etkin olup, olmadığını araştırmaktadır. Özet olarak, ilgili dönemde Turizm Sektör Endeksi'nde haftanın günleri anomalisi gözlemlenirken, ay etkisi gözlenmemektedir. Çalışma, Türk Turizm Sektör Endeksi'nin zayıf tipte etkin olmadığı yönünde kanıt sunmaktadır.

Anahtar Kelimeler: *Haftanın Günleri Etkisi, Piyasa Anomalileri, Türk Menkul Kıymet Borsası (İMKB), Turizm Sektör Endeksi, Probit Model, Logistik Regresyon*

* This study is an extended version of the papers those have been presented Hamarat B., Tufan E., Cristea M & Ödül Y. "Is the Turkish Tourism Index Efficient" at 2007 International Tourism Biennial. 30/04-5/5/2007. Çanakkale, Turkey and Bahattin Hamarat, Ekrem Tufan, Mirela Cristea. "Day of the Week and Seasonal Effects in Tourism Index: Evidence from the Istanbul Stock Exchange". International Conference Advances in Tourism Economics 2007. 13-14 April 2007, Vila Nova de Sto André, Portugal.

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1. INTRODUCTION

The markets reflecting all the existing information of the shares are labeled as efficient markets. In such markets, considering that everybody can reach the information without any effort or cost, it is not possible to beat the market. According to the efficient markets hypothesis there are three types of efficiencies: Weak Form Efficiency, Semi-Strong Form Efficiency, and Strong Form Efficiency. The Weak Form Efficiency states that all the previous price movements are reflected on the current prices. In such markets considering those previous price movements, one cannot make more than average market returns.

In finance literature, the efficiency of the world stock exchanges has been tested several times according to the efficient market hypothesis. The findings indicate that developed stock exchanges are weak form efficient, whereas developing stock exchanges are not efficient. This study will test whether or not the Istanbul Stock Exchange's Tourism sector index is efficient or not according to the Efficient Market Hypothesis. The Istanbul Stock Exchange (ISE) Tourism Sector Index was set up on 27.12.1996 to measure the performance, as a whole and as a sector, of price and profit of Tourism shares traded at ISE. The index contains 5 tourism companies. These companies market value represents 0,1172% of ISE 100 Index companies market values which is also represents 1,4582% of ISE Services Index. Because there are just five companies in tourism sector index, it is more important to know the index's efficiency. If the market knows any anomaly of the tourism sector index prices some investors can beat the market and earn more money than the average. So, to investigate this index efficiency is important.

A vast number of literature studies provide evidence for day of the week effect and seasonal anomalies. Defusco (1993) has examined returns for U.S. firms in the five-day interval surrounding a board meeting date and found that a firm's Monday return in that interval is more likely to be negative than other Monday returns. Cornell (1985) has investigated whether cash and futures markets have some seasonal pattern or not for S&P500 Index. He has reported that a weekly pattern of returns was observed in the cash market but that no similar pattern could be found for the S&P500 futures. Ayadi (1998) has reported that there is no seasonality in the distribution of monthly stock returns in Nigeria, Zimbabwe and Ghanaian market. Kato (1990) has reported low Tuesday and high Wednesday returns for the Japanese Stock returns. Gibbons and Hess (1981) have reported strong and persistent negative mean returns on Mondays for the S&P500 and the value-and-equal weighted portfolios. Athanassakos and Robinson (1994) have tested day of the week effect for Toronto Stock Exchange and they have reported that they found evidence for a strong and statistically significant negative Tuesday effect. Rogalski, in his study (1984) investigated the daily profit of DJIA index and found that daily returns were different. When the returns of each day of January were investigated, the returns were not found different. Balaban (1995) has investigated daily anomalies for Turkish Stock Market and reported that significant day of the week effect for the Turkish market. Metin et al (1997) have examined the weak form efficiency of Istanbul Stock Exchange (ISE) by using random walk test and the day of the week effect. They have used data between January 4, 1988 and December 27, 1996. They have reported Friday and Monday effect but Monday effect was not statistically significant. Bildik (1999) has investigated the day of the week effect in overnight interest rates in Interbank Market, overnight interest rates in interest rates of the Istanbul Stock Exchange (ISE) and daily closing values of the Istanbul Stock Exchange's Composite Index. The researcher has reported that there is no significant difference between the repo rates occurred in the ISE repo Market and interest rates in Interbank Market. He also reported an overnight interest rates decrease on Wednesdays and increase on Mondays, relative to previous days. In the stock market, he found patterns of low or negative returns over the first part of the week (Monday

through Tuesday) and high and positive returns over the second part of the week (Wednesday through Friday). Çinko (2006), in his study, investigated the returns of ISE 100 index. The researcher divided the data into two parts according to exchange duration, and tested whether the exchange period had a day of week effect. The entire data set and exchange duration for one day was found negative for Monday and Tuesday and positive for the other days of the week. The highest profit was found to be earned on Friday. When the exchange was carried out in two days, Tuesday was also positive. Çinko applied Logistic Model analysis to the returns of the days and found the Monday and Tuesday regression coefficient to be negative for the entire data set.

In this study, to search weak form efficiency of the tourism sector index, return has been calculated and non-parametric methods used to investigate whether or not the average return shows significant differences with respect to days and months. Daily returns have been taken as a factor variable. The Probit Model has been applied to take into consideration the possibility of negative returns of the tourism sector index for days and months. Logistic Regression Method has provided us the return variation of the tourism sector index between base day and month to other day and month returns. However, using logistic Logistic Model and taking the day or month as a base, it has been investigated to be negative or positive of the Tourism Sector Index.

2. DATA AND METHODOLOGY

In this study, the tourism sector index daily closing values have been used, covering the period of 2 January 1997 to 30 December 2005. The data are in a time order. The closing values of the index were obtained from ISE index. The return series were calculated using the following formula:

$$R_t = \frac{V_t - V_{t-1}}{V_{t-1}} 100 \qquad (1)$$

Here Rt indicates the return of day t, Vt and Vt-1 show respectively the closing prices of t and t-1 days. ISE Tourism Sector Index has been calculated by ISE since December 27th, 1996. The index contains 5 tourism companies which names are Favori Dinlenme Yerleri A.Ş., Marmaris Altınyunus Turistik Tesisler A.Ş., Marmaris Martı Otel İşletmeleri A.Ş., Net Turizm Ticaret ve Sanayi A.Ş. and Tek-Art Turizm Zigana A.Ş. All companies occupy with hotel, camp, restaurant, motel and pension management.

The first phase of the study investigated whether there is a difference between daily and monthly average returns using non-parametric statistical methods. In the other phase of the study, the data was transformed according to dummy dependent variable Logistic Model. For this, the data were converted into the following equity.

$$R_i = \begin{cases} 0, & \text{if return} > 0 \\ 1, & \text{if return} \leq 0 \end{cases} \qquad (2)$$

Here, if the return is smaller than 0, which means that a negative return was observed, dependent variable takes value of 1. On the other hand, if the return is greater than 0, which means that a positive return was observed, then dependent variable takes value of 0. The negative and positive index return possibilities have been investigated according to the days and months, using the Probit Model and Logistic Regression.

2.1. Probit Model

The Probit Model is a probability model in which variables have binary values; the individual's decision depends on unobserved positive index. The Probit Model is based on utility theory and rational preference choices. In this study, the higher Ii index which determined by explanatory variable Xi, the higher the possibility of negative return. The index can be expressed as follow:

$$I_i = \beta_1 + \beta_2 X_i \tag{3}$$

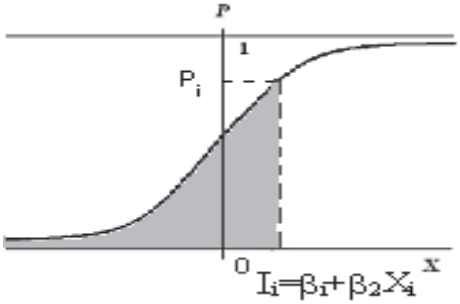
Where X_i indicates the day i th return or month i th return. If the index is negative, $Y_i = 1$, if it is positive, $Y_i = 0$. It can be assumed that the index has a critical value that can be called I_i for each observation. If Ii exceeds I_i^* the return of the day or the month will be negative for the investor. If it does not, it will be positive. I_i^* critical value can not be observed as I_i can be, but when it is assumed that it is distributed normally with the constant mean and variances, it can not only predict the population coefficient of the given index but also give clues about the unobserved index itself. Under the normality assumption the possibility of $I_i^* < I_i$ can be calculated from the cumulative normal distribution function as in the equity 4 (Powers 2000).

$$P_i = P_r(Y=1) = Pr(I_i^* \leq I_i) = F(I_i) = \frac{1}{\sqrt{2\pi}} \int_{\infty}^{\beta_1+\beta_2} e^{-t^{2/2}}\, dt \tag{4}$$

Where t indicates standardized normal variable. P_i indicates the possibility of loss or in other words no profit for the tourism investor. The possibility of the event occurring is measured with the area below the standard normal curve from $-\infty$ to I_i (Gujarati 1995). In case the inverse of the normal distribution function is taken, the following equity is obtained to obtain information about utility index I_i, β_1 and β_2

$$I_i = F^{-1}(I_i) = F^{-1}(P_i) = \beta_i + \beta_2 X_i \tag{5}$$

This equity will give us the positive and negative possibility of TI and will enable us to explain graphic 1. While Ii*< Ii, the negative possibility of TI can be found from the vertical line (Kutlar 2005).



Graphic 1. Probit Model

2.2. Logistic Regression

Logistic Regression is a method used to determine cause and effect relations with explanatory variables where the response variable is observed in binary, triple and multiple categories. This model, according to explanatory variables (in our study these are the returns in relation to days and months), is a Regression Model from which the expected values of the response variable were obtained as a probability (Özdamar 2002). The main idea behind the Logit Model is the logistic distribution function shown below:

$$P_i = \Pr(Y = 1|X_i) = \frac{1}{1+e^{-(\beta_1+\beta_2 X_i)}} \quad (6)$$

In this model the negative return probability of TE is Pi and also the positive probability is 1- P_i. Accordingly, P_i / (1- P_i) is the rate of positive return probability to the negative return probability of any day or any month of the index. This rate can be explained as Odds Ratio (OR). It can be showed this model as Logit Model as follows (Sharma 1996):

$$P_i = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_1+\beta_2 X_i \quad (7)$$

Where β_2 indicates the slope as it is in the Probit Model and Xi indicates the independent variables. Accordingly it can be predicted how the unit of shift changes the logarithmic rate of the negative probability of the index to the positive probability. It is assumed that variable X is in linear relation with logarithmic bet ratio indicated in the Logit Model. Exp (β) values of each parameter can be seen as OR values. Hence, Exp (β_p) shows what percentage and how many times the dependent variable has the probability of observation with the effect of X_p (Özdamar 2002).

3. FINDINGS

First of all, it has investigated whether TI returns distributed normally or not. According to the Kolmogorov-Smirnov and Shapiro-Wilk normality tests, the returns represented normal returns [Kolmogorov-Smirnov=,84, p<0,001 and Shapiro-Wilk=,936 p<0,001]. Similarly, normality tests were applied to the days and months and the returns were found not to distributed normally according to all sub-categories. Thus, while sub-categories (days of the week returns or years of the months return) average returns are compared with each other, non-parametric statistical methods will be applied.

Secondly, descriptive statistics has been calculated for investigating the days of week anomaly. The highest return was observed on Thursdays, while the lowest was on Mondays, respectively. Standard deviation as a risk measure was observed to be the highest on Mondays while it was the lowest on Wednesdays and Fridays, respectively. Mondays and Tuesdays had negative returns. The results are provided in Table 1.

Table 1. The Descriptive Statistics of Tourism Index for Days of the Week

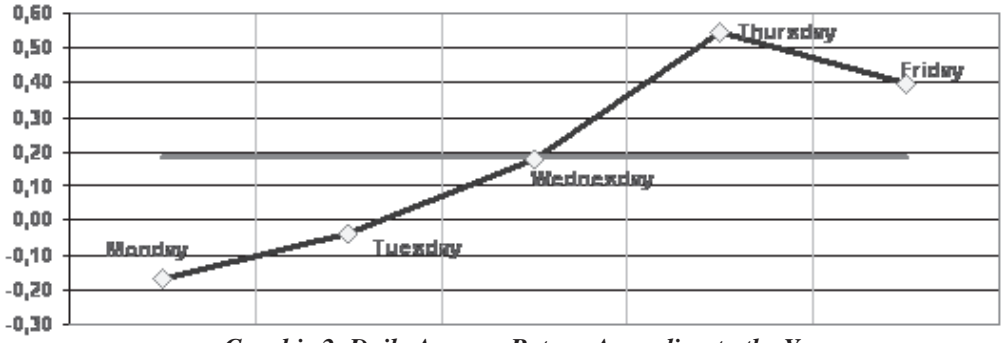
Days	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Monday	444	-.166689189	4.528941154	.214934035	-14.82579437	21.561382870
Tuesday	449	-.039220490	4.070208354	.192085008	-15.38755578	21.414476280
Wednesday	448	.176227679	3.694128943	.174531187	-17.71272619	20.135524173
Thursday	448	.548683036	4.136155020	.195414957	-16.024810526	17.599520075
Friday	441	.398616780	3.694411337	.175924349	-16.794360213	21.948535574
TOTAL	**2230**	**.183376682**	**4.042054637**	**.085595266**	**-17.712726195**	**21.948535574**

When the daily returns were examined according to the years, it was observed that the negative return occurred four times each on Mondays and Tuesdays. Although the returns on Thursdays and Fridays showed a positive tendency in general, Thursdays in 1998 and Fridays in 2002 and 2003 showed negative returns. Another significant finding is that in 1999 all days of the week have positive returns. The findings are given in Table 2.

Table 2. Daily Returns According to the Years

Years	Average Return				
	Mon.	**Tues.**	**Wed.**	**Thurs.**	**Fri.**
1997	0.69	-0.73	0.71	0.60	1.01
1998	0.14	-0.93	-0.56	-0.67	0.95
1999	0.71	0.48	0.41	0.45	0.45
2000	-1.57	0.29	0.61	0.18	0.08
2001	0.04	-0.78	0.13	1.82	0.23
2002	-1.41	-0.12	0.26	0.85	-0.44
2003	0.16	0.79	-0.27	0.71	-0.02
2004	-0.15	0.40	0.15	0.03	0.60
2005	-0.08	0.25	0.17	0.91	0.71
Observation	444	449	448	448	441
Average Return	-0.17	-0.04	0.18	0.55	0.40
Standard Deviation	4.53	4.07	3.69	4.13	3.69

Daily returns according to the years are also examined as a graphic and the results are shown in the Graphic 2. In the graphic 2, the bold horizontal line indicates 0.18 (the average daily return). According to that the graphic, the returns of Mondays and Tuesdays are under the average return, on the other hand, returns of Thursdays and Fridays are above the average return, and the return of Wednesdays is the same level with the average return.



Graphic 2. Daily Average Return According to the Years

In this study, it has been tried to find out the positive/negative rate of return days. For this purpose, distribution of negative and positive returns has examined based on to the days. The results are shown in Table 3 and Graphic 3. The results indicate that, the higher negative return rates are belonging to Monday and Tuesday. In the TI, the highest negative return rate observed as 56.76% on Monday. However, Thursday has the lowest negative return rate, which is 44.52%.

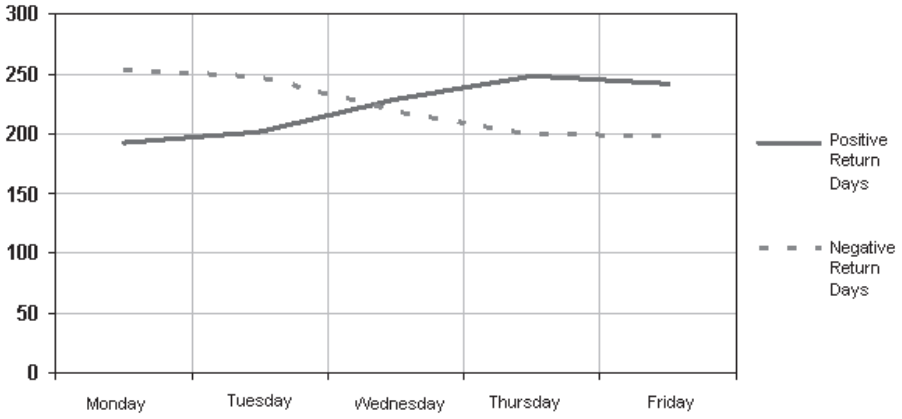
In this study, the negative/positive return rates of the days were also observed. For this purpose, distribution of negative and positive returns was examined according to days. The findings are shown in Table 3 and Graphic 3. These findings indicate that, the highest negative return rates belong to Mondays and Tuesdays. In the TI, the highest negative return rate was observed as 56.76% on Monday, and the lowest negative return rate was observed on Thursday.

Tablo 3. Distribution of Negative/Positive Rate of Days

Days	Number of Days with Positive Return	Percentage	Number of Days with Negative Return	Percentage	Difference
Monday	**192**	**43.24%**	**252**	**56.76%**	**-13.51%**
Tuesday	**201**	**44.87%**	**247**	**55.13%**	**-10.27%**
Wednesday	**229**	**51.23%**	**218**	**48.77%**	**2.46%**
Thursday	**248**	**55.48%**	**199**	**44.52%**	**10.96%**
Friday	**242**	**55.00%**	**198**	**45.00%**	**10.00%**

As seen in Table 3 and Graphic 3, the positive return rate of Wednesday, Thursday and Friday are quite higher than the negative return rate. Also, the positive return rate of Wednesday, Thursday and Friday are higher than the positive return rate of Monday and Tuesday. The highest positive return rate belongs to Thursday.

As seen in Table 3 and Graphic 3, the positive return rates of Wednesdays, Thursdays and Fridays are significantly higher than the negative return rates. Also, the positive return rates of Wednesdays, Thursdays and Fridays are higher than the positive return rates of Monday and Tuesday, the highest positive return rate belonging to Thursday.



Graphic 3. Positive and Negative Rates of the Days

Subsequently descriptive statistics has been calculated for months; the highest returns were observed in January and April where the lowest were in August and September, respectively. The returns were observed to be negative in May, June, August and September. The lowest and the highest risks were found to be in June and February respectively. The results are given in Table 4. May, June, August and September had negative returns.

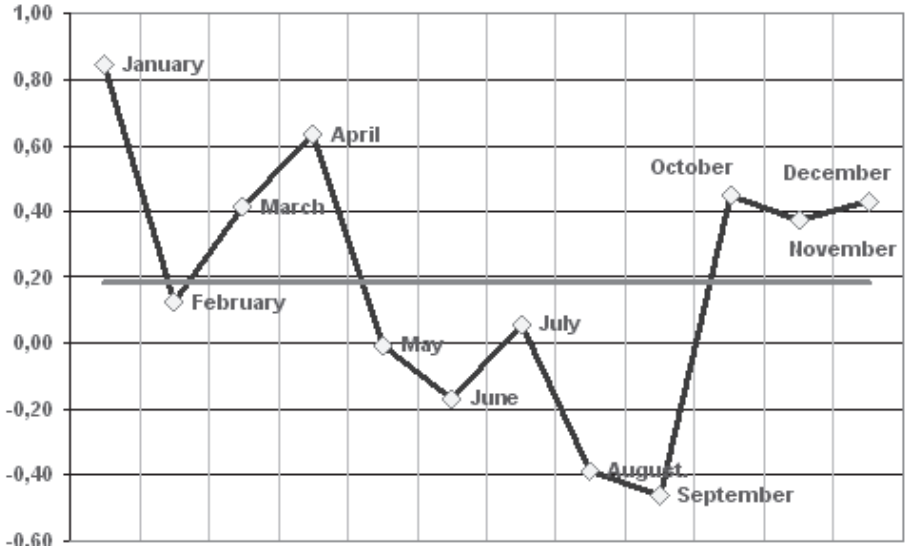
Table 4. The Descriptive Statistics of Tourism Index for Months

Months	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
January	177	.84882154	4.65143070	.34962693	-11.90348663	21.414476280
February	169	.12279201	5.00838686	.38524191	-17.71272619	21.948535574
March	186	.41543638	3.84411024	.28185651	-9.576786289	14.984244481
April	177	.62896854	4.37075125	.32849927	-11.48423317	21.561382870
May	191	-.00812606	3.44252045	.24908736	-8.274654055	17.588171685
June	193	-.16964072	2.69828970	.19425283	-8.742685658	10.515084567
July	200	.05596035	3.17042511	.22421519	-9.566039176	9.112232149
August	185	-.38754184	3.26798765	.24024565	-12.87135474	9.340508910
September	193	-.46418668	4.47485155	.32209016	-16.79436021	19.304172860
October	191	.44869573	3.64855263	.26401768	-12.46679193	12.485100465
November	182	.37537991	4.99714537	.37042202	-15.38755578	15.095699281
December	186	.42822983	4.32465958	.31711751	-13.02710723	21.28277565
TOTAL	**2230**	**.18335367**	**4.04204490**	**.08559526**	**-17.71272619**	**21.94853557**

In this study average rate of returns of the years according to months was examined and compared thus; it was found that the average return rate of January was always positive in every year. However, in August the return was occurred negative in seven years. In other months, return was negative in four or five years. The findings are shown in Table 5. Also, graphic of monthly average return was drawn and it is presented in Graphic 4. In the graphic 4, the horizontal line shows 0.18 (the average monthly return) and the average return of all over months was determined as green line. When the monthly data of ISE TI was examined it is understood that there are significant decreases between April and October.

Table 5. Average Return of the Years According to Months

Years	Average Return											
	JAN	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**
1997	1.64	0.06	0.20	-0.25	-0.36	1.16	0.42	-0.14	1.28	1.28	0.14	-0.16
1998	0.19	-0.29	-0.06	1.42	0.31	-0.50	0.44	-1.67	-1.13	-1.58	-0.05	0.58
1999	0.04	1.77	-0.62	-0.63	0.46	-1.32	-0.25	-1.65	0.56	0.30	2.96	3.55
2000	3.08	-0.95	1.16	0.55	-0.10	0.10	-0.40	-0.09	-1.64	0.75	-3.16	0.59
2001	0.83	-0.44	2.33	2.45	-0.59	0.36	-0.87	-0.14	-4.06	1.89	0.94	0.96
2002	0.21	-1.03	1.13	-0.08	-0.52	-0.75	-0.46	-0.27	-0.69	0.41	2.02	-2.19
2003	0.30	-0.17	0.01	2.69	0.07	-0.99	-0.32	-0.05	0.37	0.62	-0.21	0.76
2004	0.40	1.95	0.21	-0.34	0.05	-0.18	0.27	0.02	0.14	0.22	-0.05	0.13
2005	0.74	0.34	-0.11	-0.12	0.76	0.60	1.72	0.03	0.43	-0.08	0.60	-0.18
Observation	177	169	186	177	191	193	200	185	193	191	182	186
Average Return	0.84	0.12	0.42	0.63	-0.01	-0.17	0.06	-0.39	-0.46	0.45	0.38	0.43
Standard Deviation	4.64	5.01	3.84	4.37	3.44	2.70	3.17	3.27	4.47	3.65	5.00	4.32



Graphic 4. Monthly Average Return (02.01. 19997 - 30.12.2005)

To investigate whether there is a significant difference among the average daily returns, the Kruskal Wallis Test (K-W) was used and a significant statistical difference between the average daily returns was found. The Kruskal Wallis Test is a rank test and investigates whether a random independent variable comes from a specific group or not, with using k coefficient. It tests especially the hypothesis, $H_0: \tau_1=\tau_2=....=\tau_n$ and the alternative hypothesis claims these parameters are not equal (Gamgam, 1989).

A statistically significant difference was found among returns of days according to K-W test [$\chi^2_{(4)}$= 17.634, p=0,002]. So to identify these differences which days returns belong to the Mann Whitney U Test was applied. The Mann Whitney U Test is used to test whether two independent samples with n_1

and n_2 unit numbers are the random samples taken from population which has the same median. Mann Whitney U Test is a non-parametric alternative of t test (Özdamar, 2002). The daily differences in returns are shown in the Table 6. As can be seen in Table 6 there is a statistically significant differences among the returns of Wednesdays, Thursdays and Fridays on the one hand, and those of Mondays on the other hand. Similarly there is a significant difference between the returns of Tuesdays and those of Thursdays and Fridays.

Table 6. The Results of Mann Whitney U Test for Days of Wee

Days	Tuesday	Wednesday	Thursday	Friday
Monday	Z=-1.090 P*=.276	Z=-2.371 **P=.018**	Z=-3.384 **P=.001**	Z=-3.196 **P=.001**
Tuesday		Z=-1.464 P=.143	Z=-2.452 **P=.014**	Z=-2.305 **P=.021**
Wednesday			Z=-1.158 P=.247	Z=-.865 P=.387
Thursday				Z=-.329 P=.743

* P>0.05 ^{ns} there is no significant difference. P≤ 0. 01 ** there is a highly significant difference
P≤ 0.05 there is a significant difference P≤0.001*** there is highly significant difference.

The Kruskal Wallis Test was applied for monthly returns as well, but it was not able to find a statistically significant difference [$\chi^2_{(11)} = 12.164$, p=.351].

In the following phase of the study, it will be searched the possibility of having negative returns of TI according to days and months. If it is known that possibility of having TI's negative returns, investors can be used active trading strategies. The fact that the return is null or smaller than null means the index causes a loss for this observation; on the other hand the fact that the return is bigger than null means the index causes positive return. The returns of TI have been recalculated as in the equity 2 and the days when index causes the loss are coded as 1 because the possibility of negative return will be focused on in this study. The Probit Model was first applied to the data and then the following results were obtained.

In the Probit Model, response frequency indicates the variable which calculated by formulas 2, factor variable indicates days of the week while covariate variable indicates months respectively. The covariate variable was not found to be statistical significant in the results of the analysis. Factor variable and as a sub-categories returns of Monday and Tuesday were found statistically significant. The regression coefficients of these days and those of other days have a positive and negative signs respectively, as expected. TI returns to be negative on Mondays and Tuesdays while be positive on other days. According to Probit Regression Model, when the day is Monday, the possibility of negative of TI returns increases 0.167 while other days coefficients are zero. Similarly, the returns of Tuesday will increase the possibility of negative return by 0.129. The regression coefficient of other days (Probit Model) was not found to be statistically significant. However it can be said that the coefficient of Thursday is significant when the level of significance is taken as 10%. The probit regression coefficients of these days are being expected to be negative. Because in these days TI returns are positive. These findings are supported by the results presented in Table 1. Briefly, TI tends to cause a profit, not a loss for Wednesdays, Thursdays and Fridays. The results are provided in Table 7.

Table 7. Probit Model Results

Variables	Estimate	Std. Error	Z	Sig.
Month	.000	.008	.053	.958
Intercept-Monday	.167	.079	2.121	.034
Tuesday	.129	.065	1.984	.050
Wednesday	-.031	0.79	-.392	.695
Thursday	-.137	.078	-1.752	.080*
Friday	-.125	.079	-1.590	.112

* : It is significant p<0.10

On the other hand, the Probit Model coefficients show the effect of independent variable on the probability. This effect is being called as marginal effects and to find them the related coefficient should be multiplied with probability density function. These values are calculated by SPSS 15.0. Accordingly, when the day is Monday and the month is December the negative return probability of TI is calculated as 0.568439 max. (56.84%).

Similarly when the day is Thursday and the month is January the negative return probability of TI is shown as 0.445524 min. All the possible circumstances that may occur according to days and months are given in Table 8. This table demonstrates, as the most important find that the possibility of negative return of TI depends on the days, whatever the month is. This is because, no matter what the month is, on Mondays, as the negative return possibility of TI increases, it decreases daily towards to weekend. The negative return possibility of index is higher on Friday than on Thursday. However, this is not found significant according to the Mann-Whitney U Test.

Table 8. The Probability of Negative Return of TI Obtained from Probit Model

Days	Months	Probability	Days	Months	Probability
Monday	January	0.566661	Wednesday	July	0.488909
Monday	February	0.566822	Wednesday	August	0.489073
Monday	March	0.566984	Wednesday	September	0.489237
Monday	April	0.567146	Wednesday	October	0.489401
Monday	May	0.567307	Wednesday	November	0.489565
Monday	June	0.567469	Wednesday	December	0.489729
Monday	July	0.567631	***Thursday***	***January***	***0.445524***
Monday	August	0.567793	Thursday	February	0.445687
Monday	September	0.567954	Thursday	March	0.445849
Monday	October	0.568116	Thursday	April	0.446012
Monday	November	0.568278	Thursday	May	0.446175
Monday	***December***	***0.568439***	Thursday	June	0.446337
Tuesday	January	0.551432	Thursday	July	0.4465
Tuesday	February	0.551595	Thursday	August	0.446662
Tuesday	March	0.551757	Thursday	September	0.446825
Tuesday	April	0.55192	Thursday	October	0.446988
Tuesday	May	0.552083	Thursday	November	0.44715
Tuesday	June	0.552245	Thursday	December	0.447313
Tuesday	July	0.552408	Friday	January	0.450342
Tuesday	August	0.55257	Friday	February	0.450505
Tuesday	September	0.552733	Friday	March	0.450668
Tuesday	October	0.552896	Friday	April	0.45083
Tuesday	November	0.553058	Friday	May	0.450993
Tuesday	December	0.553221	Friday	June	0.451156
Wednesday	January	0.487926	Friday	July	0.451319
Wednesday	February	0.488089	Friday	August	0.451482
Wednesday	March	0.488253	Friday	September	0.451645
Wednesday	April	0.488417	Friday	October	0.451807
Wednesday	May	0.488581	Friday	November	0.45197
Wednesday	June	0.488745	Friday	December	0.452133

So far in this study, it has been calculated how the returns of TI differ according to the days. In addition, it has been observed how the negative return possibility of TI changed in relation to variables by means of the Probit Model. In the later phase of the study, using Logistic Regression, it has been calculated the rate of the negative return possibility of any day or any month of TI to positive return possibility according to the probability of negative return P_i and negative return possibility $1-P_i$. The results are

given in Table 9. According to this table the independent variables of returns of day were found significant while independent variables of month were not. With Friday, taken as the base in the variables of returns of days, the amount of negative return was determined. Accordingly the regression coefficients were found positive for days except Thursday. This state may mean that TI returns may be negative days of the week except on Thursdays. According to Logistic Model, TI returns have observed negative on Mondays, Tuesdays and Wednesdays as 1.6, 1.505, 1.167 times respectively, as much as Friday. TI returns have observed positive on Thursdays as 1.018 (1/0.982) times as much as Fridays. Both in Logistic and Probit Regression Models months variable have not obtained statistically significant. So, it has not investigated the TI returns whether being negative or positive. Therefore, variable of months was not investigated as a factor variable.

Table 9. The Negative Return Probability of TI Obtained from Logistic Regression

Independent variables	**B** **Lower**	**S.E.** **Upper**	**Wald** **Lower**	**Df** **Upper**	**Sig.** **Lower**	**Exp(B)** **Upper**
Days			***22,580***	***4***	***,000***	
Monday	.470	.136	12.018	1	.001	1.600
Tuesday	.409	.135	9.159	1	.002	1.505
Wednesday	.154	.135	1.309	1	.253	1.167
Thursday	-.018	.135	.018	1	.893	.982
Months			***7.352***	***11***	***.770***	
January	.008	.211	.001	1	.969	1.008
February	.082	.214	.149	1	.700	1.086
March	-.020	.209	.010	1	.922	.980
April	-.014	.211	.004	1	.948	.986
May	.187	.207	.814	1	.367	1.206
June	.330	.207	2.525	1	.112	1.390
July	.112	.205	.301	1	.583	1.119
August	.255	.209	1.484	1	.223	1.290
September	.183	.207	.782	1	.377	1.201
October	-.026	.207	.015	1	.902	.975
November	.020	.210	.009	1	.925	1.020
Constant	-.293	.171	2.928	1	.087	.746

4. CONCLUSION

In this study, it has been studied the days of the week and the months of the year anomaly for TI which is calculated for Turkish Stock Exchange. It has been investigated the differences between daily average returns and also monthly average returns, using non-parametric tests. Then, using so called Probit and Logit Models, where the dependent variable is binary variable, it has been obtained the probability of loss for the Tourism Sector Index. Thus, the weak form efficiency has been tested for Turkish TI using a different approach.

According to main findings of the study, there is a day effect on TI, and that there are differences among the days in terms of return. Returns are negative on Mondays and Tuesdays, but positive on the other days. It was found that TI has the lowest return on Mondays and the highest return on Thursdays.

Statistically significant differences were found between the return of Mondays and Wednesdays, Thursdays and Fridays. Significant differences were found between the return of Tuesdays and Thursdays, too. The returns of Mondays and Tuesdays were found negative, but those of the others positive.

It was also found that there is no month in TI. However it was found that the highest return was realized in January. This also coherent with the past researches results in market anomalies literature.

It has been tested the probability of loss in TI, and it was found that the days of the week effect was significant but the months of the year effect was insignificant both in Logit (Logistic Regression) and Probit Models.

The Regression Model Mondays and Tuesdays coefficients which obtained by the Probit Model are positive while the rest are negative. These findings are compatible with the findings of non-parametric statistical methods. Indeed, this is the expected result, because the days with a positive regression coefficient of TI indicate loss. Thus, the probability of loss of TI increases on Monday and Tuesday.

Another result is that, according to Probit Model, no matter what the month is, the probability of loss is highest on Monday, and decreases along the days of the week. The minimum loss probability was found for Thursday. It can be concluded that day effects of the week is seen in TI in terms of Probit Model.

Probit Model results are also similar to non-parametric statistical methods results. Day variable is significant but month variable is insignificant in the Logistic Model. So, when Fridays are assumed as the base, TI returns have the tendency of loss in the days of the week except Thursdays. This result supports all other findings of the study mentioned above.

As a conclusion, TI return is not influenced by the month of the year, but rather by the days of the week. All these findings reveal that TI is influenced by day, not by month. This result shows that investors are taking into account daily events data rather than monthly companies income data for tourism sector index. So far, the investor can set an active trading strategy using the days of the week anomaly, but not months of the year. This study proves that Turkish TI is inefficient in weak form.

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