CALENDAR ANOMALIES AT BORSA ISTANBUL

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─Abstract─

The aim of the study is to find out the presence of abnormal day of the month return at Borsa Istanbul (BIST) and to make investors have higher returns from these anomalies. Daily percentage returns between January 4, 2000 and December 31, 2012 are used for the study. 31 hypotheses are tested in the research and the validity of daily returns is tested with Z statistics. Results show that there are 11 statistically significant days at Istanbul Stock Exchange. There are 7 days with abnormal positive return whereas 4 days with abnormal negative return.

Keywords: abnormal return, calendar anomalies, Borsa Istanbul
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1. INTRODUCTION

According to Efficient Market Hypothesis (Fama, 1970), asset prices reflect all available information in the market, there is no uncertainty about future; namely none of the investors have chance to get abnormal return.

Abnormal return or financial anomaly means the deviation from the average return. Financial anomalies are divided into two groups as calendar anomalies, fundamental anomalies and technical anomalies. Examples of calendar anomalies are day of the week effect, day of the month effect, turn of the month effect, intraday effect, January effect, Friday the thirteenth effect and holiday effect. Examples of fundamental anomalies are value versus growth anomaly, dividend yield anomaly, overreaction anomaly, price to earnings ratio anomaly and low price to sales anomaly. Moving averages and momentum effect are the examples of technical anomalies (Latif et al. 2011)

Another assumption of Efficient Market Hypothesis is that all investors are rational but in practice investors react by taking into account their feelings. As a result of including emotions in the field of finance, a new subsection under finance takes place entitled "Behavioral Finance". Calendar anomalies are analyzed under the heading of behavioral finance.

2. CALENDAR ANOMALIES

Watchtel (1942) studied the seasonality effect of stock returns firstly in the literature. Rozeff and Kinney (1976) analyzed New York Exchange returns from 1904 to 1974 and reported that January return average was higher than other months.

Ariel (1987) tested the returns of US stock market. He found that stock returns were positive in the first half of the month. Barone (1990) studied calendar anomalies at Italian stock market and he found that stock returns are higher than average at the beginning and end of the month which is named turn of the month effect. Cadsby and Ratner (1992) analyzed stock returns of nine countries and reported turn of the month effect for five of the countries.

Agraval and Tandon (1994) analyzed the weekend, turn of the month, end of December, monthly and Friday the thirteenth effect on eighteen stock markets. They found that Friday returns were significantly positive with one exception. Pre-holiday returns were found positive and returns were significantly positive in January, whereas negative in December.

Husain (1998) investigated the presence of Ramadhan effect in Pakistan equity market. Stock return volatilities were found to decrease during Ramadhan, however average return is stable during month.

Brooks and Persand (2001) studied calendar anomalies at Taiwan, South Korea, Malaysia, The Philippines and Thailand from 1989 to 1996. At Malaysian and Thailand stock markets, the presence of day of the week effect was found. There was significant positive return on Monday and significant negative return on Tuesday. There was not any evidence of calendar anomaly at south Korea and the Philippines.

Al-Khazali el al. (2008) examined calendar anomalies in the Athens Stock Exchange between 1985 and 2004. They found a strong "day" effect and rather weak "week" and "January" effects by using GARCH-M analysis.

Depenchuk et al. (2010) examined the January effect, weekend effect, and turn-of-the-month effect at Ukrainian stock and bond markets. According to regression analysis results, although there was no evidence of January effect or a weekend effect in the Ukrainian stock and bond markets, turn of month effect was in the Ukrainian stock market.

Desai and Trivedi (2012) analyzed the calendar anomalies at Sensex, S&P 500, Merval, Bovespa, Shanghai Composite, Nikkei, Strait Times, CAC, DAX and FTSE stock markets. Daily returns of indices are calculated and compared to Z statistics. Results showed that day of the month effect were present at all of the ten equity markets.

3. DATA AND METHODOLOGY

3.1. Data

In order to test day of the month effect, the study is limited to daily percentage returns of ISE from January 4, 2000 to December 31, 2012. The data of stock index was downloaded from the web page of BIST(www.borsaistanbul.com).

3.2. Methodology

Daily return of closing prices for Istanbul Stock Exchange is calculated as follows:

$$R_t = (P_t - P_{t-1}) / P_{t-1} \times 100$$

R_t : Daily return $(R_1, R_2, R_3,\ldots\ldots, R_{31)}$
P_t : Closing value of day
P_{t-1} : Closing value of previous day

The average return of each day is calculated as follows:

$$AR_t = \sum AR_t / N$$

AR_t : Average return of day $(AR_1, AR_2, AR_3,\ldots\ldots, AR_{31)}$
N   : Number of observations
Z-Test is used for testing the statistical significance of returns and follows:

$$Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$$

$\bar{x}$: Average return of each day
μ : Population mean
σ : Standard deviation
n   : Number of observations

Z value of each day is tested at 80%, 90%, 95% and 99% level of confidence.

Table 1. Z Table Values

Symbol	Confidence Interval	Z Table Value
*	80 %	1.282
**	90 %	1.645
***	95 %	1.96

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****	99 %	2.58

The hypothesis is tested for ISE for 31 days, namely 31 hypotheses are tested. Hypothesis for each day are follows:

$H_0 \quad : \bar{x} = \mu$

$H_1 \quad : \bar{x} \neq \mu$

Table 2. Z Scores of Each Hypothesis

	% Return	**Z**
1	**0,604**	**2,01***
2	**0,459**	**2,5***
3	-0,026	-0,47
4	**0,49**	**1,68**
5	0,156	0,29
6	0,07	-0,01
7	**-0,302**	**-1,57***
8	**-0,266**	**-1,58***
9	-0,027	-0,52
10	-0,099	-0,8
11	-0,138	-1,01
12	0,039	-0,16
13	-0,121	-0,89
14	0,031	-0,2
15	0,141	0,34
16	**0,399**	**1,45***
17	**-0,559**	**-2,33***
18	0,193	0,53

19	0,172	0,32
20	-0,146	-1,02
21	-0,168	-0,95
22	**-0,213**	**-1,37***
23	-0,063	-0,61
24	0,257	0,84
25	**0,341**	**1,46***
26	**0,384**	**1,45***
27	0,162	0,44
28	-0,017	-0,48
29	0,07	-0,02
30	0,198	0,44
31	**0,545**	**1,82****

4. FINDINGS

Table 2 shows that there are 11 statistically significant days at Borsa Istanbul
There are 7 days with abnormal positive return whereas 4 days with abnormal
negative return. At the beginning and at the end of the month, there is opportunity
for investors to benefit from abnormal positive return which is named "turn-of-
month" effect.

5. CONCLUSION

We tested the presence of day of the month effect at BIST by analyzing 31
hypotheses for each day. Results show that calendar anomalies are present at ISE.
At the beginning and at the end of the month, there is opportunity for investors to
get excess return.

Since there is opportunity for excess return, assumptions of Efficient Market
Hypothesis are rejected for BIST. Namely, BIST is not an efficient equity market
that all information reflects in stock prices. Investors of BIST can benefit from

positive abnormal return if they take into account and avoid from negative abnormal return.

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