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GELİŞMEKTE OLAN PİYASALARDA AYIN GÜN ETKİSİ

DAY OF THE MONTH EFFECT IN EMERGING MARKETS

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ÖZET

Bu çalışmanın amacı İstanbul, Bovespa, Merval, Shanghai ve Sensex hisse senedi piyasalarında ayin gün etkisinin varlığını ve yatırımcıların bu yüksek getirilerden fayda sağlama şansının olup olmadığını araştırmaktır. Çalışmada Asya – Pasifik' ten ve Amerika' dan gelişmekte olan piyasalar seçilmiş ve sonuçlar Türk hisse senedi endeksi ile karşılaştırılmıştır. Her piyasaya ait günlük getiriler, endekslerin işlem görmeye başladığı tarihten 31 Aralık 2012 tarihine kadar hesaplanmıştır. Beş endekse ait 31 hipotez Z istatistiği kullanılarak test edilmiştir. Bulgular beş hisse senedi piyasasında da negatif ve pozitif normal olmayan getirilerin varlığını göstermektedir.

Anahtar Kelimeler: *Normal Olmayan Getiri, Anomali, Gelisen Piyasa Endeksi*

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ABSTRACT

The aim of this study is to test the existence of day of the month effect at Istanbul, Bovespa, Merval , Shanghai and Sensex stock markets whether investors have chance to benefit from these abnormal returns. In the study, emerging markets from Asia-Pacific and America are chosen and results are compared to Turkish stock index. Daily percentage returns of each market are calculated starting from the first transaction day to the December 31, 2012. 31 hypotheses for each of five markets are tested by using Z statistics. Results show that positive and negative abnormal returns exist at all of the five stock markets.

Keywords: *Abnormal Return, Anomaly, Emerging Market Index*

1. INTRODUCTION

The efficiency of stock markets after proclaim of Efficient Market Hypothesis by Fama (1970) have been a very popular topic in finance literature. Various studies are held to empirically analyze the efficiency of capital markets and to find out the anomalies in stock markets.

Anomaly means the deviation from the average. Calendar effects are anomalies in returns depending on the time period at calendar. Calendar effects or seasonal effects are used interchangeably in terms of definition in literature. Some examples of calendar anomalies are day of the week effect (weekend effect), January effect, turn of month effect and holiday effect. Day of week effect also called as weekend effect which means higher Friday returns when compared to Monday returns. Contrary on this, recent studies have examined the larger Monday returns as weekend affect in finance literature. January effect exhibits much higher returns than any other months. According to Gultekin and Gultekin (1983) and Seyhun (1993) the month of the year effect have been mostly explained by the size of the firm, tax-loss selling at the end of the year hypothesis, insider-trading information, January seasonal in the risk-return relationship, and omitted risk factors, etc . Turn of the month effect is the occurrence of higher returns towards the last few days of the previous month and first few days of the following month as compared to the returns on the rest of the trading days of the month. Some of the reasons accountable for this phenomenon are the cash flows received and new information arriving towards the end of the month (Namaz and Mirza, 2012). Pre- holiday effect, a day immediately before the holiday, is described as the stocks returns become higher than the returns generated on post holidays.

Calendar anomalies are tested at stock, bond and futures markets of both developed and developing markets in the literature that different methodologies including regression analysis, GARCH analysis and Z statistics are applied to the data set. In this paper, to test the day of the month effect as a calendar anomaly, we analyzed emerging stock markets. We conducted this study to find out the presence of abnormal return in the Istanbul, Bovespa, Merval , Shanghai and Sensex stock markets, aiming to inform individual and professional investors about stock market returns to benefit from these abnormal returns where the abnormal return is statistically significant.

We design the study in five sections. In first part we introduce the anomaly, in the second section we summarize the literature. Section three reports data and methodology, results are shown in fourth part and fifth section concludes the article.

2. PRIOR RESEARCH

In the last decades, various studies have been conducted to examine calendar anomalies in stock returns in both developed markets such as U.S., U.K. and Japan and developing markets such as Taiwan, Thailand, Singapore, Philippines, Malaysia and Korea. These anomalies refer the day-of-the-week effect, the January effect and the firm-size effect (Lian and Chen, 2004). Until the Wachtel

(1942)'s study, according to all research up to 1925, there has not been seasonality effect in stock markets. Rozeff and Kinney (1976)'s study is the one of the studies that investigates the anomalies. They used New York Stock Exchange (NYSE) prices and reported evidence of seasonal anomalies in stock market return. Ariel (1987) conducted a research from 1963 to 1981 and proved half-month effect in US market. Bourdreaux (1995) investigated seven countries' (Denmark, Germany, Norway, Singapore/Malaysia, Spain and Switzerland) stock markets and reported that there is strong evidence of a January effect and week-end effect. He found an end of month effect in Norwegian, Danish, and German markets. He also determined that the January effect was not adequate to explain the existence of monthly effects. Cheung and Coutts (1999) researched the January effect or other monthly seasonality in Hang Seng Index. They did not find persistent January effect or other monthly seasonality in Hong Kong market surprisingly. Coutts and Sheikh (2000)'s empirical results on the Johannesburg Stock Exchange were supported Cheung and Coutts (1999)'s findings that they provide no evidence for existence of January effect in All Gold Index. Maghayereh (2003) tested seasonal anomalies/calendar effects with GARCH, EGARCH and GJR methods and did not find any evidence of monthly seasonality and January effect in Amman Stock Exchange. Haug and Hirschey (2006), find a persistent January effect in US portfolio returns during various periods (1802-2004 and 1927-2004) for large and small caps. They also examined the anomalies after Tax Reform Act of 1985 and conclude that January anomaly is for small cap stocks.

Chan et al.(1996), examined seasonality on the Stock Exchange Bombay (SEB), Kuala Lumpur Stock Exchange (KLSE), the Stock Exchange of Singapore (SES) and The Stock Exchange of Thailand. They found strong day-of-the-week effects in all stock markets and month-of-the-year effects on the KLSE and the SES. Choudhary (2001) investigated using non-linear GARCH model seasonal anomalies in the German, UK and US stock markets during pre-WWI period. He found the month of the year effect and January effect in the UK and the US returns. According to the study, the German returns did not show January effect but show the month of the year effect. Brooks and Persand (2001) investigated the day-of-the-week effect in Southeast Asian stock markets: the Philippines, Taiwan, South Korea, Malaysia and Thailand during 31.12.1989-19.01.1996. They found that South Korea and the Philippines did not show any significant evidence. But Malaysia, Taiwan and Thailand had one day of the week at least. Kiymaz and Berument (2003), reviewed the day-of-the-week effect for Canada, Germany, Japan, United States and United Kingdom' s stock indices for period January, 1988 to June, 2002. They examined return and volatility equation and reported the presence of the day of the week effect in both. According to results, highest return was observed on Monday for Germany and Japan, on Friday for Canada and the United States, on Thursday for the United Kingdom. On the other hand, the lowest return was observed on Monday for Canada, on Tuesday for the United Kingdom, the United States, Japan and Germany. Lian and Chen (2004) examined the daily anomalies

in the five Asian equity markets of Malaysia, Singapore, Thailand, Indonesia and the Philippines before, during and after the Asian financial crisis. They found during the pre-crisis period Monday and Friday effects. Except the Tuesday effect in two countries Thailand and the Philippines, during the crisis period there are no daily anomalies. Apolinario et al (2006) investigated the day-of-the-week effect on the European stock markets (France, Germany, Portugal, Austria, Spain, Belgium, Denmark, The Netherlands, Italy, The United Kingdom, The Czech Republic, Sweden and Switzerland) from July 1977 to March 2004. They noted that most of the European markets do not show a day of the week effect because of not significant difference from the other days of the week. Busher and Sadorky (2006), investigate the day-of-the-week effect in 21 emerging stock markets and they found that day-of-the- week effects in the Philippines, Pakistan and Taiwan. According to Busher and Sadorsky (2006), day-of-the-week effect is generally not presence in the emerging stock markets. Wong et al. (2011) studied January effect, day of the week effect, turn of the month effect and pre-holiday effect period from 1993 to 2005 for Singapore Stock Market. Besides, they divided their data as pre-crisis (1993-1997) and post crisis (1998-2005) period to provided an evidence for the crisis of 1997. Their results indicated that anomalies declined or disappeared in post-crisis period. Desai and Trivedi (2012), examined existence of day month effect on ten stock markets Sensex-India, S&P500-United States, Merval-Argentina, Bovespa-Brazil, SCI-China, Nikkei-Japan, Straits Times-Singapore, CAC-France, DAX-Germany, FTSE-England) and calculated daily returns with Z-statistics. They found significantly higher returns in some days and day of month effect in all stock markets.

Anomaly known as turn of month effect has more recently investigated and discovered. Ariel (1987) first reported a monthly seasonality that according to study for period 1963 to 1981 it is observed positive returns at the beginning of the month, starting on the last trading day of the previous month and continuing through the first half of the new month. Hanzel and Zemba (1996) defined turn of month (TOM) effect as last trading day of the previous month and first four trading days of the new month. Their found an evidence of stronger turn of month effect for last two days of previous month and first three days for current month. Kunkel and Compton (1997) tested turn of month effect on retirement fund data (April 1998- December 1997), Dow Jones Industrial Average (1885-1995) and Standard and Poor's 500. Results pointed out that strong TOM effect extended over six days (last 4 days of the previous month and first two days of next month). Chen and Chua (2011) tested the presence of the turn of the month (TOM) anomaly in the exchange traded funds (ETF) returns (from 1993 to 2010) and in the Standard and Poor's 500 Index (from 1950 to 2010). According to results they found TOM anomaly for Standard and Poor's 500 Index for first four days when compared with rest returns of month.

Kim and Park (1994), reported abnormal high stock return on the trading day before holiday in major three US markets: the NYSE, AMEX, and NASDAQ. They also reported holiday anomaly in UK and

Japonese markets and conducted that holiday effects in the U.K. and Japanese stock markets were independent of the holiday effect in the U.S. stock market. Chong et al. (2005) examined the holiday effect for the U.S., U.K. and Hong Kong markets. Their hypothesis was the pre-holiday effect has declined across the past three decades. They tested period of January 1979-July 2003 and found that a decline in all three markets was only statistically significant for the U.S. until the late 1990s.

3. DATA AND METHODOLOGY

Daily closing prices are used starting from the first transaction day of all indices to the December 31, 2012.

The data set used in this paper is summarized in Table 1.

Table 1: Indices and Data Period

Indices (Country)	**Data Period**
Bovespa (Brazil)	27.04.1993 – 31.12.2012
SSE (Shanghai)	19.12.1990 – 31.12.2012
Sensex (India)	01.07.1997 – 31.12.2012
Merval (Argentina)	08.10.1996 – 31.12.2012
BIST (Turkey)	04.01.1988 – 31.12.2012

To find out the abnormal return of each market index, Z-Test is used as a method 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 : Average return of each index (population mean)

σ : Standard deviation

n : Number of observations

Daily return of closing prices for each index 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,……, R_{31}),

P_t : Closing value of present 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 day return for each date (AR_1, AR_2, AR_3…, $AR_{31)}$

N : Number of observations of each time

The average return AR_t of all indices listed for the study is calculated for the period mentioned in Table 1.

Table 2: Z scores at levels

Symbol	Confidence Interval	Z Value
*	80 %	1.282
**	90 %	1.645
***	95 %	1.96
****	99 %	2.58

Table 2 shows the critic values of Z-statistics at 80%, 90%, 95% and 99% level of confidence. In table 3, 4 and 5 we point (*) for z value: 1.282, (**) for z value: 1.645, (***) for z value: 1.96 and (****) for z value: 2.58. The hypothesis is tested for 31 days of a month and that 155 hypothesis are tested totally. Null and alternative hypotheses for each day compares sample mean ($\bar{x}$) with average daily return of all data (μ).

Null and alternative hypothesis can be shown as follows:

H_0 : Sample mean is equal to population mean ($\bar{x} = \mu$) and

H_1 : Sample mean is not equal to population mean ($\bar{x} \neq \mu$)

Calculated Z statistics for each day of the market indices is interpreted as “abnormal positive return” when the calculated value is higher than the table value. On the contrary, defined as “abnormal negative return” if the calculated Z value exceeds the table value in terms of absolute value.

4. RESULTS

Table 3: Z Scores for Asia Pacific

	GROUP OF ASIA PACIFIC			
	SSE (Shanghai)		SENSEX (India)	
DATE	% RETURN	Z SCORE	% RETURN	Z SCORE
1	0,1	0,06	**0,351**	**1,75****
2	0,158	0,47	**0,428**	**2,27*****
3	**0,43**	**2,01*****	0,212	1,08
4	**0,3**	**1,33***	**0,386**	**1,75****
5	0,038	-0,24	-0,111	-1,19
6	0,022	-0,41	0,185	0,97
7	0,26	1,19	0,141	0,61
8	0,202	0,72	-0,041	-0,7
9	0,093	0,05	0,189	1,01
10	0,046	-0,22	0,01	-0,29
11	0,062	-0,14	**-0,271**	**-2,35*****
12	-0,073	-1,21	**-0,294**	**-2,5*****
13	-0,038	-0,85	0,033	-0,13
14	0,118	0,2	0,177	0,81
15	-0,021	-0,86	-0,201	-1,43*
16	-0,057	-1,02	0,156	0,8
17	-0,204	-1,89	-0,238	-1,59*
18	0,078	-0,03	-0,02	-0,36
19	0,22	0,79	-0,072	-0,85
20	0,248	1	-0,065	-1,01
21	0,718	1,1	0,001	-0,33
22	**-0,271**	**-2,04*****	**-0,306**	**-2,65******
23	-0,116	-1,21	-0,068	-0,81
24	0,312	1,26	0,1	0,3
25	0,048	-0,18	0,222	1,18
26	-0,029	-0,75	0,148	0,6
27	-0,088	-1,04	0,007	-0,35
28	-0,015	-0,75	0,099	0,31
29	0,082	-0,03	0,217	1,18
30	0,037	-0,3	0,12	0,49
31	-0,038	-0,76	**0,452**	**2,02*****

Table 3 shows abnormal returns of Asia-Pacific group. Excess returns of Shanghai and India indices in terms of Z statistics intersect generally on same days. Namely, investors of Asia-Pacific do not have chance to arbitrage from abnormal return among these stock markets due to intersection. Abnormal returns have been observed in Shanghai market on 3.4. and 22. day; in India market on 1.,2.,11., 12., 22. and 31. day respectively.

Table 4: Z Scores for America

	GROUP OF AMERICA			
	BOVESPA (Brazil)		MERVAL (Argentina)	
DATE	% RETURN	Z SCORE	% RETURN	Z SCORE
1	**0,937**	**3,34******	-0,432	-0,09
2	0,419	1,24	-10,946	-0,92
3	0,34	0,87	-0,005	1,14
4	0,118	-0,28	**0,077**	**2,26*****
5	0,207	0,19	**0,108**	**2,62******
6	0,297	0,69	**0,087**	**2,38*****
7	**-0,091**	**-1,41***	-0,308	0,25
8	0,268	0,59	**-0,028**	**1,69****
9	**-0,311**	**-2,93******	-0,184	0,84
10	0,2	0,11	-0,581	-1,02
11	-0,427	-1,02	-0,183	0,89
12	0,099	-0,36	-0,473	-0,71
13	0,232	0,35	**0,26**	**3,05******
14	**-0,088**	**-1,39***	**-0,017**	**1,87****
15	0,1	-0,22	**0,232**	**2,66******
16	**0,532**	**2,21*****	**0,207**	**3,13******
17	0,404	1,22	**-0,051**	**1,56***
18	-0,015	-1,02	**0,473**	**4,13******
19	0,109	-0,35	**0,26**	**3,23******
20	0,011	-0,91	**0,089**	**1,90****
21	0,01	-0,83	**0,122**	**2,04*****
22	0,164	-0,04	**-0,013**	**1,64***
23	0,129	-0,23	**0,111**	**2,92******
24	0,061	-0,64	**0,003**	**1,86****
25	**0,426**	**1,32***	**0,346**	**4,56******
26	0,218	0,29	**0,2**	**3,31******
27	0,057	-0,59	-0,133	1,06
28	0,322	0,9	**0,033**	**2,00*****
29	0,22	0,26	**0,05**	**2,07*****
30	0,22	0,25	**0,129**	**2,35*****
31	0,322	0,71	**-0,065**	**1,59***

Table 4 indicates excess returns of group of America. Results of group America is very interesting in terms of abnormal return, especially in Argentina stock market there are 22 days with statistically abnormal positive return, in contrary to some of days with negative return which means that investors of Argentina stock market have change to benefit from abnormal positive return 22 out of 31 days of a month.

Table 5: Z Scores for BIST

DATE	BIST	
	% RETURN	Z SCORE
1	**0,59**	**1,94****
2	**0,49**	**1,71****
3	0,169	-0,1
4	**0,777**	**2,78*****
5	0,194	0,03
6	0,301	0,55
7	**-0,251**	**-2,43*****
8	**-0,039**	**-1,32***
9	-0,029	-1,26
10	0,153	-0,18
11	0,001	-0,98
12	0,287	0,5
13	**-0,062**	**-1,31***
14	0,355	0,93
15	0,397	1,27
16	**0,462**	**1,46***
17	**-0,182**	**-1,71****
18	0,372	0,92
19	0,181	-0,03
20	0,214	0,16
21	**-0,056**	**-1,34***
22	0,043	-0,79
23	0,04	-0,72
24	-0,074	-1,27
25	0,266	0,43
26	0,33	0,76
27	0,025	-0,77
28	0,058	-0,71
29	0,177	-0,06
30	0,213	0,12
31	**0,623**	**2,00*****

Table 5 shows statistically abnormal returns of Borsa Istanbul, National 100 Index. At the beginning and end of the month positive abnormal return exist contrary to the presence of negative abnormal return in the mid of the month which can be named “turn of the month effect”.

Abnormal positive and negative returns are found regardless of the region where the stock market takes place. Number of statistically significant days is presented in Table 6.

Table 6: Number of Abnormal Return

Market	Number of Positive Abnormal Return	Number of Negative Abnormal Return
Bovespa	3	3
ISE	5	5
Merval	22	0
Sensex	4	5
Shanghai	2	1

According to Table 6, Merval has the highest number of abnormal return, compared to Shanghai which is the stock market with the least number of abnormal returns. It is found in the study that at the beginning and end of the month there is positive abnormal return in Sensex and BIST. Namely, turn of the month effect is present at these stock markets. Number of days with abnormal return at Merval is extremely high. Especially, second half of the month except 27th of the month each day has statistically positive return.

5. CONCLUSION

We conducted this to find out the presence of abnormal return at stock markets of developing countries consisting of Argentina, Brazil, China, India and Turkey by analyzing 31 hypotheses for each day from the since the first transaction days which covers the minimum period for Sensex with 15 years and the maximum period for BIST with 24 years. At all of the stock markets in the study, the presence of abnormal positive and negative returns is found statistically significant regardless of the region.

This paper's statistical results show that the selected emerging markets are not efficient according to Fama (1970). Although Efficient Market Hypothesis assumes that excess returns cannot be earned by trading, the statistical results of this paper show that abnormal return is present at the selected emerging markets. As it is aimed in the paper, abnormal return and calendar anomalies are statistically tested. Consequences of the tests indicate that current investors of these stock markets have opportunity to benefit from excess positive return if they protect their portfolios from negative abnormal return which attracts the potential investors.

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