TESTING OF THE WEEKEND (MONDAY) EFFECT FOR ISTANBUL GOLD EXCHANGE

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Abstract

The study examines the weekend (Monday) effect related to gold prices at Istanbul Gold Exchange in the period from 27.07.1995 to 31.12.2012. Data set used is consisted of daily gold prices. The analyses are made via regression model and Mann Whitney U Test. According to results, statistically significant positive returns could be acquired on Mondays at Istanbul Gold Exchange. Besides; return level acquired at the weekend is higher and more significant comparing to weekdays. Hence; the weekend effect is comprehended to be important for the investor reated to the issues such as portfolio management and determining the sell-buy strategies.

Key Words: Monday Effect, Anomaly, Gold Price, Weekend Effect.

1. Introduction

According to the behavioral approach, investors in the financial marketplace do not always display rationalistic behavior. As a result of this situation there appear marketplace anomalies. As to periodically anomalies that consist in the marketplace give investors ground for securing more premium than expected. On Mondays low, on Fridays high closure costs are a matter of the weekend anomaly which is also known as the week day effect in the financial marketplaces. In this case while investor secures negative premium on Mondays, S/he secures positive premium on Fridays. For mentioning about relevance of this anomaly, in addition to this situation that recognizes, also coefficient values which are secured should statistically be meaningful.

After the 2008 global finance crisis, gold which is favored as a secure investment tool by investors in Turkey has quite fluctuating prices. This situation both gave an opportunity to investor to secure high level premium and caused him/her to expose high risk. The investigation is important in terms of analyzing the existence of; gold investors' in Turkey possibility of getting profit above normal by besides price fluctuations also profit by the weekend anomaly. Also, the knowledge of existence of the weekend anomaly in gold prices provides useful information to investor about deciding purchase-sale proceeding period. This information is important because thorough it, there can be an increase in premium level. For this reason, to analyze whether the changes in gold prices is relevant with days of week or not is among the primary purposes of study. In the meantime, investor who keeps his/her investments as gold; is tried to be questioned whether s/he secures a positive and meaningful premium or not. In accordance with these purposes, it is believed that this practiced study contributes to literature at three main points. Primarily; it is identified that whether gold investors in turkey have a possibility of making a profit which is above normal in specific days of week. Circumstantially, it is aimed to contribute to literature on the subject of whether new investment strategies are in question or not. Secondly; it is defined that an investor who keeps gold in weekend, in comparison to weekdays has a possibility of more premium or not. Moreover; due to

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the anomaly researches which are performed for equity securities marketplace has not made enough for gold which is the most popular investment tool recently, it is thought that it is going to contribute to enrich literature which is about anomalies in gold prices.

This research analyzes weekend (Monday) effect on the basis of 3616 daily price data in seventeen year period which comprise 27.07.1995 - 31.12.2012 session in Istanbul Gold Exchange. Moreover, it is one of the truck jobbers which tests anomaly researches that appear in Istanbul Gold Exchange. With this study, it is searched that in investor's portfolio diversification in purpose of decreasing risk s/he chooses one of the important tools, gold prices with weekend (Monday) anomaly has any situation that can help obtain premium above expected or not.In this direction the study is organized in this way. After the introduction, it is addressed literature studies which are made in marketplaces of gold and equity securities. After that model and data set that are used in research are introduced, in sequent part, obtained findings are mentioned. In conclusion part, there are general evaluations which are based on obtained findings.

2. Literature

There are various studies that analyze the existence of anomalies in the world of gold marketplaces. In these studies anomalies such as the day of week effect, the weekend effect, session and month effect are analyzed. Monday which is generally studied in stock market and weekend anomaly are among the subjects that are studied in gold market. According to the day of week anomaly, some days of week provides statistically siignificiant positive or negative premium. According to weekend anomaly, Friday is a day in which it can be secured the highest positive stock premium (Uslu, 2002:58).

Ball, Torous and Tschoegl (1982), in the period of 1975-1979, studied gold market for morning and afternoon in London Metal Exchange. Study findings reinforce statistically significiant existence of weekend effect in this market.

Ma (1986) is another researcher who studies gold markets. According to his study findings, gold before the period 1981; presents its inventor positive premium in weekends. But in the period of 1981-1985 it is confirmed that gold presents its inventor negative premium on Mondays. These obtained findings are evaluated as proof to existence of the weekend effect in gold market.

Coutts and Sheikh (2002), study existence of January, day of week, weekend, session effect in gold index in Johannesburg Exchange. In this research, profit by data from the years between January 1987 and May 1997, regression model is used. Obtained findings support that there is not any January effect on this index. But, significiant negative Monday and January premium are reached.

Kamstra, Kramer and Levi (2003) in their studies explain that daylight saving affects the demand for gold. It is explained in the study that with the winter time in north hemisphere, gold in autumn months appears as more attractive investment tool in great stock exchanges.

Lucey and Tully (2006) in their studies, in the period of 1982 and 2002 with using COMEX end of day gold prices and through GARCH method study gold premiums. According to research results, they state that statistically weak negative weekend premium is in question.

Baur and McDermott (2010) carry out a research with using monthly price data between the years 1979 and 2009, in this study they show that in many developed European countries gold is preferred as safe investment tool. In addition to that different from other investment tools gold; gives positive reaction to negative shocks appears in markets is detected in this study.

Baur (2012) in his study analyzes whether changes that appears in gold prices are relevant to months or sessions or not in terms of both premium and volatility. As a result of study, he state that there is a positive and significiant premium in September, October, November months which are called as ‘’autumn effect’’. Moreover, he determines this situation in variance; he states that the highest variance values appear in autumn session.

Blose and Gondhalekar (2012) in their studies, by using COMEX end of day gold prices 32 years period between the years of 1978-2009 analyze the weekend effect in gold premiums in bear, bull and depressed markets. According to study findings, the premium which is secured in weekends is lower than weekday, but statistically significiant. Also, it is determined that the weekend effect is relevant to negative bias.

In nternational market, contrary to anomaly researches about gold prices in Turkey, this issue is newly started to analyzed. The studies in Turkey that are about anomaly analysis on gold prices are very limited.

Aksoy (2013) in her study by using Istanbul Gold Exchange’s gold and silver reference prices, searches day of week effect in premium and volatility for between the dates August 2008 and December 2011. According to study result; day of week effect are encountered for gold in premium and volatility. However, day of week effect is encountered for silver in just volatility.

Kırlıoğlu and Tuna (2013) in their mutual studies, profit by 414 monthly premium data in the period of between 1977:12- 2012:06, and the changes in gold prices in Turkey are analyzed by taking notice of months and seasons. According to research result, gold provide statistically significiant premium in January and September if month is taken as period. They determine that when session is taken as period, in autumn and winter season’s positive and statistically significiant gold premium is in question. Also, they cannot reach any findings which are related to existence of any Spring and Summer month which are seen as wedding season anomaly.

Although there are limited number of research which analyze existence of anomalies in gold prices, in equity securities market, there very few research that analyze anomaly. Muradoğlu and Oktay (1993), Balaban (1995), Bildik (2000), Karan and Uygur (2001), Demirer and Karan (2002), Oğuzsoy and Güven (2003) , Berument, Inamlik and Kıymaz (2004), Kıyılar and Karakaş (2005), Aktaş and Kozoğlu (2007), Tuncel (2007), Dicle and Hassan (2007), Atakan (2008), Ergül, Akel and Dumanoğlu (2009) and Küçüksille (2012), are researches who analyze day of week effect in Istanbul Exchange.

3.The Method and Data Set

3.1. Method

In the study, when the analysis of the weekend anomaly on gold prices is appeared, two different regression models are used. First model is;

$$R_t = c + \beta_2 D_{Tuesday} + \beta_3 D_{Wednesday} + \beta_4 D_{Thursday} + \beta_5 D_{Friday} + \varepsilon_t \quad \text{Equation (1)}$$

iscomprised as it is illustrated in Equation 1. R_t in the model reflects that gold premium in t time, D reflects dummy variable which is defined for every day of week. For example, while dummy variable for Tuesday is D Tuesday takes 1 value in related day, other days it takes 0 value. Regression model which is comprised for studying Monday effect in Istanbul Gold Exchange is added as stable (c) on Mondays. So, it is analyzed premium value that is secured on Monday and its difference than other days. Monday premium which is added regression model as static; if it is bigger than other days, except from static which is referred as c other all coefficient values are supposed to smaller than zero. In this case, obtained findings refuse hypothesis which is "coefficient is equal to zero'' and it allows make comment that daily premium which is defined by static is bigger and statistically more meaningful than other days (Kırlıoğlu and Tuna, 2013:31-32).

In the study, the second regression model which is comprised in the purpose of analyzing the weekend effect is;

$$R_t = \beta_1 D_{Weekday} + \beta_2 D_{Weekend} \quad \text{Equation (2)}$$

iscomprised as it is illustrated in Equation 2;β1 and β2 in here express regression coefficients. D weekend dummy variable take 1 value for weekend and for other days it takes zero value. D weekday is 1-Dweekend dummy variable (Blose and Gondhalekar, 2012:27). While the weekend effect is analyzed, the premium between Friday closing price and Monday closing price is accepted as gold's weekend premium value (Blose and Gondhalekar, 2012:28). The rest of the days consist weekday premiums. In weekday for every day separate premium calculation is carried out. Based on the obtained findings five days of week obtained gold premiums are equal or not is analyzed buy Mann Whitney U Test. Mann Whitney U Test which is nonparametric tests any month premium is equal to other month or not. To calculate the test criterion two months premiums put together and give sequence values according to their order low to high. It is taken average values is sequence numbers in equal values. If months' premiums are equal, difference of sequence values totality is not expected. As test statistics;

$$T = S - \frac{n_1(n_1+1)}{2} \quad \text{Equation (3)}$$

It is calculated. The situation of observation values numbers which are taken from both groups over 20, according to central limit theorem normality assumption can be used. In this case, average and standard inequality of T statistics are

$$\mu_T = \frac{n_1 * n_2}{2}$$

$$\sigma_T = \sqrt{\frac{n_1 * n_2 (n_1 + n_2 + 1)}{12}} \quad \text{Equation (4)}$$

It is calculated in this way. Standard normal range test statistics is

$$Z = \frac{T - \mu_T}{\sigma_T}$$ Equation (5)

It is calculated in this way. The most important advantage of Mann Whitney U Test which is nonparametric test is; the normal range quality of premiums is not needed. At the same time, this proceeding is applied for premium of gold in weekends and also for all other days of week.

3.2. Data

This researcher's purpose is to analyze the existence of the weekend anomaly in Istanbul Gold Exchange. In this purpose, s/he uses 3616 daily gold price data from the date 27.07.1995 to 31.12.2012. All data that are used in research are obtained from the address www.iab.gov.tr. Data that are used are in the type of TL/gr, by using daily closing prices; daily premium values are calculated. In this purpose;

$$R_t = \ln\left(\frac{P_t}{P_{t-1}}\right) * 100$$ Equation (6)

Formula is used. In this formula:

R_t = t time premium,

P_t = t time closing price,

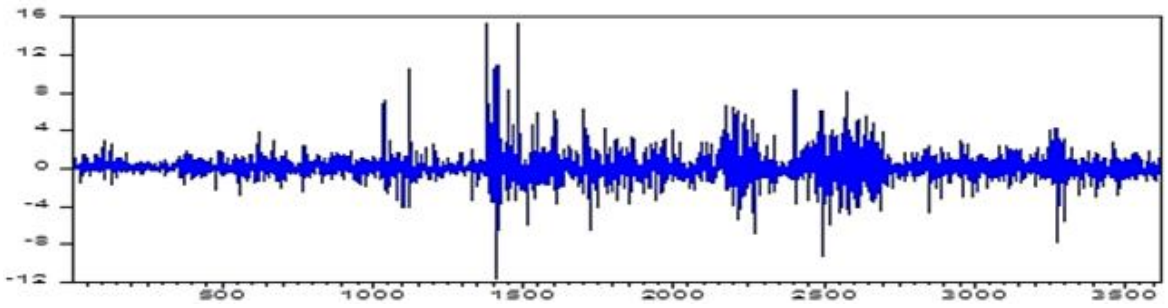
P_{t-1}= t-1 time closing price reflect.

In this study when (1) number regression equation is applied, 3615 premium value which are calculated by using gold prices are used. When (2) number regression equation is applied, it is regulated that the first proceeding day is as Monday and the last proceeding day is as Friday. So, the weekend effect on gold prices is analyzed again with 2947 premium data. So values of 613 for weekends Premium, and 2334 premium value that belongs to weekday are used.

4. Findings

In the research period, gold premium figure is as shape 1.

Figure 1. Gold Yield in 1995-2012



As is seen in Figure 1, gold premium displays instability. Even if considerable premiums are obtained, it is seen that there are also costs.

The daily obtained basic statistics values of data set which is used in research are as in Table 1.

Table 1. Basic Statistic Values

Day of The Week	The Number of Observat ons	Average mean	Standard Deviat on	Skewness	Kurtosis	Jarque-Bera	Probabil ty
MONDAY	705	0.276	1.5953	1.7270	20.6661	9504.7	0.0000
TUESDAY	731	0.124	1.3274	-0.8258	17.4362	6430.8	0.0000
WEDNESDAY	736	0.109	1.2901	1.6207	15.0791	4796.6	0.0000
THURSDAY	729	0.131	1.3431	1.3523	16.1394	5466.3	0.0000
FRIDAY	715	0.072	1.4173	1.7695	24.4497	14080.0	0.0000

When basic statistic values are analyzed, it is seen that the highest Premium is secured on Monday. On the contrary, the lowest Premium appears on Friday. The highest standard deviation is seen on Monday. Conversely, the lowest Premium is seen on Friday and its standard deviation degree is 1.4173 and it is the second highest value. Moreover, Jarque- Bera test's statistic result support that premiums does not show normal range quality. In normal range, it is expected that bias degree is zero, kurtosis degree is 3. In Figure 1, when ranges are analyzed, it is seen that there are aculeate figures that shows bias to left or right. While premiums from Tuesday are skew to left, other days shows right skew quality.

The number (1) regression model results which are comprised for analyzing Monday effect on gold prices are as in Table 2.

Table 2. The Number (1) Regression Model Results

Variable	β	t Statistics	Probability
MONDAY (C)	0.27595	5.244602[I]	0.0000
TUESDAY	-0.152	-2.060235[V]	0.0394
WEDNESDAY	-0.1669	-2.2669[V]	0.0235
THURSDAY	-0.1448	-1.961751[V]	0.0499
FRIDAY	-0.2033	-2.742312[I]	0.0061

* I, V in sequence %1 and %5 reflect significiance level.

When obtained regression coefficients are analyzed, coefficients of Monday positive and statistically meaningful; it is seen that coefficients of other days negative and also statistically meaningful. This situation gives chance to comment that Monday premiums are in comparison with other days more than average premium. In other words, except for Monday, premiums of other days are below the average value.

In purpose of analyzing the weekend effect in gold prices alternatively regression with number (3) model is used. With the usage of Friday closing price and Monday closing price premium is called as weekend premium. Every premium value that is obtained for Tuesdays, Wednesdays, Thursdays, and Fridays is called as weekday premium set. While with this model the weekend effect is analyzed, in the data set which is included the research, it is regarded that the first proceeding is Monday, the last proceeding day is Friday. According to this, the obtained values from regression model with number (3) are as in Table 3.

Table 2. The Number (3) Regression Model Results

Variable	β	**t Statistics**	**The Value of Probability**
Weekend	0.2944	5.8527[I]	0.0000
Weekday	-0.1984	-3.5106[I]	0.0000

* I, V in sequence %1 ve %5 reflect thesignificance level.

According to Table 2, it is supported that with the data from Istanbul Gold Exchange the premiums which are obtained from the weekend are higher than the average value of weekday premiums. Besides; both of the premium set statistically significant.

Both the results of regression modelwith the number (2) and regression modelwith the number (3) support each other. According to result of regression model with number (2) in Mondays are in comparison with other days in Turkeystatistically significiant premium is occured. At the same time with the regression model with the number (3) in gold market statistically significiant positive premium is occurred.

The differences between obtained premiums which are for days of week statically significiance is analyzed by Mann Whitney U test. The test statistic results that are classified into pair groups are as in the Table 4.

Table 4. Results for Mann-Whitney U Test

Mann-Whitney U Test		
	Z Value	**The Value of Probability**
Monday- Tuesday	2.57298	0.0101
Monday -Wednesday	3.66817	0.0002
Monday -Thursday	3.69779	0.0002
Monday -Friday	3.91012	0.0001
Weekend- Weekday	5.024701	0.0001

Results obtained via Mann-Whitney U test show that the difference in gold premiums are statisticallysignificiant. So, Monday premium; the premium of Tuesdays, Wednesdays, Thursdays, and Fridays is meaningfully different. Besides, Mann Whitney U test's result is to give the same result for the situation of weekend and weekday group. In other words, in Istanbul Gold Exchange premium between weekend and weekday have statistically significant differences.

5. Conclusion

In this study for the period 27.07.1995 and 31.12.2012, it is analyzed that the weekend effect in Istanbul Gold Exchange. For this purpose, 3616 end of day gold closing price are used. As research model dummy variable regression model is used. Regression model result which is applied within the research, support that there is no Monday anomaly in other words; weekend anomaly in Istanbul Gold Exchange. In the contrary of the weekend anomaly, in Istanbul Gold Exchange Fridays low premium is obtained but in Mondays there is high premium. Besides, to have stronger obtained results, days of week are separately analyzed with nonparametric test Mann Whitney U and it is recognized that there is a meaningful differences between premiums. Moreover, Mann Whitney U test results which are applied to weekend premiums and weekday premiums support this situation. So, it can be said that there is no weekend anomaly in Istanbul Gold Exchange. However, there is statistically meaningful positive premium on Monday. These obtained findings can be evaluated as assistive information in applications like defining the time of purchase- sale of investor in Turkey. So, if gold investor makes his/her purchase proceedings on Fridays, sale proceedings on Monday, S/he makes strong the possibility of obtaining above average premium.

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