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THE WEEKEND EFFECT AND BORSA ISTANBUL

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ABSTRACT

The main goal of this paper is to examine whether the day of the week effect in Borsa Istanbul is significant as in a developing stock market. A dataset of day to day total return and closing prices of the firms listed atBİST-100 from the period 02.09.2015 to 29.09.2017 was gathered from Bloomberg Terminal and was applied to investigations. The results of conducted analysis reports positive and significantly greater Monday returns than other days returns, that is appears to be an evidence of reversal weekend effect. Another essential result indicated in this study is that weekend and reverse form of weekend effects are related to firm size, as tendency is mainly strongerin the portfolios of small-cap companies, but there is no any evidence concerning weekend effect and the sector firm operating in. Lastly, mean values and standard deviations were analyzed to examine volatile pattern with upward and downward trends in different sub-periods. Findings in this analysis indicate a possible seasonality in the volatility of daily stock returns in BIST-100.

ÖZET

Bu araştırmanın amacı Borsa Istanbul'da Haftanın Günü Etkisinin gelişmekte olan menkul kıymetler borsası üzerinde anlamlı olup olmadığını araştırmaktır. 02.02.2015 tarihinden 29.09.2017'ye kadar BIST-100'de faaliyet gösteren firmaların günlük toplam getiri ve kapanış fiyatlarını Bloomberg Terminali'den toplanan ve araştırmaya uygulayan bir veri seti kullanılmıştır. Yapılan analizlerin sonuçlarına göre Pazartesi günün getirilerinin pozitif ve statistiksel olarak anlamlı olduğu anlaşılmıştır. Ulaşılan bulgular Haftanın Günü'nün ters etki gösterdiğini açıklamıştır. Bu çalışmada, Haftanın Günü etkisi ve Haftanın Günü ters etkisinin firmanın büyüklüğüyle ilişkili olduğu sonucuna varılmıştır. Özellikle bu eğilimin küçük sermaye değerleri olan firmaların portföylerinde güçlü bir etkisi olduğu belirlenmiştir. Ancak Haftanın Günü etkisinin ve faaliyet sektörü ilgili herhangi bir bağ olduğuna dair kanıt bulunmamaktadır. Son olarak, ortalama değerleri ve standart sapma değerleri farklı alt dönemlerdeyukarı ve aşağı doğru yönlü desenleri analiz edildi. Bu çalışmada, BIST-100'dekigünlük getirilerin mevsimselliğe bağlı farklılığı izlenmektedir.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY: THEORY AND PRACTICE

The distribution of returns in stock market is, undoubtedly, one of the most intensive researched conception in finance literature for many decades. Recently it has been found that stock market returns in a number of countries are not completely random. The non-randomness of stock market returns means significant deviations in stock returns that is contradict with what the efficient market hypothesis states. Calendar anomalies are referred to as the January effect, monthly effect, weekly effect, and daily effect (Jacobs and Levy 1988). What influence do calendar effects have on return distribution? Do returns variateby day of the week? Does the weekend effect shows itself in different periods? Whether the weekend effect is interrelated with firm size or not? Which day of the week has positively higher returns and excessive variability? Does the Turkish stock market appear to be an efficient in terms of daily returns and investors' expectations? These are issues that cover whether a knowing of this unexplained phenomena will give the opportunityformarket participants to beat the market and to gain abnormal earnings.

The most noted of all calendar effects is the day of week effects that have been reviewed in empiric studies on different stock markets, indexes and periods. The aim of this study is to test whether investors can earn higher returns at certain periods without risk. For that reason, the examination of the calendar anomalies has a significant meaning in thefinancial decision making process and astrongposition in finance literature. In the study daily returns of Borsa Istanbul are used to define whether there are day of the week anomalies exist in the Turkish stock market or not. Also, conducted econometric analysis showed that stock returns are different on Mondayscompared to the rest of the week. This is the evidence of reverse form of weekend effect in Borsa Istanbul that is the rare

anomaly in stock markets. That is the reason why additional investigations were conducted to analyze the relations between 'reverse' weekend effect and firm size.

Additionally, besides the firm level analysis, study is covering the investigations according to mean values and standard deviations of daily stock returns of companies operating in BIST. As a contribution to finance literature,this paper is embracing the data of listed companies from the period of September 2015to current date. This database is obtained from Bloomberg Terminal and is very up to date. The main direction of study is to examine whether there are financial market anomalies appeared in return movementin different days of the week in BIST.

Further, it was detected in the study that weekend effect showed itself not in the form of a significantly negative Monday and positive Friday, but in 'reverse' form in BIST 100 data. Reverse weekend effect is an uncommon characteristic in Turkish stock market. Also, daily returns analysis showed that 'reverse' weekend effect becomes stronger and prominent for portfolios of the small capitalization companies. However, there is no any evidence concerning weekend effect and sector the firms operated in, it mixed across companies and different segments in the market. The results of the study are contradict with the literature results obtained by Keim and Staumbaugh (1984) and Wang, Li and Ericson (1997), who found that the traditional weekend effect is positively higher for small companies than for large ones. The causesof contradiction may appear from the difference in the behavior of market participantsor the structure of small capitalization companies operating in Turkish market.

First part of this paper presents the theoretical basics of efficient market hypothesis (EMH) and behavioral finance by appreciating theparameters of the efficiency of stock market based on the financial literature review, and its assistance to modern finance development. Secondly, study presents the data obtained from Bloomberg Terminal, analysis and the applied methodology.Finally, empirical results of conducted analyses of weekend effect in terms of firm size and conclusion are presented. The aim of the research is to

detect if the Turkish market influenced by day of the week effect as many developing world markets.

CHAPTER 2

LITERATURE REVIEW

The subject of this study 'calendar anomalies' in Turkish stock market is examined in the outlook of behavioral finance that is in meaning opposed to the rules of efficient market hypothesis. Market efficiency assumes that stock prices cannot be forecastedaccording to the informationthat includeprevious price dynamic, publicly accessible information andinternal or domestic information. Additionally, it is impossible to attain returns higher than the market return. If an observation cannot be interpreted according to the rules of hypothesis of the efficient market (EMH) and cannot be explained logically than it is called 'Anomaly'. Various kinds of calendar anomalies, firm anomalies, and price anomalies are the mainly researched anomaly types in finance literature. Over the last hundred years, seasonal or calendar anomalies in stock markets (seasonality can detected at specific days of the week, also months and some phases of months) have gainedsignificant attention by practitioners and academics. Anomalies could take place once and disappear or could occur repeatedly. Market participants have given a great importance to stock prices dynamics as knowing and understandingthe information allows to make justified decisions concerning when to buy, allocate or sell stocks to earn capital gains. In today's financial markets investors take into consideration not only economic and financial characteristics but also sociological and psychological factors, past experiences, and perception of opportunities while decision-making process, they may overreact or underreact in some situations. The main object of behavioral finance is to recognize the anomalies and to find out the symptoms and possible causes that lead to anomaly.

2.1 BEHAVIORAL FINANCE

The concept that personal behavioral characteristics have an influence on market outcomes laid the foundation of a new direction in financial economics that is called behavioral finance. Applying conceptions from psychological sciences to financial decision-making process behavioral finance is mainly focused on cognitive biases, paying attention to the investors' behavior inmaking financial decisions through different psychological biases. Many researchers supported the view that stock market returns are predictable to some extent and behavioral factors are also affect stock market prices (Malkiel, 2003).

Without doubts, traditional finance theory has failed in interpreting several anomalies noticed in stock markets and, since so many different anomalies have been reported, traditional finance paradigm has been challenged. These anomalies are considered as evidence of market inefficiency that, therefore, put into dispute the fundamental hypothesis of the theory of efficiency.

Behavioral finance has a foundation on two main hypotheses further that was appeared significantly from the hypotheses that are based on the EMH. First one is that some participants are not completely rational and their decision making at risk is influenced by their psychological convictions or their state of mind, which evidently have not been completely described by economic 'fundamentals'. These market participants are named noises traders because they estimate the stock on a noise rather than by using the appropriate information about a stock. Because noise traders tradeusing imperfect information it will cause prices to diverge from their balanceweights. According to De Long (1990) the actions of irrational investors have an influence on the stock prices and produce a risk that can cause the arbitragers to operate against the irrational investors to receive a profit which they called a noise trader risk. The second hypothesis is the arbitration, an activity which presents the second class of market participantswhosecompletely rational activity is also risky and thus theirperformance is limited. Practically, arbitrage involves costs as well as the assumption of risk, and that is why there are limits to

the effectiveness of arbitrage in eliminating security mispricing. There is adequate argumentaboutrestrictions to arbitrage activity.An arbitrager may leave out or refuse an arbitrage, by the reason of the irrational investing activities of noise traders. However, Black (1986) demonstrated that noise traders provide liquidity and thustake a central point in promoting transactions as experienced traders.Because risk is awarded and there is limited arbitration, it is hardly believable that market forces would liquidate noise traders and preserve efficient prices.

However, despite the existence of many observed market anomalies, hypothesisof the efficient marketis though the prevalent pattern in order to arrange and manage the market. On account of this, the main object of the following review is to expressthe details of efficient market theory and calendar anomalies to explore the question "whether markets are rational or not"? Cause if markets are irrational as concepts traditional finance theory assumes, trading principles, rules and dynamics have to be challenged. The next part of the study explains a short view on the development of the market efficiency from the beginning of random-walk theory and the forms of the efficient market hypothesis. Also, the statements about the modern approachto EMHarepresented. Then, more frequently observed calendar anomalies not confirmed by the statements of the efficient hypothesis have been submitted.

2.2 THE EFFICIENT MARKET HYPOTHESIS (EMH)

Hypothesis of efficient market states that markets are rational and stock prices completelyand accurately reflect all the existing available information, meaning that prices are consideredas ideal appreciators of proper rational investment value. Stock pricesrapidly react to the new information and represent all the available information. Thus, investors trading in stock with the assumption that the stocks cost more than the price they are paying, while stocks sellers are believe that stocks have a value less than the selling price. Therefore this hypothesis suppose

that the stock prices have a random movement in an efficient market. As the stock prices cannot be predicted in advance, getting a profit above the market is impossible by the buying and selling strategies.Thereby, no investor can beat the market to gain abnormal returns. However, the statements of behavioral finance assume that the concept of efficient market in unable to properly reveal the anomalies and deviations in prices. In contradiction with the market efficiencybehavioral finance affirms that it is possible to obtainhigher returns in the market or benefitfrom price variations that will insure profitable actions. These findings are seriously conflicts with the theory of efficient markets.

Firstly, for fully understanding of the concept of market efficiency it is meaningful to begin with a short view on the historical origin and development of efficient market hypothesis. Louis Bachelier in 1900 has made the investigations on stock and commodity prices to examine whether prices changing randomly or not. In 1905 random-walk concept (called drunkard-walk) was represented by Karl Pearson. First the term of random-walk was used by Kendall in 1953 in examining commodity prices and stock indexes to discover if there are regular price cycles. He proved that prices have a tendency of random-walk, regardless the situation in the market on the previous day. Some other researchers have found the similar results in American stock market including Fama (1965). He also supported that it is impossible to obtain abnormal profit observing the past movements of the prices because coherent movements are independent, like what random-walk concept claims. In brief, random walk theory declares that price variation cannot pursue any trends or patterns so future price movements cannot be predicted referring to past tendency.

According to financial literature, efficient market wascharacterized by Fama (1965) as follow:

> "a market where there are large numbers of rational profit maximizes actively competing with each trying to predict future market values of individual securities, and where important current information is almost freely available to all investors".

This statement supposes that a variety of rational market participants who rival with each other lead to the exclusion of imbalance between the actual price and intrinsic or fundamental value. Additionally, method of fundamental analysis is commonly usedby the market professionals to predict the stock market prices. The formulation of this analysis is found on the assumption that stock has afundamental value other than actual price. Intrinsic value is the value of the stock's potential earnings. The general conditions of the sector in which the company functions and the economic situation itself can make an influence on the potential earnings. The factual or expected new information can change the intrinsic value. As Fama's statement assumed, real prices may be instantly changed in respond to the new information. Another essential description of the efficient market hypothesis claimed by Fama is that new information costless and easily available to all market participants simultaneously, therefore, stock prices adjust accordingly to the investors' reaction to the new information. However, this statement is not applicable in current stock market and not reasonable in the real economic world, because the marginal cost of obtaining new data outweighs the marginal benefit of applyingthis data to earn higher returns.

According to the definition of the "all available information" efficient market hypothesis was divided into three groups, those are the weak form, semi-strong form, and the strong form. Firstly, weak form suggests that actual stock prices already contain all previous market data such as past price movements and trading volume. The evaluation of weak form is compatible with the results of findings on random-walk theory. Thereby, price movements are independent from one time to another causing impossibility to make a profit only by investigating previous price information. So, in short, past price and future direction of stock prices are not interrelated. However, investor can beat the market and make a profit in the weak efficient market applying the fundamental analysis. Secondly, semi-strong form claims that, in addition to the last prices, publicly accessible information is accurately represented in the stock prices. In other words, official documents issued freely should be into consideration as any accessible information that may influence the future estimation. Therefore, in efficient semi-strong market investor

cannot earn abnormal revenues applying the fundamental analysis. Finally, strong form of market efficiency means that stock prices represent not only all information about last prices and publicly accessible information, but also private information that is not been publicly available. It assumes that no any investor has monopolistic access to relevant information creating a picture of perfect market. Again, it is impossible to beat the market to achieve higher returns in strong form of efficiency using technical and fundamental analyses.

Consequently, the impossibility to forecast the stock prices movements was the feature of efficient functioning of the stock market according to finance literature. The theory of efficiency maintains that as markets are efficient and current prices represent all accessible information, efforts to outperform the market and obtain excessive returns are essentially a game of chance. Economistsdescribe an efficientmarkets s follow: „do not allow investors to earn above-average returns without accepting above-average risks" (Malkiel, 2003).

In today's market statements of efficient market hypothesis are questionable and clear explanation concerning market efficiency that covers all markets cannot be given. Considerable ongoing debates were generated under the concept of access and availability. According to the EMH investing markets are 'informationally efficient', in meaning that all investors have an access to investing information, however, in practice they are not. The rapid movements of events, market globalization and vast number of the available investment techniques make market participants enable to be in line with changes. Information is dispersed through different information channels (TV, radio, web sites), making even the most involved investors unable to be completely competent about price movements. Availability is the second weak side of EMH. Before information becomes available to the general public it is available long before to a limited group of investors or to speculators. From this point of view behavioral finance acknowledges that stock markets (in terms of access to data and availability) are 'informationally' inefficient.

2.3 EMH: MODERN APPROACH

In modernfinancial theory the importance of EMH continues to be a point of disputes. Shiller (2013) described the EMH as 'half-true'. Multiple modern finance phenomena are inconsistent with the EMH. Firstly, as general investing in small-cap companies gives an opportunity to gain higher returns than investing in large-cap companies. However, this statement also was studied by Fama and French (1988), they argued that the risk taken is less dependent on the correlation of company and market return movements. Contrary to their arguments, many researchers have proved that this phenomenon is a challenge to EMH. Secondly, excessive volatility is one of the main contradictions to EMH. Market may be inefficient on the macro-level but efficient on the micro-level, causing the emergence of another phenomenon, closely associatedwith excessive volatility, named overreaction to unexpected corporate news(Shiller, 2003). Announcing an unexpectedly bad news in market causes an obvious overreaction (Mishkin, Eakins, 2012). Another contradiction is the underestimation of financial announcements. Variability of challenges to market efficiency emerged from the irrationality of market members, which is mainly was proved by behavioral finance. Supporters of 'gamble's fallacy' described it like human tendency to false percept the probabilities of future returns according to the past movements. Individual investors considered future returns directly proportional toactual rate of return, however, institutional investors saw them in inverse ratio (Shefrin, 2007).The most frequently observed irrational phenomena in behavioral finance are risk aversion, overconfidence, anchoring. Despite the fact that these are some of the most frequently displayed phenomena, many other biases present themselves in decision-making process.Malkiel, Mullainathan and Stangle (2005) claimed that fail on holding a short position in a mispriced asset caused the emergence of asset bubbles. In modern world as the housing bubble reached its peak and market participants go on to put up capital into mortgages, irrational behavior began to exceed in the markets. In contrast to rational behavioral, investors operated irrationally in favor of possible arbitrage conditions.

Another issue in challenging theEMH in recent years is stock prices seasonality.The analysis on 'January effect', demonstrated that a vast number of markets have the positively higher returns in the beginning of the year, which is a good opportunity for investors to obtain higher returns due to its riskless. January effect commonly was seen in small firms although does not necessary appearin the stock market in general. Moreover, the stock market returns are variable during the week.The day of the week effect or weekend effect is the anomaly that appear in negative stock returns on Mondays and positive stock returns on Fridays. The intra-day anomaly is observed in positive or negative stock returns in the specific hours or minutes. The holiday's anomaly was proved by observing abnormal returns of stock before various holidays (Barak, 2008). Thus, the predictability of stock returns is one of the characteristics of inefficiency of stock market.

To sum up, the irrational behavior creates various issues to the EMH as it challenges the investors' ability to correctly assessthe mispriced securities. The EMH is insufficient to interpret theseasonality in stock returns, excessive volatility in stock prices, investor's overreaction, asset bubbles, etc. To clarify, stock returns are frequently found randomly fluctuated, and market participants are not able to attain benefit on excessive returns.

2.4 THE MARKET ANOMALIES

There is undoubtedly that unexplained market movementsof stock market returns was the topic of huge number of studies and researches in recent years. In finance literature these observed market movements that are contradict to hypothesis of the efficient market are called anomalies. As claimed byTversky and Kahneman (1986) 'an anomaly is a deviation from the presently accepted paradigms that is too widespread to be ignored, too systematic to be dismissed as random error…' Seasonal trends and periodicity at the share priceshave been detected not only in the developed markets, but also in the developing markets. Sometimes anomaly

happen once and then disappeared, however, another can take place frequently, or continuously. The existence of these anomalies presents market inefficiency, whichgives an opportunity to market participants to gain abnormal returns establishing a set of operating rules. Financial market anomalies indicate that performance of stock may diverge from the statements of EMH and it is impossible to explain them applying standard finance theory. For simplicity, market anomalies were divided into three basic types: fundamental anomalies, technical anomalies, calendar or seasonal anomalies. Fundamental anomalies include value anomalies, small cap effect, low price to book, high dividend yield, low price to sales (Karz,2011). Despite the statement about the weak form efficiency, that prices already represented the past information and technical analysis is of no use, as the investor cannot beat the market to obtaining higher returns on the basis of technical analysis. So, two types of technical anomalies Moving Averages Anomaly (Brock, 1992) and Trading Range Break Anomaly (Josef,1992) showed deviations from this statement. Calendar anomalies are the major phenomena that have violated market efficiency, particularly seasonality and monthly effects contradict the weak form efficiency, so investors can earn abnormal returns in different day or month.Possibility to attain high stock returns and predict the behavior of stock prices issignificant for market participants and subjects of studies. Detection the day of the week effects in the stock markets is one of the methods to predict returns. Being the most observed anomaly type in stock market 'week day effect' illustrates the state that the returns of each trading day of the week are not equal (Tunçel,2007). 'Week day effect' as a specific anomaly was found from 1950's to 1970's for Standard and Poor's Index (Rogalski, 1984) and was tested in different studies for specific periods. Thus, Gibbons and Hess (1981) were the first researches who examined the day of the week effect in United States and then reached the conclusion that the returns of stocks and treasury bonds were variable through the week and the returns on Mondays are low or negative. The day of the week anomalies in trading volume also has been investigated by Lakonishok and Maberly (1990) and Sias and Starks (1995) with objective to explain calendar anomalies. Findings submitted that

among the days of the week Monday trading volume is higher.Particularly, there are more tendencies to sell on Mondays than to buy for individual investors or more tendencies to buy than to sell for institutional investors. The probable reason for this anomaly, supported by studies, is connected with the private information and the behavior of the individual and institutional investors. Taking into consideration the fact that investors,individual or institutional, their decision-making style, differences in risk taking may cause a difference in activity on weekdays and, thus, changing the selling/buying rates.

After the researches reached the evidence about the presence weekend effect in USA, additional researches started to appear worldwide. Additionally, Kiymaz and Berument (2003) conducted a research on Japan, United Kingdom, Canada, Germany, and USA and defined the day effect in specific days in these markets. After week day effect was investigated in returns denoted in U.S. dollars and local currencies in the nineteen countriesfrom 1993 to 1998. (Bayar, Kan, 2012). According to the results, the highest return yields were detected on Tuesday and Wednesday, the lowest returns were seen toward the end of the week on Tuesday and Friday. In contrast, negative Monday and positive Friday returns were not detected in Indian stock market. It was discovered that lowest returns in Indian market are observed on Tuesday, when the returns on Monday were significant andhigher than on other days. This fact may be the base to assume that 'reverse' weekday still effectsexistin stock market.

CHAPTER 3

3.1 REVERSE FORM OF WEEKEND EFFECT

Today, there have been a vast number of assumptionsshowing that market returns may be changeable in specific days, notably returns on Mondayshow negative meaning. The concept of the weekend effect means that Monday returns have a tendency to be lower or negativeamongthe returns of other week days. Several

facts proving the presence of week day effect were announcedin developed markets (Kiymaz and Berument, 2003) as well for the developing markets (Demirer and Karan, 2002; Cinko, 2008). The existence of this market anomaly in foreign markets was detected in the Tokyo Stock Exchange (Jaffe, Westerfield, 1985), The London Stock Exchange (Condoyanni, O'Hanlon, Ward, 1987), Belgium and Switzerland Stock Exchanges (Agrawal, Tandon, 1994). Further, Lee, Pettit, Swankoski (1990) proved the appearance of the weekend effect in Asian stock markets, especially Hong Kong, Singapore. According to the early studies in the finance literature it is possible to propose that the weekend effect is not aseparatedtendency, otherwise, it is a worldwide permanent phenomenon, which existence was proved in many foreign countries. Recent studies have reported that the tendency to disappear was detected recently in United States. Additional interesting finding were obtained during previous examinations in finance. Finance studies have reported that the weekend effect interrelated with other calendar anomalies, notably Keim (1987) reported that returns on Mondayin most cases positive in January however negative on the other month. Furthermore, it was detected that returns on Monday in the first half of the month are statistically insignificant, while effect is mainly focused in the second half of the month and diminished in the fourth weeks of the month (Wang, Li, Ericson, 1995). After Brusa (2000), Mehdivan and Perry (2001) reported that the weekend effect has been observed in reverse form whenstock returns on Monday are significantly positively higher than other day returns. Further findings offinance researches of reverse weekend effectrevealed that the negative returns on Monday associated with small capitalization companieswhen the positive Monday returns - with large capitalizationcompanies. Thus, firm size and the reverse form of weekend effect are interrelated with each other. When big capitalization companies exhibit strong reverse weekend effect, at the same time small capitalization companies show diminishing tendency. Following researches in finance were conducted to examine if the Monday positivereturns is equallyspreadthroughout each week of the month. Mehdivan and Perry (2001)

investigated that the positive returns on Monday for the last two weeks are significantly lower than returns of thefirst three weeks.

One interesting fact is that the observed in indexes positive Monday returns perhaps manageable byfew companies' extremely large positive Monday returns when the returns of the rest companies are negative or even insignificant. Consequently, positive significant returns on Mondayobserved in indexes not always explain the positive return distributioninindividual stocks.For further understanding the currently observed reverse weekend effect in large companies, it is necessary to understanding how extensively the positive Monday returns are distributed across individual stocks. In finance literatureit was stated by the authors that the reverse form of weekend effect is not necessary managed by several stocks. Additional findings were conducted to examine whether the difference in stock ownership is related to reverse effect. As institutional investors operate separately from individual according to different market conditions, reverse effect was mostly detected in stocks of large capitalization and more liquid companies, that is more frequently managed by institutional investors. In other words, trading activity of individual investors are negatively correlated with Monday returns.

To sum up, the weekend effect and reverse form of weekend effects are some kind of the calendar anomalies discovered to indicate that stock market may be inefficient, mainly in the weak market efficiency form.

3.2 THE WEEK DAY EFFECT IN TURKISH STOCK MARKET

Only one Turkish stock market is Istanbul Stock Exchange (ISE) began to operation in 1986. From its establishment The Istanbul Stock Exchange was described as highly volatile in terms of returns. The high volatility indicators attractnot only local but also foreign investors because it provides higher return opportunity. Although financial crises occurred when Istanbul Stock Exchange was established, it appeared as dynamic and emerging market. As emerging

markets are attractive for international investors, the researches of stock market return behavior in ISE will be of interest to domestic and foreign investors.

There are several causes why it is essential to examine the BIST. Since the 1980s Turkey has turned its economy into a free market, but the Turkish government is a primaryfigure in determining market participants' behavior, either directly by its economic activities, or indirectly creatingfor investors and corporations the unstable political environment. Despite the fact that the Turkish market is young, the improvement and development tendencies put in place among the world promising markets. But, unlike thedeveloped countries with a stable political and currency structure (United States, United Kingdom), the Turkish market operates in problematic environment under uncertainty. Turkish market participants face uncertainties not only in meaning of corporate profits but also in the political system stability. The instability of the currency structure creates challenges for investors to make additional investments to stockas they perceive foreign currencies (USD, EUR). Lastly, different investors' expectations of future inflation make itmore sophisticated to examine what need to balance rates of return in the stock market. By this reason, relevant examining needed to be conductedwhether the Turkish market exhibits week day effect like established markets.

Several studies examined whether the stock returns of BIST-100, BIST-50, BIST-30 and sector indexes on the days of the week are equal or not and the existence of week day effect in Borsa Istanbul (Cinko, Avci, 2011, Dicle, Hassan, 2007, Demirer, Karan, 2002). Detected on different days BIST returns showed that, for example, the highest returns were on Friday, Tuesday and Monday, Thursday and Friday returns were the lowest. Previous studies showed that Friday and Monday effects were observed for the period 1988 to 1996 (Metin, Muradoglu, Yazici, 1997), and the market returns were lower in the first two days of the week and higher in the second part of the week. They conducted a research on ISE and observed the existence both Monday and Friday effects. The more recent researches have proved that it is possible to obtainhigher returns as the market is

not efficient. Hepsen (2012) searched for anomalies in ISE Real Estate Investment Trust (REIT) Index and detected a Monday effect. Then, Aksoy and Ulusoy (2015) examined the return and volatility behavior for the period from 2000 to 2014 and defined that calendar anomalies still exists for BIST-100 index. Hence, as finance literature assumes the week day effect was broadly supported and, as result, BIST-100 is an inefficient market. Based on these findings, the recent situation of the market is needed to be examined. For this purpose, a recent dataset of daily returns BİST-100 index period from 02.09.2015 to 29.09.2017 was selected from Bloomberg for additional analysis.

CHAPTER 4

DATA AND METHODOLOGY

4.1 RESEARCH DATA

The data which are used during research in this paper was gathered from Bloomberg Terminal. The dataset consists of two main sections. One is contains day to day total return BİST-100 Index from 02.09.2015 to 29.09.2017, the other is last price at which the stock traded for the same sample period. Used data contains 100 firms operating in Borsa İstanbul.

The first data consist of 2 main columns. While in the first column, the data shows the date that is BIST operation days excluding the weekend and the official holidays (to avoid the so called 'holiday effect'), in the second column, the data displays the value of daily return BIST-100 Index.

The second data in the same way involve 2 main columns. In the first column, again, the data displays the date that each firms' operations days in BIST. In the second column, for each date in first column, the stock prices of firms at trade close time in BIST is shown.

In order to analyze the weekend effect for BİST-100 index it is necessary to calculate the daily return in dynamics. Therefore, by using the BİST-100 index, the daily percentage returns for sample period from 02.09.2015 to 29.09.2017 are computed as follows:

Return = $(BIST_t - BIST_{t-1}) / BIST_{t-1}$

In equation, $BIST_t$ is the closing price of each index on day t, $BIST_{t-1}$ is the closing price of the index on day t-1.

4.2 MODEL

This section described the model used to test day of the week effect in daily stock returns. The first part is mainlybased on the standard tests of weekend effect, than further analysis is expanded applying a regression equation that include dummy variables representing each day.

$$R_{it} = \sum_{t=1}^{5} (\beta_i D_{it}) + \varepsilon_t (1)$$

R_{it} = Daily return on each index at day t;

D_{it}'s = Dummy variables representing the trading days of the week for Monday, Tuesday, Wednesday, Thursday and Friday, respectively (for example, $D_{1,t}$ is equal to 1 if day is Monday, 0 for all other days; $D_{2,t}$ is equal to 1 on Tuesdays, 0 for all other days; $D_{3,t}$ is equal to 1 if day is Wednesdays, 0 for all other days; $D_{4,t}$ is equal to 1 if day is Thursday, 0 for all other days; $D_{5,t}$ is equal to 1 if day is Friday, 0 for all other days).

β_i= The coefficients of the regression corresponding to the five dummy variables;

ε_t= An error term (independently and identically distributed).

Dummy variables represented as D_{it} in the equation (1) are independent variables which take the value of either 0 or 1; while a "dummy variable is a numeric stand for a qualitative fact or a logical proposition" (Garavaglia, Sharma, 1998).

Error term represented as ε_t in the equation (1) and also is called is "residual" represents "the difference between the actual value of the independent variable and the estimated value of the dependent variable at the regression equation" (Zikmund, 2000).

The method of Ordinary Least Squares (OLS) was applied to obtain the coefficients of the returns of the day of the week. Then descriptive statistics were constructed to detect the features of the stock returns in analysis.

$$R_t = \beta_0 + \beta_1 M + \beta_2 W + \beta_3 Th + \beta_4 F + \varepsilon_{it}; \quad (2)$$

β_0 is the coefficient of fixed variable in the model (coefficient of Tuesday);

$\beta_1 - \beta_4$ - are the coefficients of regression for the days (Monday, Wednesday, Thursday and Friday) – dummy variables in the model.

Model is created to verify whether there is a possible difference between the returns onspecific days of the week in BİST. Detecting any differences contradict with the efficient market hypothesis. Analysis were applied to companies constantly operated in BIST to examine whether other days have an effect while Tuesday stock returns were kept constant. Coefficients of regression with P-value below or equal significance level 0.01; 0.05 or 0.1 are considered to be significant.

The analysis was divided into two parts, where one is conducted using the absolutevalues of returns and the other using sign transitions between returns that areseparated with weekends. The first part is basically concerned with the standardtests of the weekend effect. Several null hypotheses are tested regarding a

possibleMonday effect and the analysis is further enlarged with the constructionof a regression equation including dummy variables that represent each day ofthe week as stated above.

The regression model is formed to test the following hypothesis that the average returns of each trading day are equal to zero. The null hypothesis is:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0 \quad (3)$$

For each day of the week within sample data period, mean percentage of daily returns, variance and standard deviations of these returns was calculated. Table 4.1 provides the mean and variancevalues (as well as the t-statistic, standard error, and P-values) for daily returnsin analyzed period. Within period from 02.09.2015 to 29.09.2017, daily returns for Mondays through Fridays were analyzed constructing regression model separating each day and report the means, variances, and so on, for it. Also analysis was conducted to the overall sample of daily returns disregarding what day it belongs to. The t-statistics values reported in Table 4.1 are the heteroscedastic-consistent t-statistics values for mean percentage returns. These numbers are then used to test the null hypothesis. Mean values of Monday and Wednesday are significantly greater than other days of the week. So, this is an another evidence about the inefficient of the stock market (especially in weak form of market efficiency) and, so adjusting additional trading buying and selling strategies by investors, might give an opportunity to obtain higher profit on these days. The results imply that the most significant dependency occurs between Monday and Tuesday returns, probably since it is the start of the week, the fresh information about the market makes the system more dynamic relative to the rest of the week. Another explanation for this finding might be the existence of foreign firms operating in the Istanbul Stock Exchange and the time difference between countries.

Apart from testing individual returns for each day of the week, significance of the differences between days of the week is also tested based on the null hypothesis.As can be seen from Table 4.1, when the test is done on returns for each day of the week, the attained significance levels are found to be below 10 percent for Monday, Wednesday and Friday, whereas the other days are found below the 5 percent significance level.The conclusions of the tests do not vary in general, whether adjusted or unadjusted returns are used. The equality of returns is rejected for the pairs "Monday–Friday," "Monday–Wednesday," and "Wednesday–Friday" at a 90 percent significance level. However, the null hypothesis is not rejected for the pair "Tuesday–Friday" and "Thursday–Friday"at a significance level (p-value) of 0.042 and 0.043 respectively, but this value is still close to the boundary of the 95 percent significance level. This observation supports the idea that there is significant day-of-the-week effect in Istanbul Stock Exchange returns, no matter adjusted or unadjusted. The one more significant finding that can be seen is that Monday variability is almost always above the ones for the other days of the week, indicating that Monday has the highest uncertainty in the daily returns, so returns on Monday are more volatile than other days deviating from normal expected returns. The finding is compatible with Godfrey et al. (1964), Gibbons and Hess (1981), and Foster and Viswanathan (1990), where they find high Monday variability. Although the variability values fluctuate around a lower level during the rest of the week when compared with Monday, the other days of the week seem to have less consistent variability with upward and downward moving variability values. Although Monday is generally more variable than the other days, the distribution of Monday variability can be estimated with more certainty relative to other days, which have a more randomly scattered variability distribution.

Table 4. 1 Results of Descriptive Statistics of BIST 100 Daily Returns

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	0,4262	0,0025	0,13531	0,0196	0,0446
SD	0,7913	0,3661	0,2307	0,4395	0,3426
Variance	0,0831	0,0789	0,0399	0,0197	0,0665
t-Statistic	-1,7621	-2,5706	-0,1493	-2,5449	-1,6227
Std. Error	0,1207	0,2162	0,3529	0,091	0,2562
P-value	0,128	0,042	0,886	0,043	0,156

Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

The rejection of the null hypothesis in favor of H_1 indicates a specific observable pattern in the stock market returns, thus proving the disturbance of weak-form market efficiency. The idea of weak-form efficiency, as mentioned above, claims that there are no consistent patterns in the stock prices and, accordingly, returns. So, stock prices move randomly and price changes are independent of each other.

Alternative hypothesis is H_1: All β's are not equal to zero. If the null hypothesis is rejected, there is a statistically significant difference among the coefficients that indicate a specific observable pattern in the stock market returns. It has a meaning that there is a week day effect exists in Borsa Istanbul during sample period from 02.09.2015 to 29.09.2017.

Model was analyzed by Eviews 9.0 software. It is defined that the problem of heteroskedasticity is eliminated, and the model do not include autocorrelation. The findings of the analysis are displayed in Chapter 5 on Table 5.1 and Table 5.2.

CHAPTER 5

ANALYSIS

The results of the regression model indicate, as can be seen from the Table 5.1, that returns on Monday are significant and positive for BJKAS (Services Sector) with a regression coefficient 1,583 with significance at 0.05%, but only for one firm out of 100 tested with statistical significance level below 1%has significant effecton Friday.ANELE which is Capital Goods Sector has a highest regression coefficient on Friday - 1,151 with 0.2% significance. Furthermore, for PETKM (Basic Materials Sector) there are double effect was observed on Monday and on Wednesday with significant results of probability below 1%. Additionally,the results of 523 conducted observations in researches showed that for the total sample period from 02.09.2015 to 29.09.2017 the mean return on Monday is significantly positive for eight out of ten companies with significance below 1% as showed in Table 5.1. Notably, five companies out of ten analyzed are small capitalization companies with end year market capitalization value under 2 billion dollar.From this point of view weekend effect and firm size might be interrelated but additional researches were conducted below to prove this assumption.The resultsof statistical analysispointed that the week day effect in BİST 100 was found. However, this result of consequently positive Monday returns is different from traditional weekend effect and appeared in this study as a reverse form of the weekend effect, sincereturns on Monday are positive and significantly higher than other day returns.

Table 5. 1 The Ten Companies That Have The Day Effect Significant Below 1% Statistical Significance Level

Firm/Sector	Prob/Coefficient	Day effect	Mkt Cap
ANELE/Capital Goods	0.002 (1.151)	Friday	425,7M/small
BJKAS/ Services	0.0005 (1.583)	Monday	1,034B/small
DEVA/Healthcare	0.009 (0.713)	Monday	932,09M/small
PETKM/Basic Materials	0.0097(0.413)/ 0.0077(0.422)	Monday/Wednesday	9,93B/mid
THYAO/Transportation	0.0024(0,585)	Monday	14,489B/big
TRCAS/Utilities	0.0058(0,547)	Monday	691,2M/small
VAKBN/Financials	0.0030(0,583)	Monday	14,775B/big
YATAS/Consumer Cyclicals	0.0019(0,802)	Monday	1,116B/small
ZOREN/Utilities	0.0000(0,993)	Monday	3,22B/mid
SKBNK/ Financials	0.0079(0.481)	Monday	1.563B/small

Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

Additional researches were conducted to make clear that weekend effect is really exists in BIST 100. Regression model results with statistical significance below 10% were collected in Table 5.2 to reveal possible day effects. Overall, from 100 analyzed firms 42 firms showed positive day effects and, like the first conclusions showed in Table 5.1, most of them have positive and significantly greater Monday returns. One more interesting result was obtain from Table 5.2: SASA and TOASO (Consumer Cyclicals Sector) have the Monday and Friday positive returns at the same time with approximately the same regression coefficients (0.744/0.771 and 0.434/0.311) respectively, that means that during the sample period this two firms tend to follow in the same directions. To make it more easily readable, conclusions obtained from Table 5.1 and Table 5.2 were showed in Chart 5.1. As can be observed, for 56 firms from 100 analyzed the week day effect was found. Significantly positive returns were observed more often in small-cap firms, the second Wednesday positive returns were seen in small-cap firms, however, Friday effect frequently was observed in mid- and big-cap

companies like TOASO (15.48B market value) and AEFES (19.855B market value).

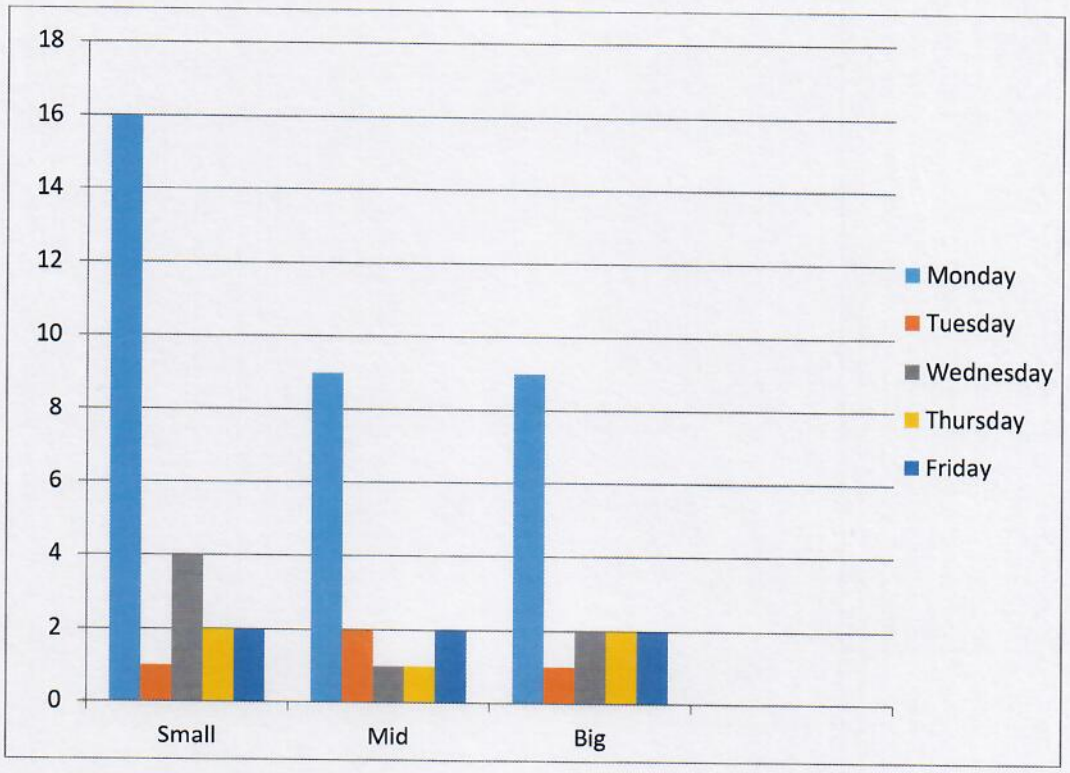
Table 5. 2 The List Of The Companies That Have The Day Effect Significant Below 10% Statistical Significance Level

Firm/Sector	Prob/Coefficient	Day effect	Mkt Cap
MGROS/Consumer Non-Cyclicals	0.026(0.538)	Monday	4.216B /mid
YKBNK/Financials	0.041(0.522)	Monday	17.649B /big
AFYON/Basic Materials	0.012(0.944)	Monday	693M /small
AKENR/Utilities	0.046(0.562)/ 0.021(0.652)	Wednesday /Thursday	583.331M /small
ALGYO/Financials	0,019(0.736)	Monday	451.168M/small
ALKIM/Basic Materials	0.044(0.482)/ 0.048(0.471)	Monday/Wednesday	583.016M /small
ASELS/Industrials	0.036(0.366)	Tuesday	33B/big
BAGFS/Basic Materials	0.021(0.531)	Monday	413.55M/small
BANVT/Consumer Non-Cyclicals	0.027(0.873)	Tuesday	2.076B/mid
CCOLA/Consumer Non-Cyclicals	0.026(0.595)	Monday	8.954B/mid
ENKAI/Industrials	0.046(0.419)	Monday	26.496B/big
ERBOS/Basic Materials	0.022(0.795)	Monday	389.15M/small
EREGL/Basic Materials	0.025(0.611)	Monday	29.4B/big
GSRAY/Consumer Cyclicals	0.016(1.152)	Monday	636.12M/small
GUBRF/Basic Materials	0.047(0.556)	Monday	1.256B/small
IHLAS/Consumer Cyclicals	0.017(0.816)/ 0.054(-0.924)	Tuesday/Wednesday	363.58M/small
ISCTR/Financials	0.804(0.494)	Monday	28.196B/big
IZMDC/Basic Materials	0.013(0.826)	Monday	1.02B/small
KCHOL/Financials	0.055(0.427)	Monday	41.994B/big

KRDMD/Basic Materials	0.017(0.756)/ 0.073(0.567)	Monday/Thursday	2.453B/mid
NTTUR/Consumer Cyclicals	0.047(0.633)	Wednesday	1.111B/small
PGSUS/Industrials	0.011(0.532)	Monday	2.69B/mid
SAHOL/Financials	0.022(0.356)	Monday	20.873B/big
SASA/Consumer Cyclicals	0.013(0.744)/ 0.010(0.771)	Monday/Friday	2.916B/mid
SISE/Industrials	0.012(0.423)	Monday	9.338B/mid
SODA/Basic Materials	0.048(0.305)	Monday	4.437B/mid
TMSN/Industrials	0.027(0.468)	Monday	825.7M/small
TOASO/Consumer Cyclicals	0.016(0.434)/ 0.081(0.311)	Monday/Friday	15.48B/big
TSKB/Financials	0.059(0.321)	Monday	3.168B/mid
TSPOR/Consumer Cyclicals	0.038(0.595)	Wednesday	208M/micro-cap
VKGYO/Financials	0.031(0.481)	Monday	513.3M/small
YATAS/Consumer Cyclicals	0.010(0.656)/ 0.053(0.49)	Wednesday/Friday	1,116B/small
SKBNK/Financials	0.022(-0.414)	Thursday	1.563B/small
ARCLK/Consumer Cyclicals	0.095(0.409)	Wednesday	13.704B/big
AEFES/Consumer Non-Cyclicals	0.052(-0.511)	Friday	19.855B/big
AYGAZ/Energy	0.077(0.265)	Tuesday	4404B/mid
KOZAL/Basic Materials	0.069(0.979)	Thursday	4.545B/mid
METRO/Industrials	0.062(0.791)	Thursday	285M/micro-cap
PRKME/Basic Materials	0.054(0.531)	Monday	543.36M/small
TKFEN/ Industrials	0.086(0.381)	Friday	5.406B/mid
TKNSA/Consumer Cyclicals	0.052(0.409)	Monday	486.2M/small
TUPRS/Energy	0.097(0.256)/ 0.015(0.371)	Monday/Wednesday	29.549B/big

Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

Chart 5.1 Quantity Of TheCompanies (Small, Mid and Big capitalization) That Have The Day Effects With Significant Below or Equal 10% Statistical Significance Level



Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

Further, it may be essential to investigate whether the weekend effect and reverse form of weekend effect are interrelated with company size, by this reason future researcheswere conducted according to the firm market capitalization value. According to results of Table 5.1, the presence of the reverse form of weekend effect interrelated with the firm size and as firm become larger the weekend effect begins to decrease and a weak reverse form of weekend effect begins to appear in mid-capitalizationcompanies. Researches were conducted using the year ends stock market capitalization values. Further, stocks were broken up into sections from highest value to the lowest.

It is important to notice that analyzed 100 companies are the largest trading companies that included in BIST in the Turkish Stock Exchange. If we had used all the companies traded in BIST, the result might have been slightly different. However, the companies outside the BIST 100 are not comprised in the study because they are very small on the global level and characterized by lower market liquidity.

Findings indicated that out of the ten companies that have the day effect significant below 1%only two have market capitalization more than 10 billion dollar with the high number of employees more than 15000 person. Regression coefficients of the two large-cap companies THYAO (TÜRK HAVA YOLLARI) and VAKBN (VAKIFLAR BANKASI) are approximately the same - 0,585 and 0,583 respectively. In these two major stocks positive Monday returns are significantly greater in comparison with other days that fact proves the existence of the reverse form of weekend effect. Similarly, findings demonstrated the presence of 'reverse' effect for portfolios of two mid-cap companies: PETKM (0.413) and ZOREN (0,993) exhibit significant positive returns. Also there is a double weekend effect on Monday and Wednesday for PETKM that was proved from regression analysis with statistically same coefficients.

However, reverse form of weekend effect isgetting stronger and prominent in the small capitalization companies, showing significant results in five out of ten analyzed companies (BJKAS, DEVA, TRCAS, YATAS, SKBNK). The similar evidence was obtained according to regression analysis with significance level below 10%. Chart 5.1 indicates that the 'reverse' effect occurs mainly in small cap companies (AFYON, ERBOS, GSRAY and etc.). However, positive Friday returns with significance below 10% are more frequently seen in big- and mid-capitalization companies (AEFES and TKFEN respectively). Lastly Table 5.1 showed an interesting result. Only one company ANELE that has a small market capitalization value presents positive significant Friday effect with regression coefficient of 1.151, which is the evidence of 'traditional' weekend effect.

Results of Least Squares Estimations obtained from software Eview 9 and collected in Table 5.3 below are the evidences about the existence of reverse form of weekend effect in small capitalization companies with significance level below 1%.

5.1 LEAST SQUARES ESTIMATIONS

Conducted researches on BIST 100 stock market have been concluded to determine whether there is a significant relationshipbetween stock returns and day of the week. According to results obtained from estimations only one company which is ANELE showed statistically significant regression coefficient on Friday- 1,151247 with probability 0.2%.ANELE is a Turkey-based project development company operated in İndustrıals Sector with capitalization value 425.7 million dollars. According to range categories in terms of year end market capitalization value ANELE is a small cap company. The Company's activities include developing electrical projects for airports, shopping centers and tourism facilities both domestically and abroad. The results represented in Table 5.3 proved that traditional weekend effect with significance below 1% was found during sample period only for ANELE.Consequently, investors trading in BIST have an opportunity to obtain higher returns adjusting their buying and selling strategies on different days of the week.

Further, BJKAS is the company engaged in the production, marketing and sales of Besiktas branded products and operate in Services Sector. According to its capitalization value which in numbers is 1,034 billion dollars is a small cap company like ANELE, bur the regression analysis showed a contradictory results. Unlike the ANELE's regression results which is significant on Friday, BJKAS has a higher statistically significant coefficient on Monday - 1.582763 with probability 0.05%. According to statements in finance literature, these results are the evidence of the existence of reverse form of weekend effect in stock market. Furthermore, conducted regression analysis indicated that in summary five out of ten companies with significant below 1% exhibit higher significant positive

returns. Moreover, all of them are small capitalization companies. In details, DEVA is a small cap company with capitalization value 932 million dollars that operated in Healthcare Sector. Deva Holding is a Turkey-based pharmaceutical company that is primarily engaged in the production and marketing of finished pharmaceutical products, pharmaceutical ingredients and veterinary products, as well as animal health products, among others.Like BJKAS, DEVA is a small cap company, as was mentioned above, has a higher significant returns on Monday - 0.713247 with probability 0.93%. Additionally, the same results was deducted from regression analysis for TRCAS (Utilities Sector), YATAS (Consumer Cyclicals Sector) and SKBNK (Financials Sector). Turcas Petrol whicn is a Turkey-based investment company, focused in the oil and energy sector, has capitalization value 691.2 million dollars. YATAS is a Turkey-based company engaged in the manufacture and marketing furniture and other related home furnishing products market capitalization value of 1,116 billion dollars. SKBNK is a Turkey-based commercial bank. The Bank is mainly engaged in agriculture, small business and small to medium enterprise banking. SKBNK is a small cap company with market capitalization value under 2 million dollars.

So, taking into consideration the information presented in Table 5.1, similarly positive returns with significance below 1% were determined on Monday and more frequently in small capitalization companies. This fact is a strong evidence about the existence of reverse effect in small capitalization companies and, consequently, about the interrelation with firm size, because reverse form was detected mostly in small capitalization companies with market value under 2 billion dollars. However, two out of ten companies with capitalization value more than 10 billion dollars showed significant positive returns on Monday: VAKBN (Financials Sector) and THYAO (Transportation Sector).

It is important to add that according to findings, there is no any evidence concerning weekend effect and sector the firms operating in. The presence of week day effect in Borsa Istanbul was estimated on the basis of BIST-100 returnstrading stocks, despite that, firms from different sectors exhibited the day effect (Financial, Services, Healthcare, Transportation and etc). Also it is prominent to mention that positive returns on Monday with statistical significance level below 10% mainly were observed in Industrials, Basic Materials, Financials sectors.

It is important to add that across all the companies from BIST 100 only 56 out of 100 analyzed showed significantly positive weekend effect. So, remaining companies do not have significant differences in daily stock returns and, as result, it is no meaningful for investor to change buying or selling strategies to obtain higher return in transactions with this indices. According to these results, Turkish stock market appears inefficient in terms of expected returns because it is possible for market participants to obtain abnormally positive or negative returns by creating a set of trading rules. BIST 100 companies that have no any significant weekend effect is represented below in Table 5.4. According to results from conducted researches, the absence of weekend effect is interrelated with the sector companies operating in. As can be seen in the Table 5.4 mainly statisticallyinsignificant coefficients were detected in Consumer Cyclicals and Financials Sector. Taking into consideration the year end capitalization value, unlike the results obtained about the existence of traditional weekend effect and reverse form of weekend effect in small capitalization companies, statisticallyinsignificant results were obtained mainly in big and mid-capitalization companies.However, according to BIST classification only three companies out of 100 analyzed are Nano Capitalization companies with market capitalization value is under 50 million dollar (GOZDE/Financials Sector – Mkt Cap 11.649 million dollars, KLGYO/Financials Sector – Mkt Cap 7.075 million dollars, METRO/Industrials Sector - Mkt Cap 5.555 million dollars).But it is important to note that analyzed 100 companies are the largest that covers BIST in the Turkish Stock Exchange. If we had used all the companies traded in BIST, the

result might have been slightly different. However, the companies outside the BIST 100 are not included in the study because they are very small on the global level and characterized by lower market liquidity.

Table 5. 4 The List of The BIST 100 Companies Statistically Insignificantin Terms of Weekend Effect

Firm/Sector	Mean Dependent	Standard Deviation	Mkt Cap
MAVI/Consumer Cyclicals	0,134	1,481	2.811B /mid
ARCLK /Consumer Cyclicals	0,128	1,773	13.636B /big
KIPA/Consumer Non-Cyclicals	0,101	3,454	3.758B/mid
VESTL/Technology	0,139	2,547	3.277B/mid
AKSA/Consumer Cyclicals	0,089	1,864	2.612B/mid
FENER/Consumer Cyclicals	0,005	1,863	968.87M /small
TRKCM/Consumer Cyclicals	0,216	1,758	5.526B/mid
TCELL/Services	0,048	1,469	35.354B/big
OTKAR/Industrials	0,071	1,811	2.81B/mid
ULKER/Consumer Non-Cyclicals	0,033	1,834	7.852B/mid
AKBNK/Financials	0,091	1,747	40.88B/big
AKSEN/Utilities	0,058	1,868	2.943B/mid
ALARK/Financials	0,186	1,963	1.6B/small
ALCTL/Technology	0,076	3,352	299.54M/small
ANACM/Basic Materials	0,128	1,798	2.49B/mid
BIMAS/Consumer Cyclicals	0,094	1,487	22.94B/big
BRISA/Consumer Cyclicals	-0,012	1,472	2.447B/mid
CEMTS/Basic	0,181	2,344	546.28M/small

Materials			
CLEBI/Industrials	0,062	2,232	871.39M/small
CRFSA/Consumer Non-Cyclicals	0,005	2,415	3.801B/mid
DOAS/Consumer Cyclicals	-0,031	1,917	1.852B/small
DOHOL/Industrials	0,151	2,867	2.198B/mid
ECILC/Consumer Non-Cyclicals	0,221	2,063	3.091B/mid
EGEEN/Consumer Cyclicals	0,073	2,101	1.038B/small
EKGYO/Financials	0,041	1,829	9.994B/big
FROTO/Consumer Cyclicals	0,118	1,718	21.213B/big
GARAN/Financials	0,082	1,775	47.46B/big
GLYHO/Industrials	0,192	2,283	1.548B/small
GOLTS/Basic Materials	0,061	2,019	476.64M/small
GOODY/Consumer Cyclicals	0,139	2,631	1.134B/small
GOZDE/Financials	0,116	2,677	11.649M/Nano Cap
GSDHO/Industrials	0,095	2,087	337.5M/small
HALKB/Financials	0,055	2,226	12.613B/big
HLGYO/Financials	0,045	1,572	746.2M/small
ICBCT/Financials	0,184	2,739	3.681B/mid
IPEKE/Energy	0,331	4,565	1.486B/small
ISGYO/Financials	0,059	1,299	1.261B/small
KARTN/Basic Materials	0,072	2,185	837.77M/small
KLGYO/Financials	0,348	3,863	7.075M/Nano Cap
KONYA/Basic Materials	0,013	1,734	1.281B/small
KORDS/Consumer Cyclicals	0,164	2,069	1.611B/small
KOZAA/Basic Materials	0,348	4,534	2.34B/mid
METRO/Industrials	0,122	3,044	5.555M/Nano Cap
NETAS/Technology	0,069	2,283	1.024B/small
ODAS/Utilities	0,202	2,337	985.55M/small
OTKAR/Industrials	0,071	1,811	2.81B/mid

Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

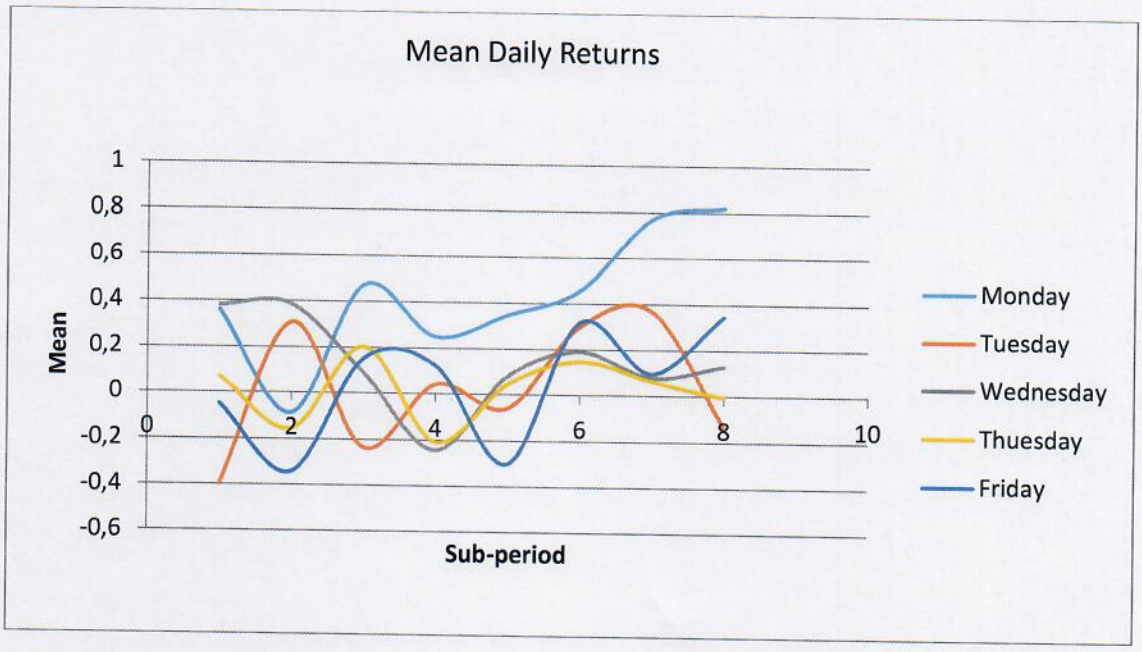
Apart from the analysis of daily returns for sample period from 02.09.2015 to 29.09.2017, it is important to go into details about mean values because the time-series plot of the daily returns shows a quiteunstable pattern with upward and downward trends in specific periods. Because of analysis was made in different periods, the data was split up into eight sub-periods, as shown in Table 5.3, based on quarterly upward and downward trends in market returns. Thus, it facilitates to estimate which quarter of year is significantly effective on BIST daily return.Further investigations were conducted to analyze possible upward and downward trends of effect. Mean returns and standard deviations were calculated for each day from Monday through Fridays within each sub-period. Table 5.3 and Table 5.4 provide the mean and standard deviation values for daily returns in each of the sub-periods analyzed. The results obtained after analyzing thedaily return variability indicated that Monday variability is almost always above the other ones, showing that uncertainty in returns is higher on Monday. At the same way results showed that Monday mean returns are higher than other days of the week and, as can be seen in Chart 5.2, Monday's line is far above than other ones. Possibly this is so because the start of the week begins with new expectations and information that has collected during the weekend.

Table 5. 5 Quarterly Based BIST 100 Mean of Daily Returns

Sub-periods	Monday	Tuesday	Wednesday	Thursday	Friday
02.09-30.11.2015 (1)	0,365	-0,397	0,381	0,068	-0,049
01.12.2015-29.02.2016 (2)	-0,086	0,309	0,385	-0,154	-0,339
01.03-31.05.2016 (3)	0,474	-0,235	0,086	0,203	0,153
01.06-31.08.2016 (4)	0,252	0,041	-0,245	-0,208	0,125
01.09-30.11.2016 (5)	0,351	-0,058	0,079	0,045	-0,301
01.12.2016-28.12.2017 (6)	0,458	0,301	0,188	0,146	0,3206676
01.03-31.05.2017 (7)	0,772	0,369	0,078	0,063	0,097
01.06-31.08.2017 (8)	0,823	-0,129	0,129	-0,006	0,351

Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

Chart 5.2 Quarterly Based BIST 100 Mean of Daily Returns



Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

Also, Chart 5.3 showed, that Monday's, Thursday's and Friday's lines have approximately the same directions between 2 and 4 sub-periods. The variability of the returns showed an increase in the level during summer month between 3 and 5 sub-periods, reaching a peak in the 4 sub-period (01.06-31.08.2016). These observations provide the evidence about the possible seasonality in the daily return volatility. However, the other days of the week have less consistent variability with upward and downward moving throughout sub-periods in comparison with Monday. As can be seen from Table 5.6, the highest standard deviation value on Monday was detected during 4 sub-period. Results obtained from these examinations about high Monday variability and low Friday variability are compatible with Foster and Viswanathan (1990) and Agrawal and Tandon (1994) found approximately the same results after analyzing eighteen countries. Despite the fact that Monday is generally more variable than the other days, the distribution of Monday variability can be evaluated with more certainty in

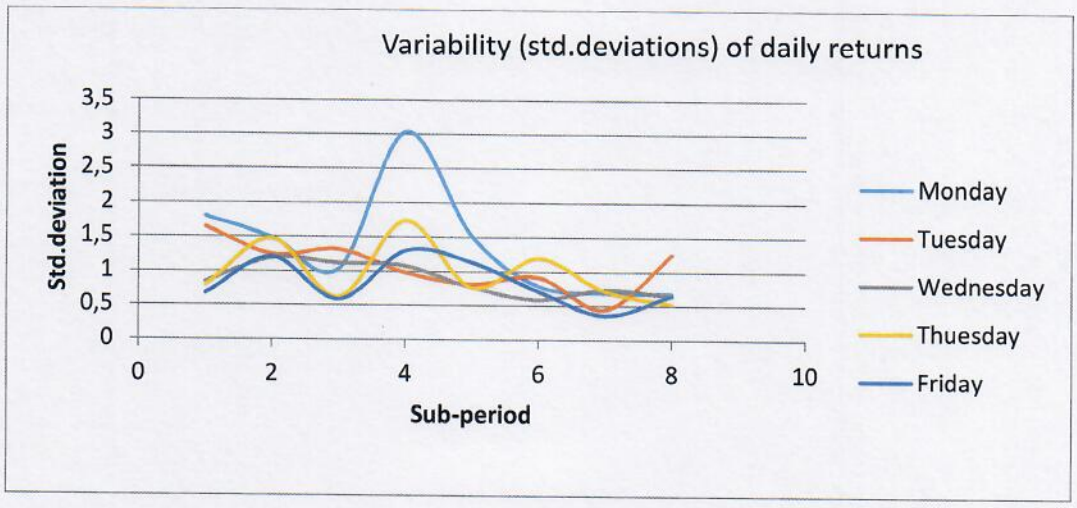
comparison with other days with more randomly distribution. As a conclusion to findings, reverse form of weekend effect was seen in the return variability as presented by positively higher Monday and low Friday variability, so Turkish stock market appears to be inefficient in sense of expected variability of daily returns.

Table 5. 6 Quarterly Based Variability (Standard Deviations) of Daily Returns

Subperiods	Monday	Tuesday	Wednesday	Thursday	Friday
02.09-30.11.2015 (1)	1,795	1,641	0,842	0,789	-0,049
01.12.2015-29.02.2016 (2)	1,488	1,248	1,192	1,469	-0,339
01.03-31.05.2016 (3)	1,038	1,319	1,121	0,614	0,153
01.06-31.08.2016 (4)	3,035	0,986	1,082	1,733	0,125
01.09-30.11.2016 (5)	1,512	0,818	0,768	0,761	-0,301
01.12.2016-28.12.2017 (6)	0,788	0,921	0,587	1,197	0,321
01.03-31.05.2017 (7)	0,686	0,445	0,736	0,714	0,097
01.06-31.08.2017 (8)	0,677	1,259	0,642	0,521	0,351

Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

Chart 5.3 Quarterly Based Variability (Standard Deviations) of Daily Returns



Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

In summary, regardless of the market capitalization, for the sample period returns on Mondaywas seen as positive across all the company sizes (notable that positive returns take place more frequently than negative), but this concept is stronger for the portfolio of small-cap firms. These results are not consistent with Keim and Stambaugh (1984) and Wang, Li and Ericson (1997), who found that the traditional weekend effect is stronger for small capitalization companies. However, the detecting of the reverse form of weekend effect, which was investigated in portfolios of the small capitalization companies, is a contemporary finding in the finance literature.

5.2 CORRELATION BETWEEN MONDAY RETURNS AND FRIDAY RETURNS

After detecting the interrelations between the reverse form of weekend effect and the firm size, further analysis examine the correlation between Friday and Monday returns in companies that have statistically significant level below 10%. Vast number of attempts in finance literature explain the traditional weekend effect, reporting a positive autocorrelation between Monday returns and the previous Friday returns (i.e. positive Friday returns tend to be followed by positive Monday returns, and negative Friday returns tend to be followed by negative Monday returns). According to literature, this pattern is stronger for small and mid-size stocks and this Friday–Monday return autocorrelation is related to the trading activities of individual investors. Also, this assumption called a start-of-the-week effect, which suggests that a week starting with a positive Monday return leads to a much greater average daily return for that week when compared with a week starting with a negative Monday return.Additional investigations were conducted in study to test whether this literature statement is significant in BIST 100 during sample period from 02.09.2015 to 29.09.2017. Interrelation between Monday and Friday returns from 100 analyzed companies of Istanbul Stock Exchange that have significance level below 10% is presented in Table 5.7.

Table 5. 7 Monday-Friday Correlation of Daily Returns Significant Below 10% Statistical Significance Level (P: positive returns, N: negative returns)

Company/ Mkt Cap	N to N	N to P	P to N	P to P
ANELE/small	-	-	-	0.039/1.151
BJKAS/ small	-	-	-	1.582/0.6305
DEVA/ small	-	-	0.713/-0,146	-
PETKM/ mid	-	-	-	0.413/0.081
THYAO/ big	-	-	0.584/-0.135	-
TRCAS/ small	-	-	0.546/-0.07	-
VAKBN/ big	-	-	0.582/-0.261	-
YATAS/ small	-	-	-	0.802/0.495
ZOREN/ mid	-	-	0.993/-0.08	-
SKBNK/ small	-	-	0.481/-0.02	-
MGROS/ mid	-	-	0.538/-0.051	-
YKBNK/ big	-	-	0.522/-0.191	-
AFYON/ small	-	-	0.944/-0.104	-
AKENR/ small	-	-	-	0.319/0.213
ALGYO/ small	-	-	-	0.735/0.467
ALKIM/ small	-	-	-	0.481/0.141
ASELS/ big	-	-	0.173/-0.258	-
BAGFS/ small	-	-	0.531/0.071	-
BANVT/ mid	-0.538/0.579	-	-	-
CCOLA/ mid	-	-	-	0.595/0.367
ENKAI/ big	-	-	-	0.419/0.480
ERBOS/ small	-	-	0.795/-0.007	-
IZMDC/ small	-	-	-	0.826/0.246
EREGL/ big	-	-	-	0.610/0.03
GSRAY/ small	-	-	-	1.151/0.328
GUBRF/ small	-	-	0.556/-0.267	-
IHLAS/small	-0.383/-0.782	-	-	-

ISCTR/ big	-	-	-	0.494/0.008
KCHOL/ big	-	-	0.426/-0.212	-
KRDMD/ mid	-	-	-	0.756/0.317
NTTUR/small	-	-	-	0.176/0.412
PGSUS/ mid	-	-	0.531/-0.012	-
SAHOL/ big	-	-	0.356/-0.252	-
SASA/ mid	-	-	-	0.743/0.771
SISE/ mid	-	-	-	0.422/0.112
SODA/ mid	-	-	-	0.304/0.207
TMSN/ small	-	-	0.467/-0.023	-
TOASO/ big	-	-	-	0.434/0.311
TSKB/ mid	-	-	-	0.321/0.029
TSPOR/ micro-cap	-	-	0.061/-0.151	-
VKGYO/ small	-	-	-	0.481/0.175
YATAS/ small	-	-	-	0.802/0.496
SKBNK/ small	-	-	0.481/-0.016	-
ARCLK/ big	-	-	-	0.280/0.103
AEFES/ big	-	-	0.133/-0.511	-
AYGAZ/ mid	-	-	0.265/-0.328	-
KOZAL/ mid	-	-0.469/0.566	-	-
METRO/ micro-cap	-	-	-	0.305/-0.015
PRKME/ small	-	-	-	0.530/0.216
TKFEN/ mid	-	-	-	0.118/0.380
TKNSA/ small	-	-	-	0.409/0.009
TUPRS/ big	-	-	0.256/-0.146	-

Source: Bloomberg; BIST100 daily return (02.09.2015-29.09.2017)

According to the results presented in Table 5.7 having found consistent weekend effect on daily returns, the signs of the returns was analyzed further (rather than the absolute values) in order to see any possible day-of-the-week effects. For this purpose, the percentage of returns that are positive is calculated for all companies

that have significant coefficients. The analysis of the overall data period from 02.09.2015 to 29.09.2017 showed that 51.9percent of the return values have positive to positive correlation between Monday and Friday. As further estimations showed returns from Monday to Friday exhibit a positive to negative transition in 42.3 percent of cases. Further,Friday returns take negative values in 3.8 percent of the time when Monday returns are negative; whereas the negative-to-positive transition in BIST 100 is found to occur with a 1.9 percent rate of the time in this analysis. These results are similar with the literature review. The results of Friday to Monday sign transitions are given in Table 6.

As seen in Table 5.7, it is more likely that a positiveMonday return would lead to a positive Friday return. Similarly, it is more likely that a favorable close of the week with a positive Friday return would lead to a positive return on Monday, probably as a result of the positive expectations of the investors from the stock market. One interesting finding is that, although on average, a "positive-to-positive" transition is more likely to occur, a "positive-tonegative" transition, most likely with a 42.3 percent occurrence rate; this gives an idea about how the behavior of investors have changed according to the financial environment and outcomes during the week.

Also, Table 5.7 indicates that the "positive-to-positive" transition occurs with the highest rate of 42.3 percent. Such an observation suggests that probably Monday returns could be an indicator of how the market will behave for the rest of the week. As a conclusion, examining the correlation between Monday and Friday, it is possible to assume that the average daily return for the weeks starting with a positive Monday return is quite high comparing with the weeks starting with a negative Monday return. This is what called a start-of-the-week effect, which suggests that a week starting with a positive Monday return leads to a much greater average daily return for that week when compared with a week starting with a negative Monday return.

To summarize, the idea of the correlation between Monday and Friday is based on the fact that how the market starts the week can be a good indicator of how the

market will behave for the rest of the week. It was proposed that the expected daily return within a week that starts with a positive Monday return is significantly higher than the expected daily return for a week that starts with a negative Monday return. Starting the week with an increase in the index leads to a positive average daily return for that week, whereas starting the week with a decrease in the index leads to a negative average daily return for that week. This is probably a result of a quick response of the investor to the market's starting position. The investors' expectations get optimistic as the market starts the week well with a positive return and carries on with a similar pattern for the rest of the week. However, a decrease in the index value compared to Friday closing leads the investor to disorganize the expectations so that a negative daily return for that week will be performed.

CONCLUSION

This paper examines the existence of weekend effect in listed companies in Borsa Istanbul. By considering the dynamic of the daily returns, conducted econometric analysis showed that stock returns are different on Mondays comparing to the rest of the week. This results being statistically significant indicated that the week day effect in BİST 100 was found. This finding of consistently positive Monday returns is a reverseform of the weekend effect, whereby mean returns for Monday are positive and significantly greater than the returns for the other days of the week. This is the evidence of the presence of reverse form of weekend effect in Borsa Istanbul that is the rare anomaly in stock markets.

In addition, while analyzing the weekend effect, relations with firm size was also examined on the basis of stock market capitalization value. Findings indicate that while reverseform of weekend effect getting stronger and more prominent for the small capitalization companies, traditional weekend effect more frequently was seen in big- and mid-capitalization companies. Thereby, the firm size and weekend effect are interrelated. No any evidence about dependency of weekend effect with the sector firm operating in was obtained. Absolutely different sectors may experience the week day effect. It is important to note that analyzed 100 companies are the largest that covers BIST in the Turkish Stock Exchange. If we had used all the companies traded in BIST, the result might have been slightly different. However, the companies outside the BIST 100 are not included in the study because they are very small on the global level and characterized by lower market liquidity.

To summarize, mean returns and standard deviations were calculated for each day from Monday through Fridays within each sub-period to analyze the return variability with upward and downward trends. Turkish stock market seems inefficient in terms of expected variability of daily returns as Monday more variable than the other days. Also, seasonality in the volatility of daily returns was

seen as the variability of the returns showed an increase in the level during summer month.

The results of this studyhave showed that the presence of the day of the week effect, that is one of the factors of inefficiency of the stock market, was found in BIST like in any emerging stock market. So, Istanbul Stock Exchange (ISE) is not an efficient market. However, firm size based results are conflict with the literature's saying.Complementary researches should be conducted to reveal at what degree reverse weekend effect is justified compared to literature saying. Possibly it will be essential to examine whether weekend effect in Turkish market has a declining trend or not. These researches may distinguish BIST from other stock exchange markets.

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