VESNA GEORGIEVA SVRTINOV[*]
DUSKO TODEVSKI[**]
DIANA BOSKOVSKA[***]
OLIVERA GJORGIEVA-TRAJKOVSKA[****]

NEW EVIDENCE FOR MONDAY'S AND JANUARY'S EFFECTS ON THE MACEDONIAN STOCK EXCHANGE INDEX (MBI10) RETURNS

Abstract

This paper examines the calendar effects on the Macedonian stock market's daily returns during the period from 2006 to 2016. We focus on two market anomalies: the day of the week and the month of the year effect. Our aim is to find out if it is possible to earn higher return than the market return on the Macedonian Stock Exchange by using the alternative investment strategies related to Monday and January effects.

We apply standard regression models with dummy variables for the effects in the mean returns. The results of the empirical analysis provide evidence for the existence of the Monday effect. However, the results did not indicate the existence of the January effect for the MBI 10 returns in the case of the Macedonian stock exchange.

Keywords: calendar effects, market anomalies, day of the week effect, month of the year effect, market efficiency.

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[*] Assis.Prof., Ph.D., University of Ss. Cyril and Methodius, Republic of Macedonia, e-mail vesna@ek_inst.ukim.edu.mk.
[**] Ph.D. student "Goce Delcev University" Faculty of Economics, Republic of Macedonia
e-mail duskotodevski@yahoo.com
[***] Assoc.Prof., Ph.D.,University of Ss. Cyril and Methodius, Republic of Macedonia, e-mail diana@ek_inst.ukim.edu.mk.
[****] Assoc. Prof.., PhD, "Goce Delcev University" Faculty of Economics, Republic of Macedonia, e-mail- olivera.trajkovska@ugd.edu.mk.

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Introduction

Capital market efficiency has been a very popular topic for empirical research since Fama in 1970 introduced the theoretical analysis of market efficiency and proclaimed the Efficient Market Hypotheses. According to this hypothesis, in an efficient market, the prices have a random movement. The prices are stabilized since the new information is reflected in the prices rapidly. Because the prices cannot be forecasted, a yield above the market is not possible by the purchase and sale strategies. The investors are rational and they act in accordance with the preference of low risk-high income. However, there is empirical evidence which states that ther eare some unexplained market movements called "Stock market anomalies".

In this paper, we try to explore if it is possible to earn higher return than market return on the Macedonian Stock Exchange (MSE) by using the alternative investment strategies related to calendar effects. Calendar effects mean that, seasonality at the markets can be seen at different days of the week, different months of the year and some parts of the months.

French (French, 1980) defines the Day of the week effect as the statistically significant difference between the average yields (or returns) of some of the days of the week, and the increase of yields from the first day until the last day of the week. Cross (Cross, 1973) and Rogalski (Rogalski,1984) refer to the Day of the week effect as the Weekend effect. According to the Weekend effect, Fridays are the highest average yield days, and Mondays are the lowest, even the negative ones. In some way these anomalies can be explained by the investor's optimistic mood on Friday and pessimistic mood on Monday.

The most common type of anomaly related to the months is "The month of the year effect. Rozeff and Kinlay (Rozeff & Kinlay,1976) define the Month of the year effect as January's average yield being much higher than in the other months.One explanation of the higher returns in January is the tendency to realize losses in December to reduce the taxable speculation gains. By avoiding to report to many losses in their portfolios at the year-end, institutional investors tend to sell "losses" in December. They buy these stocks after the reporting date in January to

hold their desired portfolio structure again. This yields higher returns in January compared to other months.

However, we have to take into the account that these effects are short-term phenomena, due to the learning of market participants. If investors based on the past experience are aware of calendar anomalies and can run trading strategies, such effects should disappear over time. Our aim in this paper is to explore if Monday and January effects are present on the Macedonian Stock Exchange.

The structure of the paper is as follows. Section 2 surveys the literature. Section 3 presents the data and methodology. Empirical results are discussed in the Section 4. Section 5 is summary of the thesis.

LITERATURE REVIEW

There is extensive literature for Monthly effects on stock returns. Rozef and Kinney (Rozef and Kinney,1976) demonstrated that stock returns of the US stock markets are signifcantly larger in the frst month of the year compared to the other months. Other major capital markets in developed countries exhibit similar calendar effects: Ofcer (Ofcer,1975) focused onthe Australian Stock Exchange; Tinic, Barone-Adesi and West (Tinic, Barone-Adesi and West,1990) on the Canadian market; Barone (Barone ,1990) on the Italian market and Lewis (Lewis, 1989) analyzed stocks listed on the London Exchange. All these studies confirmed existence of the January effect.

There is also a large body of literature for the Day of the week effect on stock returns. Cross (Cross, 1973) found that the mean return on Friday was higher than the mean return on Monday of the S&P 500 Index during the period from 1953 to 1970. Similar results are reported by French (French, 1980), who also studied the S&P 500 index for the period from 1953 to 1977. Gibbons and Hess (Gibbons and Hess,1981) found negative Monday returns for 30 stocks of Dow Jones Industrial Index.

More recent studies have also confirmed the existence of this phenomenon on stock exchange. Hansen and Lunde (Hansen & Lunde, 2003) found the existence of calendar effects on the stock markets in Denmark, France, Germany, Hong Kong, Italy, Japan, Norway, Sweden, UK, and USA. Corhay and Rad (Corhay & Rad, 1994) and Theodossiou

and Lee (Theodossiou & Lee, 1995) found the existence of these effects on the major European stock markets.

Briefly said, the month of the year and the day of the week effect is a common phenomenon across diferent countries and diferent types of markets.

There are also empirical studies which confirmed the existence of market anomalies on the Macedonian stock exchange: (Kovačić, 2007); (Angelovska, 2013); (Georgantopoulos and Tsamits, 2008); (Tevdovski, 2012); (Filipovski & Tevdovski, 2017).

DATA AND METHODOLOGY

In order to analyze monthly and daily effects on stock returns, we use the market index for the MBI 10 values of the Macedonian Stock Exchange. The data are public and obtained from the official website of the Macedonian Stock Exchange. The time series of the observed data includes the time period from 01.01.2006 to 31.12. 2016.

The data belonging to the period between 4th of January 2006 and 29th of December 2016 are consisted of 2706 observed units. The daily yields used in the statistical calculations would be defined as the percentile increase or decrease in the closing prices between one trading day and the following trading day:

$$Rt = (Pt - Pt-1) / Pt-1$$

(1)

Where:

Rt = the percentile exchange rate of the index on day't'(the market yield),

$P t$ = the price of index on day't',

$P t1$ = the price of index on day t-1

We consider two hypotheses. The first hypothesis is that there are no calendar specific anomalies in returns in the case of Day of the week and Month of the year effects.

The estimations used in the empirical analysis are based on the use of the OLS regression with the construction of the dummy variables. In addition all the functions used for the estimation for the Day of the week and Month of the year effect are presented.

Regarding the day of the week effect the following model is specified:

$$R = \sum_{i=1}^{t} \alpha_t W_i + \varepsilon$$

(2)

where Wi is a dummy variable taking a value of one for day i and zero otherwise where $i = 1$ Monday, Tuesday… Friday, α are parameters to be estimated and ε is the error term. For the model of the day of the week effect, the estimation of the model in addition consists of the lag variable Y_{t-1} in order to obtain the proper values of autocorrelation as the correction for the basic model which did not include the value of Y_{t-1}.

For the month or January effect, the model used is described by the following equation (e.g., Gultekin and Gultekin, 1983; Jaffe and Westerfield, 1989; Raj and Thurston, 1994):

$$R = \sum_{i=1}^{t} \alpha_t W_i + \varepsilon$$

(3)

where Wi is a dummy variable taking a value of one for month i and zero otherwise where $i = 1$ January, February…December, α are parameters to be estimated and ε is the error term.

Figure 1. Values of the MBI 10 index for the period from 01.01.2006 to 31.12.2016
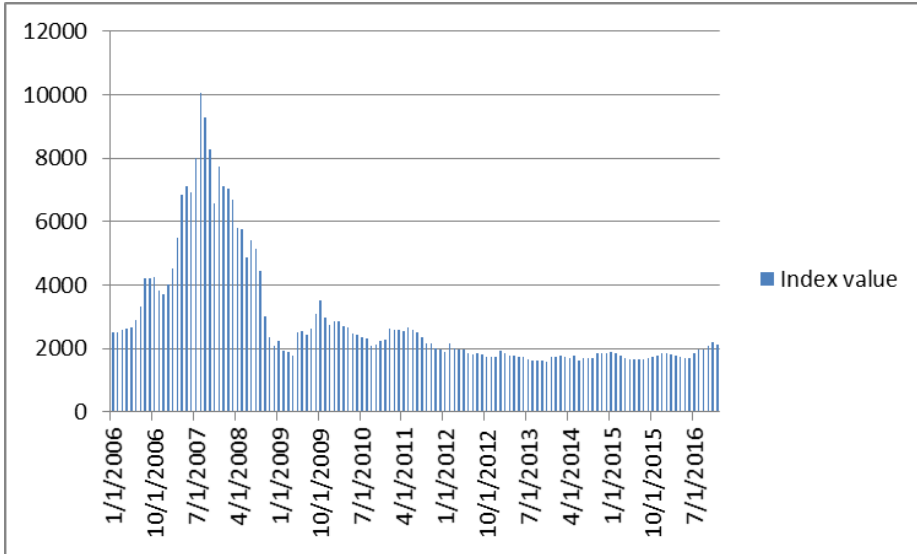
Source: Authors calculation based on MSE database.

Figure 1 represents the values of the index for the observed period. The figure shows the Macedonian golden age period represented form the year 2007 until the part of year 2008. The afterward period can be considered as the period of low stock exchange activity.

EMPIRICAL RESULTS

The first step in our research regarding the determination of the Monday effect on the Macedonian stock exchange is the presentation of the descriptive statistics of the index values for the days of the week.

Table 1. Descriptive statistics of the daily data of the MBI 10 index

	X1	X2	X3	X4	X5
Median	-0.09	-0.11	0.01	0.04	0.09
Average	-0.08	-0.08	0.05	0.04	0.09
Max.	6.89	6.68	6.82	6.83	5.91
Min.	-8.65	-7.84	-7.63	-8.40	-9.77
St. dev	1.24	1.28	1.23	1.30	1.15

Source: Authors calculation based on MSE database.

The data representing the median for the days of the week suggest the negative values of the MBI 10 returns for the Monday and Tuesday with the values of (-0.09 and -0.11) respectively. This suggests the negative income for the investors in the case of investing on the Macedonian Stock Exchange in these days. The median values for the other days are positive and present the values within the margin of 0.01 for Wednesday and up to 0.09 for Friday. This situation for the positive values for the rest of the week and especially the highest value of 0.09 registered in Friday suggest that investors have positive effect from the investment in the end of the week. The value of the average return of the MBI 10 index suggests nearly similar effects for the positive and negative values referring the return of the index in the days of the week.

Regarding the value of standard deviation of the days of the week data, the values represent that the largest volatility of the return occurs on Thursday with the value of 1.3 and the smallest volatility on Friday with 1.15.

Table 2. OLS regression estimation of the daily effects

Variable	Coefficint	Prob.
C	-0.108407	0.0278**
Y(-1)	0.401431	0.0000***
X2	0.062193	0.3698
X3	0.190207	0.0060***
X4	0.130076	0.0601*
X5	0.171886	0.0136**
F-statistic		105.7701
Prob(F-statistic)		0.000000
Durbin-Watson stat		1.894616

*** significance of 1 %

** significance 5 %

* significance 10 %

The results of the estimation represented above suggest the significance of all the coefficients with the exception of the coefficient which represents the Tuesday return of the MBI 10 index. The highest significance is registered in the coefficient representing X3 variable with

the 1% significance. The significance of the Monday effect is represented with the values of the C coefficient probability and its 5% margin significance. Also the negative value of the C coefficient must be noted, and it suggests the negative effect of the MBI 10 return for the investors on Monday. The F statistics and its probability suggest jointly significance for the independent variables regarding the dependent variable included in this model.

Table 3. Wald test statistics day of the week effect model

Test Statistic	Value	df	Probability
F-statistic	88.15057	(6, 2699)	0.0000
Chi-square	528.9034	6	0.0000
Null			Hypothesis:
C(1)=C(2)=C(3)=C(4)=C(5)=C(6)=0			

The Wald statistics presented in table 3 presents the argument for the rejection of the null hypothesis, which suggests that the values of the coefficients are identical and equal to 0. This probability presents that the values of the return of the days of the week is different in all variable representing the days of the week. In general, the results from the Wald test support the previous findings for the significance of the coefficients, and prove once again the existence of Monday effect in the case of the Macedonian Stock exchange.

Table 4. Descriptive statistics of the monthly data of the MBI 10 index

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
Median	0.26	0.42	0.22	-0.09	0.24	-0.03	-0.06	0.24	-0.05	0.33	-0.26	0.73
Average	-0.21	0.48	0.46	-0.22	0.28	0.29	0.29	0.05	-0.04	0.30	-0.81	0.76
Max.	1.63	1.57	2.65	0.89	2.86	3.73	2.14	1.73	0.85	3.75	0.92	2.89
Min.	-5.01	-0.82	-0.57	-2.31	-1.26	-0.52	-0.46	-1.43	-1.41	-3.97	-2.50	-0.64
St. dev	1.83	0.65	0.93	0.83	1.17	1.17	0.76	0.87	0.63	1.94	1.16	1.00

Source: Authors calculation based on MSE database.

The data representing the median for the months of the year suggest the negative values of the MBI 10 returns for the April (-0.09), June (-0.03), July (-0,06), September (-0.05) and November (-0.26). This suggests the negative income for the investors in the case of investing on the Macedonian Stock Exchange in these months. The median values for the other months are positive and present the values within the margin of 0.22 for March and up to 0.73 for December. This situation for the positive values for the rest of the months and especially the highest value of 0.73 registered in December suggest that investors have positive effect from the investment in the end of the year. The value of the average return of the MBI 10 index suggests nearly similar effects for the positive and negative values referring the return of the index for the February, May, September, October and December. The difference between the values for the other months can be explained by the dispersion of the index values return data for the observed period. This argument is supported with the values of standard deviation which presents the high standard deviation in the cases of months which don't have big difference for the months for the median and average values. The example of this case is noted in the values of the standard deviation of October with the value of 1.94 and the values of the median 0.33 and average 0.30.

Table 5. OLS regression estimation of the monthly effects

Variable	Coefficient	Prob.
X2	0.683636	0.1661
X3	0.670000	0.1747
X4	-0.008182	0.9867
X5	0.490909	0.3191
X6	0.499091	0.3111
X7	0.498182	0.3120
X8	0.252727	0.6075
X9	0.166364	0.7352
X10	0.502727	0.3076
X11	-0.600909	0.2231
X12	0.967273	0.0510*
C	-0.207273	0.5514
F-statistic	1.419588	
Prob(F-statistic)	0.172650	
Durbin-Watson stat	1.885713	

*** significance of 1 %

** significance 5 %

* significance 10 %

The results of the estimation represented above suggest the insignificance of all the coefficients with the exception of the coefficient which represents the December return of the MBI 10 index. The insignificance of the value of the C coefficient must be noted, and it suggests that there is no January effect of the MBI 10 return for the investors. The F statistics and its probability suggest jointly insignificance for the independent variables regarding the dependent variable included in this model.

Table 6. Wald test statistics month of the year effect model

Test Statistic	Value	df	Probability
F-statistic	1.455415	(12, 120)	0.1507
Chi-square	17.46498	12	0.1329
Null			Hypothesis:
C(1)=C(2)=C(3)=C(4)=C(5)=C(6)=C(7)=C(8)=			
=C(9)=C(10)=C(11)=C(12)=0			

The Wald statistics presented in table 6 presents the argument that the null hypothesis is not rejected. This suggests that the values of the coefficients are identical and equal to 0. In general this finding form the results from the Wald test support the previous findings for the insignificance of the coefficients, and prove once again that the January effect does not exist in the case of the Macedonian Stock exchange.

Conclusion

This paper offers evidence of the calendar effect for the return on the MBI 10 index of the Macedonian Stock Exchange. This empirical research studied the two types of calendar effects in the return on the Macedonian Stock Exchange index MBI10. The results of the models presented two opposite findings for the case of the Day of the week and the Month of the year effect.

In the case of the Day of the week effect, results offered the confirmation of the negative Monday effect for the return of the MBI 10 index for the period from 2006 to 2016. The results and the analysis we have made, offered proof for the significance and positive effect on the return of the MBI 10 index in Wednesday, Thursday and Friday. However, the results indicated that there is no significance for the return in Tuesday. In general, these findings showed that the investments in Monday have negative effect on the return and positive effect in Wednesday, Thursday and Friday. This situation suggests that Wednesday, Thursday and Friday may result with higher return for the investors in the MSE.

On the other side, the results from the study offered evidence for the insignificance of the negative January effect of the return for the MBI 10 index for the period from 2006 to 2016. The results indicate that December is the month of the year with statistical positive significance

for the return of the MBI 10 index. According to that, the basic hypothesis for the January effect was rejected and the final conclusion is that the January effect does not exist in the case of the return of the MBI 10 index.

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