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INVESTIGATION ABOUT THE PRESENCE OF THE DAY – OF - THE - WEEK EFFECT IN THE BUCHAREST STOCK EXCHANGE

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Abstract

In the last decades the specialized literature revealed the seasonal effects on the financial markets evolution. Among them there is the day – of – the – week effect, which consists in significant differences from the average returns on some days of the week than others. This paper investigates the presence of the day – of – the – week effect in Bucharest Stock Exchange. Our analysis is based on the BET index and on the returns of all the stocks traded in BET during the first semester of 2009. The tendency of the Bucharest Stock Market to display systematic patterns of certain day of the week is studied by regressions with dummy variables for the working days of a week. The results indicate a significant Thursday effect for BET and for most of the ten stocks.

Keywords: Romanian Stock Market, Seasonality, Thursday Effect

JEL Classification: G02, G14, G19

1. Introduction

During the last quarter of the century empirical researches discovered seasonal effects (known as calendar effects or calendar anomalies) of the returns for some assets traded on the financial markets. There were revealed systematic patterns of these returns for different periods of time: hours, days, weeks, months, quarters etc. One of the most important calendar effects is the so-called day – of – the – week effect, materialized in significant differences for the average returns of the assets between some days of the week.

In the specialized literature there are many papers, which approach the day – of – the – week effect. Many of them, for example

French (1980), Gibbons and Hess (1981), Keim and Stambaugh (1984) or Dubois and Louvet (1996), revealed that average returns on Monday were in general low or negative [5, 6, 8 and 3]. Other studies, for example Pena (1995) or Gardeazabal and Rogulaz (2002), found no evidence for the day – of – the – week effect on the financial markets [9, 6]. Abraham and Ikenberry (1994) demonstrated that, in general, when the Friday's returns were negative the Monday's returns were also negative and when the Friday's returns were positive the Monday's returns were also positive [1].

The calendar anomalies are often taken into consideration for the investors' strategies. For example, when they are confident about the patterns of low returns, Monday they tend to sell equities at the close on Friday. Chen and Singal (2003) argued that inability of the speculators to trade over the weekend was likely to lead them to close with risky positions on Fridays and to reestablish new short positions on Mondays [4]. These actions contribute to the rise of prices Fridays and to the fall of prices Mondays.

The calendar effects could be considered as being in contradiction with the classical theory of the efficient markets since they imply a level of stocks returns predictability. However, more recent approaches of this theory incorporated the asset prices evolutions seasonality (e. g. Brooks, 2008) [2].

In this paper we investigate the day – of – the – week effect to the Bucharest Stock Exchange (BSE) in the first semester of 2009. We use the daily values of BET, a reference index for BSE, and the daily values of ten stocks traded in BET.

The rest of this paper is organized as follows. In the second part we approach the data and the methodology; in the third part we present the empirical results and in the fourth part we conclude.

2. Data and Methodology

We study the day – of the – week effect on BSE employing daily values of BET index and of the ten stocks aggregated in the BET index. We use a sample of data from 20th of January to 20th of July provided by BSE. For each stock and for BET we calculate the returns applying the formula:

$$R_t = 100 \times [\ln (P_t) - \ln (P_{t-1})] \quad (1)$$

where, R_t = the return in the day t ; P_t is the price in the day t and P_{t-1} = the price in the day $t-1$.

In order to evidenciate the seasonality of BSE we compose, for each day of the week, descriptive statistics of the returns. We also define five dummy variables, one for every working day of the week:

$D1_t = 1$ for Monday and zero otherwise; $D2_t = 1$ for Tuesday and zero otherwise; $D3_t = 1$ for Wednesday and zero otherwise; $D4_t = 1$ for Thursday and zero otherwise; $D5_t = 1$ for Friday and zero otherwise.

We investigate the day – of – the – week effect using three regressions. First of them uses intercept dummy variables combined in the equation:

$$R_t = a_1 D1_t + a_2 D2_t + a_3 D3_t + a_4 D4_t + a_5 D5_t + u_t \quad (2)$$

where u_t = an error term.

The value of a coefficient a_i , associated with a dummy variable D_i , could be considered as an average of returns for the day i . We use the t-ratio obtained for a coefficient a_i to test the significance of the seasonality for the day i .

The second regression equation includes, along with intercept dummy variables, a lagged term of the dependent variable which allow to test the efficient market hypothesis in the context of day – of – the – week effect:

$$R_t = b_1 D1_t + b_2 D2_t + b_3 D3_t + b_4 D4_t + b_5 D5_t + b_6 R_{t-1} + u_t \quad (3)$$

The first five coefficients, associated to the dummy variables, reflect the impact of the day – of – the – week effect while the sixth, associated to the lagged term of the dependent variable, could be used to verify the efficient market hypothesis.

The third regression uses slope dummy variables in combination with BET index returns:

$$R_t = c_1 D1_t RBET_t + c_2 D2_t RBET_t + c_3 D3_t RBET_t + c_4 D4_t RBET_t + c_5 D5_t RBET_t + u_t \quad (4)$$

where, $RBET_t$ = the return of BET index t in the day t .

By considering the ten stocks as an efficient portfolio, we may study, based on the significance of the equation (4) coefficients, how the market risk varies across the days of the week.

3. Empirical Results

Table 1 exhibits the results of the regression performed on the equation (2). It reveals a significant Wednesday effect for BET and for six of the ten stocks, all coefficients of D4 dummy variable being positive. For a single stock there is a significant Tuesday effect with a negative coefficient of D2 dummy variable.

*Table 1 Day of the week effects revealed by the equation
 $R_t = a_1 D1_t + a_2 D2_t + a_3 D3_t + a_4 D4_t + a_5 D5_t + u_t$*

<i>Stock</i>	a_1	a_2	a_3
BET	-0.0923633 (-0.1565)	-0.568379 (-1.0044)	0.747168 (1.3203)
Azomures	-0.0178828 (-0.0166)	-0.88218 (-0.8542)	1.69995 (1.6461)
S.S.I.F. Broker	0.354707 (0.2257)	-0.903912 (-0.6034)	1.13623 (0.7755)
Impact Developer	-0.114964 (-0.0933)	-1.36315 (-1.1598)	1.71863 (1.4286)
Biofarm S.A.	0.175495 (0.1821)	-0.230228 (-0.2490)	0.600098 (0.6491)
Transelectrica	-0.196725 (-0.3111)	-1.19546 (-2.0627)**	0.523595 (0.9034)
S.N.T.G.N. Transgaz	-0.514934 (-0.9496)	0.0541862 (0.1044)	0.32183 (0.6327)
Rompetrol Rafinare	1.02839 (1.2183)	-0.786089 (-0.9709)	0.549973 (0.6793)
Banca Transilvania	-1.41298 (-1.5635)	-1.42577 (-1.6448)	0.201941 (0.2330)
BRD - GSG	-0.42006 (-0.4763)	-1.33521 (-1.5785)	-0.00208729 (-0.0025)
Petrom	0.0533935 (0.0722)	-0.907087 (-1.2532)	0.388337 (0.5476)
<i>Stock</i>	a_4	a_5	
BET	1.29321 (2.2390)**	-0.219851 (-0.3806)	
Azomures	1.69599 (1.6091)	-0.680984 (-0.6461)	
S.S.I.F. Broker	0.559384 (0.3900)	1.3571 (0.8850)	
Impact Developer	3.02369 (2.5726)**	-0.225021 (-0.1915)	
Biofarm S.A.	1.86583 (2.0181)**	0.975132 (1.0547)	
Transelectrica	0.723826	0.48804	

	(1.2737)	(0.8421)
S.N.T.G.N. Transgaz	1.44168 (2.8902)***	-0.179435 (-0.3527)
Rompetrol Rafinare	1.26588 (1.5635)	0.11657 (0.1440)
Banca Transilvania	2.21643 (2.5569)**	0.493424 (0.5692)
BRD - GSG	1.76452 (2.1274)**	0.21691 (0.2564)
Petrom	1.34941 (1.9404)*	0.169497 (0.2390)

Notes: Coefficients are given in each cell followed by t-ratios in parentheses;
*, ** and *** denote significance at 10%, 5% and 1% levels, respectively.

In the Table 2 there are presented results of the regression performed on the equation (3). The efficient market hypothesis, tested by significance of the lagged dependent variable coefficient, is verified for only four of the ten stocks. It shows a significant Wednesday effect for BET and for seven of the ten stocks, with positive coefficients of the D4 dummy variable. For only one stock it was revealed a Tuesday effect, with a negative coefficient.

Table 2 Day of the week effects revealed by the equation
 $R_t = b_1 DI_t + b_2 D2t + b_3 D3_t + b_4 D4_t + b_5 D5_t + b_6 R_{t-1} + u_t$

<i>Stock</i>	b_1	b_2	b_3
BET	-0.0697049 (-0.1183)	-0.560906 (-0.9932)	0.817164 (1.4398)
Azomures	0.0600298 (0.0558)	-0.878234 (-0.8522)	1.7995 (1.7407)*
S.S.I.F. Broker	-0.220918 (-0.1490)	-0.813556 (-0.5784)	1.4453 (1.0490)
Impact Developer	-0.0988665 (-0.0811)	-1.33819 (-1.1515)	1.92912 (1.6145)
Biofarm S.A.	0.0619503 (0.0647)	-0.305374 (-0.3327)	0.64424 (0.7023)
Transelectrica	-0.191068 (-0.2975)	-1.19608 (-2.0547)**	0.518172 (0.8795)
S.N.T.G.N. Transgaz	-0.521379 (-0.9619)	0.107275 (0.2058)	0.316796 (0.6231)
Rompetrol Rafinare	1.09229 (1.3012)	-0.672202 (-0.8326)	0.425493 (0.5266)
Banca Transilvania	-1.41437 (-1.5590)	-1.38894 (-1.5830)	0.233206 (0.2664)

BRD - GSG	-0.516722 (-0.5896)	-1.2733 (-1.5164)	0.174111 (0.2060)
Petrom	0.0149605 (0.0202)	-0.88903 (-1.2258)	0.452556 (0.6331)
<i>Stock</i>	b_4	b_5	b_6
BET	1.20243 (2.0693)**	-0.366935 (-0.6233)	0.113736 (1.2259)
Azomures	1.50513 (1.4154)	-0.872361 (-0.8203)	0.112841 (1.2179)
S.S.I.F. Broker	0.15554 (0.1152)	1.00248 (0.6950)	0.357467 (3.8923)***
Impact Developer	2.72715 (2.3245)**	-0.771576 (-0.6432)	0.180757 (1.8324)*
Biofarm S.A.	1.77151 (1.9286)*	0.681886 (0.7312)	0.157167 (1.7231)*
Transelectrica	0.725503 (1.2696)	0.489797 (0.8404)	-0.00547605 (-0.0593)
S.N.T.G.N. Transgaz	1.39207 (2.7800)***	-0.288152 (-0.5556)	0.0967699 (1.0594)
Rompetrol Rafinare	1.34669 (1.6712)*	0.302576 (0.3724)	-0.146938 (-1.6073)
Banca Transilvania	2.21038 (2.5397)**	0.42708 (0.4780)	0.0299325 (0.3267)
BRD - GSG	1.79533 (2.1819)**	-0.0154244 (-0.0182)	0.155717 (1.7244)*
Petrom	1.31402 (1.8828)*	0.0723786 (0.1004)	0.0737477 (0.7983)

Notes: Coefficients are given in each cell followed by t-ratios in parentheses; *, ** and *** denote significance at 10%, 5% and 1% levels, respectively.

Table 3 contains the results of the regression performed on the equation (4). For all the ten stocks most of the slope dummy coefficients are significant, so we can consider that both the risk and the return vary across the days of the week.

Table 3 Day of the week effects revealed by the equation

$$R_t = c_1 D1_t RBET_t + c_2 D2_t RBET_t + c_3 D3_t RBET_t + c_4 D4_t RBET_t + c_5 D5_t RBET_t + u_t$$

<i>Stock</i>	c_1	c_2	c_3
Azomures	1.46569 (3.9946)***	1.01522 (3.6858)***	0.548454 (1.4947)
S.S.I.F. Broker	1.89723 (5.4652)***	1.7933 (4.4022)***	1.08725 (2.3472)**
Impact Developer	1.53479	1.31231	1.43234

	(5.2315)***	(4.7585)***	(4.0776)***
Biofarm S.A.	1.32943 (5.2091)***	1.11354 (4.5749)***	0.950118 (3.5338)***
Transelectrica	0.703631 (3.8399)***	0.905014 (6.1323)***	0.582279 (3.5616)***
S.N.T.G.N. Transgaz	0.790671 (5.1133)***	0.655195 (4.5629)***	0.616778 (4.0153)***
Rompetrol Rafinare	0.556899 (2.7691)***	0.892953 (4.6554)***	1.37088 (6.4703)***
Banca Transilvania	0.574828 (2.5295)**	0.866008 (3.5521)***	0.675726 (2.4510)**
BRD - GSG	1.21796 (7.3027)***	1.53662 (9.9062)***	1.23814 (7.2261)***
Petrom	1.091 (6.2534)***	0.854607 (5.1006)***	1.09083 (6.0860)***
<i>Stock</i>	<i>c₄</i>	<i>c₅</i>	
Azomures	0.799452 (2.7435)***	0.503995 (1.4263)	
S.S.I.F. Broker	0.772604 (2.4059)**	0.652165 (1.4086)	
Impact Developer	1.58222 (7.2923)***	1.1534 (3.3313)***	
Biofarm S.A.	1.14713 (6.0687)***	0.99987 (3.7706)***	
Transelectrica	0.801039 (7.1737)***	0.560731 (3.4775)***	
S.N.T.G.N. Transgaz	0.600354 (5.7100)***	0.357625 (2.3606)**	
Rompetrol Rafinare	0.987874 (4.6554)***	1.47122 (7.0405)***	
Banca Transilvania	1.38871 (5.9703)***	1.08026 (3.9592)***	
BRD - GSG	1.20903 (10.3309)***	1.23935 (7.3338)***	
Petrom	0.964588 (7.6647)***	0.885376 (5.0085)***	

Notes: Coefficients are given in each cell followed by t-ratios in parentheses;
*, ** and *** denote significance at 10%, 5% and 1% levels, respectively.

4. Conclusions

In this paper we studied the presence of the day-of-the-week effect in the Romanian stock market. In our investigation we used daily values of the BET index and the ten stocks traded in BET during the first semester of 2009.

We analysed the day-of-the-week effect by employing three regressions. In the first regression, with intercept dummies, we found a significant Thursday effect for BET and most of the stocks. The Thursday effect was obtained again, for BET and for most of the ten stocks, when we used the second regression with a lagged dependent variable. It resulted, also, the efficient market hypothesis was verified only for four stocks. In the third regression, with slope dummy variables, we found that in general risk and return are significantly different for each days of a week.

The weak evidence of efficient market hypothesis and the variation of the risk and return across the day-of-the-week could be interpreted as indices of the high risk perceptions, induced by the recent financial crisis. In these circumstances it is not sure the Thursday effect would be verified for more tranquil periods.

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