Turn-of-the-year effects on Bucharest Stock Exchange

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Abstract: This paper examines the presence of the turn-of-the-year effects on the Romanian capital market. We use the daily closing values of some important indexes of the Bucharest Stock Exchange for the period January 2000 – August 2017. In order to reveal the impact of a turbulent context on the turn-of-the-year effects we split this sample of data into three sub-samples. The first one, from January 2000 to December 2006, corresponds to a relatively quiet context. The second one, from January 2007 to June 2012, was marked by significant turbulences provoked mainly by the global crisis. The third one, from July 2012 to August 2017, could be considered as relatively quiet as the Romanian capital market recovered after the global crisis. For the first and the third sub-samples we identified turn-of-the-year effects for all the indexes employed. Instead, for the second sub-sample we found this calendar effect only for one of the five indexes used in the investigation. We conclude that turn-of-the-year effects, banished from Bucharest Stock Exchange by the turbulences, came back after the capital market regained its relative stability.

Keywords: calendar anomalies; Romanian capital market; turn-of-the-year effects; quiet and turbulent times

JEL: G10, G14, G19

1. INTRODUCTION

In the last decades, the Behavioral Finance Theory (BFT) emergence led to an intensification of study on the calendar effects, which refers to unusual returns of the stock prices during some specific periods of a year. When such a form of seasonality was revealed, it could be exploited in simple trading rules. If these trading rules are proved to be successful, they could erase doubts on the Fama (1970) Efficient Market Hypothesis (EMH), which postulates that information about the stock prices past evolutions is not useful for building profitable investment strategies. In fact, calendar effects on the stock prices evolutions are among the most used arguments of the BFT against the EMH.

Empirical researches proved that many calendar effects were not persistent in time. According to Dimson and Marsh (1998), many of them disappeared or went into reverse after they were identified. There were also revealed significant changes on the calendar effects caused by the passing from quiet to turbulent times (e.g., Holden et al., 2005).

One of the first discovered calendar effects associated to the financial markets is the turn-of-the-year (TOY) effect, which refers to the unusual returns of the stock prices in a period of time that lasts from the end of a year until the first days of the next year. Before the EMH was formulated, Wachtel (1942) had revealed that, especially for small firms, the stock returns were higher in January than in the other months. After more than three decades later, the so-called January effect was again brought to attention of the financial markets literature by Rozeff and Kinney (1976). They investigated the seasonality on the New York Stock Exchange from 1904 to 1974 and they detected, for most of this period, unusual large returns in January (during the period 1929 - 1940, when the capital market from United Sates was rather turbulent, this calendar effect was not found).

The presence of the January effect on the United Sates capital market was confirmed by Keim (1983) who examined the relation between abnormal returns and companies' size for the period 1963 - 1979. He identified abnormal returns in January, especially in the first trading days. A distinction between TOY and January effects was made by Roll (1983) who investigated the seasonality associated to a period that included the last trading days of December and the first trading days of the January from the next year (in fact, there is no unanimity, in the financial markets literature, over the length of the period of time associated to the TOY effect). Later researches identified TOY effects in several developed or emerging capital markets (e.g., Berges et al., 1984; Chui and Wei, 1998; Poterba and Weisbenner, 2001; Dai, 2007; Al-Rjoub and Alwaked, 2010; Sander and Veiderpass, 2013).

BFT offered several explanations for TOY effects. The tax-loss-selling hypothesis highlighted a technique of the stockholders who want to reduce their tax liability by obtaining capital losses. They sell, near the end of the year, stocks with poor performances, generating a downward pressure on their prices. This pressure disappear at the beginning of the next year (or even in the last trading days of the current year), causing an increase of the prices (e.g., Branch, 1977; Dyl, 1977; Sias and Starks, 1997; Reinganum, 1983; Roll, 1983). The Window Dressing hypothesis stresses on the concern of the institutional investors to mask the unfortunate decisions. Before making their reports from the end of the year they sell the stocks with descendant evolution. As in the case of tax-loss-selling hypothesis, their transactions cause a downward pressure, which led to a decline of the prices. At the beginning of next year, the intensity of such transactions diminish and the prices rise (e.g., Maxwell, 1988; Haugen and Lakonishok, 1988). Anderson et al. (2007) revealed the psychological factors impact that makes investors to pay higher prices at the beginning of the new year than at the end of the precedent one.

An investigation on TOY effects has to take into consideration the possibility of other calendar effects interferences. The TOY effect could be viewed as a particular case of turn-of-the-month effects associated to a period that includes the last days of a month and the first days of the next month (e.g., Lakonishok and Smidt, 1988). The holiday effect could also interfere with TOY effects because, usually, stock markets have public holidays for the first and last days of a year (e.g., Lakonishok and Smidt, 1988; Brockman and Michayluk, 1998).

This paper approaches TOY effects in the Romanian capital market from January 2000 to August 2017. We identify this type of seasonality by performing regressions on the daily closing values of some important indexes of Bucharest Stock Exchange (BSE). In order to find out if TOY effects behave differently during the quiet and turbulent times we separate the period of investigation in three sub-periods:

- the first sub-period, from January 2000 to December 2006, when BSE experienced a relative quiet growth;

- the second sub-period, from January 2007 to June 2012, when Romanian capital market was affected by turbulences generated by the adhesion to European Union and by the global financial crisis;

- the third sub-period, from July 2012 to August 2017, when BSE was recovering from the global financial crisis and it experienced again a relative quiet growth.

The remainder of this paper is organized as it follows: the second part describes the data and the methodology employed to investigate the presence of TOY effects on the Romanian capital market during the three periods, the third part presents the empirical results and the fourth part concludes.

2. DATA AND METHODOLOGY

2.1. Description of the Data

In this investigation about the presence of TOY effects on BSE we employ daily closing values of six important indexes of BSE: BET, BET C, BET FI, BET XT, BET NG and BET BK. The sample of data is divided into three sub-samples corresponding to the sub-periods mentioned before. The values of some indexes are not available for all three sub-samples (the composition of indexes and the availability of data are reported in the Table 1). For the first sub-sample we have to take into consideration that BSE had, every year, a public holiday that started in the last 6-12 days of December and ended in the first days of the next year.

Tab. 1. Compositions and sub-samples of the BSE indexes

Index	Composition	First sub-sample	Second sub-sample	Third sub-sample
BET	the shares of most liquid 10 companies listed on the BSE regulated market	January 2000 – December 2006	January 2007 – June 2012	July 2012 – August 2017
BET-C	the shares of all companies listed to BSE	January 2000 – December 2006	January 2007 – June 2012	x
BET-FI	the shares of the five investment funds (SIFs) established in 1993 to facilitate the privatization of the Romanian economy	November 2000 – December 2006	January 2007 – June 2012	July 2012 – August 2017
BET-XT	the most liquid 25 shares traded on the BSE, including SIFs	x	January 2007 – June 2012	July 2012 – August 2017
BET-NG	the shares of companies which have the main business activity located in	x	January 2007 – June 2012	July 2012 – August 2017

	the energy sector and the related utilities			
BET-BK	the shares of the most liquid 25 companies purposed but it is calculated in a different way than BET XT; it is meant to be a benchmark for investment on BSE	x	x	July 2012 – August 2017

Source: Bucharest Stock Exchange

We study the TOY effects on the logarithmic returns (r_t) of the BSE index, computed the by formula:

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

where P_t and P_{t-1} are the closing prices of an index on the days t and t-1, respectively.

Tab. 2. Descriptive statistics of the returns

Index	Mean	Median	Std. Dev.	Skewness	Ex. kurtosis	Jarque-Bera test
First sub-sample						
BET	0.162	0.111	1.542	-0.271	7.036	3594.29***
BET-C	0.135	0.109	1.313	-0.351	5.256	2028.85***
BET-FI	0.273	0.146	2.322	0.209	3.680	868.67***
Second sub-sample						
BET	-0.042	0.025	2.023	-0.497	5.614	1876.12***
BET-C	-0.049	0.029	1.866	-0.640	6.416	2469.85***
BET-FI	-0.082	-0.052	2.921	-0.166	5.003	1450.80***
BET-XT	-0.063	0.030	2.178	-0.436	5.028	1503.12***
BET-NG	-0.042	-0.028	2.118	-0.349	8.011	3731.96***
Third sub-sample						
BET	0.042	0.046	0.798	-0.791	6.972	2760.25***
BET-FI	0.041	0.022	0.847	-0.575	7.251	2910.82***
BET-XT	0.042	0.049	0.766	-0.876	7.879	3518.51***
BET-NG	0.013	0.017	0.843	-0.669	6.183	2161.05***
BET-BK	0.042	0.054	0.724	-0.926	8.676	4249.82***

Note: *** means significant at 0.01 level.

The Table 2 reports the descriptive statistics of returns in the three sub-samples. The means values, which were significantly positive for the first sub-sample, became negative in the second sub-sample (as a result of the global crisis) and rose again to positive levels for the third sub-samples. The largest values of standard deviation occurred in the second sub-sample. Except BET-FI index for the first sub-sample, the returns have negative asymmetry, meaning significant probabilities of large decreases. The kurtosis in excess was significantly positive for all the indexes, in all three samples, indicating the leptokurtosis of the returns distribution. The results of Jarque-Bera test lead to rejection, for all three sub-samples, of the null hypotheses that returns are normally distributed.

2.2. Methodology

The TOY effects on BSE are to be identified by regressions with dummy variables. We establish the TOY days, corresponding to the period associated to the turn-of-the-year effect, by successive trials.

As a preliminary stage, in order to avoid spurious regressions, we study the stationarity of the returns using Augmented Dickey – Fuller (ADF) unit root tests with intercept as deterministic term. We employ Akaike (1974) Information Criterion to identify the optimum number of lags. For an ADF test, the null hypothesis is that the variable studied is not stationary.

To identify the TOY effects on the returns we employ a regression with the equation:

$$r_t = \alpha + \beta \times TOY + \varepsilon_t \quad (2)$$

where:

- α is the intercept term that coincides with the mean of returns from the non-TOY days;

- β is the slope term that coincides with the mean of excess returns of TOY period relative to the non-TOY days (equal to the differences between the average of returns from TOY days and non-TOY days);

- TOY is a dummy variable which takes value 1 for every day of the period associated to the TOY effects and zero otherwise;

- ε_t is the error term.

On the results of this regression we test the null hypothesis H_0: β=0 (in other words, the returns of TOY days are not different from the returns of non-TOY days). If this hypothesis is rejected we consider that TOY is present.

3. EMPIRICAL RESULTS

The results of ADF tests, presented in the Table 3, led, for all the indexes and all three sub-samples, to the rejection of null hypothesis of the returns non-stationarity.

Tab. 3. Results of ADF tests

Index	First sub-sample		Second sub-sample		Third sub-sample	
	Nr. of lags	Test stat.	Nr. of lags	Test stat.	Nr. of lags	Test stat.
BET	6	-14.18***	8	-11.62***	4	-15.13***
BET-C	7	-13.03***	8	-11.45***	x	x
BET-FI	6	-12.32***	4	-14.90***	4	-14.50***
BET-XT	x	x	8	-11.17***	4	-14.89***
BET-NG	x	x	4	-16.09***	7	-11.88***
BET-BK	x	x	x	x	4	-15.12***

Note: *** means significant at 0.01 levels.

Based on successive trials we chose the days associated to the TOY effects. It resulted the interval [-7; 7] which contained in the last seven days of a year and the first seven days of the next year.

The results of regressions with the independent TOY dummy variable are reported in the Table 4. The Breusch-Godfrey (1980) Lagrange multiplier tests revealed, for all indexes in all three sub-samples, the presence of serial correlations of the regressions residuals. Moreover, White (1980) tests indicated the regressions residuals heteroskedasticity for all the indexes in all three sub-samples. In these circumstances, we applied the Newey-West (1994) corrections to the standard errors and the p-values associated to the regressions coefficients. For the first sub-sample, the values of the coefficients associated to the TOY variable were, for all three indexes, significantly positive. In the case of second sub-sample we found a significant positive slope β only for the index BET-NG. For the third sub-sample, the results indicate, again, significant positive values of β for all the indexes (however, these values were smaller than those for the first sub-sample).

Tab. 4. Results of the regressions for the three sub-samples

Index	**First sub-sample**		**Second sub-sample**		**Third sub-sample**	
	Const.	**TOY**	**Const.**	**TOY**	**Const.**	**TOY**
BET	0.1195*** (0.0370)	0.7802*** (0.2331)	-0.0566 (0.0567)	0.2699 (0.2045)	0.0245 (0.0223998)	0.3279*** (0.1155)
BET-C	0.0943*** (0.0315)	0.7333*** (0.2043)	-0.0585 (0.0515)	0.1695 (0.2243)	x	x
BET-FI	0.2136*** (0.0597)	0.9847*** (0.3522)	-0.0991 (0.0810)	0.3129 (0.3175)	0.0301 (0.0241)	0.1952* (0.1092)
BET-XT	x	x	-0.0755 (0.0605)	0.2185 (0.2388)	0.0248 (0.0214)	0.3230*** (0.1218)
BET-NG	x	x	-0.0733 (0.0584)	0.5642** (0.2545)	-0.0056 (0.0235)	0.3499** (0.1403)
BET-BK	x	x	x	x	0.0254 (0.0202)	0.3134*** (0.1209)

Notes: Standard errors are in the round brackets; ***, ** and * mean significant at 0.01, 0.05, and 0.1 levels, respectively.

4. CONCLUSIONS

This study examined the presence of the TOY effects on BSE from January 2000 to August 2017. The results revealed the impact of a turbulent context on the calendar effect.

The most significant TOY effects were found for the period January 2000 – December 2006. We could speculate that long public holidays from this period (about 1-2 weeks before the New Year) could have a significant impact, by amplifying the “holiday euphoria” on TOY effects. We also have to take into consideration the possibility of the inference of other calendar effects, such turn-of-the-month effect or holiday effect, identified in that period (Dumitriu et al., 2011; Stefanescu and Dumitriu, 2011).

Between January 2007 and June 2012 we identified a significant TOY effect only for one index from the five employed. This index (BET-NG) has a particular behavior being very sensitive to the international oil prices (Stefanescu and Dumitriu, 2013).

For the period July 2012 – August 2017, TOY effects seemed to come back after the turbulent context was replaced by a relative quiet one. For all the employed indexes we found significant positive means of the excess returns of TOY period relative to the

non-TOY days. However, they were smaller than those from the first sub-sample (as the post-crisis period seemed to be less profitable than the pre-adhesion period).

This investigation could be extended to the study of possible comeback of other calendar effects that had been identified before 2007 but disappeared in the turbulent context.

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