GONE FISHIN' EFFECTS ON THE BUCHAREST STOCK EXCHANGE

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ABSTRACT: *This paper investigates the presence of Gone Fishin' Effects on the Romanian Capital Market from January 2000 to July 2013. In this analysis we employ daily values of five main indexes of Bucharest Stock Exchange. We use GARCH models to reveal this seasonality not only on indexes returns but also on the capital market volatility. In order to identify the differences between quiet and turbulent periods of time we split our sample of data into two sub-samples. The first, from January 2000 to December 2006, corresponds to a relative quiet period, while the second, from January 2007 to August 2013, corresponds to a turbulent period. Our results indicate the decline of Gone Fishin' Effects on returns from the first to the second sub-sample.*

KEY WORDS: *Calendar Anomalies, GARCH, Romanian Capital Market, Volatility, Persistence in Time.*

JEL CLASSIFICATION: *G02, G14, G19.*

1. INTRODUCTION

The Gone Fishin' Effect is a calendar anomaly consisting in significant differences between the stock returns from the periods associated to the summer holidays (July – September for the Northern Hemisphere and January - March for the Southern Hemisphere) and the rest of the year (Hong & Yu, 2009). This seasonality could be related to some particularities of investors' behavior during the holidays. Their aversion to risk could be increased because the so called spirit of holiday (Brockman & Michayluk, 1998; Bouman & Jacobsen, 2002; Coakley et al., 2007). During these periods, when many investors are gone, the volume of transactions on the stock markets decreases and the stock prices fall (Hong & Yu, 2009). In comparison with the rest of the year, the investors usually spent larger amounts of money which

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could cause some liquidity constrains (Abadir et al., 2005). Moreover, the good weather that usually occurs in the months of summer holidays could affect the investors' behaviors (Hirshleifer & Shumway, 2003; Cao & Wei, 2005).

The knowledge about calendar anomalies, such as Gone Fishin' Effect, could be exploited by the investors in building successful strategies of trading on the stock markets. This kind of opportunities are used, by Behavioral Finance theories, as arguments against Fama (1970) Efficient Markets Hypothesis (EMH) which stipulates that the past values of stock prices are not useful in obtaining profits on the capital markets. However, the exploitation of the calendar anomalies is very difficult if they are not persistent in time. Some studies revealed the changes suffered, in the last decades, by these forms of seasonality (Dimson & Marsh, 1999; Marquering et al., 2006; Siriopoulos & Giannopoulos, 2006). It was also proved that passing from quiet to turbulent periods could affect some calendar anomalies (Holden et al., 2005).

In the last decades it was revealed the importance of the volatility of stock prices in investment decisions. The discovery of General AutoRegressive Conditional Heteroskedasticity (GARCH) models facilitated the analysis of the time-varying volatility of financial markets (Engle,1982; Bollersev,1986). These models were also employed for studying the seasonality of the stock prices returns and volatility (Choudhry, 2000; Kiymaz & Berument, 2003).

In this paper we study the presence of the Gone Fishin' Effects on the Bucharest Stock Exchange (BSE) from January 2000 to July 2013. In order to analyze the persistence in time of this calendar anomaly we perform our investigation for two periods of time: the first, from January 2000 to December 2006, when stock prices experienced a moderate growth could be considered as relatively quiet, while the second, from January 2007 to July 2013 was affected by significant turbulences caused by events such as Romania's adhesion to the European Union or the recent global crisis. We employ GARCH models to reveal the seasonality not only for the indexes returns but also for their volatility. Along with the standard GARCH model we use also other variants which allow us to capture the asymmetrical reactions of stocks volatility to good and bad news such as Nelson (1991) EGARCH and Glosten et al. (1993) GJR GARCH.

The rest of this paper is organized as it follows: the second part describes the data and the methodology used to study the Gone Fishin' Effects, the third part presents the empirical results and the fourth part concludes.

2. DATA AND METHODOLOGY

In this investigation about the presence of the Gone Fishin' Effects we employ daily closing values of five important indexes of BSE: BET, BET-C, BET-FI, BET-XT and BET-NG from January 2000 to July 2013. We use two sub-samples of data:

- the first sub-sample, from January 2000 to December 2006, corresponding to a relative quiet period;
- the second sub-sample, from January 2007 to July 2013, corresponding to a turbulent period.

Not all the indexes covered integrally the two periods. The calculation of BET FI started in November 2000, while BET-XT and BET-NG were launched in January 2007 (Table 1).

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

Index	Composition	First sub-sample (quiet period)	Second sub-sample (turbulent period)
BET	Contains the shares of most liquid 10 companies listed on the BSE regulated market	January 2000 - December 2006	January 2007 – July 2013
BET-C	Contains all the big companies listed on BSE, excepting the investment funds (SIFs)	January 2000 - December 2006	January 2007 – July 2013
BET-FI	The five investment funds (SIFs)	November 2000 - December 2006	January 2007 – July 2013
BET-XT	Contains the most liquid 25 shares traded on the BSE, including SIFs	x	January 2007 – July 2013
BET-NG	Contains the shares of companies which have the main business activity located in the energy sector and the related utilities	x	January 2007 – July 2013

For all the five indexes we compound logarithmic returns ($r_{i,t}$) as:

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

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

In order to avoid spurious regressions on GARCH models we analyze the stationarity of returns by employing the Augmented Dickey – Fuller (ADF) unit root tests with intercept as deterministic term (Dickey & Fuller, 1979). The numbers of lags are chosen based on Akaike Information Criteria (Akaike, 1973). We continue by investigating the autocorrelation and the heteroscedasticity on returns employing ARMA (p, q) models, in which the values of p and q are determined by Box-Jenkins methodology (Box et al., 1994). On the residuals of these regressions we run the Ljung - Box test Q and the Engle Lagrange Multiplier (LM) test for ARCH effects (Ljung & Box, 1978; Engle, 1982).

We identify the Gone Fishin' Effects using a dummy variable, named GF, which takes value 1 for every day of the period July - September and zero otherwise. All the three variants of GARCH models are described by two equations: the conditional mean and the conditional variance. The first equation expresses the values of returns (r_t) as:

$$r_t = \mu_0 + \mu_1 * GF_t + \sum_{k=1}^{n} (\xi_k * r_{t-k}) + \varepsilon_t \tag{2}$$

where:

μ_0 is a constant reflecting the returns from the days without summer holiday (October - June);
μ_1 is a coefficient which reflects the differences between the returns from the days of summer holiday (July - September) and those from the rest of the year;
ξ_k is a coefficient of the k-order lagged returns;
n represents the number of lagged returns, calculated by the Akaike Final Prediction Error Criterion (Akaike, 1969);
ε_t is the error term.

The second equation, which expresses the conditional variance of the returns (σ_t^2), has different forms for the three GARCH models. For the first one it consists in:

$$\sigma_t^2 = \omega + \nu * GF_t + \sum_{k=1}^{q} \alpha_k * \varepsilon_{t-k}^2 + \sum_{l=1}^{p} (\beta_l * \sigma_{t-l}^2) \quad (3)$$

where:
ω is a constant term reflecting the volatility of the returns from the days without summer holiday;
ν is a coefficient which reflects the Gone Fishin' effects on the stocks volatility;
α_k (k = 1, 2, …q) are the coefficients associated to the squared values of the lagged values of error term from the conditional mean equation;
q is the number of lagged values of the error term, calculated by the Akaike Information Criteria (Akaike, 1973);
β_l (l = 1, 2, …p) are coefficients associated to the lagged values of the conditional variance;
p is the number of lagged values of conditional variance, calculated also by the Akaike Information Criteria.

For the GJR GARCH model, the conditional variance of the returns is expressed as:

$$\sigma_t^2 = \omega + \nu * GF_t + \sum_{k=1}^{q} [\alpha_k * \varepsilon_{t-k}^2 + \gamma_k * \varepsilon_{t-k}^2 * I(\varepsilon_{t-k} < 0)] + \sum_{l=1}^{p} (\beta_l * \sigma_{t-l}^2) \quad (4)$$

where:
$I(\varepsilon_{t-k}<0)$ is a dummy variable, taking the value 1 if the k-lagged error term is strict negative and value zero otherwise;
γ_k is the coefficient associated to the variable $I(\varepsilon_{t-k}<0)$, expressing the asymmetrical responses of the volatility on the good and bad news.

For the EGARCH model, the conditional variance equation has the form:

$$\ln(\sigma_t^2) = \varpi + \nu * GF_t + \sum_{j=1}^{p} \beta_j * \ln(\sigma_{t-j}^2) + \sum_{k=1}^{p} \left[\gamma_k * \frac{\varepsilon_{t-k}}{\sqrt{\sigma_{t-k}^2}} + \alpha_k * \left(\frac{\varepsilon_{t-k}}{\sqrt{\sigma_{t-k}^2}} - \sqrt{\frac{2}{\pi}} \right) \right] \quad (5)$$

which could be transformed in:

$$\ln(\sigma_t^2) = \omega + \nu * GF_t + \sum_{j=1}^{p} \beta_j * \ln(\sigma_{t-j}^2) + \sum_{k=1}^{p} \left[\gamma_k * \varepsilon_{t-k} + \alpha_k * |\varepsilon_{t-k}| \right] \quad (6)$$

where $\omega = \varpi - \sqrt{\frac{2}{\pi}} * \sum_{k=1}^{p} \alpha_k$

For all the returns, after performing the two regressions of GARCH models we investigate the presence of the ARCH effects on their residuals by employing Lagrange Multiplier (LM) tests. We consider a model as valid only if it eliminates ARCH effects. For each index, we use the significance of the specific GARCH terms as criteria to choose between the valid models.

3. EMPIRICAL RESULTS

The descriptive statistics of the returns indicate, for both sub-samples, differences between the returns from the summer holidays (the period July – September) and the rest of the year (Table 2).

Table 2. Descriptive statistics of returns from the first sub-sample

Index	Mean	Median	Standard Deviation	Skewness	Minimum	Maximum
First sub-sample; July - September						
BET	0.165277	0.111185	1.52080	-0.65407	-9.39800	8.95773
BET C	0.123746	0.0803791	1.16914	-0.23842	-5.15229	6.24570
BET FI	0.411625	0.217678	2.23802	0.547106	-10.9945	13.0864
First sub-sample; October - June						
BET	0.166969	0.111138	1.55605	-0.12409	-11.9018	8.37798
BET C	0.140834	0.117953	1.36256	-0.37541	-10.2876	5.85592
BET FI	0.223936	0.119234	2.34984	0.112618	-12.3493	10.2708
Second sub-sample; July - September						
BET	-0.056373	-0.043204	1.75290	-0.211275	-8.76389	8.84876
BET C	-0.045970	-0.031918	1.58806	-0.352349	-7.69957	8.16686
BET FI	-0.060353	-0.090268	2.37245	0.324658	-9.40364	13.5634
BET XT	-0.066816	-0.048421	1.84007	-0.160455	-9.32892	9.54710
BET NG	-0.043433	-0.027806	1.80502	0.135222	-9.21942	10.5822
Second sub-sample; October - June						
BET	-0.0171697	0.0571190	1.91388	-0.637370	-13.1168	10.5645
BET C	-0.0330822	0.0494921	1.77245	-0.785856	-12.1184	10.8906
BET FI	-0.0640453	0.000000	2.79055	-0.319141	-16.0756	13.8255
BET XT	-0.0405672	0.0427129	2.06764	-0.580275	-12.6874	11.0239
BET NG	-0.0279403	-0.0048979	2.01853	-0.508333	-15.2569	13.4552

The results of ADF tests indicate the stationarity of the returns for both sub-samples (Table 3).

Table 3. Results of ADF tests for the returns

Index	First sub-sample		Second sub-sample	
	Number of lags	Test statistics	Number of lags	Test statistics
BET	24	-8.41907***	19	-7.18438***
BET C	19	-8.15408***	21	-7.0756***
BET FI	16	-7.80248***	19	-7.98841***
BET XT	x	x	19	-7.28617***
BET NG	x	x	19	-7.82667***

*Note: ***, **, * mean significant at 0.01, 0.05 and 0.1 levels, respectively.*

The Table 4 reports the results of Ljung-Box Q and ARCH LM tests which indicate, for all the returns, the presence of the autocorrelation and the heteroscedasticity of the residuals from ARMA models.

Table 4. Results of Ljung-Box Q and ARCH LM tests

Index	First sub-sample		Second sub-sample	
	Ljung-Box Q Tests	ARCH LM Tests	Ljung-Box Q Tests	ARCH LM Tests
BET	11.0535*	219.3***	10.3392*	255.727***
BET C	7.64962*	171.071***	8.57509**	286.072***
BET FI	15.2338***	117.136***	9.14922**	369.018***
BET XT	x	x	7.49322*	316.136***
BET NG	x	x	8.32526**	508.898***

*Note: ***, **, * mean significant at 0.01, 0.05, and 0.1 levels, respectively.*

For the first sub-sample we perform the GARCH models on the returns of BET, BET C and BET FI. The results of conditional mean equation indicate, for all three indexes, the significance of the constant term (Table 5).

Table 5. Results of conditional mean equation for the first sub-sample

Index	BET	BET C	BET FI
Constant term	0.145380 (0.0341972) [4.251]***	0.119774 (0.0287636) [4.164]***	0.206315 (0.0579342) [3.561]***
Coefficient of GF variable	-0.0522323 (0.0549734) [-0.9501]	-0.0271653 (0.0471161) [-0.5766]	-0.0462522 (0.0859064) [-0.5384]
First order lagged returns	0.134167 (0.0261135) [5.138]***	0.152701 (0.0268534) [5.686]***	x

*Notes: Standard errors in round brackets; z-statistics in square brackets; ***, **, * mean significant at 0.01, 0.05, and 0.1 levels, respectively.*

For all the three indexes, the best GARCH variant proved to be the standard (symmetrical) one. The results of conditional variance equation indicate the significance of the constant term for the three indexes, while the coefficient of the GF variable is significant only for BET and BET C (Table 6).

Table 6. Results of conditional variance equation for the first sub-sample

Index	BET GARCH (1,1)	BET C GARCH (1,1)	BET FI GARCH (1,1)
Constant term	0.157994 (0.0686516) [2.301]**	0.171748 (0.064907) [2.646]***	0.319983 (0.167759) [1.907]*
Coefficient of GF variable	-0.0785822 (0.0356022) [-2.207]**	-0.0584878 (0.0342588) [-1.707]*	-0.134152 (0.0954519) [-1.405]
alpha	0.204879 (0.0559382) [3.663]***	0.260300 (0.0626375) [4.156]***	0.226223 (0.0710127) [3.186]***
beta	0.75143 (0.0713656) [10.53]***	0.671714 (0.0798128) [8.416]***	0.762146 (0.0738723) [10.32]***
ARCH LM tests for the residuals of GARCH models	6.4069	15.3448	1.9374

*Notes: Standard errors in round brackets; z-statistics in square brackets; ***, **, * mean significant at 0.01, 0.05, and 0.1 levels, respectively.*

The results of GARCH conditional mean equation for the second sub-sample indicate no significance for the constant term or for the coefficient of GF variable (Table 7).

Table 7. Results of conditional mean equation for the second sub-sample

Index	BET	BET C	BET FI	BET XT	BET NG
Constant term	0.00506748 (0.0328361) [0.1543]	0.00688515 (0.0283229) [0.2431]	-0.0123816 (0.041624) [-0.2975]	-0.0027808 (0.0314765) [-0.08835]	-0.0020821 (0.0311856) [-0.06676]
Coefficient of GF variable	-0.0030043 (0.0625517) [-0.04803]	0.00671805 (0.0576619) [0.1165]	0.027563 (0.0770249) [0.3578]	0.0133233 (0.0319823) [0.4166]	0.0201269 (0.0434422) [0.4633]
First order lagged returns	0.0669097 (0.0265431) [2.521]**	x	0.0987989 (0.0272495) [3.626]***	x	x

*Notes: Standard errors in round brackets; z-statistics in square brackets; ***, **, * mean significant at 0.01, 0.05, and 0.1 levels, respectively.*

For the second sub-sample we find that for three indexes (BET, BET XT and BET NG) the most adequate model is EGARCH. For BET FI we use GJR GARCH model, while for BET C we chose the standard GARCH model. The results of conditional variance equation indicate the significance of the constant term for four indexes (BET, BET C, BET XT and BET NG), while the coefficient of GF variable was found not significant for any index (Table 8).

Table 8. Results of conditional variance equation for the second sub-sample

Index	BET EGARCH (1,1)	BET C GARCH (1,1)	BET FI GJR GARCH (1,1)	BET XT EGARCH (1,1)	BET NG EGARCH (1,1)
Constant term	-0.247299 (0.0506010) [-4.887]***	0.0310219 (0.0158615) [1.956]*	0.0229731 (0.0154523) [1.487]	-0.194460 (0.0434056) [-4.480]***	-0.221863 (0.0493272) [-4.498]***
Coeff. of GF variable	0.00155405 (0.0185622) [0.08372]	-0.00236263 (0.0190157) [-0.1242]	-0.0133260 (0.022542) [-0.5912]	-0.00114038 (0.0139519) [-0.08174]	0.00244536 (0.0169147) [0.1446]
alpha	0.364179 (0.0835239) [4.360]***	0.156403 (0.042056) [3.719]***	0.123805 (0.0301929) [4.100]***	0.279661 (0.0665795) [4.200]***	0.335220 (0.0831829) [4.030]***
gamma	-0.0494860 (0.0263701) [-1.877]*	x	0.171436 (0.05254) [3.263]***	-0.0377840 (0.017968) [-2.103]**	-0.0463324 (0.0254806) [-1.818]*
beta	0.963325 (0.0175985) [54.74]***	0.844413 (0.0405758) [20.81]***	0.880368 (0.0264018) [33.35]***	0.980507 (0.00996761) [98.37]***	0.964040 (0.018935) [50.91]***
ARCH LM tests for the residuals of GARCH models	39.6576	39.6342	2.13427	7.57371	7.22758

*Notes: Standard errors in round brackets; z-statistics in square brackets; ***, **, * mean significant at 0.01, 0.05, and 0.1 levels, respectively.*

4. CONCLUSIONS

In this paper we approached the Gone Fishin' Effects on BSE for two periods: the first one from January 2000 to December 2006 and the second one from January 2000 to July 2013. For the returns, we found that this calendar anomaly was significant during the first period, but it disappeared in the second one. For the volatility, we found the Gone Fishin' Effects during both periods, but with more intensity in the first one.

For the second period of time BET FI was the single index which didn't display Gone Fishin' Effect on volatility. This fact could suggest that shares of the investment funds reflected by this index are not so sensitive to the holiday spirit as shares of the other companies.

Our analysis identified asymmetrical reactions of the returns to good and bad news only for the second sub-sample. We could link this evolution to the impact of the global crisis which affected the investors' behaviors in the context of stocks prices decline.

The disappearance of Gone Fishin' Effects on returns between 2007 and 2013 could be linked to the substantial development that Romanian capital market experienced in this period of time. Another explanation is that the holiday spirit didn't survive in turbulent times.

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