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THE JANUARY EFFECT ON CEE STOCK MARKETS – IS IT REAL?

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Abstract
In this paper we aim at bringing new empirical evidence regarding the stock market efficiency, by testing the existence of one of the most debated market anomalies, the January effect, on 11 Central and Eastern European stock markets, for the time period 2009 onwards. By employing Garch (1,1), our results indicate that the January effect still exists for some stock markets such as the Croatian, Bulgarian, Estonian and Latvian ones. Particularly, during this period, returns are on average higher than in any other month of the year. For the other considered CEE stock markets, the results are not statistically relevant.

Keywords: *stock market, CEE, market efficiency, January effect*

JEL : *J14, J15*

INTRODUCTION

The January effect is one of the most debated market anomaly in both academic and professional literature since the first empirical paper realized on this subject by Rozeff and Kinney (1976), with application on the American stock market. However, the first that documented the January effect was Wachtel (1942). The rationale behind this effect is lying in the assumption that at the beginning of the new year, there can be registered abnormal returns on the stock market in comparison with the other months of the year due to the behavior of the investors.

The primary explanation of the investor behaviour that could trigger changes in the stock returns lies in the tax-loss selling hypothesis (Wachtel, 1942), that put the investors in the position of wanting to sell their holdings in order to realize capital losses and ofset potential capital gains, at the end of the year, especially in what concerns the less liquid or capitalized stocks and buy them again, at the beginning of the new year, while benefiting from the tax loss. Another possible explanation that has to do with the investors' behaviour is the one which considers the behaviour of the institutional investors that could disinvest at the end of the year in the underperforming stocks and start fresh with other stocks, at the beginning of the new year, in their attempt of realizing more sound annual financial

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reports, also known as the window-dressing hypothesis (Haugen and Lakonishok, 1988). The January anomaly, alongisde other stock market anomalies (such as day of the week, turn of the month, quarter of the year, holiday effect or political-cycle effect) position themself against the efficiency market hypothesis proposed by Fama (1970), which mainly presumes that all public information existent on the market is immediately incorporated in the stock markets prices, making it impossible for individual/institutional investors to obtain abnormal benefits, while taking advantage of the possible market inefficiencies. However, the empirical studies performed over the last thirty years have proved that not all the stock markets can be characterised by a strong form of market efficiency, fact that triggers the appearance of market anomalies (such as calendar anomalies), making it possible for the different participants on the stock market to realize higher returns in some periods of the year/month/week. The developing stock markets, the emergent stock markets are the ones usually subject to market inefficiency and calendar anomalies. However, a less significant academic endevour was realized in respect with these countries, in order to study the market anomalies, respectively the presence of the January effect.

Consequently, in this paper we examine the presence of the January effect for 11 Central and Eastern European countries (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia), having in consideration a significant and recent period of time (2009-2018), bringing an input to the current empirical literature. Our study is of use for both academics and practictioners, that want to analyse/benefit from the market anomalies that exist on the CEE stock markets.

THEORETICAL BACKGROUND

Since the seminal paper of Wachtel (1942), which pointed on the bullish tendencies of the DJIA index from December to January, respectively the empirical paper of Rozeff and Kinney (1976), which found that the mean returns are not equally distributed and that they are significantly higher in January than in any other month of the year, other authors have confirmed and developed the January effect hypothesis. For example, Keim (1983) and Reinganum (1983) have proved that the returns are usually higher in the first period of the month, which might have to do also with the half-month effect or turn-of-the month effect. This finding was supported also by Schwert (2003), which identifies the first half of January as the one when higher returns are registered.

Beside the tax-loss selling hypothesis, as an explanation for this market anomaly, another possible explanation that was found in the literature had to do with the transactions performed on the stock market by institutional investors, in their attempt to present in a more favourable light the annual reports, getting rid of the portfolio's bad performers at the end of the year. The so called window-dressing hypothesis or portfolio rebalancing was also discussed by Sias and Starks (1997) which got to the conclusion that the January effect is more prone to appear in stocks of interest for the individual investors rather than institutional ones and that the tax-loss selling hypothesis is offering actually a better explanation for the market seasonality. Reinganum (1983) was also of the opinion that January effect applies especially to small firms, with low market capitalization. This opinion was also shared by Roll (1981), which finds that small firm stocks, rather than large firm stocks are impacted more by the tax-loss hypothesis.

There were however studies which outlined the fact that the January effect occurs in the absence of the tax-loss selling hypothesis, bringing empirical evidence on countries like Australia or United Kingdom (where the beginning of the tax year is different) and where the January effect had withstood (Gultekin and Gultekin, 1983). The size determinant on the January effect impact was also rejected by other authors (Agrawal and Tandon, 1994), which find empirical evidence for market seasonality in fourteen out of the eighteen countries investigated, that together with United States, respresented approximately 95 % of total world's traded equity on the stock exchanges.

In the last twenty years, various studies have concluded that while still present, the January effect has declined in importance (Mehdian and Perry, 2002; Gu, 2003; Podgorski, 2018).

We have summarized in the following table the main empirical papers that dealt over the last decade with testing the January effect anomaly on some Central or Eastern European stock markets in terms of sample, period, methodology and results (Table 1).

Table 1 Main empirical literature review

Authors	Sample	Period	Methodology	Results
Filipovski and Tevdovski (2018)	Serbia, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Macedonia, Montenegro, Romania, Slovenia, Turkey	2007-2014	Garch	Turn of the month effect present in Serbia, Bulgaria, Romania, Slovenia, Greece
Podgorski (2018)	Poland, Czech Republic, Estonia, Lithuania, Latvia, Slovenia, Slovakia, Hungary,	1994-2013	GMM	In most cases confirmed the existence of January effect, however, for most cases, the effect wears off over time
Milošević Avdalović and Milenković (2017)	Serbia, Bosnia and Herzegovina, Macedonia, Montenegro, Croatia, Romania, Bulgaria	2008-2014	Regression analysis	January effect for Macedonia
Andrieş, Ihnatov & Sprincean (2017)	11 CEE countries	2000-2015	Garch	Mixed evidence, stronger presence of January effect in Slovenia and Bulgaria, and poorer effect in Romania and Slovakia
Georgantopoulos and Tsamis (2014)	Bulgaria and Greece	2002-2008	Garch	January effect for Bulgaria exists only in variance
Heininen and Puttonen (2008)	12 CEE countries	1997-2000 2001-2004 2005-2008	Regression analysis	January effect in the case of Croatia, Lithuania, Romania and Slovenia
Asteriou and Kavetsos (2006)	Czech Republic, Hungary, Lithuania, Poland, Romania, Russia, Slovakia, and Slovenia	1991-2003	Garch	January effect in the majority of the countries, stronger in Hungary, Poland and Romania

(Source: Authors` estimations)

DATA AND METHODOLOGY

Data

In order to perform the empirical analysis, we used time series for the main 11 CEE market indexes for the 2009-2018 period (daily closing prices), from Investing.com and some additions from the websites of the countries' stock exchanges:
SOFIX (Bulgarian market index): follows the most liquid stocks on the Bulgarian Stock Exchange-Sofia, which surpass a certain market capitalization;
CROBEX (Croatian market index): is a blue-chip index following the most liquid companies on Zagreb Stock Exchange;
BUX (Hungarian market index): is a blue-chip index following the evolution of the 25 major companies on the Budapest Stock Exchange;
BET (Romanian market index): reflects the evolution of the most traded companies on the Romanian stock market, Bucharest Stock Exchange;
PX (Czech market index): tracks the performance of the most traded companies on Prague Stock Exchange; until March 2006, this index included 50 companies;
OMXT (Estonian market index): follows the performance of the shares listed on the Talinn Stock Exchange, currently Nasdaq OMX Talinn;
OMXR (Latvian market index): comprises all the companies listed on the Riga Stock Exchange, currently Nasdaq OMX Riga;
OMXV (Lithuanian market index): follows the performance of the companies traded on Vilnius stock exchange, currently Nasdaq OMX Vilnius;
WIG20 (Polish market index): follows the performance of the largest 20 companies on the Warsaw Stock Exchange;
SAX (Slovak market index): tracks the performance of the large companies traded on Bratislava Stock Exchange;
SBITOP (Slovenian market index): tracks the performance of the most liquid shares on Ljubljana Stock Exchange.

Methodology

We started the empirical analysis with the OLS approach. In the initial OLS models, the main assumptions of normality of residuals, no autocorrelation and constant variance, were not validated. Therefore, to correct the issues we re-estimated the OLS models with robust standard errors and also employed GARCH(1,1). The general functional forms of the models for each country can be presented as

$$R_t = \alpha + \sum_{i=1}^{n} \beta_i D_{it} + \varepsilon_t \quad (OLS) \tag{1}$$

$$R_t = \alpha + \sum_{i=1}^{n} \beta_i D_{it} + \varepsilon_t \quad (GARCH(1,1))$$
$$\sigma_t^2 = \alpha + \gamma \sigma_{t-1}^2 + \mu R_{t-1}^2 \tag{2}$$

where Rt is the return rate, Dit is the i^{th} dummy for the period (month of the year), σ_t^2 is conditional time-dependent variance in the GARCH(1,1) model.
The main hypothesis is as follows:

H0: *There is a month of the year effect (January effect) in the case of the considered CEE stock exchanges*

The descriptive statistics for all the considered indexes (daily returns) are presented below (Table 2).

Table 2 Descriptive statistics for the stock market daily returns

Index	N	mean	p50	Sd	min	max	skewness	Kurtosis
BET	2545	0.0004	0.0000	0.0129	-0.1312	0.1056	-0.7787	17.7388
BUX	2545	0.0004	0.0000	0.0137	-0.0757	0.1067	0.1155	7.1034
CROBEX	2545	0.0000	0.0000	0.0087	-0.0702	0.0856	0.2263	15.7036
OMXR	2545	0.0005	0.0000	0.0118	-0.0810	0.1160	0.9858	15.2409
OMXT	2545	0.0006	0.0002	0.0097	-0.0644	0.1209	0.9278	18.3987
OMXV	2545	0.0005	0.0001	0.0088	-0.1194	0.1093	0.0668	34.9393
PX	2545	0.0001	0.0000	0.0113	-0.0704	0.0725	-0.1872	7.9836
SAX	1862	0.0002	0.0000	0.0106	-0.0933	0.0912	-0.0332	12.0540
SBITOP	2545	0.0000	0.0000	0.0088	-0.0606	0.0372	-0.2808	6.5232
SOFIX	1861	0.0003	0.0000	0.0075	-0.0474	0.0564	-0.1150	9.3050
WIG20	2545	0.0001	0.0000	0.0128	-0.0782	0.0672	-0.1871	6.5274

Source: Authors` estimations

In table 3 there can be seen the results of Breusch-Pagan/Cook-Weisberg test for heteroskedasticity, Breusch-Godfrey LM test for autocorrelation and Shapiro-Wilk W test for normality. The null hypothesis of the tests are constant variance, no first order serial correlation and normal distribution. As can be seen from the results, we reject the null hypothesis and conclude that the problems are existing.

Table 3 Summary of model diagnostics

	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity			Breusch-Godfrey LM test for autocorrelation			Shapiro-Wilk W test for normal data		
Index	chi2	Prob. > chi2	Heteroskedasticity	chi2	Prob. > chi2	Autocorrelation	z	Prob.>z	Normality
BET	1.32	0.25	No	41.08	0.00	Yes	19.62	0.00	Yes
BUX	0.01	0.92	No	41.50	0.00	Yes	19.62	0.00	Yes
CROBEX	3.00	0.08	No	41.03	0.00	Yes	19.63	0.00	Yes
PX	4.23	0.04	Yes	41.04	0.00	Yes	19.63	0.00	Yes
SBITOP	0.02	0.88	No	42.26	0.00	Yes	19.63	0.00	Yes
SOFIX	0.31	0.57	No	43.28	0.00	Yes	19.61	0.00	Yes
WIG20	1.23	0.27	No	42.48	0.00	Yes	19.62	0.00	Yes
SAX	43.92	0.00	Yes	42.25	0.00	Yes	19.62	0.00	Yes
OMXR	4.18	0.04	Yes	9.39	0.00	Yes	19.63	0.00	Yes
OMXT	10.31	0.00	Yes	9.46	0.00	Yes	19.62	0.00	Yes
OMXV	39.25	0.00	Yes	7.72	0.01	Yes	19.59	0.00	Yes

Source: Authors` estimations

RESULTS

According to the results of the Garch (1,1), we found positive effects for January for CROBEX, SOFIX, OMXR, OMXT; particularly, during the January, returns are on average higher by 0.09, 0.11, 0.13, 0.30 percentage points. This

means that on these markets, there can be obtained abnormal profts, when considering the January effect. For the other considered CEE stock markets, the results proved not to be statistically significant.

Table 4 Summary of January model (GARCH (1,1))

Day	BET	BUX	CROBEX	PX	SBITOP	SOFIX	WIG20	SAX	OMXR	OMXT	OMXV
Jan	0.0009	0.0005	0.0009*	0.0005	0.0006	0.0011**	0.0002	0.0012	0.0013***	0.0030***	-0.0000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
_cons	0.0005***	0.0005*	0.0001	0.0002	-0.0001	0.0002	0.0001	0.0003	0.0004***	0.0004***	0.0004*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ARCH											
L.arch	0.3771***	0.1492***	0.3212***	0.3189***	0.2205***	0.2273***	0.1281***	0.2793***	0.6072***	0.5012***	0.1848***

* p<0.10 **, p<0.05 and *** p<0.01
Standard errors are in the parenthesis
Dependent variable is return (ln(P(t)) - ln(P(t-1))

Source: Authors` estimations

CONCLUSIONS

The existence of the January effect has been of interest for both academics and professionals, in their pursuit of finding suitable trading strategies that could exploit this market seasonality (profit opportunities). We found empirical evidence for the existence of the January effect in the case of the Bulgarian, Croatian, Estonian and Latvian stock markets. Those results are consistent with some empirical studies that concluded in a similar way, but in contradiction with others, in respect with the other CEE countries, for which we have found no statistically significant results. Consequently, one can ask himself whether those effects were there in the first place, or they disappeared due to the increase in the level of efficiency of the CEE stock markets.

Future research will have in consideration other stock market anomalies (such as the turn of the month, holiday effect, day of the week) and also other indexes (from developed stock markets) in order to have a benchmark and see whether the market anomalies tend to dissapear once with the increase of the level of efficiency of the stock market.

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