Department of
Economics and Finance

CALENDAR ANOMALIES

IN THE RUSSIAN STOCK MARKET

Guglielmo Maria Caporale

Brunel University London

Valentina Zakirova

Higher School of Economics, Moscow

July 2016

Abstract

This paper investigates whether or not calendar anomalies (such as the January, day-of-the-week and turn-of-the-month effects) characterise the Russian stock market, which could be interpreted as evidence against market efficiency. Specifically, OLS, GARCH, EGARCH AND TGARCH models are estimated using daily data for the MICEX market index over the period 22/09/1997-14/04-2016. The empirical results show the importance of taking into account transactions costs (proxied by the bid-ask spreads): once these are incorporated into the analysis calendar anomalies disappear, and therefore there is no evidence of exploitable profit opportunities based on them that would be inconsistent with market efficiency.

Keywords: calendar effects, Russian stock market, transaction costs

JEL classification: G12, C22

Corresponding author: Professor Guglielmo Maria C

1 Introduction

There is a large literature testing for the presence of calendar anomalies (such as the "day-of-the- -of-the- and "month-of-the- effects) in asset returns. Evidence of this type of anomalies has been seen as inconsistent with the efficient market hypothesis (EMH see Fama, 1965, 1970 and Samuelson, 1965), since it would imply that trading strategies exploiting them can generate abnormal profits. However, a serious limitation of many studies on this topic is that they neglect transaction costs: broker commissions, spreads, payments and fees connected with the trading process may significantly affect the behaviour of asset returns and calendar anomalies might disappear once they are taken into account, the implication being that in fact there are the on Russia and discovered various anomalies (January, day-of-the-week and turn-of-the month effect) in the MICEX index daily returns.

Transaction costs were first taken into account by Gregoriou et al. (2004), who estimated an OLS regression as well as a

Mahendra, 2006); however, these might differ across countries. Rystrom and Benson (

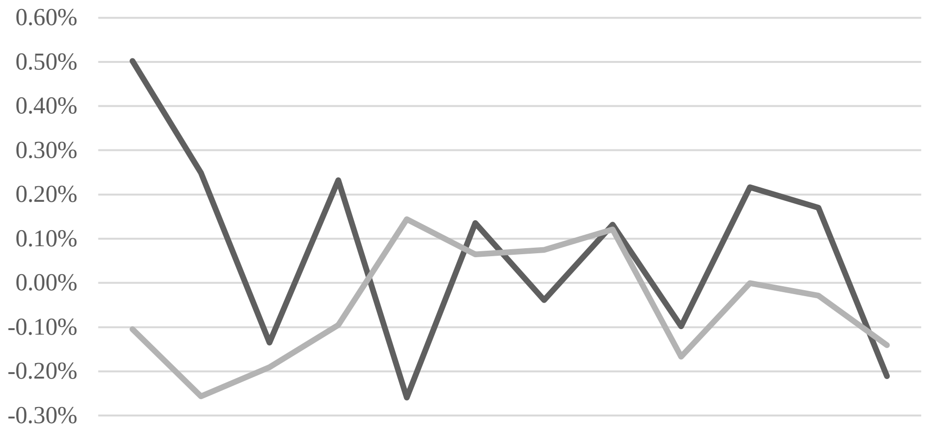
0.60%
0.50%
0.40%
0.30%
0.20%
0.10%
0.00%
-0.10%
-0.20%
-0.30%

Figure 4

3. 2 Methodology

We estimate in turn each of the four models used in previous studies on calendar anomalies, i.e. OLS, GARCH, TGARCH, EGARCH.

3.2.1 January effect

3.2.1.1. OLS Regressions

Following Compton (2013), we run the following regression to test for anomalies:

$$_0 : \ _1 = \ _2 = .. = \ _{12}$$

$$= \ _1 \ _1 + \ _2 \ _2 + \quad + \ _{12} \ _{12} + \quad ,$$

where the coefficients $_1 \dots \ _{12}$ represent mean daily returns for each month and each dummy variable $_1 \dots \ _{12}$ is equal to 1 if the return is generated in that month and 0 otherwise, and is the error term. If the null is rejected than we conclude that seasonality is present and we run a second regression, namely:

$$_0 : \quad = 0$$

$$= \quad + \ _1 \ _1 + \ _2 \ _2 + \quad + \ _{11} \ _{11} + \quad ,$$

where s, the coefficients $_1 \dots \ _{11}$represent the difference between expected mean daily returns for January and mean daily returns for other months, each dummy variable $_1 \dots \ _{12}$ is equal to 1 if the return is generated in that month and 0 otherwise, and is

3.2.1.2 GARCH Model

Given the extensive evidence on volatility clustering in the case of stock returns we follow Levagin (2010), Gregoriou (2004), Yalcin, Yucel (2003), Luo, Gan, Hu, Kao (2009) and Mangala, Lohia (2013) and adopt the following specification.

$$= \;{}_{1}\;{}_{1} + \;{}_{2}\;{}_{2} + \quad + \;{}_{12}\;{}_{12} + \quad ,$$

$$^{2} = \quad + \quad {}^{2}_{-1} + \quad {}^{2}_{-1} + \quad (\quad)$$

where is an intercept, $\sim \; (0, \; {}^{2})$ is the error term, and D(Jan) is a series of dummy variables equal to 1 if the return occurs in that month and zero otherwise.

Since ^{2} should be positive, we have the following restrictions: ≥ 0, ≥ 0, ≥ 0.

3.2.1.3. TGARCH Model

Standard GARCH models often assume that positive and negative shocks have the same effects on volatility, however in practice the latter often have bigger effects. Therefore, following Levagin (2010)

$_0 \colon \; _1 = \; _2 = .. = \; _5$

$= \; _1$

where is an intercept, $\sim (0, {}^2)$, $_1 \cdots {}_{18}$ are the dummy variables corresponding to each day around the turn of the month that are equal to 1 if returns occur on that day of the month and zero otherwise (D1 = -9, D2 = -8, D3 = -7, D4 = -6, D5 = -5, D6 = -4, D7 = -3, D8 = -2, D9 = -1, D10 = 1, D11 = 2, D12 = 3, D13 = 4, D14 = 5, D15 = 6, D16 = 7, D17 = 8, D18 = 9)

Then we estimate the following model

$$= \quad + \qquad + \quad ,$$

$$^2 = \quad + \quad {}^2_{-1} + \quad {}^2_{-1} + \qquad (\qquad),$$

where is an intercept, $\sim (0, {}^2)$, D(TOM) is a dummy variable that is 1, if returns occur on the day around TOM (the last day of the month and the first three days of the month), and zero otherwise.

As usual, since ^{2} should be positive, we have the following restrictions: $\geq 0, \quad \geq 0, \quad \geq 0.$

3.2.3.3 TGARCH Model

First, we run

$$= \; {}_{-9} \; {}_{-9} + \; {}_{-8} \; {}_{-8} + \quad + \; {}_{8} \; {}_{8}$$

$$\ln(\ ^2) = \quad + \quad \ln(\ ^2_{-1}) + \frac{_{-1}}{_{-1}} + \frac{|\ _{-1}|}{_{-1}} + \ _1\ _1 + \ _2\ _2 + \quad + \ _{17}\ _{17} + \ _{18}\ _{18},$$

where captures the asymmetric response to shocks.

Next, we estimate the following regression:

$$= \quad + \quad\quad + \quad ,$$

$$\ln(\ ^2) = \quad + \quad \ln(\ ^2_{-1}) + \frac{_{-1}}{_{-1}} + \frac{|\ _{-1}|}{_{-1}} + \quad\quad (\quad\quad),,$$

In each

4 Empirical results

4.1 Empirical results without the adjustment

Table 1 reports the evidence on the January effect for the four models, i.e. OLS, GARCH (1,1), TGARCH (1,1), EGARCH (1,1). It is only found in the mean equation of the GARCH and EGARCH models (but not in the conditional variance equations). Table 2 displays the results for the day-of-the week effect. A Monday effect is found in the mean equations of the GARCH and TGARCH models, and a Friday effect in the mean equation of the EGARCH specification as well. A Monday effect is also present in the conditional volatility of returns. The results for the TOM effect are displayed in Table 3 and provide some evidence for it in the conditional volatility of returns. The second model (Table 4) measures the TOM effect by using a single dummy variable for the last day and the first three days of the month, and provides stronger evidence of such an effect.

Table 1

Table 2

Mean Equation

Table 4

Mean Equation

4.2 Empirical results with the adjustment

Table 5 suggests that a January effect is present in the variance equation of the GARCH and TGARCH models. However, the negativity restrictions for these models are not satisfied; this issue does not arise in the case of the EGARCH model, that does not have any restrictions on its coefficients. Table 6 shows that a Monday effect is only present in the conditional variance equation of the EGARCH model. Table 7 provides less evidence of a TOM effect in the conditional variance equation compared to Table 3. The results for the second model to test the TOM effect are reported in Table 8; this is now not present in the mean equation, but can still be found in the variance equation, except in the case of the EGARCH model.

Table 7 0.1890.189

Mean Equation								
	OLS		GARCH		TGARCH		EGARCH	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
D1	0.26	1.242	0.194	1.054	0.2	1.017	0.113	0.485
D2	0.118	0.559	0.12	0.677	0.119	0.663	0.097	0.55
D3	0.035	0.163	-0.033	-0.132	-0.03	-0.117	-0.164	-0.715
D4	0.319	1.505	0.322	1.551	0.319	1.563	0.307	1.519
D5	-0.219	-1.033	-0.227	-1.245	-0.229	-1.235	-0.275	-1.544
D6	-0.329	-1.553	-0.288	-1.705*	-0.293	-1.744*	-0.234	-1.397
D7	-0.285	-1.365	-0.209	-0.922	-0.221	-0.995	-0.228	-1.185
D8	0.189	0.903	0.126	0.441	0.127	0.46		

Table 7 (continued) -

Variance Equation							
	OLS	GARCH		TGARCH		EGARCH	
		Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
C		1.511	2.703***	1.508	2.641***	-0.107	-1.583
ARCH		0.077	1.725*	0.077	1.425	0.146	3.441***
GARCH		0.563	2.974***	0.554	2.88***	0.949	41.047***
Leverage				-0.003	-0.045	-0.065	-2.658***
D1		-0.915	-1.693*	-0.9	-1.662*	0.488	1.503
D2		-1.494	-2.983***	-1.459	-2.928***	-0.442	-1.189
D3		-0.851	-1.63	-0.819	-1.617	0.024	0.068
D4		-0.504	-0.894	-0.531	-0.959	0.389	1.015
D5		-1.024	-1.765*	-0.999	-1.71*	0.065	0.159
D6		-1.392	-2.673***	-1.364	-2.67***	-0.107	-0.275
D7		-0.964	-1.819*	-0.95	-1.774*	0.287	1.041
D8		-1.128	-1.937*	-1.124	-1.955*	-0.562	-2.005**
D9		-0.883	-1.475	-0.879	-1.693*	-0.077	-0.254
D10		-0.803	-1.484	-0.784	-1.477	0.285	0.999
D11		-0.789	-1.09	-0.766	-1.11	-0.111	

Table 8

Table 9 summaris

References

pp.161-174

Caporale, G., Gil-
Economics, Volume 47, Issue 2, pp. 275-295

-of-the-month effect still lives: the international
International Review of Financial Analysis, Vol. 12, 2, pp. 207-221

Financial and Quantitative Analysis, Vol. 24, pp. 133-169

Cross, F. (1973)
Journal, Vol. 29 No. 6, pp. 67-69

Review of Financial Studies, Volume 2, Issue 4, Pp. 607-623.

Seasonal anomalies: A closer look at the johannesburg stock exchange - Contemporary Management

-of-the- Journal of Banking & Finance, Volume 20, Issue 9, Pages 1463 1484

-
176

French, K. (1980)
8, pp.55-69

Gibbons,
buisiness, Vol. 54, pp. 579-596.

transaction costs have been accounted for? Ev
Economics14, 215-220.

Journal of Financial Economics, Volume 12, Issue 4, Pages 469-481

Hamilton, J. (1994). Time Series Analysis, Princeton University Press, Princeton, New Jersey.

An empirical analysis of calendar anomalies in the Malaysian stock market
Applied Financial Economics, Taylor & Francis

Keef S & McGuinness -of-
the- Volume 11, Issue 4, pages 361-
372

returns, Journal of Finance, Vol.39, pp. 819-835

Kohers, Kohli (2012) -of-the-week effect and January effect examined in gold and silver - Insurance Markets and Companies: Analyses and Actuarial Computations, Volume 3, Issue 2

Mahendra Raj, Damini Kumari, (2006) "Day-of-the-week and other market anomalies in the Indian stock market", International Journal of Emerging Markets, Vol. 1 Iss: 3, pp.235 246

Compton, Kunkel, Kuhlemeyer, (2013) "Calendar anomalies in Russian stocks and bonds", Managerial Finance, Vol. 39 Iss: 12, pp.1138 - 1154

Vol.39, pp. 883-889

-of-the year
Financial Economics, Vol.13, pp. 435-455

-
Review of Financial Studies, Vol. 1, pp. 403-425

l analysis of Chinese stock price anomalies and

Mangala, Deepa; Lohia, Vandana. (2013): Market Efficiency in Emerging Economies: An Empirical Analysis of Month-of-the-Year Effect IUP Journal of Applied Finance 19.3

Lappeenranta University of Technology, bachelor thesis

A survey of the Monday effect literature - Quarterly Journal of Business and Economics - JSTOR

Journal of Finance, Vol.43, pp. 701-717

Rogalski, R. and Tinic, S. (1986)
Financial Analyst Journal, Vol. 42, pp. 63-70

Journal of Financial Economics, Vol. 3, pp. 349-402

Rystrom and Benson (1989) Investor psychology and the day-of-the-week effect - Financial Analysts Journal - CFA Institute