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IS THERE A FRIDAY EFFECT IN FINANCIAL MARKETS?

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Abstract

This paper tests for the presence of the Friday effect in various financial markets (stock markets, FOREX, and commodity markets) by using a number of statistical techniques (average analysis, parametric tests such as Student's t-test and ANOVA analysis, non-parametric ones such as the Kruskal-Wallis test, regression analysis with dummy variables). The evidence suggests that stock markets are immune to Friday effects, whilst in the FOREX Fridays exhibit higher volatility, and in the Gold market returns are higher on this day of the week. Using a trading robot approach we show that the latter anomaly can be exploited to make abnormal profits.

Keywords: *Calendar Anomalies; Day-of-the-Week Effect; Stock Market; Efficient Market Hypothesis.*

JEL classification: *G12, C63*

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1. Introduction

Calendar anomalies in financial markets have been extensively analysed in the empirical literature with the aim of establishing whether they generate exploitable profit opportunities that would be inconsistent with market efficiency.

One of the best known calendar anomalies is the -of-the- weekend namely the common finding that asset prices tend to increase on Fridays and decrease on Mondays (Cross, 1973). Whilst most existing studies analyse the latter phenomenon, the present one will focus on anomalies in price behaviour on Fridays. Two main reasons have been invoked to explain them, i.e. profit realisation (by closing opened positions with a profit

price increases on Fridays and decreases on Mondays for US stock prices. French (1980) found negative returns on Mondays. Gibbons and Hess (1981), Keim and Stambaugh (1984), Rogalski (1984), Smirlock and Starks (1986), Agrawal and Tandon (1994), Racicot (2011), and Caporale et al. (2016, 2017) also found some evidence of a weekend effect.

Possible explanations for these anomalies are psychological factors (traders and investors look ahead to the weekend optimistically, but are rather pessimistic about Mondays because of the ; trading patterns of institutional investors; the closing of speculative positions on Fridays and the establishing of new short positions on Mondays by traders; important news releases on Fridays. Another possible reason is that over the weekend market participants have more time to analyse price movements and, as a result, on Mondays a larger number of trades takes place. Alternatively, this might be due to deferred payments during the weekend, which creates an extra incentive for the purchase of securities on Fridays, leading to higher prices on that day.

There is some evidence that the weekend effect has become less important over the years (Fortune, 1999; Schwert, 2003; Olson et al., 2010). As previously mentioned, most studies focus on the Monday effect for mean returns, but anomalies on Fridays, especially concerning the behaviour of price volatility, might be in fact more interesting to investigate. These could be due to profit realisation (by closing opened positions with a profit at the end of the week) and/or important macro news releases. Therefore the following two hypotheses will be tested below:

- Hypothesis 1: Mean returns are different on Fridays from the rest of the week;
- Hypothesis 2: The volatility of prices is different on Fridays from the rest of the week.

3. Data and Methodology

We analyse daily data from different financial markets: stock markets (in both developed and emerging countries), the FOREX and commodity markets. Specifically, the following series are

examined: the Dow Jones Industrial Index, the SP 500 and the NASDAQ for developed stock markets; the MICEX (Russian stock market) and UX (Ukrainian stock market) indices for emerging stock markets; the EUR/USD, GBP/USD, USD/JPY and RUB/USD exchange rates for the FOREX; Gold and Oil (Brent) for the commodity markets. The sample period goes from

We also run multiple regressions including a dummy variable to identify calendar anomalies:

(3)

1y

where return in period *t;*

mean return (volatilir--11( )20( )

namely there are no specific days of the week when extreme behaviour of the stock market occurs.

Table 3: 100 biggest price movements during 2004-2016 in the emerging stock markets (Russian and Ukrainian stock markets) in percentage terkets)

Table 7: Overall results for the FOREX

Methodology/Instrument	Average analysis	t-test	ANOVA	Kruskal - Wallis test	Regression analysis with dummies
Returns analysis					
EURUSD	+	-	-	-	-
GBPUSD	**+**	**+**	**+**	**+**	**+**
USDJPY	+	-	-	-	-
RUBUSD	+	-	-	-	-
Volatility analysis					
EURUSD	**+**	**+**	**+**	**+**	**+**
GBPUSD	**+**	**-**	**+**	**+**	

on this day of the week. Using a trading robot approach we show that a trading strategy based on the anomaly detected in Gold prices is profitable. These

Appendix A

Empirical results for the Stock Markets

Average analysis

Figure A.1 Average analysis case of returns (DJI index)

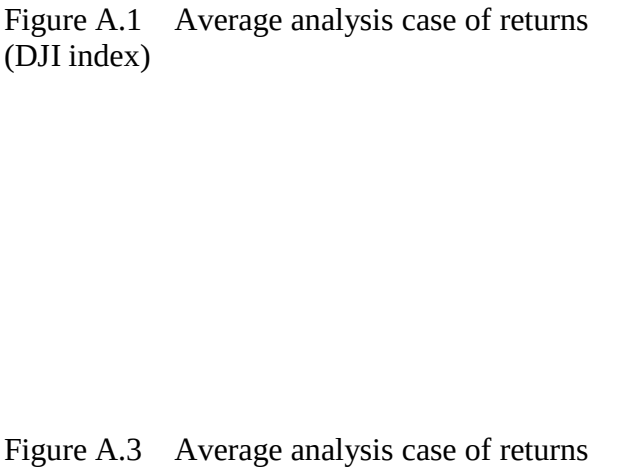


Figure A.2 Average analysis case of volatility (DJI index)

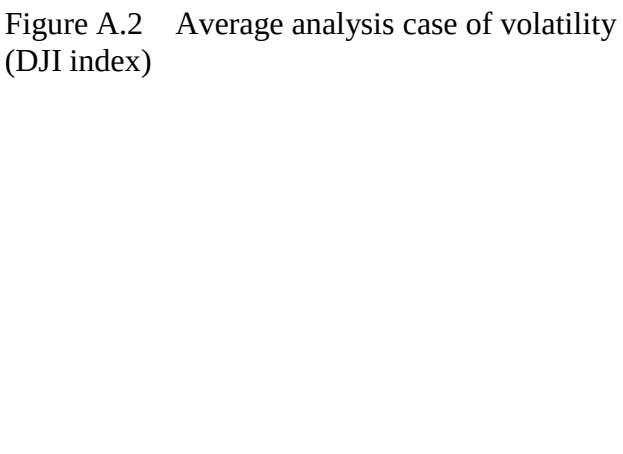
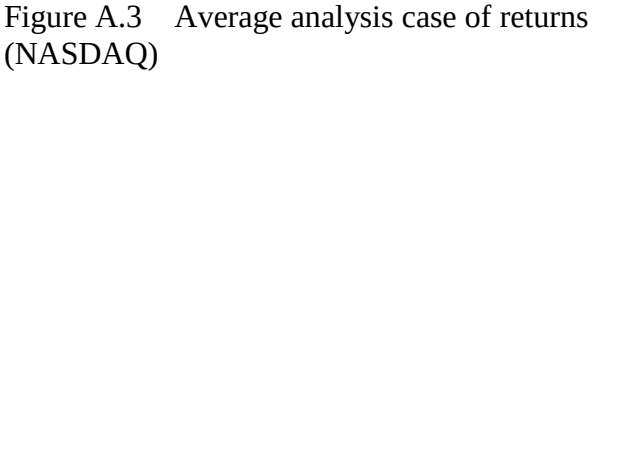


Figure A.3 Average analysis case of returns (NASDAQ)



Parametric tests: Student’s t-test

Table A.1: T-test of the Friday Effect for DJI

Parametric tests: ANOVA

Table A.5: ANOVA test of the Friday Effect in the Stock Market

2.42

	DJI		NASDAQ		MICEX		UX	
Parameter	Returns	Volatility	Returns	Volatility	Returns	Volatility	Returns	Volatility
F	0.78	1.26	1.39	1.79	1.43	3.67	1.39	2.42

Appendix B

Empirical results for the FOREX

Average analysis

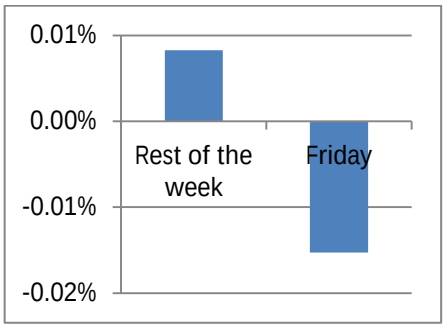


Figure B.1 Average analysis case of returns (EURUSD)

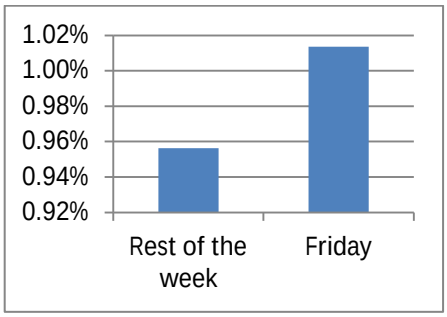


Figure B.2 Average analysis case of volatility (EURUSD)

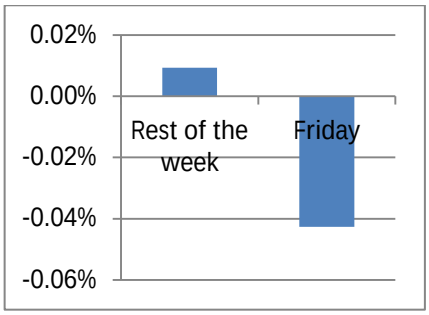


Figure B.3 Average analysis case of returns (GBPUSD)

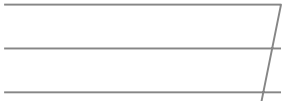


Figure B.4 Average analysis case of volatility (GBPUSD)

Figure B.5 Average analysis case of returns (USDJPY)

Figure B.6 Average analysis case of volatility (USDJPY)

Figure B.7 Average analysis case of returns (RUBUSD)

Figure B.8 Average analysis case of volatility (RUBUSD)

Parametric tests: Student's t-test

Table B.1: T-test of the Friday Effect for EURUSD

	Returns		Volatility	
Parameter	Rest of the week	Friday	Rest of the week	Friday
Mean,%	0,01%	-0,02%	0,96%	1,01%
Standard deviation,%	0,63%	0,67%	0,49%	0,50%
Number of observations	3708	925	3708	925
t-criterion	0,97		3,15	
t-critical (p=0,95)	1,96			
Null hypothesis	Accepted		Rejected	

Table B.2: T-test of the Friday Effect for GBPUSD

	Returns		Volatility	
Parameter	Rest of the week	Friday	Rest of the week	Friday
Mean,%	0,01%	-0,04%	0,86%	0,90%
Standard deviation,%	0,56%	0,62%	0,46%	0,64%
Number of observations	3707	925	3707	925
t-criterion	2,33		1,77	
t-critical (p=0,95)	1,96			
Null hypothesis	Rejected		Accepted	

Table B.3: T-test of the Friday Effect for USDJPY

Parametric tests: ANOVA

Appendix C

Empirical results for the Commodities

Average analysis

Figure C.1 Average analysis case of returns (Gold)

Figure C.2 Average analysis case of volatility (Gold)

Figure C.3 Average analysis case of returns (Oil)

Figure C.4 Average analysis case of volatility (Oil)

Parametric tests: Student's t-test

Table C.1: T-test of the Friday Effect for the Commodities

	Gold				Oil			
	Returns		Volatility		Returns	Volatility	Returns	Volatility
Parameter	Rest of the week	Friday	Rest of the week					

Appendix E

Results of trading imitation: case of Gold (period 2004-2016)

Table E.1: Trading report

Symbol		XAUUSD (Gold (Spot))			
Period		1 Hour (H1) 2004.01.01 00:00 - 2016.12.30 19:00 (2004.01.01 - 2016.12.31)			
Model		Every tick (the most precise method based on all available least timeframes)			
Parameters		Lots=1;			
Bars in test	74530	Ticks modelled	139022254	Modelling quality	n/a
Initial deposit	10000.00			Spread	Current (315)
Total net profit	36058	Gross profit	291454	Gross loss	-255396
Profit factor	1,15	Expected payoff	60.96		
Absolute drawdown	261.50	Maximal drawdown	38411.12 (49.14%)	Relative drawdown	49.14% (38411.12)
Total trades	640	Short positions (won %)3 11.04 Tf			