

# Report on Bachelor Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague

<b>Student:</b>	<b>Patrik Černý</b>
<b>Advisor:</b>	<b>PhDr. Jiří Kukačka, Ph.D.</b>
<b>Title of the thesis:</b>	<b>The weather and stock returns</b>

## **OVERALL ASSESSMENT** (provided in English, Czech, or Slovak):

*Please provide your assessment of each of the following four categories, summary and suggested questions for the discussion. The minimum length of the report is 300 words.*

### **Contribution**

The intended contribution of the thesis is to provide an updated research of the weather effect on stock returns and expanding the research to larger amount of markets with focus on the difference between emerging and developed markets. The author provides reasonable update of previous research when using data from 2006 to 2017. I highly appreciate that after rejection of testable hypothesis about no evidence of impact of weather variables on stock returns using designed form of model (Eq. 4.1), the author replicates approaches of previous studies (Saunders (1993) and studies using GARCH) to test whether previously concluded significant effect is present also at updated dataset. Unfortunately, the additional promising contribution about analysing difference between emerging and developed markets is a bit lost in confusing design of testable form of the model (selectively including lagged variables see below).

### **Methods**

The author primarily uses Ordinary Least Squares method (OLS) to analyse the weather effect on stock returns and author also implements Akaike information criteria as an estimator of the relative quality of statistical models in order to find out model with best fit for each analysed market.

The author formulates testable form of the model (Eq 4.1). The author mentions that as lagged returns are not included for every market, the variable does not figure in equation 4.1. The lagged return (lag1) is used only in 13 out of 24 emerging markets and 3 out of 22 developed market. Two models include also lag2. The selective including of lagged returns is explained as treatment of autocorrelation: *"..when the model 4.1 was showing marks of autocorrelation, lags of the dependent variables were included and the model was tested again. Using a test level of a significance of 1%, among all the markets serial correlation can be rejected after including 0 to 2 lagged dependent variables in the regression"* (p 26). The selective change of testable form of the model for individual markets is little bit confusing, especially as lagged returns are significant factors if included. Thus same logic could be applied as author using for justification of including dummy for January and Monday effect in model: *"Because of previous results, it seems to be reasonable to include also these variables (i.e. seasonal effects like Monday and January effects) in an econometric model, because their significance implies their place among the explanatory variables of market returns"* (p 19). Why does not the author include lagged returns as standard part of testable form? Does the author try to perform econometrical analysis including lagged returns for all markets? Do you expect any changes in results after including lagged returns?

Due to fact that the results of author's model did not reject the hypothesis of no evidence of impact of weather variables on stock returns, he proposes to replicate approaches of previous studies that

# Report on Bachelor Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague

<b>Student:</b>	<b>Patrik Černý</b>
<b>Advisor:</b>	<b>PhDr. Jiří Kukačka, Ph.D.</b>
<b>Title of the thesis:</b>	<b>The weather and stock returns</b>

conclude significant relationship in order to find out if their designed models fit the updated data better or not. For the replication approach, the author uses OLS model and GARCH

As a part of methodology section, the author presents theoretical principle of relevant statistical tests for validation of OLS assumptions as well as testing of stationarity of the time series data. I appreciate that author does not forget verify the validity of OLS assumptions and stationarity of the time-series.

With respect to data, the author uses financial and weather data. The individual variables of dataset is well described and clearly defined which is important especially for weather variables that is not commonly used. From the reader's perspective, it would be beneficial to present some basic descriptive statistics of dataset to indicate the central tendency and variability of individual variables.

## Literature

The author has performed a thorough literature review. The literature review starts with general introduction into research field via pioneer work of Saunders (1993) and relevant reactions. Furthermore, the author presents the relevant literature broken down by individual weather variables included in research. Finally, the author provides insight into relevant literature based on used data and findings (found and rejected effects). The separate sub-section for effect could be little bit confusing for a reader as findings are at least partially mentioned already in sub-section broken down by individual weather variables included in research. Overall, the literature review offers a balanced survey of historical and the most recent studies.

## Manuscript form

The thesis is standardly structured and written in decent English. The text itself is understandable and easy to follow. The minor imperfection is presentation of Table 6.11 and 6.13 as continued table without first column with variable names that makes it difficult to follow.

## Suggested questions for the discussion during the defense

Except several questions already suggested in report (see above), I would like to ask:

- (i) *Does the author think about controlling for the effect of financial crisis as your examined period (2006 – 2017) cover the financial crisis period? Do you expect any effect of financial crisis on your model?*
- (ii) *Does the author have any explanation for different influence of lagged returns in replicated Saunders model (almost always positive for emerging markets vs. nearly evenly distribution for developed markets)?*

# Report on Bachelor Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague

<b>Student:</b>	<b>Patrik Černý</b>
<b>Advisor:</b>	<b>PhDr. Jiří Kukačka, Ph.D.</b>
<b>Title of the thesis:</b>	<b>The weather and stock returns</b>

## Summary

I do find this thesis meeting academic standards for bachelor theses written at IES and I can recommend the thesis of Patrik Černý to defense at the IES FSV UK. With respect to comments above, I suggest grade "C".

**SUMMARY OF POINTS AWARDED** (for details, see below):

<b>CATEGORY</b>	<b>POINTS</b>
<i>Contribution</i> (max. 30 points)	21
<i>Methods</i> (max. 30 points)	19
<i>Literature</i> (max. 20 points)	17
<i>Manuscript Form</i> (max. 20 points)	16
<b>TOTAL POINTS</b> (max. 100 points)	<b>73</b>
<b>GRADE</b> (A – B – C – D – E – F)	<b>C</b>

**NAME OF THE REFEREE:** *Mgr. Aleš Čornanič*

**DATE OF EVALUATION:** 24.1.2019

---

*Referee Signature*

**EXPLANATION OF CATEGORIES AND SCALE:**

**CONTRIBUTION:** *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
30	15	0

**METHODS:** *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
30	15	0

**LITERATURE REVIEW:** *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
20	10	0

**MANUSCRIPT FORM:** *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
20	10	0

**Overall grading:**

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F