Report on Bachelor / Master Thesis

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

Student:	Bc. Marek Vavřina
Advisor:	Mgr. Lukáš Vácha, Ph.D.
Title of the thesis:	Comovement of Stock Markets and Commodities: A Wavelet Analysis

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

The thesis is focused on application of wavelet methods to stocks and commodity markets. Part of the results is compared with more popular Granger causality test. Author tests hypothesis whether there is significant increase of comovement between commodities and stock indices during the period of current financial crisis. Further author examines contagion of the crisis measured by correlation change before and after some points defining the crisis. Using the wavelet decomposition these differences in correlations can be tested on various frequency bands representing different (trading) horizons.

The fist part of the thesis introduces theoretical background of both continuous and discrete wavelet decompositions and motivates following analysis. Following parts are devoted to data description, wavelet correlation and contagion and comovement study. The final part is focused on causal relations between stock and commodity markets, where author compares results from wavelets and Granger causality approach.

Contribution of the thesis is strong and the topic is very actual since interrelations and dependencies between financial markets are important for portfolio analysis and various risk measures. These risk measures are generally very volatile in periods of financial crisis and even the long term structures of these markets can change. Furthermore, wavelets allow for examination on scale-by-scale basis and analyzing the time series for different horizons. This advantage is demonstrated in the wavelet correlation part. Other important feature of the wavelet methodology is its ability to work also with non-stationary (or only locally stationary) time series which is of great importance in turbulent periods during the crisis. This ability is nicely demonstrated in the comovement part, where wavelet coherence is used for a localized analysis.

Interesting results are in the part where the contagion is tested. The analysis is performed on two time windows - before and after the bankruptcy of Lehman Brothers. Results indicate that there was no contagion spreading from the US stock market to other examined stock markets except the German stock market. This is very interesting result but more discussion is needed in this point (potential question for a defense). Interestingly, the method demonstrates the importance of the decomposition because the correlation differs at many scales.

To conclude, author shows his understanding and ability to use advanced wavelet methods, the thesis is well structured and every chapter contains relevant literature review. The contribution is strong, but an economic interpretation of these interesting results can be, in some cases, more detailed.
I recommend the thesis for defense with the grade **"výborně" (excellent, 1).**

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

CATEGORY		POINTS
Literature	*(max. 20 points)*	20
Methods	*(max. 30 points)*	30
Contribution	*(max. 30 points)*	25
Manuscript Form	*(max. 20 points)*	15
TOTAL POINTS	*(max. 100 points)*	**90**
GRADE	**(1 – 2 – 3 – 4)**	**1**

NAME OF THE REFEREE: Mgr. Lukáš Vácha, PhD.

DATE OF EVALUATION: 5.9.2012

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Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

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

Strong	Average	Weak
20	10	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.*

Strong	Average	Weak
30	15	0

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.*

Strong	Average	Weak
30	15	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.*

Strong	Average	Weak
20	10	0

Overall grading:

TOTAL POINTS	GRADE		
81 – 100	1	= excellent	= výborně
61 – 80	2	= good	= velmi dobře
41 – 60	3	= satisfactory	= dobře
0 – 40	4	= fail	= nedoporučuji k obhajobě