Report on Diploma Thesis

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

Student:	**Bc. Kristýna Čechová**
Advisor:	**PhDr. Ladislav Krištoufek**
Title of the thesis:	**Multifractal Analysis of Stock Market Prices**

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

Diploma thesis "Multifractal Analysis of Stock Market Prices" is majorly an empirical work focusing on multifractal properties of DJI30 index components. Importantly, Kristyna focuses not only on financial returns, which is quite standard in the literature, but also on volatility (estimated using the efficient Garman-Klass estimator) and standardized returns. The thesis can be in a sense seen as an expanded reproduction of series of papers by Di Matteo *et al.* (2003, 2005) and Di Matteo (2007) *(see the reference list in the thesis)*. Such statement is based on the presentation style and focus on the generalized Hurst exponent of moments $q=1$ and $q=2$. However, the analysis is broadened with the volatility and standardized returns study and also by the application of both the generalized Hurst exponent approach (GHE) and the multifractal detrended fluctuation analysis (MF-DFA). Kristyna finds interesting results. Firstly, anti-persistence is a characteristic of several stocks (such a characteristic is attributed to the most developed stock markets in the original studies). Secondly, volatility is found to be strongly persistent, which is a standard result, but also, it seems that volatility is not multifractal which is a rather interesting (as well as important) result. And third, standardized returns get closer to uncorrelated behavior and show no or only weak signs of multi-scaling (multi-fractality). The contribution of the thesis is thus evident.

The thesis is well structured and reads well. The methodological part suffers a little from the fact that the theory behind (multi)fractals, self-affinity and self-similarity is of a level well beyond the level of master's studies. Reader might sometimes find it hard to follow the text interspersed with many definitions. It is thus needed to be stressed that the topic of interest is very demanding. I believe that Kristyna has done a good job handling it.

Kristyna has consulted the thesis repeatedly and she has incorporated all the important suggestions of mine. Therefore, I have no further questions. **I suggest the thesis for the defense with grade A.**

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

CATEGORY		**POINTS**
Literature	*(max. 20 points)*	19
Methods	*(max. 30 points)*	28
Contribution	*(max. 30 points)*	29
Manuscript Form	*(max. 20 points)*	15
TOTAL POINTS	*(max. 100 points)*	**91**
GRADE	**(1 – 2 – 3 – 4)**	**1**

NAME OF THE REFEREE: PhDr. Ladislav Krištoufek

DATE OF EVALUATION: 4.9.2013

Ladislav Kristoufek
cn=Ladislav Kristoufek, o=Academy of Sciences of the Czech Republic, ou=Institute of Information Theory and Automation, email=kristouf@utia.cas.cz, c=CZ
2013.09.04 22:05:56 +02'00'

Referee Signature