Report on Master Thesis

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

Student:	**Bc. Daniel Tóth**
Advisor:	**PhDr. Jozef Baruník, Ph.D.**
Title of the thesis:	**Modelling Conditional Quantiles of CEE Stock Market Returns**

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

The thesis "Modelling Conditional Quantiles of CEE Stock Market Returns" very thoroughly analyses an extension of the Value at Risk (vaR) modelling via quantile regression (QR) framework. The main motivation is not only to make a step further in terms of the explanatory and forecasting power of related financial models but particularly to abandon unrealistic and thus restrictive assumption of the normal distribution of returns of a financial portfolio which can be rarely observed empirically.

I am pleased to summarise at the very beginning that **Daniel has written a high quality piece of work and therefore I can honestly suggest the highest grade (1)**.

Within the course of the work, Daniel managed to master two new advanced econometrics topics (realised volatility and quantile regression), which are only partially part of the standard IES curriculum, and demonstrated good programming skills without which the thesis results could not have been produced. However, the most outstanding part of the thesis is a very large and extremely detailed analysis of the forecasting power of extended linear QR models compared to standard VaR approach where authors robustly show that QR perform generally better both for one-step- as well as for multi-step-ahed. This finding is definitely contributive to the field, especially in combination with empirical elaboration of two CEE markets (PX and BUX) and the idea of division of volatility into so called positive and negative semivariances capturing potential "loss aversion/gain-loss asymmetry" of market participants. This feature brings another improvement to the forecasting performance but only for one-step-ahead forecasts, for longer horizons the simpler version proves the most accurate and often the usual VaR with normality assumption beats the QR model with realised semivariances.

On the other hand, below I mention several minor comments which consideration might have shifted the thesis to even higher level:
1. The very first sentence of the abstract talks about models to forecast returns but the work is mainly about volatility. This was a bit confusing to me at the very beginning. The same holds for introducing the realised semivariance (2.1.2) where somewhat confusing term +/- variance is used.
2. The thesis would benefit from one more independent proofreading, several sentences are grammatically wrong (", while constant unconditional variance and so improve"; "For this process is likelihood"; "We could evidence of"; "depends does not"; "and forecasting, we proceed"; "underestimates of overestimates"; etc.), the "third person" is time to time not associated with "s" finishing the related verb, and spaces between words - often after ")" - are sometime missing. Short forms such as "let's" or "haven't" should not appear in academic English at all.
3. "Table X-X" or "Table XX" does not help the reader much... In figures, generally, the dates on x-axis instead observation numbers would serve well. In Fig. 4.1 and 4.1 I did not recognise what results are depicted. List of Acronyms would also help.
4. In 2.15 different "phis" are used; in 4.7 "t+i" should appear.
5. White noise assumption in Fig. 3.3 and related should also be tested more rigorously, not only visually.

The aim, design, working hypotheses, and conclusion are clearly stated and carefully elaborated. The work is well structured and meets high academic standards. The theoretical part is very well elaborated and provides the reader with a useful summary of utilised methods, at the same time the author demonstrates deep undestanding of a rich portfolio of methods to evaluate the forecasting power of analyses models. Literature is sufficient for the purpose, although I generally prefer broader literature review of the topic. However, the empirical part is to my mind unnecessarily detailed and

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repetitious, the reader might loose concentration easily (I understand the need of this detailed-level empirical elaboration for the analysis but not everything must appear in the text or some other form of presenting figures might help to demonstrate result in a more comprehensible form). On the other hand, and very importantly, it contributes to recent literature.

Suggested questions for the defense:
1. My main concern regards the utilisation of the PX data. Authors themselves state that PX is the less tradable market from four markets analysed. To what extent might this potential lack of liquidity influence the results? Can you summarise the main differences in results for PX and BUX on one side and "benchmark developed market" indices DAX and FTSE on the other? What inaccuracies might this bring combined with the "problem" of estimation of the 1% quantile caused by insufficient number of observation in the out-of-sample period? Are jumps in results for PX and BUX (50% quantile LAD coefficient) partially likely to be effect of this?
2. To be honest, I got confused with the interpretation of the results on the "globalisation" hypothesis. Results of the thesis show smaller and even decreasing correlation (when more precise quantile correlation is used) and are interpreted in a way that diversification benefits are decreasing within European countries. Maybe I miss some point or do not understand what authors consider under term "diversification benefits". Can you make this clear, please?

Summary:
As large, I do find this thesis **satisfying high academic standards for master theses written at IES**. Personally considered, the detailed empirical elaboration utilising high-frequency data together with theoretically contributive results are the most distinctive qualities of the work.
I am very pleased **I can strongly recommend the thesis of Daniel Tóth to defense at the IES FSV UK. I suggest the grade "1". i.e. "excellent"**.

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

CATEGORY		POINTS
Literature	*(max. 20 points)*	18
Methods	*(max. 30 points)*	30
Contribution	*(max. 30 points)*	29
Manuscript Form	*(max. 20 points)*	15
TOTAL POINTS	*(max. 100 points)*	**92**
GRADE	**(1 – 2 – 3 – 4)**	**1**

NAME OF THE REFEREE: Jiří Kukačka
DATE OF EVALUATION: 10. 6. 2015

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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