Report on Rigorous Thesis

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

Student:	**Mgr. Radek Bulva**
Advisor:	**PhDr. Jan Zápal, MRes MSc**
Title of the thesis:	**Heavy Tails and Market Risk Measures: The Case of Czech Stock Market**

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

The referee assessed an earlier version of the current thesis, submitted by the author in August 2010 as a Master's thesis. The current version of the thesis contains but minor changes of its predecessor, the most significant change being an update of the analysis with a longer dataset and a removal/update of some of the sections found in the earlier version of the thesis. For this reason, the present assessment will be brief.

Objective of the Current Thesis

The thesis aims to investigate the tail behavior of the main market index of the Prague Stock Exchange (PX) using a variety of both parametric and semiparametric approaches. The parametric approaches considered by the author include the Block Maxima method (where the maxima are assumed to follow the Generalized Extreme Value distribution) and the Peaks Over Threshold method; the semi-parametric approach is based on several well-known estimators (e.g., Hill (1975), Pickands (1975)) employed to estimate the tail index. The author also considers the implications of fat tails for risk management when he tries to assess how the presence of fat tails (as estimated in the previous part of the thesis) influences two common measures of risk, namely VaR and Expected Shortfall.

Main Contribution

The contribution of the current version of the thesis is limited. As mentioned in the referee's assessment of the earlier version of the thesis (16/08/2010), the tail behavior of the main market index of the Prague Stock Exchange (PX) was investigated using extreme value methods in the work of Baran (2009).[1] Understandably, the author may have been unaware of Baran's work at the time of writing of the earlier version of the thesis; hence the *contribution* in the earlier assessment.[2] However, given the width of Baran's analysis – who, for example, also investigated *conditional* extreme value methods and illustrated their implications/usefulness via a portfolio application – the current thesis represents in its present form and at this degree level but a naive empirical investigation of the unconditional distribution of extreme values, offering a contribution that is all but insufficient to warrant the award of the PhDr. degree.

General Comments

In addition to what has been written above, it remains a fact that an overwhelming part of the empirical analysis found in the current thesis follows that of Zivot and Wang (2006) who apply majority of the methods employed in the current thesis in their book on financial time series modeling using S-Plus. Moreover, given that entire passages of the current thesis are but adjusted versions of the text found in Zivot and Wang (2006),[3] it remains difficult to imagine that it would not have required but a few days worth of work on the author's part to both write the thesis and obtain the results.

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[1] Although this study does not go beyond the Peaks over Threshold (POT) method for tail estimation.
[2] Interestingly, the current thesis still fails to mention Baran's (2009) work.
[3] For example, compare the second remark on p.159 of Zivot and Wang (2006) with the text of the last paragraph on p. 33 of the current thesis.

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Unless significant adjustments are made to extent/improve the current thesis relative to its previous version and, in light of the comments made above, I do not recommend the thesis for defense of the PhDr degree.

References

Baran, Jaroslav (2009): "Analysis and Comparison of Different Value at Risk Models for Nonlinear Portfolio", Masters Thesis (unpublished), Department of Probability and Mathematical Statistics, Faculty of Math and Physics, Charles University in Prague. Available at the following URL address: www.quantitative.cz/file/49/analysis-and-comparison-of-different-value-at-risk-models-for-nonlinear-portfolio-jaroslav-baran-2009.pdf

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

CATEGORY		POINTS
Literature	*(max. 20 points)*	10
Methods	*(max. 30 points)*	5
Contribution	*(max. 30 points)*	5
Manuscript Form	*(max. 20 points)*	20
TOTAL POINTS	*(max. 100 points)*	**40**
GRADE	**(1 – 2 – 3 – 4)**	**4**

NAME OF THE REFEREE: Vít Bubák

DATE OF EVALUATION: 10. 10. 2010

Vít Bubák

Referee Signature