

## Opponent's Report on Dissertation Thesis

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Title of the Thesis:	Three Essays on Risk Modelling and Empirical Asset Pricing
Type of Defense:	<b>DEFENSE</b>
Opponent:	Prof. Ing. Evžen Kočenda M.A., Ph.D., DSc.

Address the following questions in your report, please:

- a) Can you recognize an original contribution of the author?
- b) Is the thesis based on relevant references?
- c) Is the thesis defensible at your home institution or another respected institution where you gave lectures?
- d) Do the results of the thesis allow their publication in a respected economic journal?
- e) Are there any additional major comments on what should be improved?
- f) What is your overall assessment of the thesis? (a) I recommend the thesis for defense without substantial changes, (b) the thesis can be defended after revision indicated in my comments, (c) not-defensible in this form.

*(Note: The report should be at least 2 pages long.)*

The dissertation consists of three essays in financial econometrics.

The first paper brings forth a new model for multivariate volatility modelling and forecasting that employs a system of seemingly unrelated regressions to model and forecasts a realized covariance matrix. The model is tested on fifteen US stocks and shown to be economically as well as statistically well performing.

The second paper analyzes how to measure common market risk factors based on a Panel Quantile Regression Model for Returns. Empirical assessment of the method shows its substantial benefits from the economic and statistical points of view.

The third paper generalizes previous results in that it shows how a quantile Euler equation can be transformed into basic quantile pricing equation. Dynamic quantile model for bond pricing is then introduced and empirically tested on the US and German bonds with favorable results.

All three papers definitely represent an original contribution of the author to the field.

The dissertation is written in a competent manner and shows that the author has mastered his theoretical as well as analytical skills. The work is well structured and the introduction provides a clear overview of the dissertation. The references are plentiful and their use



demonstrates that the author is well acquainted with the contemporaneous literature in the field. Moreover, revised version of the dissertation contains some new recent and relevant references as well.

The dissertation, after incorporating the comments of referees, is without doubt defensible at the IES. The dissertation ranks more than favorably with dissertations written in this particular field in other institutions I have taught at or served as a dissertation committee member.

The first paper was already published in the *Journal of Forecasting*. It is solid and well executed paper, with clear contribution and economically sound results. I have no comments as the first paper is a complete piece.

The second paper is under review in the *Journal of Financial Econometrics* and I believe it has very good chances to be published there. It is well structured as well as executed paper with a clearly articulated contribution. I made several comments with respect to its earlier version. Specifically with respect to the theoretical background associated with the penalty term  $\lambda$  in the optimization problem and its link to other terms, plus some minor issues. All of my comments were completely accounted for in the presented form of dissertation. The paper itself represents a very solid piece of work.

At the time of pre-defense, the third essay represented a work in progress and I made number of comments showing the ways for its improvement – specifically with respect to the asymmetry in empirical results between upper and lower quantiles, dominance of results at different quantiles for different bonds, plus other issues. I am pleased that all my comments were answered in a competent way. At this stage, the paper is a finished and polished piece. I trust that the paper has potential for publication in a good outlet as it is currently under review.

Finally, the dissertation was also carefully checked and remaining errors in sentences' structure and typos were corrected.

Overall, my assessment of the dissertation is very favorable and I recommend the thesis for defense without substantial changes. The dissertation is of high quality and represents a valuable contribution to the field.

Date:	8.4.2019
Opponent's Signature:	
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