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:	**DEFENSE**
Date of Pre-Defense:	May 23, 2018
Opponent:	Michael Ellington BA, MSc, PhD

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 defendable 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-defendable in this form.

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

This thesis contains three papers with the underlying theme of modelling volatility and empirical asset pricing. Overall, the first two papers provide methodological innovations that extend on previous, well known, literature. The third paper builds on recent work and provides a theoretical and intuitive motivation to move from classic asset pricing to quantile asset pricing. I believe this paper is the most promising in terms of likely journals that will publish this work; the most suited that comes to mind would be Journal of Econometrics.

The first paper proposes a generalized HAR model and examines the forecasting ability of this model against a battery of alternatives used in the literature. Then, economic evaluation is conducted in a mean-variance framework. The second paper puts forward a panel quantile regression model for returns and also compares this against an array of models previously used in this area. The third paper applies results permitting the transition from classic preferences to quantile preferences, and analyses the impact of realized variance to bond returns.

Overall, following the correction of typos and re-wording sentences as advised in my first report, each paper reads well. The thesis also flows far better with the inclusion of an introduction and conclusions; as well as the proper list of tables and figures. I would like to

commend František for responding to all referee reports in a professional and considered manner.

After re-reading the thesis, I have some minor amendments that should be made prior to defense. Once these are corrected, **I recommend that František be awarded his PhD.** He is an extremely competent researcher and he definitely has a promising career ahead.

Comments on Chapter 2

- Section 2.6.3, please provide a footnote discussing the implications of your answer to my initial question within the thesis itself. Of course, this is beyond the scope of your paper, but a referee might ask for the implications of your results from an economic perspective. Providing a new way of modelling something is fine, but the author(s) of these papers must stress and sell why others should adopt the approach, and how. A footnote summarizing your answer on page 138 to this question is more than sufficient.

Comments on Chapter 3

- Regarding my previous comment:

  The results of your single factor models using the Method of Moments Estimator (MM) and standard Quantile Regression (QR) across both bond markets are qualitatively similar. Given that you then move on to multi-factor models estimated only using conventional QR methods, I think the MM estimator of de Castro et al. (2018) can relegated to the appendix, as well as the discussion of the GMM estimator in detail. To me, it is important to be consistent with the estimation method of your single and multi-factor models. The MM estimator of your single factor models, as well as an investigation of over-identified models can be provided in the appendix as a robustness exercise. To me, the contribution of your paper is not the estimation method, but the modification of the theoretical results of de Castro and Galvao (2018) to an asset pricing framework.

  It is fine to keep the chapter as is for the thesis. However, if a referee suggests relegating this to the appendix when you submit to a journal, I would strongly encourage you to do so.

- On page 88, you state median anomalies require future research since they violate the EMH. Please provide a footnote stating that a trading strategy taking advantage of the violation could result in profit for investors. I am not asking you to formulate the strategy, just show that you have thought about what the implications of your results are for the wider financial community.

Comments on Bibliography

- Please update reference de Castro et al. (2018) Smoothed GMM for quantile models. This paper has just been accepted in Journal of Econometrics.
  See: https://www.sciencedirect.com/science/article/pii/S0304407619300636

- page 125 should read "The US treasury yield curve"

- inconsistencies in citing papers from Review of Financial Studies, on page 125 you name, "Review of Financial Studies" and on page 122 "The Review of Financial Studies". Please remove "The" from citation on page 122.

- page 125 "International Journal of Forecasting" not "International Journal of forecasting".

- Page 126 remove "The" from "The Journal of Finance".

- Page 127, "The Journal of Politics" not "The journal of Politics".

Date:	
Opponent's Signature:	
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