Opponent's Report on Dissertation Thesis

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Title of the Thesis:	Three Essays on Credit Risk Quantification
Type of Defense:	**DEFENSE**
Date of Pre-Defense:	April 16, 2014
Opponent:	**doc. Ing. Tomáš Tichý, Ph.D.**

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?
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) Were your comments raised at the pre-defense, addressed in the dissertation submitted to the regular defense? (The pre-defense report is enclosed below)
g) What is your overall assessment of the thesis? (a) I recommend the thesis to be defended without major changes; (b) The thesis is not defendable.

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

Content of the Report:

The author submitted a thesis focused on contemporary topic of credit risk and consisting of three separate but mutually interconnected papers.

A joint theme of these three papers, and thus the core idea that lies behind the motivation of the thesis, is the question how to improve the commonly accepted approach of Vasicek to credit risk modeling and what might be the impact of such improvements on capital charge.

The thesis are structured historically, that is, particular chapters completely coincide with papers as they have been elaborated and submitted to selected journals. Therefore, the first paper (chapter 2), in which the author relaxes the assumption of normality of residuals, is the oldest one and uses the most restricted databases, while the third paper (chapter 4) thus utilizes some additional recent findings as well as data more, which is required besides others by the dynamic as well as seniority that were added to the original model.

The leitmotif of all papers and as well as the thesis is to show several deficiencies of the standard approach to credit risk measuring and suggest improvements. Hence, in the first paper, the author focuses on the loss distribution and formulate a more general model that can

be based on a historical evolution of selected risk factors, which are related to particular banking products and thus a credit risk sources.

Obviously, the novel approach is related to IRB approach of Basel II. In order to prove, that the author's model works better, historical data of US mortgage are used. As one might suppose, the results obtained under the assumption of normal distribution do not match empirical data, while the advance model based on generalized hyperbolic distribution works much better and might lead to higher regulatory requirements on the capital due to captured tail behavior.

In the second paper the author makes some steps further to approach the model to the reality – besides the distribution driving PD he focuses also on LGD, which is supposed to be a random two-factor model. Moreover, a multiperiod case is considered as well. In fact, since the author in his analysis applies not only a random sub-model for the default, but also for LGD, he is moving away from Vasicek ideas. In contrast to the first paper, the advanced model might lead to lower capital requirements due to the real distribution of the factors over selected databases of credit events. Obviously, since some more variables are studied, the author extends also the databases by some additional types of observations.

Finally, the last step, which author shows here, to make the credit risk model more reliable is to take into account also the seniority of the debts and built up a complex model with a lot of parameters. Even in this case, a decrease of the capital requirements can be observed.

The methodology suggested in each of the papers above have shown sufficient amount of novelty and support original results of the research presented therein as well. It is also not surprising that two of these papers have already been published. Moreover it seems that quick publication might be assumed in the case of the third paper. We might also appreciate that two journals used for publishing the author's results presented in the thesis receive highly positive recognition inside the international community.

As it was already stated, the models presented in particular chapters are derived from Vasicek assumptions, which lie behind the IRB approach of Basel II. The author extends the approach especially by relaxing some unrealistic assumptions and allowing for some additional randomness. However, the models can still be regarded as falling within Basel II approach. Moreover, since current proposal of Basel III does not differ from Basel II in terms of the credit risk quantification, the author's findings remain inspiriting for further improvements of the regulatory approach.

The structure of the thesis as a collection of three papers written in the past without any chance to rewrite and up-to-date the papers does not allow to present really all relevant references, from the point of view of the time of thesis submission, but we can well assume, that the list was complete at least at the time of papers' submission.

Since the thesis provides novel approach that can be of great interest for credit risk management purposes and all relevant comments and suggestions from the previous (pre-defense) round were carefully followed by the author, the thesis can be recommend for defense without any major change.

Date:	24. 8. 2014
Opponent's Signature:	
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