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Professor Jan Trlifaj
Vice-Dean of Faculty of Mathematics and Physics
Charles University, Prague

Edmonton, December 1, 2019

Dear Professor Trlifaj:

This is the review of the Habilitation Dissertation of Dr. Michal Pešta, as requested by your letter from November 14, 2019.

The text of the thesis conveys an impressive research program of the candidate, the program that does not limit itself to extensions and improvements of existing statistical procedures, but rather aims at scientific breakthroughs in statistical methodology relevant for the actuarial science, with further outreach into a broader area of business decisions. Rather than cultivating well-established academic topics, Pešta dares to venture into yet uncharted territories. Such an ambitious program may not be initially always fully recognized and appreciated by all the members of the scientific community, especially by those in habit to think within the established paradigms; nonetheless however, the collection of the attached publications witnesses also the fact that the candidate has already mastered the craft of the dissemination of scientific results, that very important skill for a young researcher at this stage of his or her career. I was happy to realize that Pešta is able to get his results published in respected international publication outlets (for instance, "Insurance: Mathematics and Economics" is a premier journal in its field).

Regarding the thesis per se, there are several recurrent themes: the evolution of the data in time, and more generally, dependence patterns in the data; the hunt for structural changes; and complex data structures (panel data, chain-ladder data) motivated by the need of applications. The technologies themselves are diverse as well: estimation and testing, various kinds of bootstrap, copulas, generalized estimating equations, nonparametric methods, and others. Given that your faculty is that of Mathematics and Physics, I feel it important to mention that his treatment of the investigated problems is not in the style of some simplified "economic statistics" approach, but he employs sophisticated mathematical tools to achieve deeper theoretical understanding of the proposed methods: the use of asymptotic probability theorems using invariance principles and mixing notions for stochastic processes is widespread. On the other hand, the attached papers care about the applied impact of the pursued research, and make an effort to attract users with less mathematical background by including computer experiments and real-data examples.

The thesis is organized in the chapters according to the type of the data structures and subsequent problems studied. After the introduction in Chapter 1, Chapter 2 addresses structural changes in the time-series context. This research is the most recent one, and contains some contributions that are the highlights of the presented material (the paper with Wendler, to mention but one). Chapter 2 then deals with the so-called panel data, and Chapter 3 with their very specific case appearing in the actuarial science: the triangular, "chain-ladder" data. In this way, the thesis is thus not merely a collection of vaguely related published papers, but constitutes a coherent, unified treatise. (The brief online search revealed that to achieve this character, the candidate deliberately made a sacrifice of not including all his publications, some of which are of independent interest and would be definitely worth showcasing.)

The text is a pleasure to read, and the author exercised the utmost care in presenting the results; the whole package, and also the choice of co-authors (few, but selected, and rather peers than subordinates or superiors) reveals a strong and independent research personality (I would like to note that some papers are single-authored), with very well-developed mathematical, statistical, and other culture. Truly a person deserving to be granted "venia docendi".

I do not have an access to the complete Curriculum Vitae of the candidate, but based on this habilitation and on his online publication record, I can responsibly assert that he will be a strong and unambiguous case should he apply for the tenure and the promotion to the Associate Professor rank at my own institution, Faculty of Science of the University of Alberta. In view of all said and done, I thus recommend, strongly and unreservedly, Dr. Michal Pešta for the promotion to the Associate Professor rank at the Charles University, based on the Habilitation Thesis my task was to review.

Yours faithfully,
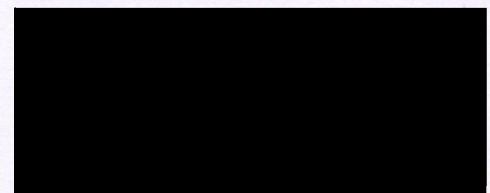
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