Report on Master Thesis

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

Student:	**Bc. Michal Spišiak**
Advisor:	**prof. PhDr. Petr Teplý, Ph.D.**
Title of the thesis:	**Cyber risk modelling using copulas**

OVERALL ASSESSMENT

Cyber risk management and modelling has attracted both academics and practitioners in the last years. Michal Spišiak investigates the topic when analysing data breach events. The main value added of the thesis is an analysis use of a unique dataset comprising 5,713 loss events in three sectors (technology, services, government). In the theoretical part, he demonstrated a strong mathematical background and addressed weaknesses of other researcher's models. In the empirical part, he builds own model when employing the Clayton copula. His contribution to the literature is therefore clear.

Methods

The author presents four hypotheses. When testing them, Michal applies standard methods used in operational risk management such as frequency and severity distributions, goodness of fit tests, extreme value theory, risk measures and copulas.

Literature

A 5-page literature review on relevant works is comprehensive and underlines Michal´s research abilities. The author compares his results with relevant studies in the field including Valle et al. (2008), Lu (2011) and with seminal works by Eling & Jung (2018) and Eling & Wirfs (2019), what makes his research valuable. He fills the gap in the literature when making improvements of previous studies.

Manuscript form

The manuscript form fulfils standard requirements. I appreciate that Table 6.11 on p. 52 includes a comparison of authors´ findings with other researchers and hence it highlights the author´s contribution.

Summary and suggested questions for the discussion during the defense

Michal has developed a solid academic approach, reviewed the existing literature, identified and investigated open research questions and drew relevant policy recommendations from that. I believe that a revised part of the thesis could be published in a journal with an impact factor. In my view, the thesis fulfills the requirements for a master thesis at IES, Faculty of Social Sciences, Charles University, I recommend it for the defense and suggest a **grade A.**

The results of the Urkund analysis do not indicate significant text similarity with other available sources.

Questions to the defense:

1) Michal has indentified several caveats of previous works. Which one was the most important one and how did he fix it in his research?

2) Based on Hypothesis 2 testing, the author does not reject the hypothesis that lognormal distribution is the distribution of loss severities. Is it true for all three analyzed sectors? What are key differences?

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

CATEGORY		**POINTS**
Contribution	*(max. 30 points)*	28
Methods	*(max. 30 points)*	29
Literature	*(max. 20 points)*	18
Manuscript Form	*(max. 20 points)*	18
TOTAL POINTS	*(max. 100 points)*	**91**
GRADE	**(A – B – C – D – E – F)**	**A**

NAME OF THE REFEREE: prof. PhDr. Petr Teplý, Ph.D.

Digitálně podepsáno (31. 8. 2020)
Petr Teplý

DATE OF EVALUATION: August 31, 2020

Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

CONTRIBUTION: *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

Strong	*Average*	*Weak*
30	*15*	*0*

METHODS: *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

Strong	*Average*	*Weak*
30	*15*	*0*

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

Strong	*Average*	*Weak*
20	*10*	*0*

MANUSCRIPT FORM: *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

Strong	*Average*	*Weak*
20	*10*	*0*

Overall grading:

TOTAL	**GRADE**
91 – 100	**A**
81 - 90	**B**
71 - 80	**C**
61 – 70	**D**
51 – 60	**E**
0 – 50	**F**