Report on Bachelor / Master Thesis

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

Student:	**Jiří Kolísko**
Advisor:	**PhDr. Michael Princ**
Title of the thesis:	**Bankruptcy prediction models in the Czech economy: New specification using Bayesian model averaging and logistic regression on the latest data**

***OVERALL ASSESSMENT** (provided in English, Czech, or Slovak):*

A master thesis is focused at bankruptcy prediction models for the Czech economy using data sets from year 2002 to 2016. The thesis implemented Bayesian Model Average method as well as robust methods dealing with data set imperfections including undersampling, oversampling and winsorization. The thesis tackled also a topic of false and positive prediction rate, which is often neglected, although it can improve overall quality of researched models. The thesis is accompanied by extensive amount of straightforward graphical outputs and various appendices, which enrich a main analytical part.

Literature:
The master thesis has used relevant domestic and foreign literature including the most recent studies. Methodology is supported by proper scientific sources. The author fulfilled standards of scientific works and maintained quality consistent with other diploma theses at Charles University in Prague. Literature includes various sources including economic and business studies, also mathematics and biology.

Methodology:
A structure of the work is clear and straightforward. The master thesis has used multiple advanced econometric methods including logistic regression and a Bayesian model averaging, which were accompanied by straightforward graphical output of ROC curves, Sensitivity-specificity curves and Precision-sensitivity curves.
The author incorporated robust methods, which should overcome most of data set imperfections, which can be regarded as a substantial extension to standard master studies. Some parts of the work could be even published in EconLit journals, but they would have needed some prior revision.

Contribution:
The thesis includes a synergy of advanced econometric models, unique data sample, robustness checks, but alas author did not properly discuss the value added properly. Concluding remarks are rather short and lack a deeper comparison with similar studies. Alas figure 9 of Kalouda and Vaníček (2013) cannot be compared directly to output of the author. Tables 12 and 13 are also rather incompatible and should be commented during the defence.
While appendices usually include only redundant outputs, in this case they should be also taken into account, because they can help with a more straightforward interpretation of conclusions.
False positive prediction rate is an important topic in biological studies, while in economics the topic is often set aside. The thesis incorporates this task. Alas the actual economic value of known false prediction rate is not described. There is only a very brief introduction to this topic. Author can describe some extreme scenarios during the defence, which would depict importance of this metric.
Tables 9-11 are very extensive, but they are described rather briefly in the text, tier classification of different variables is rather short and should be extended with respect to other researchers (e.g. Z-Score equation).
Although the author used a rather unique output using precision-recall curves, he missed the opportunity to thoroughly discuss their meaning and importance in relation to researched topic. The author mentioned full data sample curve is different for two and three year horizon, but did not include any discussion.
A final discussion could be more thorough and punctual e.g. conclusions based on testing of hypotheses could have been linked with more sources. There is a part, where author confronts his

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results with other scientific literature and business practices (in chapters 6.2.2. and 6.2.3), but mentioned remarks are rather hidden and does not conform to structure of the thesis. Alas this part is omitted in a final conclusion, which can hamper overall impression. Mentioned drawbacks could be improved during defence.

Manuscript Form:

A form of the work achieved a high standard, but it could be improved. There are missing some abbreviations in the list (AUC, ROSE, SMOTE, CART, TN etc.). Altman Z-score equation is missing its numbering and a style of tables is inconsistent e.g. table 1 and table 7.
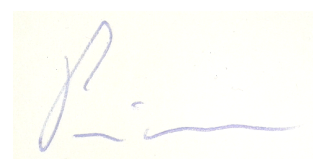
In the case of successful defence, I recommend "výborně" (excellent, 1). While the contribution of the work the author revealed to me during various discussions, it was not fully reflected in the work. I recommend that student should focus on his way through researched topic and should describe various stages of his research and uniqueness of his findings. He can describe thoroughy his work on data set analysis and economic reasoning.

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

CATEGORY		POINTS
Literature	*(max. 20 points)*	19
Methods	*(max. 30 points)*	25
Contribution	*(max. 30 points)*	23
Manuscript Form	*(max. 20 points)*	18
TOTAL POINTS	*(max. 100 points)*	**85**
GRADE	**(1 – 2 – 3 – 4)**	**1**

NAME OF THE REFEREE: MICHAEL PRINC

DATE OF EVALUATION: **6.9.2017**

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                    Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

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

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

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

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 POINTS	GRADE		
81 – 100	1	= excellent	= výborně
61 – 80	2	= good	= velmi dobře
41 – 60	3	= satisfactory	= dobře
0 – 40	4	= fail	= nedoporučuji k obhajobě