

Assessment of Master Thesis – Academic Consultant



Study programme: **Quantitative Methods in Economics**

Field of study: **Quantitative Economic Analysis**

Academic year: **2019/2020**

Master Thesis Topic: **Logistic regression in R**

Author's name: **Alicem Karaca**

Ac. Consultant's Name: **Mgr. Milan Bašta, Ph.D.**

Opponent: **doc. RNDr. Ivana Malá, CSc.**

	Criterion	Mark (1–4)
1.	Are the topic and objectives of the master's thesis comprehensive?	3
2.	Have the defined objectives been fulfilled?	3
3.	Does the thesis have a logical structure and is there cohesion between the different parts?	3
4.	Is the current level of knowledge described in a relevant way?	2
5.	Are the methods chosen appropriate for the solution of the problem and in their application?	3
6.	Are the results of the thesis sufficient in their extent, quality and precision?	3
7.	Is the discussion of the thesis's results relevant and correct?	3
8.	Are the information sources correct and relevant?	3
9.	Is the grammar style, terminology and overall formal and graphic level the master's thesis adequate?	3
10.	Did the student work independently on the master's thesis?	1

Comments and Questions:

The goal of the thesis is to introduce the theory of logistic regression and to apply it in the study of job security issues. I appreciate the student's apparent effort he has put into the theoretical and practical part of the thesis. On the other hand, I have several comments related to the content.

1. Even though I appreciate to some degree that the author has written a lot on job security and related issues in Chapters 1 and 2, the text is rather cumbersome, very difficult to understand and does not generally read well. For example, the definition of the notion of job security in the introductory parts is vague and unclear, see e.g. the following unclear formulation: "According to another definition related to job security in a broad sense, it covers all the measures that allow the employee to lose his/her current job more or to reduce the risk of destruction or risk to work if he/she loses his/her job." A similar style of writing is abundant in the sections on job security. The structure of the text is very difficult to follow, some paragraphs and sections being glued together rather forcibly. The wording and content is somewhat repetitive. Moreover, the text on the issues related to job security is unnecessarily extensive given the fact that the major topic of the thesis is logistic regression.
2. The introduction to logistic regression is also flawed. For example, the second and third point at the start of Section 3.1 on page 21; or the listed conditions which must be met in a classical linear regression; or the definition of odds and odds ratio. Further, no error term should be present on the right hand side of Equation 2, etc., etc.. Even the introductory sentences to the mathematical background of logistic regression (in Section 3.3) are not comprehensible, see e.g.: "... Both theoretical and experimental studies showed that while the dependent variable has two results, the π ($1 - \pi$) shape of the response function will be S or inverse S." It is obvious that the author does not have much experience with writing of mathematical text. Even though the text addresses all the major aspects of logistic regression (model formulation, parameter estimation, inference, model selection, assessing the model performance) it does so in a rather unwieldy, flawed and unskilled manner. I doubt a reader not acquainted with logistic regression would be able to figure out how logistic regression works based on the text.

3. I do not exactly understand the role of section 4.1 "Importance of research" and section 4.2, "Scope and limitations of research". In section 4.3 Reliability analysis is mentioned, but it has never been explained before what it involves. The meaning of Table 1 on page 32 is not exactly clear. I am not sure how the scales for job security satisfaction, organizational commitment and job stress have been created. Given the fact that a lot has been written about matters related to job security in the first parts of the thesis, I miss a more detailed practical interpretation of the results of the logistic regression ('Are the estimated parameter signs in agreement with the theory?', 'What are the detailed interpretations of the estimated parameters?' 'What are the effect sizes?', 'What is the practical interpretation of the shape of the ROC curve? What does the shape tell us?', etc.). As was the case in the previous chapters, the structure of the practical part of the thesis is rather disorganized and the text is not friendly to readers.

The student cites a large amount of literature. But there are some mistakes in the way some resources and literature are cited. Specifically, citation of some secondary sources seems to be missing (in these situations student cites only primary sources – but both the primary and secondary sources should be mentioned).

I would like to ask the student to answer the following questions during the thesis defence.

1. Would you please explain the notion of odds, logit and odds ratio.
2. Please, interpret the shape of the ROC curve. What does it tell us?
3. Could you please explain how the scales for job security satisfaction, organizational commitment, job stress and intention of job leave have been created.
4. Compare classical linear regression and logistic regression. What are the differences and what are the similarities? Under what conditions would you advocate to use linear regression and under what circumstances would you advocate to use logistic regression?

In summary, Alicem Karaca has proven to be able to run a logistic regression model on an interesting data set. However, the analysis as well as the text itself is written in a very unskilled fashion, being disorganized and very difficult to follow for a reader. I recommend the thesis for the defence and propose grade 3 (= good) for the thesis.

Conclusion: The Master Thesis is recommended for the defence.

Suggested Grade: **3**

Date: 17/01/2020

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