Report on **Bachelor / Master Thesis**

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

Student:	**Bc. Magdaléna Raušová**
Advisor:	**Prof. RNDr. Jan Ámos Víšek, CSc.**
Title of the thesis:	**The least weighted squares and its asymptotics**

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

The thesis is an extensive work dealing with robust econometric methods. Its main focus is on derivation of asymptotic representation of LWS estimator under the assumption of heteroskedasticity. Overall, the thesis attempts to provide complete text of robust methods that have been previous to the main concept of the thesis.

Following the introduction, the second chapter of the thesis provides an exhaustive overview of robust methods. This review is well and systematically written starting an explanation of problem of outliers and leverage points and continues to advanced robust methods.
- Although the overview is extensive, sometimes a better motivation for some sub-sections is missing, as for the section 2.4 LWS for panel data, because the thesis further considers only cross-sectional data.

The third and fourth chapters are key parts of the thesis. Chapter 3 contains the asymptotic representation (AR) of LWS. This is done in a great detail with all necessary proves and definitions that had to be understood before the derivation itself.

Chapter 4 consists of a simulation study of the derived estimator, which is compared to the classical OLS estimator and the LWS estimator. The simulations are done under homoskedastic and heteroskedastic error and the main comparison is done for different levels of contamination of data by outliers and leverage points. Even a very small amount of data contamination shows the OLS is inappropriate. Furthermore, the AR of LWS performs better in comparison to LWS when contamination gets above some threshold.
- A small limitation of the thesis is that only the level of contamination changes in the setup. As stated in the text, the choice of weight function is more crucial for asymptotic representation than when we just need a reliable LWS estimator. A suggestion could be to change another "parameter" in simulations such as the weight function. How good the performance of AR would then be in comparison to LWS?

Minor manuscript comments:
- I would recommend to be more careful about use of abbreviations such as "e.g." and "i.e.". For instance, p. 97., there is a sentence starting by I.e. – *"I.e. the LWS estimator…"*.
- It would be helpful to have legends in figures, then one did not have to remember what colour a density function has, for example.

Suggested questions for the defense could be:
- Would the asymptotic representation in your case beat the LWS when there was used a smaller sample size in the simulations?
- Why does the matrix X in the simulation study contains 5 variables? Is it somehow crucial for your study to have higher/lower dimensional X-matrix?

In the case of successful defense, I recommend the grade **"výborně" (excellent, 1)**.

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

CATEGORY	POINTS
Literature *(max. 20 points)*	20

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Methods	*(max. 30 points)*	30
Contribution	*(max. 30 points)*	25
Manuscript Form	*(max. 20 points)*	15
TOTAL POINTS	*(max. 100 points)*	**90**
GRADE	**(1 – 2 – 3 – 4)**	1

NAME OF THE REFEREE: Mgr. Luboš Hanus

DATE OF EVALUATION: September 5, 2016

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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