

Opponent's Report on Dissertation Thesis

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Title of the Thesis:	Metody robustní ekonometrie s aplikacemi na ekonometrická data Methods of Robust Econometrics with Application to Economic Data
Type of Defense:	DEFENSE
Date of Pre-Defense	March 17, 2011
Opponent:	Doc. RNDr. Petr Lachout, CSc.

Address the following questions in your report, please:

- a) Can you recognize an original contribution of the author?
- b) Is the thesis based on relevant references?
- c) Is the thesis defensible at your home institution?
- d) Do the results of the thesis allow their publication in a respected economic journal?
- e) Are there any additional major comments on what should be improved?
- f) Were your comments raised at the pre-defense, addressed in the dissertation submitted to the regular defense? (The pre-defense report is enclosed below)
- g) What is your overall assessment of the thesis? (a) I recommend the thesis to be defended without major changes; (b) The thesis is not defensible.

(Note: The report should be at least 2 pages long.)

Content of the Report:

- Can you recognize an original contribution of the author?
The thesis contains original results of the author which are already published.
- Is the thesis based on relevant references?
The thesis refers relevant papers and books.
- Is the thesis defensible at your home institution or another respected institution where you gave lectures?
The thesis is defensible at each institution with economic and/or econometric orientation.
- Do the results of the thesis allow their publication in a respected economic journal?
The thesis is compound from three papers which are already published.
- Are there any additional major comments on what should be improved?
I have no major comment concerning to improvement of the thesis.
- What is your overall assessment of the thesis?
I recommend the thesis to be defended without major changes.

See enclosed separate sheets for my report and comments.

Date:	
Opponent's Signature:	
Opponent's Affiliation:	Doc.RNDr. Petr Lachout, CSc. Katedra pravděpodobnosti a matematické statistiky Sokolovská 83, 186 75 Praha 8 tel: 221 913 287, fax: 222 323 316 e-mail: kpms@mff.cuni.cz

Enclosure: Opponent's Report from the Pre-Defense



Referee report on the thesis

Eva Michalíková

Methods of Robust Econometrics with Applications to Economic Data

The submitted thesis deals with robust econometrics methods and their applications to real economic data. The thesis is compound from three author's published papers. In each paper a particular economic data are analyzed. The considered data sets possess structure of panel data, therefore, a strong heterogeneous pattern must be expected. Also outliers can occur either as atypical individuals or as gross errors. Hence, the traditional techniques of estimation are encumbered with unpleasant biased. This inconvenience is overcome with methodology of robust estimation. The idea was suggested and developed to prevent influence of outliers, i.e. observations atypical for the investigated data set. These techniques are well-developed nowadays and there exist many of robust estimators: e.g. M-, Z-, GM-, L-, R- estimators. Also, the Least Trimmed Squares (LTS) estimator belongs in the class of robust estimators. It is very efficient in suppressing of outliers because of its high breakdown point reaching 50%.

LTS-estimator is employed in the thesis as a parameter estimator and, also, as a diagnostic tool for outlier detection.

This thesis consists of three parts based on published scientific papers.

The first part discusses Determinants of Foreign Direct Investment (FDI) in Czech Manufacturing Industry. Czech manufacturing industry is observed by eyes of a foreign investor who intends an investigation here. The investor analysis leads to decision to realize an investment in the Czech Republic or not.

The study deals with 23 sectors of manufacturing industry between years 2000 and 2008. The author employed the linear regression model

(3), p.21, to properly describe FDI. The model includes cross-dependences which can caused bias of straightforward estimators. This disadvantage of (3), p.21, can be overcome by the first differentiation. Thus, the model (3), p.21, is converted to the model (4), p.21, which is used in the thesis. Finally, the thesis assumes a linear regression model where increment of FDI is expressed as a linear function of increment of lagged FDI and increments of capital per labor, profit per labor, R&D, energy intensity, wages, PPI, TFP, RULC, Balassa index. The regression coefficients are estimated using ordinary least squares estimator (OLS), generalized method of moments (GMM) and fixed effects estimator (FE). Reached evaluation of estimators is expressed in Table 3.

LTS estimator is used to determine outliers, i.e. industry branches showing atypical behavior. Here, the industry 2 (tobacco) was indicated by LTS. The branch was excluded and a final analysis was done, see Table 4. A results comparison and discussion is made in the next subsection.

The second part of the thesis considers The Factors of Growth of Small Family Businesses. The aim is to quantify influence and importance of factors associated with the growth of micro and small businesses in European economies. The author analysis panel data of employment and net production in 28 European countries between 2002 and 2008.

The situation is described by the fixed effects panel data model (1), p.41. The growth is related to employment, increment of enterprises and some institutional variables. Model (1), p.41, is centered by empirical mean separately for each country. Thus, the author determines model (2), p.42, without fixed country effects. Actually, the country effects α_i are estimated by empirical mean for each particular country. Application of OLS estimator to the model (2), p.42, is giving so called within-group estimator.

Influence of outliers is suppressed centering the model by medians instead of means. Hence, the country effects α_i are estimated by empirical median for each particular country. Parameters of the model are estimated using LTS-estimator.

The author's method (followed idea) is characterized by centering by median (instead of mean) and estimating via LTS-estimator (instead of OLS).

Two categories of small business are distinguished in the thesis: micro (1-9 employees) and small (10-50 employees). The results reached by LTS-estimator in robust centered model are presented in Table 2, p.57. A results comparison and discussion is made in a separate section.

The third and last part of the thesis considers Credit Support for Export: Robust Evidence from the Czech Republic. This part evaluates importance of Czech exports to particular countries. The research is based on unbalanced panel data of 160 countries between 1996 and 2008. In this section of thesis, two gravity models are considered: static and dynamic. Static model is expressed as a linear regression model. Dynamic model is defined by (1)+(2), p.79, and is reformulated in (3), p.80. OLS estimator in (3), p.8, is inconsistent because of inner dependencies. Therefore, the first differences are included in the model which is formulated as (4). Static model is estimated by (FE) and dynamic by (GMM). The results are presented in Table 4, p.82.

Again, the LTS-estimator used for detection of atypical countries. After exclusion of detected outliers a final analysis was done. Six cases for exclusions are distinguished in dependence on criterion for countries exclusion: denotation in Tables 5 and 6 is 1a, 1b, 1c, 2, 3a, 3b.

The thesis contains original results of the author which are already published in three scientific papers. That proves significant scientific level of the work.

The author removed all of my remarks from my referee report for small defense. Therefore, I can suggest a defense of the submitted thesis.

May 4, 2012

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Referee report on the thesis

Eva Michalíková

Methods of Robust Econometrics with Applications to Economic Data

The dissertation thesis is devoted to robust econometrics methods and their applications to real economic data. The thesis collects three author's published papers in one packet. In each paper a particular economic data are analyzed. The considered data sets possess structure of panel data, therefore, a strong heterogeneous pattern must be expected. Also outliers can occur either as atypical individuals or as gross errors. Hence, the traditional techniques of estimation can yield biased results. For such a case, methodology of robust estimation was suggested and developed. The idea is to prevent influence of outliers, i.e. observations atypical for the investigated data set. These techniques are well-developed nowadays and there exist many of robust estimators: e.g. M-, Z-, GM-, L-, R- estimators. Also, the Least Trimmed Squares (LTS) estimator is a representative of the class of robust estimators. It is very efficient in suppressing of outliers because of its high breakdown point. LTS-estimator is employed in the thesis as a parameter estimator and as a diagnostic tool for outlier detection.

This thesis consists of three parts.

The first part of the thesis discusses Determinants of Foreign Direct Investment (FDI) in Czech Manufacturing Industry. Analysis looks to Czech manufacturing industry by eyes of a foreign investor who intends an investigation here. The study deals with 23 sectors of manufacturing industry between years 2000 and 2008. The author decided for the linear regression model (3), p.21, to properly describe FDI. The model includes cross-dependences which can cause bias of straightforward estimators. This disadvantage of (3), p.21, can be overcome by the first differentiation. Thus, the model (3), p.21, is converted to the model (4), p.21, which is used in the thesis. Finally, the thesis assumes a linear regression model where increment of FDI is expressed as a linear function of increment of lagged FDI and increments of capital per labor, profit per labor, R&D, energy intensity, wages, PPI, TFP, RULC, Balassa index. The author employed ordinary least squares estimator (OLS) and generalized method of moments (GMM), see Table 3. Moreover, there is a middle column denoted by FE, but, I do not understand what it is. Then, LTS estimator is used to determine outliers, i.e. industry showing atypical behavior. Here the industry 2 (tobacco) was indicated by LTS. The industry 2 was excluded and a final analysis was done, see Table 4. A results comparison and discussion is made in a separate section.

The second part of the thesis considers The Factors of Growth of Small Family Businesses. The aim is to quantify influence and importance of factors associated with the growth of micro and small businesses in European economies. The author analysis panel data of employment and net production in 28 European countries between 2002 and 2008. The situation is described by the

fixed effects panel data model (1), p.41. The growth is related to employment, increment of enterprises and some institutional variables. Model (1), p.41, is centered by empirical mean separately for each country. Thus, the author receives model (2), p.42, without fixed country effects. Actually, the country effects α_i are estimated by empirical mean for each particular country. Application of OLS estimator to the model (2), p.42, is giving so called within-group estimator.

To prevent influence of outliers the author centered the model by medians for each particular country. This means that the country effects α_i are estimated by empirical median for each particular country. Surprisingly, the robust centered model is not marked by any number. Parameters of the model are estimated using LTS-estimator.

The author's method is characterized by centering by median (instead of mean) and estimating via LTS-estimator (instead of OLS).

Two categories of small business are distinguished in the thesis: micro (1-9 employees) and small (10-50 employees). The results reached by LTS-estimator in robust centered model are presented in Table 2, p.57. A results comparison and discussion is made in a separate section.

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The author used LTS-estimator to detect atypical countries. After excluding detected outliers a final analysis was done. Six cases for exclusions are distinguished in dependence on criterion for countries exclusion: denotation in Tables 5 and 6 is 1a, 1b, 1c, 2, 3a, 3b.

My comments:

1. The definition of the estimator GMM should be recalled in the thesis.
2. Abbreviation FE used in Table 3, p.24, is not explained in the text.
3. I do not understand columns of Table 3, p.24. OLS and GMM are estimators and abbreviation FE could mean Fixed Effects Model which is a model specification. Therefore, I am puzzled because I expect that FE should be an estimator, too.
4. The model using robust centering by the median (p.42) is not numbered.
5. It is a bit inconvenient for the reader that numbering of formulas and tables is repeated.
6. Misprints:
 - 'cearly' - in the page with acknowledgment
 - Wrong description of Table 3, p.60.

The thesis contains original results of the author which are already published in three papers. That proves the significant level of the work.

Finally, I suggest a defense of the submitted thesis if the procedures GMM and FE has been conveniently explained.

March 11, 2011

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