

Report on Bachelor Thesis

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

Student:	Bc. Jindřich Matoušek
Advisor:	PhDr. Lubomír Cingl
Title of the thesis:	An Experimental Test of Design Alternatives for Spectrum Auctions with Communication Channels

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

The thesis submitted by Jindřich Matoušek aims at experimentally testing various alternatives of auction designs within the oligopoly market structure, especially focused on elaborating the situation where the auction participants are able to communicate to one another and therefore having opportunity to collude. It is motivated by the current Czech Telco market that experienced two rounds of large spectrum auctions in the recent past. Unfortunately, none of these auctions ended up successfully and according the regulatory body expectations, making the research highly relevant and also of considerable practical importance.

The thesis is an exceptional piece of work, compared to other works at the IES FSV UK I had opportunity to evaluate in the past. The text of the thesis itself is only a fragment of a thoughtful and (on the master level) surprisingly well-executed research effort consisting also of a successful grant application, mastering and programming the experimental software, conducting a large and professionally designed human experiment with 96 subjects, and statistically and econometrically elaborating a large set of resulting experimental data.

From my personal point of view and academic experience, there is one specific aspect making a thesis defensible which is the formal correctness and one main aspect for a thesis to be successful which is a contribution to the field. I am pleased to summarize at the very beginning of this report that the author managed both aspects well and I especially appraise the originality and contribution to the field as exceptional. Therefore, based on the quality of the entire thesis I can honestly suggest the highest grade ("1". i.e. "excellent").

The extent of the thesis which is 68 pages of the text ranks the work to a group of rather longer theses, which, however, does not detract from its clear focus and quality. The aim, structure, working hypotheses, and conclusion are very clearly stated and carefully elaborated. The text of the thesis is supplemented by additional 23 pages in the Appendix. I especially welcome this separation of experimental design information and additional econometric results as not crowding of these to the main body of the thesis makes it well-arranged and the text generally reads very well.

Within the Introduction, the real auction importance and its main aspects (tangible possibility of collusion, results different than theoretically predicted) are stated together with the overview of the Czech Telco market situation around 2012 and 2013 as the main motivation for the experimental research. The goal of the thesis is to study four specific complex auction formats - two (Simultaneous multi-round [SMR] auction and Simultaneous multi-round package bidding [SMRPB] auction) with basic setting and two with presence of a communication channel - and compare the experimental results with those theoretically predicted in the form of working hypotheses.

In the second chapter the very detailed insight into the Czech Telco market situation and two rounds of the mobile frequency spectrum intervals auctions is offered to the reader. Here I have to comment on one sentence on page 10: "Without assessing if this is right or not...". I would expect a more economic term here than the normative "right".

The third chapter provides an extensive review of the experimental literature related to the topics of the multi-unit auction formats and the communication within those formats. The thesis is based on the most recent research findings (even papers from 2013 are considered as methodological sources).

Chapter 4 outlines the methodology, i.e. the experimental design, model specification, model parametrization, and working hypotheses. What is the most important to say is that author sets the experiment so that it utmost resembles the Czech market situation. To be honest, as a reader touching

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an experimental topic for the very first time, the level of detail and the vast quantum of information contained in this chapter (and in the entire thesis in general) exceeds to a great extent my cognitive capacity and I am often not able to distinguish between the crucial and the subsidiary piece of information in the text. What I have, on the other hand, appreciate the most is a very sophisticated system of working hypotheses on pages 34 and 35, giving the research very precise framework.

In the fifth chapter general procedure of the experiment is described. What seems crucial to me is the pilot version of the experiment in which the experimental setting was found impossible to use and the author had to reset some of parameters to make the experiment feasible.

The sixth chapter deals with the description of the statistical treatment of the experimental data. The main attention is paid to the statistical differences of individual variables between treatments and between different player types. Using two-sample t-tests together with the Wilcoxon-Mann-Whitney test the author concludes there are statistical differences not only between the experimental treatments, but also between the player types.

In Chapter 7 the econometric model is presented and evaluated using standard OLS method. Author had to deal both with the problem of multicollinearity of predictors and the non-normality of residuals. Finally, author suggests two resulting model specifications of relative efficiency to explain connections among variables.

The summary of the main findings (the eighth chapter) helped me a lot to ensure what are the main results of the two previous chapters. As I have already commented above, the vast quantum of very detailed information almost in every chapter hindered a bit my understanding of what is the main result and what is the supplementary piece of information. Also the tables with all results for each of all combinations are a bit difficult to interpret in their complexity. I understand that they are important for the researcher who has a perfect overview of the details of the research but to be honest, e.g. starting with table 17, I was very discouraged to explore also the details of table 22...

The overall results summarized in the Conclusion are of a considerable economic interest:

- allowing for communication (i.e. the collusion) resulted in generally better results and higher amounts of goods sold, i.e. it increased the efficiency of the auctions;
- the allocation worked much better under various collusive agreements among bidders;
- the simple SMR format brings the same efficiency as its more sophisticated SMRPB counterpart.

Details to the evaluation:

Literature:

Very well and extensively elaborated part of the thesis, the most recent papers used to set up the methodology, formal correctness of citations absolutely OK.

Methods:

Advanced, well chosen, greatly described. The experimental design and settings strongly surpasses requirements imposed on master level theses. The resulting experimental data well and carefully elaborated.

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Contribution:

The most distinctive feature of the whole work. The research topic is markedly original, highly relevant, and the main findings are of considerable practical importance with **several very clear and straightforward policy implications and recommendations.**

Manuscript form:

The aim, structure, working hypotheses, and conclusion are clearly stated and carefully elaborated. The work is well structured and formally meets the required quality of an academic text of this level. Moreover, the thesis reads well, which also deserves to be highlighted.

Nonetheless, there are several formatting deficiencies, typos, or systematic mistakes found in the format of the text which would deserve to be corrected, especially when author considers re-writing the text into a form of a research paper, e.g. (not exhaustive):

- the thesis is a joint work of a student and his supervisor. I do not understand why the singular nominative "I" instead of usual "we" form is used within the text;
- 58.54% (a dot, no space) is the correct English form, not 58,54 % (pg. 5 and many others);
- use a consistent format of commas before "and": both "A, B, C, and D" or "A, B, C and D" is possible, but you have to be consistent within the whole text, which you are definitely not;
- a "crazy" format of the citation (italic/non-italic) on page 8;
- the footnote figure should go after the sentence, not between the last word and the dot (almost every footnote);
- the destroyed formatting of Figure 2;
- two text sizes: pg. 12, second paragraph.

Suggested questions for the defense are:

In your experimental setting, what real features of the Czech Telco market were easy to design and what are the most controversial ones.

Are your main findings in accordance with microeconomics theory? If not, can you provide some explanation of how the subjects of your experiments distinguish from the microeconomic assumptions?

How did you deal with the issues of multicollinearity among predictors and non-normality of the residuals in the econometric part? Did your treatment altered results significantly?

Summary:

As large, **I do find this thesis exceptional in terms of originality, research effort, and contribution to the field.** The research effort behind the text of the thesis itself strongly surpasses the master level requirements imposed on students of the IES FSV UK.

I am very pleased **I can strongly recommend the thesis of Jindřich Matoušek to defense at the IES FSV UK. With no doubts, I suggest the grade "1". i.e. "excellent"**, and if Jindřich manages the defense procedure well, I kindly recommend the committee to consider **awarding the thesis with the "Dean's Award for an extraordinarily good masters diploma thesis"**.

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

CATEGORY	POINTS
<i>Literature</i> (max. 20 points)	20
<i>Methods</i> (max. 30 points)	30
<i>Contribution</i> (max. 30 points)	30
<i>Manuscript Form</i> (max. 20 points)	16
TOTAL POINTS (max. 100 points)	96
GRADE (1 – 2 – 3 – 4)	1

NAME OF THE REFEREE: Jiří Kukačka

DATE OF EVALUATION: 22. 6. 2014

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