

Report on Master Thesis

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

Student:	Ladislav SOBOTKA
Advisor:	Ondřej STRECKER
Title of the thesis:	Capacity remuneration mechanisms and the optimal electricity market design

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

The thesis contributes to the discussion concerning the optimal design of the electricity market. The topic is very well chosen as the European power market is currently going through a significant transformation and the issue of a new design and potential implementation of the capacity remuneration mechanisms is currently one of the major ones. At the beginning, the author formulates three hypotheses regarding the existence of the "missing money problem", possible solution in form of the capacity remuneration mechanisms and optimality of one particular design. All of these questions are certainly highly relevant. (Just a small note: we cannot "prove" a hypothesis as the author states several times in the chapter 6, we can only reject or fail to reject it.)

Unfortunately, the quality of the work is somehow below expectations. The inconsistency starts already in the introduction where the thesis is structured in 4 chapters whereas there are six in the reality. There are some czech comments in the text (probably from the proof-reading, i.e. p. 14, 27, 32, 36) which give the impression of reading a working draft rather than a final version. Talking about the style, there are also some inconsistencies in the formatting, as for example the titles which are sometimes centered, sometimes aligned to the left (p. 21), number of chapters sometimes with, sometimes without the dot after the final digit (p. v), or the bibliography references, where sometimes the whole reference is in brackets (p. 6), sometimes only the year (p. 7), sometimes there are no brackets at all (p. 8) and sometimes there is not even the year (p. 31). Many typos and some grammar faults do not improve the overall impression.

Even if there is no chapter dedicated to the literature survey (however, there is a discussion of results), the author proves in the text that he knows the relevant and recent literature. The big problem is that that several times the author refers to a literature in the text which is not mentioned in the bibliography which makes impossible to get to the sources. (ex. Pellini, 2006; Sensfuss, 2007; Ecofys, 2012; Madrigal, 2000; Nicolosi, 2012; Araoz, 2011; Beltran, 2008; Min, 2008;...) Even when the bibliography item is present, it sometimes contains errors (e.g. Cailliau et al. was published in 2011 instead of 2007, moreover there is a typo in the publisher's name).

There are some more serious problems with the contents and the methodology:

- The optimization problem in the chapter 5.3.2 which is used to test the first hypothesis is incorrectly formulated. There has to be at least one more constraint relating the variable q with z . Otherwise, z would be always zero, which does not make much sense while testing the hypothesis.
- The formulation of the problem does not seem to be adapted for the specific case of the study, as the author works only on the level of technologies and not with individual plants.
- There are some errors (or typos) in the explanation of the Semi-Lagrangean Relaxation (chapter 5.3.3): in the first equation, the variable x is missing; in the third equation, the intersection should be probably with the set of integers and not the matrix A ; in the fifth equation, shouldn't be u and λ identical?

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- One of the main objections is that the optimization problem for testing the other two hypotheses is not formulated. In subchapters 5.3.4. - 5.3.6. we can only see the expression for the corresponding capacity remuneration mechanism but we do not know how is it related with the original optimization problem as presented in 5.3.2. and what exactly is being optimized. Therefore, the results are sort of a black box.
- This makes the interpretation of results somehow unclear. For example, in the chapter 5.3.4. it is stated that the capacity payment is implemented with the annual payment of 28 EUR/kW as a default setting while in the chapter 6 (Results), these 28 EUR/kW are interpreted as cleared price. So is it the default setting or a result from the optimization?
- The Figure 2.2 (p. 7) certainly does not show the merit order and the source is not the presented one.
- In the chapter 2.4 (p. 9) the share of retail price attributed to the wholesale power (81,3 EUR/MWh) is overestimated as later, in the chapter 5.2.1. (p. 28), even the author himself states the average baseload price in Germany close to 42,5 EUR/MWh. The first value probably contains other supply costs such as commercialisation. In general, for the purposes of the presented study the decreasing wholesale prices are far more relevant than the increasing retail prices.

To sum up, the author has certainly chosen a very relevant topic. He understands the problem and states the right hypotheses. However, the outcomes of the study would be much more valuable if the author dedicated more attention to a rigorous analysis and also to the manuscript form.

In the case of successful defense, I recommend “**dobře**” (satisfactory, 3).

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

CATEGORY	POINTS
Literature (max. 20 points)	15
Methods (max. 30 points)	13
Contribution (max. 30 points)	15
Manuscript Form (max. 20 points)	8
TOTAL POINTS (max. 100 points)	51
GRADE (1 – 2 – 3 – 4)	3

NAME OF THE REFEREE: Ondřej STRECKER

DATE OF EVALUATION: 03/09/2013

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