

Report on Bachelor Thesis

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

Student:	Matěj Kouřilek
Advisor:	RNDr. Michal Červinka, Ph.D.
Title of the thesis:	Walras Equilibria and emission allowances

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

The thesis concerns a very important and current research question: how will the currently proposed EU policy regarding the active control of total number and initial distribution of the emission allowances affect incomes of each EU country and price of electricity energy on energy markets?

In the first part of the text, Chapters 2 and 3, the author summarizes in a very clear way the current legal frame connected to emission allowances and a limit of CO₂ emissions on the global (worldwide) level and in the European context. The author also briefly describes the current EU trading mechanisms connected to emission allowances. In the second part, Chapters 4, 5 and 6, the author attempts to apply and calibrate by data of polluters in the Czech Republic energy production sector a static equilibrium model of electricity production which includes emission allowances in the form of a special production input, the total quantity of which is limited. The mathematical formulation and properties of the model have been established by other authors, however, the specific form of production cost function and suitable choice of parameters is due to the author of this thesis. The author provides numerical solutions of several scenarios, providing total amount of energy produced by the modelled market in the equilibrium, its corresponding price of the electricity energy, optimal redistribution of initial allocation of emission allowances and its price on the secondary market. Some of the achieved results could serve as a crude, nevertheless very relevant analysis of effects of decreasing amount of available allowances and decreasing amount of freely distributed allowances (scenario D attempts to model situation of 2020).

The presented model contains all sorts of simplifications. Some simplifications were introduced to compensate for incomplete knowledge of data. Many additional simplifications were caused by insufficient flexibility of the Walras-Cournot-Nash model proposed by authors of the source papers. For me, as a supervisor of this thesis and a co-author of one of these source papers, identification of weak parts of the general model and by-a-specific-application-motivated suggestions of generalization of the model serve as an additional valuable outcome of this thesis. Among others, the results of this thesis provide motivation for enhancements of the general model by introducing several types of rare resource (there is more than just one type of emission allowance), multiple primary products on the market (emission allowances are connected with energy production but also with heat energy production, production of steel and other materials), reflecting the auction-based trading etc.

Despite the considered simplifications, I am truly amazed by the remarkable accuracy of resulting prices of electricity energy and of emission allowances based on the proposed model (scenario A) in comparison with the corresponding officially reported prices in 2014. The only shadow which clouds my overall very positive assessment of this thesis are frequent misprints and imperfect English. These, however, at least in my opinion, do not influence the readability of the manuscript in a significant way. Moreover, I am not aware of any misprint which would render the model or presented mathematical tools as wrong.

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

CATEGORY	POINTS
<i>Literature</i> (max. 20 points)	19
<i>Methods</i> (max. 30 points)	30
<i>Contribution</i> (max. 30 points)	30
<i>Manuscript Form</i> (max. 20 points)	15
TOTAL POINTS (max. 100 points)	94
GRADE (1 – 2 – 3 – 4)	1

NAME OF THE REFEREE: Michal Červinka

DATE OF EVALUATION: June 7, 2016

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