

Report on Bachelor Thesis

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

Student:	Dominik Vach
Advisor:	PhDr. Martin Gregor, Ph.D.
Title of the thesis:	Spatial agent-based models of common pool resources

This microeconomic thesis analyzes a static game where two competing agents extract a spatially distributed resource. For economics, analysis of the optimal locations helps to understand how exogenous parameters affect *convergence* or *divergence*, that is, it finds determinants of spatial competition or spatial segregation. From that perspective, the thesis is part of the broader literature which moves competitive situations into space and thus is more related to the analysis of spatial competition as such (as known in industrial organization) than to the standard issues related to resource economics, such as the dynamic rate of extraction.

Dominik Vach looks into three dimensions of the competitive extraction: (i) existence or non-existence of corners (i.e., spatial a/symmetry), (ii) uniform or non-uniform distribution of resource, and (iii) complete or incomplete information about the distribution. Instead of borrowing heavily from the literature, he has decided to analyze the problem from scratch. From that perspective, the thesis is an exercise which demonstrates his ability for the independent analytical work in well-defined settings, rather than the ambition to provide minor novel results on the existing research boundary in more complex settings.

There are two main chapters. Chapter 3 analyzes theoretically competition in 1D-space (a line segment and a circle). What I especially like is the general analysis of the local stability for a general distribution. Also, comparative statics based on Figure 3.7 is interesting for the applications.

Chapter 4 looks into the incomplete information, where the agent interprets the unobserved distribution by means of a specific (non-Bayesian) heuristic. This chapter analyzes both single-player and two-player optimal locations in both 1D and 2D spaces. Several simulations are run; the simulation of competition in 2D-space is especially novel as the author selects a square with one pair of opposite edges passable. This particular space is interesting as it combines existence of corners in one dimension (impassable edges) with non-existence of corners in the other dimension (passable edges).

My overall judgment of the thesis is positive. Albeit the analysis is sometimes cumbersome and would benefit from being more connected to the general analysis of spatial competition, I appreciate that the consistent structure begins with analysis of the simplest cases, and then proceeds to more complex derivations and simulations. I would only focus on clearly separating the less important parts from the key parts, and provide further economic intuition and interpretation of the results, perhaps in some applied situation such as a fishery problem.

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

CATEGORY	POINTS
<i>Literature</i> (max. 20 points)	16
<i>Methods</i> (max. 30 points)	28
<i>Contribution</i> (max. 30 points)	26
<i>Manuscript Form</i> (max. 20 points)	20
TOTAL POINTS (max. 100 points)	90
GRADE (1 – 2 – 3 – 4)	1

NAME OF THE REFEREE: *Martin Gregor*

DATE OF EVALUATION: *May 27, 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