

Report on Bachelor / Master Thesis

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

Student:	Jan Vainer
Advisor:	PhDr. Jiří Kukačka, Ph.D.
Title of the thesis:	Extending Hotelling's location model into Agent-based domain

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

Please provide your assessment of each of the following four categories, summary and suggested questions for the discussion. The minimum length of the report is 300 words.

Contribution

This thesis deals with an advanced topic for the bachelor's degree. It evaluates the consequences of violation of assumptions in Hotelling's location model by simulation of an agent-based model where agents adapt to market conditions by the reinforcement learning. The problem of unrealistic assumptions in theoretical models is broadly discussed in the literature, and similar research works try to answer by different means the question of what happens when the assumptions are relaxed.

Methods

The methods to answer the research question are correctly and clearly described. Unfortunately, we cannot compare author's model simulation design with different research articles in the same field. Various parameters of the simulation are chosen arbitrarily without an explanation. I would suggest completing the text with the reasoning behind the choice of a number of time steps, number of repetitions, length of location set, etc.

Literature

The theoretical part broadly explains and reviews concepts that are relevant to the thesis (Hotelling's location model, different processes of learning, Nash equilibrium, etc.). The author works with relevant sources and quotes them accurately. However, the motivation for this work could be extended by citing few recent papers dealing with agent-based modelling, simulation of agent behaviour, or evaluation of consequences when assumptions of theoretical models are violated. Such examples can serve for at least two purposes. First, we could see that the research in this domain is rich, relevant to the theory, and appreciated. Second, the review of similar articles could open the discussion about the design of simulation experiment.

Manuscript form

The manuscript form is fulfilling the requirements for bachelor thesis. The text is well and comprehensibly structured and coherent. All the references to tables and figures are clearly stated. There is a minor problem with a location of Figures in Section 5. Figures are situated a bit further than mentioned in the text (2 pages delay). Next, the equations and variables are properly described. Finally, I have another minor remark, there is a repetitive typing error where the expression "it's" is used for possessive pronoun "its" that could worsen an understanding of the text.

Summary and suggested questions for the discussion during the defense

The thesis of Jan Vainer is high-quality work that employs advanced methods to answer an interesting research question. The work contributes significantly to the field of linking the theoretical concepts with real actors of the market. The manuscript is very well written and guide the reader through the whole problematic. I only miss the motivation for work with Hotelling's location model that is not mentioned in the thesis and perhaps would answer the question why this model is important, interesting, or useful for economic theory.

I would like to suggest a following question for the defense.

Since the parameters of the simulation are not reasoned in the text part (as mentioned above), I would like to ask what was the guidance to set the parameters to given numbers. By parameters I mean the number of time steps, the number of simulation repetitions, the level of a discount rate, the length of location and price set. Have you conducted any preliminary simulations to set these parameters?

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Next, how the change in parameters could influence the results of your experiments (in which direction)?

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

CATEGORY	POINTS
<i>Contribution</i> (max. 30 points)	30
<i>Methods</i> (max. 30 points)	29
<i>Literature</i> (max. 20 points)	17
<i>Manuscript Form</i> (max. 20 points)	20
TOTAL POINTS (max. 100 points)	96
GRADE (A – B – C – D – E – F)	A

NAME OF THE REFEREE: Šarlota Smutná

DATE OF EVALUATION: 3.6.2018



Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
30	15	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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
30	15	0

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
20	10	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.*

<i>Strong</i>	<i>Average</i>	<i>Weak</i>
20	10	0

Overall grading:

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F