Report on Master Thesis

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

Student:	Bc. Oskar Gottlieb
Advisor:	RNDr. Martin Šmíd, Ph.D.
Title of the thesis:	Comparison of continuous and frequent batch auctions

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.

The thesis concerns markets with three types of agents – zero intelligence tranders, market makers (both being the so-called slow traders) and a latency arbitrageur (the so-called fast trader) - and their interactions in continuous trading and frequent-batch auctions. The thesis presents results of extensive simulations of a market with various settings of innitial parameters of the market clearing mechanisms.

Contribution

The author focuses on a rather hot debated topic and reacts to up-to-date results in the correponding community (usually no older than two years). Although I find the early parts of the thesis rather technical and sketchy and I recommend to be perhaps a little more considerate of a reader not fully familiar with the presented types of auctioning, the part involving authors numerical experiments and presentation of his novel findings is certainly very impressive. I'm quite sure the author and his supervisor consider publishing the results in an international journal targeted to a community of scientists interested in high frequency trading.

Methods

From a mathematical point of view the author uses adequate methods for his level of studies. However, he demonstrates rather remarkable computer-coding skills to obtain the presented and discussed numerical results.

Literature

The use of literature is adequate, the literature review is very well integrated with the remainder of the text (unlike many other thesis where I find the literature reviewing chapters rather artificial-like) and I find no significant shortcoming in this perspective.

Manuscript form

From the language point of view, I would recommend a further proof-reading before considering submission to a scientific journal, with occasional typos and misprints which can be easily fixed. Some sentences use a bit too elaborate grammar structure and thus making the message slightly fuzzy and not very easily to grasp upon the first glance. Also, there are occasional typographical errors involving mathematical objects. Furthermore, some formulas involve an unusual notation which I find a bit confusing and umbiguous, e.g., there may be multiple ways how to read formula (4.10); if I understand it correctly, it concerns four different formulas for four disjoint sets of values of the variables, is that correct?

I appreciate the illuminating figures which, I presume, are mostly by the author himself. Overall, the graphical aspect of the thesis is very pleasing.

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Summary and suggested questions for the discussion during the defense

To summarize, this is a very well crafted manuscript and it is my pleasure to recommend this thesis to be awarded with grade A.

I suggest the following question to be posed during the defense.

1) In section 4.4 you mention that even for a continuous trading, the simulations involve models with discretized time and you refer to principles of the so-called discrete-event simulation. Could you elaborate on theoretical results supporting the convergence of numerical results of the discretized models to a continuous trading? How fast is such a convergence? What are the properties of the limit?

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

CATEGORY	POINTS
Contribution (max. 30 points)	29
Methods (max. 30 points)	29
Literature (max. 20 points)	19
Manuscript Form (max. 20 points)	15
TOTAL POINTS (max. 100 points)	**92**
GRADE (A – B – C – D – E – F)	**A**

NAME OF THE REFEREE: RNDr. Michal Červinka, Ph.D.

DATE OF EVALUATION: June 16, 2018

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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.*

Strong	*Average*	*Weak*
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.*

Strong	*Average*	*Weak*
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.*

Strong	*Average*	*Weak*
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.*

Strong	*Average*	*Weak*
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