

# Report on Master Thesis

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

<b>Student:</b>	<b>Rastislav Kisel'</b>
<b>Advisor:</b>	<b>Jozef Baruník</b>
<b>Title of the thesis:</b>	<b>Quoting behaviour of a market-maker under different exchange fee structures</b>

## **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**

The thesis is an original piece of work proposing an economic model that has a potential for the explanation of quoting behavior of a market-maker. The author proposed an original model based on self-exciting point processes that capture differences arising from different regimes and estimate these differences on limit order book data. The contribution is also in new estimation procedure proposed by the author, that is based on novel deep reinforcement learning. The author brings several interesting findings about the behavior of market-makers. The work is contributive to the market microstructure literature, and results are publishable in respected journal interested in these types of contributions (I do not doubt that Quantitative Finance journal would be interested in publishing the results after rearranging to the proper form of paper).

### **Methods**

The author proposed his own models based on his economic intuitions about the behaviour of market-makers. I must stress that although we have been discussing the ideas broadly and on a very regular basis, all ideas are original and independent work of Rastislav. While the work with microstructure data is technically demanding, Rastislav developed his own efficient packages that allowed large-scale simulations to understand the behavior of proposed models. Also, the developed code adapts proposed estimation frameworks and estimates the models on real data. From this perspective, Rastislav showed very strong command of the economic model building, statistics, econometrics, and also efficient programming (the main code is written in C++), and spend large amount of time with the work.

### **Literature**

Rastislav demonstrated a deep understanding of the literature and gives credit to all important as well as relevant studies. The author works with relevant literature properly and develops his own original ideas based on proper understanding of the previous literature. With this respect, Rastislav provided excellent work.

### **Manuscript form**

The text is logical, well written, connects findings to the existing literature well. Rastislav worked consistently to obtain the results for long period, and we have discussed the results and text on a regular basis during the year.

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## Summary and suggested questions for the discussion during the defense

In conclusion, I believe that during the work Rastislav proved himself to be an independent researcher, obtained interesting original results, mastered advanced techniques. Hence thesis deserves to be defended. In case Rastislav is confident in presenting the details of the work during the defense, and mainly present economic motivation, why he believes the results are important for us economically, as well as where he views his work in comparison to the current literature in finance, I suggest to award the work with grade "A" without doubts.

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

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

**NAME OF THE REFEREE:** Jozef Baruník

**DATE OF EVALUATION:** January 18, 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.*

<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