

Report on Master Thesis

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

Student:	Lukáš Petrásek
Advisor:	Jozef Barunik
Title of the thesis:	On the Utilization of Machine Learning in Asset Return Prediction on Limited Datasets

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 under review contributes to the growing literature that utilizes modern machine learning techniques in asset pricing. The main hypothesis of this literature is that machine learning techniques can help us in better understanding of the market behavior. This is promising route since large literature trying to search for best factor approximating the risks still have not come to a consensus and we are far from explaining the asset returns. Few researchers have recently gained considerable improvement using machine learning techniques. Consistent with the literature, Lukáš considers very broad selection of methods and try to replicate the promising results on restricted datasets. The main results point to the fact that contrary to the mainstream literature, machine learning is costly in tasks with limited datasets and may not bring desired improvements. Lukáš hence contributes to the literature with important empirical findings since inability to replicate the promising results questions usefulness of the complex and costly methodologies.

Methods

Lukáš works with large number of machine learning methodologies including elastic nets, random forests, or neural networks. All these methods require deep advanced knowledge far beyond the curriculum of the IES master program. Reading the thesis, one quickly learns how deeply Lukáš understands all the frameworks. It is important to note that the work required technical skills for completing all scripts for all the methods highlighting even more the level of understanding and effort he put into the thesis.

Literature

Working with such a wide spectrum of methodologies itself proves deep knowledge of literature. A short survey of most important concepts in each approach further shows confidence of Lukáš to build such a wide exercise.

Manuscript form

It is surprising how well Lukáš masters the text under so many methodologies, and concepts used. The text is logical, well written, connects findings to the existing literature well, and walks the reader through the results easily. Lukáš worked consistently to obtain the results for a long period, and we have discussed the results on regular basis during the year. The text itself could enjoy bit better care (for example formulations like „This reminds us to remind the reader of...” could be polished) but overall the quality is high.

Summary and suggested questions for the discussion during the defense

In conclusion, I believe that during the work Lukáš proved himself to be an independent researcher, and obtained results interesting to wider general finance audience. As a result of his hard work, we are able to read excellent piece of work. The thesis hence deserves to be defended without doubts, I suggest to consider grade „A“.

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

CATEGORY	POINTS
<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)	16
TOTAL POINTS (max. 100 points)	96
GRADE (A – B – C – D – E – F)	A

NAME OF THE REFEREE: *Jozef Barunik*

DATE OF EVALUATION: *Sept 4, 2019*

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