

# Report on Master Thesis

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

<b>Student:</b>	<b>Bc. Karolína Chalupová</b>
<b>Advisor:</b>	<b>doc. PhDr. Jozef Baruník, Ph.D.</b>
<b>Title of the thesis:</b>	<b>Can Machines Explain Stock Returns?</b>

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

### **Contribution**

The thesis contributes significantly to the area of finance. In the thesis, Karolína motivates the use of machine learning (ML) methods in finance. In the manuscript, she demonstrates the better performance of ML predictions, but more importantly, she identifies and interprets the effects that allow for these improvements. I see the contribution in the successful effort to understand the ML approach and explain in detail the results. It is important not to take these models as black boxes but to interpret the models' decisions. An excellent example is the local feature importance where any single prediction can be decomposed into the effects of individual features.

Results show that some factors are valuable only in the neural networks setting because of their non-linear nature. It is a clear advantage over the linear models. Overall, the networks help to find the most important drivers of stock returns such as financial constraints, behavioral biases of investors, risk of illiquidity and value effect.

### **Methods**

In the thesis, Karolína uses modern methods of neural networks. From the manuscript, it is clear that she understands and applies all the methods correctly. The description and interpretation of results are on very high level.

### **Literature**

Karolína uses relevant and modern literature in the field. Considering the work with literature, it is clear that Karolína understands the topic. In the manuscript she quotes appropriately. Moreover, the literature overview section is very well structured and written.

### **Manuscript form**

The manuscript has a standard form with a logical structure. The thesis is coherent, and important technical issues are clearly and fully discussed. It is also reader-friendly. The presentation, as well as a description of the results, is very good and intuitive.

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

To conclude, Karolína presents an excellent and mature piece of work. The quality and completeness of the analysis, as well as the manuscript form, are beyond the master thesis requirements. Furthermore, the presentation and discussion of results are on very high level. In my opinion, the manuscript is ready for submission to a good journal. The results of the Urkund analysis do not indicate significant text similarity with other available sources. I fully recommend the thesis for defense suggesting grade A.

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

CATEGORY	POINTS
Contribution (max. 30 points)	30
Methods (max. 30 points)	30
Literature (max. 20 points)	20
Manuscript Form (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:** Mgr. Lukáš Vácha Ph.D.

**DATE OF EVALUATION:** 26.1.2021

Digitálně podepsáno (26.1.2021)  
Lukáš Vácha

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**Referee Signature**

