Report on **Master Thesis**

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

Student:	Martin Randa
Advisor:	Ladislav Kristoufek
Title of the thesis:	Short-term electric load forecasting using Czech data

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

Please provide a short summary of the thesis, your assessment of each of the four key categories, and an overall evaluation and suggested questions for the discussion. The minimum length of the report is 300 words.

Short summary

This thesis focuses on the critical task of accurately forecasting electric load for reliable power grid operation. The author analyzes Czech electric load data and conducts three pseudo-out-of-sample forecasting exercises using standard econometric and machine learning methods. The results indicate that high-frequency load series is predictable and that the most accurate results are produced by averaging forecasts of a specified recurrent neural network and the seasonal autoregressive integrated moving average model.

Contribution

The thesis makes a significant contribution to the field of electric load forecasting by providing a comprehensive analysis of Czech electric load data. The author successfully applies both econometric and machine learning methods to this task, demonstrating their effectiveness in predicting high-frequency load series. The thesis also contributes to the literature by comparing the results of these methods to benchmarks, including the predictions published by the Czech transmission system operator. The proposed models outperform the models used by the official authority.

Methods

The methods used in this thesis are robust and well-executed. The author conducts three pseudo-out-of-sample forecasting exercises, demonstrating a thorough understanding of both econometric and machine learning methods. The use of a recurrent neural network and the seasonal autoregressive integrated moving average model for forecasting is particularly noteworthy.

Literature

The thesis demonstrates a full understanding of the existing literature in the field of electric load forecasting.

Manuscript form

The thesis is well-structured and clearly written. The author effectively communicates complex ideas and methods, making the work accessible to readers with varying levels of expertise in the field. The use of visual aids and clear, concise language further enhances the readability of the thesis.

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Overall evaluation and suggested questions for the discussion during the defense

Overall, this thesis is an excellent piece of academic work that makes a significant contribution to the field of electric load forecasting. The author demonstrates a deep understanding of both econometric and machine learning methods and applies these effectively to the task of forecasting electric load.

Suggested questions for the defense could include:

- Could you elaborate on the choice of using a recurrent neural network and the seasonal autoregressive integrated moving average model for forecasting?
- How might your findings inform future research in the field of electric load forecasting?
- Could you discuss any limitations or challenges encountered during your research and how these were addressed?

Turnitin uncovered no systematic issues.

In my view, the thesis easily fulfills the requirements for a Master's thesis at IES, Faculty of Social Sciences, Charles University, represents an excellent piece of scientific work and I happily recommend it for the defense and suggest grade A with an additional suggestion/nomination towards the excellence award.

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
TOTAL POINTS	*(max. 100 points)*	**100**
GRADE	**(A – B – C – D – E – F)**	**A***

NAME OF THE REFEREE: Ladislav Kristoufek

DATE OF EVALUATION: 15 June 2023

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Referee Signature