

Report on Bachelor / Master Thesis

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

Student:	Bc. Martin Řanda
Advisor:	prof. PhDr. Ladislav Křišťoufek, Ph.D.
Title of the thesis:	Short-term Electric Load Forecasting Using Czech Data

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

Short summary

The presented thesis concentrates on the accurate forecasting of electric load, which is crucial for reliable power grid operation. The author focuses on the Czech market and conducts three forecasting exercises using data of various granularity. Both standard econometric and machine learning techniques are employed, and the results of the analysis are contrasted with the predictions from the Czech transmission system operator. In several cases, the approach introduced in the thesis can outperform predictions published by the system operator.

Contribution

The recent energy crisis demonstrates the necessity to have accurate predictions about the future energy consumption. With the upcoming trend to generate the majority of the electricity from renewable resources, it is even more important to know how the consumption will look like in near future to prevent instability in the whole system. From this point of view, the thesis has a considerable contribution. Since the author uses quite unique data about electric load in the Czech Republic, there is a huge potential for real application of the results by ČEPS. My only critique in the thesis is structure of the presentation of results – the author starts with the minor analysis results and then goes to the main results (see, for example, the third paragraph on p.2 in the introduction or structure of chapter 6). I believe that the most important results should be discussed first and the rest later.

Methods

The thesis consists of some well-established methods in the literature, such as SARIMA and recently very popular machine learning approaches represented by regression trees and artificial neural networks. While it is sometimes hard to find a balance between the level of detail in the description of the method, I think that the author did a good job and described methods in sufficient detail. Overall, methods seem to be applied correctly, and I have no trouble trust the results.

Literature

The submitted thesis contains an adequate literature review. The author shows a good knowledge of the literature, works with it properly and explains all the concepts used throughout the thesis nicely.

Manuscript form

The submitted thesis is nicely written using proper language, and reads well.

Overall evaluation and suggested questions for the discussion during the defense

Overall, the presented thesis is a very nice empirical exercise concentrating on an important topic. The author did a good job of describing data and methods in sufficient detail and selecting the most important results. I think the thesis brings important empirical results that will be applied in practice sooner or later.

In my view, the thesis fulfills the requirements for a master thesis at IES, Faculty of Social Sciences, Charles University, I recommend it for the defense and suggest a grade A. The results of the Turnitin analysis do not indicate significant text similarity with other available sources.

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

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CATEGORY	POINTS
<i>Contribution (max. 30 points)</i>	29
<i>Methods (max. 30 points)</i>	28
<i>Literature (max. 20 points)</i>	19
<i>Manuscript Form (max. 20 points)</i>	20
TOTAL POINTS (max. 100 points)	96
GRADE (A – B – C – D – E – F)	A

NAME OF THE REFEREE: *František Čech*

DATE OF EVALUATION: *14.6.2023*

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.*

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.*

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

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.*

Overall grading:

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F