Report on **Bachelor / Master Thesis**

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

Student:	**Bc. Vít Kulhánek**
Advisor:	**Mgr. Roman Kalabiška**
Title of the thesis:	**The Impact of Vaccinations on the Development of the Covid-19 Pandemic**

***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

The presented thesis investigates what impact vaccinations against the Covid-19 disease had on the number of new cases, the number of hospitalizations and the number of deaths in the world as well as two selected countries – Czech Republic and Israel. The author uses a fairly comprehensive dataset with daily observations which covers most countries of the world since January 2020. This includes information about the number of partly and fully vaccinated perople over time. In the joint analysis, the author aggregated daily observations into monthly due to missing data, whereas in the country-specific analysis he uses daily observations. The thesis also includes an excess deaths analysis, which is interesting as an extention, and provides some scientific value to the core analysis.

Contribution

Although the analysis has several unknowns in terms of delay of the hospitalization after being possitively tested or the beginning of vaccination's effect etc, the results are very interesting to see. For example, I was suprprised that both part and full vaccination seem to have lower effect on the number of hospitalizations and deaths than I was expecting. Also the country-level analysis suggests a significant effect of climate. This might be a topic of its own. The contribution of this thesis is hugely limited by obvious factors outside of the author's control. For example, it is impossible to control for the mutation of the virus, or a specific type of vaccine which was designed to work against a certain variant of the virus, or to allow for the time variable, etc. Despite this, I believe that the contribution of this thesis, within what is possible, is very high and meets the criteria of a master's thesis at IES.

Methods

The main part of the thesis is estimating three models in order to explain the number of new cases, hospitalizations and deaths. All three models are estimated for the joint dataset and two country-specific subdatasets. The author carefully describes his work with the data in a transparent way. He provides all necessary tests, which are interpreted correctly and chooses the right modes of estimation for each part of his analysis. In the joint model, the combination of GMM and FD estimation with robust SE is used due to the possible heterogeneity of the data, as the author correctly points out. On the country-level, the estimation is done by OLS estimator also with HAC robust SE. I did not find anything unclear in the methodology and believe that each part of the analysis is carried out without major mistakes.

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Literature

The literature review in Chapter 2 provides a comprehensive overview of literature related to the topic of the Covid-19 pandemic that are relevant for the author's topic of research. All references throughout the thesis are made in a correct way. The only thing that could be done better is if the author compared his results more to the existing literature.

Manuscript form

The thesis is well organized, convenient to read and written in good English; I did not find any typos and never struggled with the intended meaning. The thesis is typeset in LaTeX, which results in a professional appearance. Tables and figures are labeled and referenced correctly and are linked to each of their mentions in the text. In my opinion, this thesis meets the criteria of a master's thesis.

Overall evaluation and suggested questions for the discussion during the defense

The author has worked on his thesis independently, which demonstrates his ability to do an advanced research work. The results of the Urkund analysis do not indicate significant text similarity with other available sources. I believe that the thesis fulfills the requirements for a master thesis at the Institute of Economic Studies, Faculty of Social Sciences, Charles University. It is my pleasure to recommend the thesis for the defense and suggest a grade A.

Question for the defense

Could you talk a bit more about how did you arrive at the methodology you are using in each part of the analysis and how they differ in between the three parts? Is there any potential problem with using monthly-aggregated data in the world's analysis compared to the daily observations in country-level analysis? Would it be possible perhaps to divide the dataset from the joint model into several regions (*Europe, South Asia, China, North America etc*) in order to be able to use more region-specific control variables and that way you might be able to use for instance weekly aggregation instead of monthly?

Could you please interpret further the different signs of the two lags of „new cases" variable? Why does it differ so much? Would you expect a common pattern in terms of climate or the variant of the virus?

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

NAME OF THE REFEREE: Mgr. Roman Kalabiška

DATE OF EVALUATION: *30/05/2023*

Digitálně podepsáno (30.5.2023)
Roman Kalabiška

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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.*

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