

OPPONENT'S REVIEW OF BACHELOR'S THESIS

Name of student: Roman Bakhta

Thesis title: Simple DICE Model

Reviewer : Assoc. Prof. Ivan Soukal

Thesis objective: To create and simulate a model of economy with the climate module and show the differences in gross output in comparison to the textbook neoclassical model of economic growth.

Criteria required for evaluation	Evaluation scale (grade)					
	A	B	C	D	E	F
Content relevant to the field of study	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Setting and meeting objectives	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Treating theoretical aspects of the topic	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Treating practical aspects of the topic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adequacy of applied methods and their use	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Depth and accuracy of implemented analysis	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dealing with literature sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Logical structure and composition of the thesis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language and terminology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Formal layout	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student's contribution	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical applicability of results	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments to results of anti-plagiarism check:

The thesis was assessed in Odevzdej.cz (overall similarity 42%). A calculated level of similarity is concerning. An inspection of the protocol shows that eyebrow-raising ration of text marked as plagiarism comes from time/effort-saving and not true plagiarism. See Comments section. In spite of the result, I claim that the thesis is adequately original.

Comments and recommendations:

There are some content comments. The author gathered in the theoretical part some alarming claims about climate change. We could come up with even more but the idea here is that I do not see that much of damage to output by the temperature in the model. First, there is not much attention to this crucial part. Second, the author is aware that the model is running in unrealistic settings regarding temperature but did not try to change the function to e.g. sigmoid. Third, chapter 2.2 is a nice beginning to a review of estimations of the effect. The problem is that nothing more than a good introduction to the problem was provided. The DICE model did not explain all and several key coefficients came from (Ikefuji et al., 2021) which was not mentioned till the empiric

part. So, the second main source of knowledge (I am not counting a supervisor's thesis) is left undescribed. This leads us to the second issue and that is the problem of sources. Authors used mainly (Samuelson and Nordhaus, 2005) sources in some parts in a row, see plagiarism protocol. This is not how sources should be handled. Yes, the source (Samuelson and Nordhaus, 2005) and (Nordhaus and Sztorc, 2013) were referred to at the end. However, a topic is not that unique and so more sources should have been read, processed, digested and then by his own words summarized. I understand that author followed time/effort-saving path, as a good economist, but that is not the correct way of working with sources. Another example is that there is no explanation what was the source for several equations. There are very well-known equations from the growth model. However, from where the author got the idea that e.g. temperature is a function of $\ln(\text{CO}_2 \text{ concentration})$ and not any other function or approximation? Was it advice from the supervisor, was it his own work by PLS nonlinear regression, or was it from a source (Ikefuji et al., 2021) or an original DICE model simplification? Some marginal comments are that it is not common to find a well-formulated goal as far as in the conclusion. Yes, in an annotation or introduction can be found fragments such as "explore climate-economy interaction through the dynamic", "subject of the thesis is to introduce a reader to this issue through acquainting a reader with dynamics", etc. Introduction is very short, contains no reference to sources, the research gap should be described more clearly and it is not usual to refer to the thesis as a paper „The goal of the paper...“.

Overall assessment and reasons for the final grade:

The goal of the thesis was accomplished. I had the impression that I read a nice IM3 thesis, however, even modeling is suitable and can be very useful for FM3 as well. The topic is highly relevant today. The model (thesis attachment) can be run and, although I tried only a few parameters settings, it is working as presented in the thesis. In favor of the thesis speaks the fact that it required knowledge and effort I rarely see during a bachelor thesis defense. The thesis is logically structured, charts and tables are commented and a list of them is attached. Against the author speaks source handling which is below average, too short a theoretical part, and some other marginal comments.

Therefore, I claim that the submitted thesis meets the requirements for both aspects formal and content. In view of the above, I propose B rating.

Questions for oral defence:

How would you improve damage and temperature in the model? The difference $C \times NC$ economy seems too small and even unrealistic in the very long term.

Did your thesis provide some clues to a general claim that it would be sharply more costly to deal with the consequences than to limit an economy to decrease or at least postpone them?

I recommend the thesis for oral defence.

Suggested final grade: B

Hradec Králové, 27/12/2022

signature