

Referee Report

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Title: Adaptation Assessment and Analysis of Economic Growth

This paper aims at analyzing economic adaptation processes in China and whether these processes have been in favor of a more sustainable economic development in China. The authors mainly apply the following two methods for the analysis: (1) the extenics assessment method and (2) the membership function coordination degree model. Their analysis shows that China was capable of adapting its economic structures to deal with different economic challenges over time. The lack of coordination, however, makes it difficult for China to have an economic adaptation process towards a more sustainable economic development. While the topic is interesting, there are some problems in the paper that require a substantial revision. The problems are summarized as follows:

(1) The paper was submitted to a special issue of Economics on “Sustainable Development Goals (SDGs)”. While the authors indeed try to consider the factor “sustainability” in their analysis, the link to the SDGs is not really existent. This leads to some doubt about its suitability as a paper in this special issue.

(2) In Ch. 3 the authors introduce the two methods applied in their analysis.

a. The formal introduction the models is very confusing and the explanation there not sufficient.

For example, in Ch. 3.1:

- First step: what do “a” and “b” mean? Are they referring to the lower and the upper bound, respectively? Why the domain for c_n is a_{jm} to b_{jn} , but not a_{jn} to b_{jn} (similarly, why a_{um} but not a_{un} in the second step). Is m equal to n ? What do “m” and “n” mean?
- Third step: why there are two c_{ik} in R ? I guess the first c_{ik} should probably be c_{i1} . By defining R as done in the paper, I could not understand, why there is a need for indicating $k= 1, 2, \dots, p$.
- Fourth step: is the “n” there equal to the “n” in the first step?
- Fifth step: what does the “x” mean? The authors write that “...in second-class index $K\dots$ ”: is it K or k ? There is no “ K ” in the notation in the fifth step. Moreover, why the k_m column ends up with k_1 instead of k_m ? Do p in (8) and n in (9) refer to the same factor?

In Ch. 3.2:

- The coordination degree is denoted as $c_s(i, j)$ and the dynamic version as $c_d(t)$. Are these “c” somehow related to the “c” in Ch. 3.1? Using same letters/symbols for different indices is very confusing. This applies to $u(i/j)$ as well.

Since these models are not usually used for the traditional economics research, it is even more important to introduce the models here in a clear and correct way so that

readers who are not familiar with these research methods can better understand the research models. Moreover, the confusing introduction of the model leads one to doubt the reliability of the results presented in the following chapter.

- b. The models are introduced in a very formal way. It is difficult to really understand what, for example, each step means. The authors may improve it by using a concrete example for additional explanation.
 - c. The authors argue that the method introduced in Ch. 3.1 “not only qualitatively analyses the state of being of the system...but also quantitatively analyses the adaptation capacity of the system...”, implying that it is suitable for the analysis here. Since no sufficient explanation for the model is provided, it is difficult to accept the general argument of the authors why the model is particularly suitable for the analysis here.
 - d. In Ch. 3.2 the authors write “A state of coordination and development amongst systems indicates the sustainable development of adaptation capacity in economic growth.” It is not clear to me what is “the” sustainable development of adaptation capacity and how is this state defined?
- (3) The authors consider 25 indicators to construct the index system of economic adaptation. Here I see particularly the following problems:
- a. The authors write in the first paragraph of Ch. 4.1 “The index system of economic adaptation is selected based on scientific, systematic, dynamic, leading adaptive and operable principles,”. The argument cannot be considered to be strong enough if there is no more concrete explanation how the indicators considered are selected. Are there concrete criteria and how could these criteria be measured?
 - b. The authors consider 25 indicators which can be further classified into three groups: economic capacity, social capacity, nature-resources-environment capacity. It seems that the authors just try to consider all indicators they think to be important for sustainable economic growth, without taking into account the relationships between these indicators. Are there trade-offs between some of the indicators? How could these trade-offs be considered in the analysis? Can the models applied consider these trade-offs appropriately? If yes, how?
 - c. Regarding the indicators selected I have some comments/questions as well:
 - C6: to measure the degree of factor market development by using FDI only seems to be restricted. FDI is a specific type of financial capital that is needed – to different extents – in economic development processes.
 - C14: why consider education expenditure instead of the share of population with, for example, secondary or tertiary education degrees?
 - C15: considering health expenditure for the indicator seems to me that it is not the “capacity” that is to be measured but the part of capacity that is indeed used for the system.
 - C19: same comment as for C15.
 - C21: what kind of energy?
- (4) In Ch. 4.3:
- a. The authors use “C” to denote the factor set of economic adaptation. Again, it is confusing to see the letter “C” here. Is this C again different from the “c”s used in Ch. 3?
 - b. The authors write “This paper follows the international standards, theoretical perspectives and opinions of experts in setting the standards of the three adaptation

levels". What are these standards and perspectives and who are these experts? How these experts are interviewed for their opinions?

- c. Why did the authors use entropy method to determine the class of economic adaptation indices? Could the authors explain more about the method used?
- (5) In Ch. 5.1: The authors write "The weight of each adaptation capacity index was calculated using the entropy method." Could the authors provide more information about how they get these results of weights, what are the factors determining the different weights and are there any economic meanings behind the different weights?
- (6) In Ch. 5.2: The description of the development of the economic adaptation over time in the text is not consistent with the data provided in Table 6. This is confusing.