

Interactive comment on “Regional disaster impact analysis: comparing Input-Output and Computable General Equilibrium models” by E. E. Koks et al.

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Authors: first of all, we would like to thank the referee for his kind words on the paper. We think that the comments and suggestions of the referee have substantially improved the manuscript. Please find below the applied changes in the manuscript, according to the comments and suggestions by the referee.

1. On main results and conclusions show the disparity between the ARIO and the other two models, highlighting the lack of substitution effects as the major cause of this disparity. But based on Hallegatte (2008, 2014) the ARIO “avoids the excessive rigidity of a classical IO framework by allowing for substitution by importations when local

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production is perturbed and for price-elasticity.” Though the ARIO does not consider substitution for shorter time-scales as that probably might not be a case as argued in Hallegatte (2008,2014). The authors need to clarify if they have used the ARIO in a different way than the proposed by Hallegatte (2008, 2014).

Authors: Thank you for pointing this out. You are correct that Stephane Hallegatte argues in his papers that his methodology includes substitution between products. He does this by means of rationing and prioritization of the demand. This, however, is very different to the substitution between inputs that is possible within a CGE-framework, and the substitution possibilities within the MRIA model. The results of the ARIO-model remain the same as that of a standard multiregional IO model: all results will be negative throughout all regions. The effects are linear. In that sense, there is not really substitution going on between intermediate products or production factors. To emphasize this, we have added the follow sentences to the ARIO-model section:

“This process of prioritization and rationing can be interpreted as a form of substitution, as stated in Hallegatte (2008). It should be noted, however, that this type of substitution is different than the substitution considered in the other two models. In this process, the ARIO-model only substitutes between outputs, whereas the other models specifically substitute between inputs.”

The substitution row in the table is adjusted as well:

2. The authors assume here that the readers are well aware of the three models discussed in the paper. I would assume that NHESSD has a much wider readership and familiarity with the three models cannot be assumed for the journal audiences. Sections 3.2 –3.4 would be better explained if supported by some presentation of the general equations and structures of the three models. A suggested edit would be to modify Table 2 and provide some sort of presentation/flowchart of the steps/equations in each model. This could be referred to in the text of sections 3.2 – 3.4. There is also probably some explanation before section 3.2 to be included that provides a brief

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description of the basic structure of the economy assumed in these models, leading to the development of structures such as the A matrix, etc. employed in these class of models.

Authors: We agree that the readers of NHESS might not be fully aware of the discussed models. However, considering the length of the paper, adding equations of the models or explaining IO modelling in more detail would require too much space and would go partially outside the scope of the paper. The literature on the proposed models is quite extensive. We have included in the paper reference to the literature the reader can refer to when he/she wants to know more about the models.

3. Following from point 2 above it is not clear how the recovery curves are linked to the three models. What are the durations of the recovery curves? The authors should clarify this in the text.

Authors: The duration of the curves are mentioned in Section 3.5. How the curves are linked was not emphasized yet in the paper. We thank the reviewer for pointing it out. As such, we have added the following to Section 3.5:

“In this exercise, the recovery paths are exogenously coupled to the three models. More specifically, for each individual model iteration we exogenously determine how the economy has recovered, based on one of the three recovery curves. The same level of recovery over time, determined by the curves, is applied to each model. This allows for a consistent comparison between the three modelling frameworks.”

4. Section 3.6 which explains the IO data used in the study needs some clarification. It seems there are 2 sources of IO data used here. Does one gives the national-level A matrix data which is regionalised and the other gives supply and use tables for regions? As the authors state the supply and use tables can give IO tables, so why have they not used them to get regional IO tables? Are there any differences in the IO tables between MRIA model and the other two? The authors should clarify these doubts in the paper.

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Authors: thank you for this comment. We agree that this might cause some confusion. We have now added the following sentences to Section 3.6, which hopefully removes the doubts:

“Because of the potential differences in the two datasets, a few steps are taken to make sure the model outputs can be compared consistently. First, both datasets are translated to 2004 Euro values. Second, after the translation to 2004 values, an extensive comparison is done to check for consistency in gross regional products (GRP) and industrial gross value added (GVA). These values are very comparable and, hence, well usable for a consistent comparison. In Appendix A.1, a list is provided of all the sectors.”

5. Strictly speaking the ‘convex’ recovery curve is not convex. It is either ‘convex-concave’ or ‘S-shaped’. This could be edited in the text.

Authors: We have adjusted the figure. It should look ‘more’ convex now.

6. The authors have not provided a list of the sectors considered in this study. It would be good to include a table showing what sectors are included in the study.

Authors: A list of sectors is added via an Appendix.

Some corrections in text are required:

1. Page 7056 – line 7: the sentences should probably read “the results of the comparison are presented and in Sect. 6 they are discussed.”

Authors: This has been adjusted.

2. Page 7058 – line 12: it should be ‘spent’ instead of ‘spend’.

Authors: This has been adjusted.

3. Page 7058 – line 19 – 22: Please check the two sentences as they are not clear. Should it be ‘demand-determined investment-driven IO’?

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Authors: Thank you for the thorough reading of the manuscript. You are correct that this sentence might cause some confusion. We were referring to a CGE modelling approach, but perhaps in a bit unclear way. After re-reading, we have removed the sentence and slightly rewritten the paragraph.

4. Page 7060 – line 5: a period is missing.

Authors: This has been adjusted.

5. Page 7061 – line 13: change 'mean' to 'means'.

Authors: This has been adjusted.

6. Page 7062 – paragraph above Eq. (3): please check the notation as it does not match the notation used in Eq. (3).

Authors: This has been adjusted.

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