Linking Global CGE models with Sectoral Models to Generate Baseline Scenarios: Approaches, Challenges, and Opportunities

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Why linking?

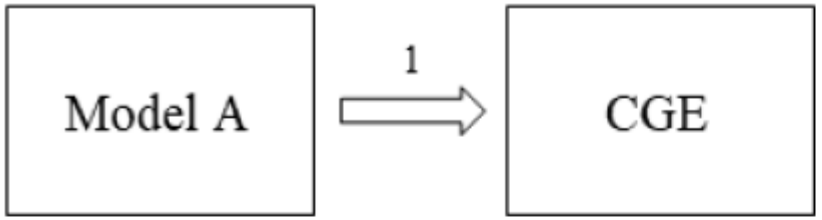
- CGE models may be not as detailed as other (economic) models, making up for parts that are not well captured in a CGE model, but are crucial for the analysis
- Additional dimensionality:
  - explicit technologies,
  - time and spatial resolution,
  - (Bio)physical constraints.
- Additional quality assurance, credibility with robust foundations
- Ultimate interest in impacts of a shock, but model linkage also helpful for baseline building!

What is linked?

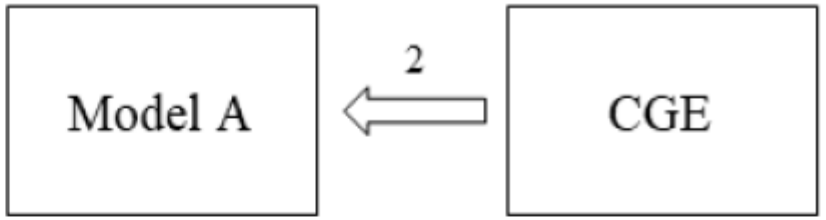
CGE +

- Agricultural PE model
- Energy PE
- Macroeconomic model
- Transport model
- Land use model
- Crop model

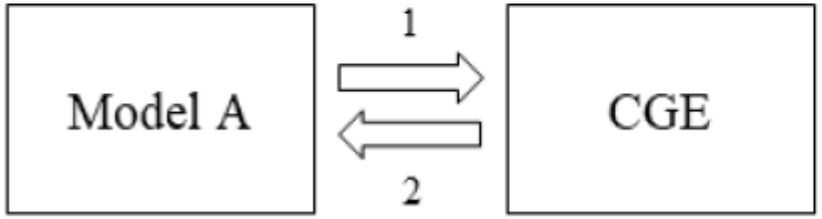
How are models linked?



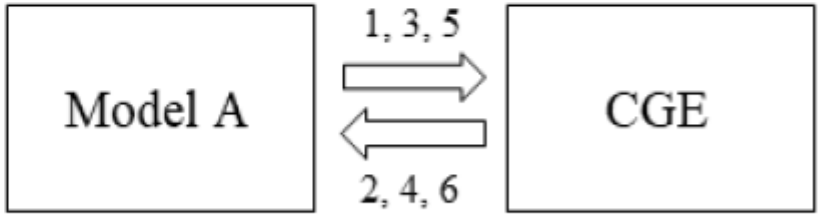
1) One-way linkage, bottom up



2) One-way linkage, top down



3) Two-way linkage, point calibration



4) Two-way linkage, sequential calibration of multiple parameters

Challenges

- Differences in data aggregation and definition:
  variables exchanged need to be made consistent
- Inconsistency of model scope, model boundaries, model concepts:
  be aware of differences, will they play a role in the analysis?
- Practical implementation:
  - Technical dimension: Do the models converge?
  - Resource and time limits: interdisciplinary teams of domain experts

Conclusions and agenda for future research

- Establishing a proper, functioning link can be time/personnel-intensive
- Need to balance additional value of extra detail from linked model with added complexity and potential data/model inconsistencies
  - Two way link needed or is a one way link sufficient?

Thank you

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