GTAP Board Report 2021

European Commission

The European Commission and its various services are active users of the GTAP database and model as well as other products provided by the GTAP Centre. This report highlights GTAP-related activities for the period 2020-2021 and identifies priority areas for future developments in respect to the GTAP model and databases.

GTAP-related activities

The Joint Research Centre (JRC) uses the GTAP database to run global CGE models like MAGNET and GLOBE for agricultural issues, JRC-GEM-E3 for analyses of climate mitigation, energy and air pollution, CAGE for climate impacts and adaptation, RHOMOLO for regional analysis and uses the GTAP global and bilateral Migration Database for the assessments of impacts of migration in conjunction with the GTAP Global Migration model (GMig).

The MAGNET model is used for assessments of bio-based sectors and agricultural policy. In this context, the GTAP database is principally used for conducting medium to long-term foresight analyses of the EU bio-based sectors, agricultural policy, international trade, SDGs and food security. The JRC-GEM-E3 model was mainly applied to analyse international climate policies and the model makes use of the GTAP-Power data disaggregation. A focus of the analysis was on long-term decarbonisation pathways to climate neutrality, linking the model with the energy system model POLES-JRC. The JRC-GEM-E3 model also informed the European Commission's impact assessment on more stringent EU climate targets for 2030. Finally, the CAGE CGE model is calibrated to GTAP data and was used to assess general equilibrium effects resulting from impacts of climate change and adaptation.

As the representation of a dynamic baseline is crucial for the analysis of long term climate policies, JRC engaged in further developping the PIRAMID framework. It allows building dynamically consistent input output tables that maintain exogenous assumptions (e.g. energy balances obtained from an energy system model). These input output tables then allow calibration of dynamic baselines for the analysis of long-term environmental impact which are shared publically.

DG TRADE uses the GTAP database and the standard and dynamic version of the GTAP model as tools for analysis of all major EU trade policy initiatives (e.g., COVID-19 impact on

trade, BREXIT, EU-Japan FTA and the EU-Vietnam FTA). Apart from using the GTAP database in combination with the static and dynamic GTAP model, DG TRADE also uses the GTAP database while operating the MIRAGE model.

Another important work based on the dynamic GTAP database was an assessment of the importance of Armington elasticities in baseline projections and a sensitivity analysis of Armington elasticities in trade policy modelling. Furthermore, DG TRADE commissioned a study to econometrically estimate Armington elasticities for GTAP services sectors.

Priority areas

European Commission services actively using the GTAP database as an input to their daily impact assessment and analytical activities have highlighted the following priority areas for future improvements.

1. Enhancing the policy relevance of the GTAP database and modelling tools in the area of services trade

DG TRADE, in cooperation with the WTO, has carried out a project, which delivered a new database splitting the trade in services data according to the modes of supply. It would be important for the GTAP centre to finalize the incorporation of the Trade in Services data by Mode of Supply (TiSMoS) hosted at the WTO to improve the bilateral flows of services by mode of supply.

2. Trade and climate change

For the upcoming years to come, exploring the trade and climate change nexus will be one of the priorities of DG TRADE along with many other Commission services. For that reason, DG TRADE has commissioned a project leading to building its modelling capacity in this field. More specifically, a model called GDynEP-AG, has been developed. It results from merging the GDynE (the energy version of the dynamic GDyn) developed by Golub (2013) and improved by Markandya et al. (2015) with the GTAP-Power model (Peters, 2016). In addition, several baselines have been calibrated, also including alternative scenarios on ageing population trends. Further improvements to the GTAP-Power database in this respect will be appreciated.

3. Other improvements in the GTAP database and CGE modelling parameters

The GTAP database and the accompanying CGE modelling framework has been constantly improved and extended to cover a broad range of policy issues. Several additional improvements are deemed important by the GTAP users at the European Commission:

- The choice of base years in future updates of the GTAP database should be as close as possible to the official release of IO data by statistical agencies. For many

countries, such data is released periodically on a 5-year cycle (e.g. 2010, 2015, 2020). The JRC-GTAP joint effort in updating the IO tables of EU Member States in the GTAP database was a good opportunity to ensure a better alignment of official statistics and the GTAP database. We would be interested to see how much rebalancing has changed the data that was originally submitted.

- We would support more ex-post historical validation exercises of CGE models using the GTAP database. It is often the case that key parameters (e.g. energy demand and supply elasticities) of these models are not econometrically estimated, and the performance of the model is not contrasted against historical outcomes. A revision and possibly a new estimation of Armington elasticities at bilateral level to make them more up to date with current economic reality would be relevant. Similarly, the dynamic capital adjustment parameters need to be re-estimated and empirically validated.

- The need to include non-tariff barriers (NTB) trade cost equivalents in the GTAP database, for goods and services. Being able to assess the impact of NTBs is of crucial importance for trade policy analysis.

5. Other issues

In addition to the above mentioned, several Commission services would be interested in the following issues:

- An improvement of the data for African countries by using recent I/O tables and further updates of existing IO tables and other recent available data sources such as farm and household surveys. Commission services (JRC Sevilla) will gladly contribute by providing single-country SAMs for the improvement of the global database and by liaising between local researchers cooperating with us, and the GTAP centre on development of specific SAMs.

- Finalizing the current efforts to increase the linkage between the GTAP agricultural and production data of the FAO database as well as fostering a more transparent and comprehensive representation of the changing nature and magnitude of agricultural domestic support.

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