

GTAP Board Report 2020

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 2019-2020 and identifies priority areas for future developments in respect to the GTAP model and database.

GTAP-related activities

The Joint Research Centre (DG 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 the GTAP global and bilateral Migration Database for the impact 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. 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.

The PIRAMID framework 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 the baseline and 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

Different services of the European Commission that are actively using the GTAP database as an input to their daily impact assessment and analytical activities highlighted various priority areas for future improvements.

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

With the growing importance of services in the global economy, the current sectoral coverage of services in the GTAP database is often seen as too limited by policy makers. The limited sectoral disaggregation of services and the representation of several key policy parameters in the area of services is lacking in the current analytical framework, notably the services modes of supply - a key feature for all trade negotiations in the area of services, as part of bilateral, plurilateral or multilateral trade negotiations. The GTAP Centre, in charge of developing the CGE tools used by the European Commission and other Board members with trade-related activities, is well placed to make progress on this important policy area. 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 work on integrating the new mode of supply dataset as well as the newly released WTO/UNCTAD/ITC trade in services dataset and the OECD/WTO balanced Bilateral Trade in Services in the GTAP database.

2. International government procurement

The GTAP centre has already carried out an important work in the context of CGE modelling and government procurement by advancing in terms of both the GTAP database i.e. splitting the total investment column of the IO tables' framework in public and private and the MRIO format and modifying the GTAP model to account for price preference margins. However, so far this work has not been updated and provided as a satellite database at least for board members. It would be important to have an operational version of the government procurement database for the GTAP version 10 of the database.

3. 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 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.

4. 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 were deemed important by the GTAP users at the European Commission:

- The GTAP database and the codes for RunGTAP and RunDynam should be provided in an official GTAP-MRIO format. Furthermore, 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 still 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. Similarly, more information on the representation of tariffs by type (specific, mixed, compound, tariff rate quotas with fill rates and rents) would be useful.
- For energy modelling, it would be relevant to have a satellite data providing the share of private and public output spending on R&D. Having a reference share will help to calibrate long-run baseline as well as technical efficiency.

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 as well as regional disaggregation of Eastern and Southern European neighbours e.g. Bosnia Herzegovina, Serbia, Algeria and Libya by using recent I/O tables and further updates of existing IO tables;
- We also support the current effort to increase the linkage between the GTAP agricultural data and production data of the FAO database, and to foster a more transparent and comprehensive representation of the changing nature and magnitude of agricultural domestic support.
- We would appreciate a further development and update of the GTAP bilateral migration data. In particular, time-series data (similar to the GTAP bilateral trade data) would be appreciated.

Selected publications

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