GTAP Board Report 2019

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 2018-2019 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, climate impacts, energy and air pollution, 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. 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 climate policies and co-benefits from reduced air pollution, 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.

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., BREXIT, EU-Japan FTA, EU-Vietnam etc). 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 MIRGE 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. Similarly, the PIRAMID framework (to be presented at this year's GTAP conference) 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 publicly.

In addition, a recently launched join project between DG GROW and DG TRADE aims at developing a tool that allows disentangling gross trade from trade in value added. The tool was developed to work with the GTAP database and modelling results offer insights over value-added by source country and source sector, domestic value-added content of bilateral exports, re-imported domestic value-added in exports, pure foreign (third countries) value-added of exports, etc.

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. 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 should be provided in an official GTAP-MRIO format. Furthermore, the choice for base years in future updates of the GTAP database should be as closely 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). 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. In addition, having regularly updated time series data on an annual basis would be greatly appreciated.

  Along these lines it is important for the GTAP centre to provide a description of the adjustments to the originally submitted data in view of incorporating it in the final (balanced)

GTAP database. This evaluation is important for increasing the transparency and quality of the GTAP database.

- 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 new estimation of Armington elasticities at bilateral level to make them more up to date with current economic reality would be very relevant. Similarly, the dynamic capital adjustment parameters need to be re-estimated and empirically validated.

- The need to include non-tariff barriers 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 very useful.

3. 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 update of existing IO tables;

- The current representation of domestic support in the GTAP database does not capture all agricultural support. There is a need to include public support going beyond the Producer Support Estimate (PSE) such as the Consumer Support Estimate (CSE) and/or General Services Support Estimate (GSSE).

- 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 greatly appreciated.

Selected publications

Scientific Articles

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Philippidis, G., Bartelings, H., Smeets, E. (2018). Sailing into Unchartered Waters: Plotting a Course for EU Bio-Based Sectors. Ecological Economics, 147, p. 410-421.

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Philippidis, G., van Berkum, S., Sanjuán, A., Tabeau, A., Verma, M. (2018). A Foresight Study of European East-West Agrifood Trade Options. German Journal of Agricultural Economics, 67(3), p. 160 – 175.

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Ciaian, P., Kancs, D., Kielyte, J. (2017) Migration to the EU: Social and macroeconomic effects on sending countries, JRC Working Papers JRC98533, DG Joint Research Centre.

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Tamba, Marie, Bert Saveyn, Jette Krause, Monica Grosso, Biagio Ciuffo and Amandine Duboz (2019), Socio-Economic Impacts of Future Mobility Disruption Scenarios, GTAP conference paper.

Weitzel, Matthias, Toon Vandyck and Bert Saveyn (2019), Including bottom-up emission abatement technologies in a large-scale global model for policy assessments, GTAP conference paper.

Wojtowicz, Krzysztof, Luis Rey, Umed Temursho, Bert Saveyn, Toon Vandyck, Marie Tamba and Matthias Weitzel (2019), PIRAMID: a new method to generate future input-output tables for baseline building, GTAP conference paper.

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