

GTAP Board Report 2018

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 2017-2018 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 an analysis of climate mitigation, climate impacts, energy and air pollution and RHOMOLO for regional analysis. Additionally, JRC has made use of the GTAP in GAMS code for some short term projects.

Furthermore, JRC also uses several GTAP migration data bases such as the GTAP Global Bilateral Migration Database, the GTAP Bilateral Migration Data Base, the GTAP GMig2 Data Base as well as the GTAP Global Migration model (GMig).

DG TRADE uses the GTAP database and standard and dynamic versions of the GTAP model as tools for analysis of all EU major trade policy initiatives (e.g., TTIP, EU-Japan FTA, EU-Vietnam etc). Moreover, DG TRADE has also made use of the Public Procurement data base and modelling extension of the standard GTAP database and model for an analysis of extending the scope and coverage of GPA countries among which the EU.

An important pre-requisite for this was the successful completion of the joint EU-GTAP project involving cooperation among various Units at JRC, DG TRADE, EUROSTAT as an observer and the GTAP centre. The outcome of this project was the timely submission of new Input-Output tables covering all EU Member States under full compliance with the new European statistical standards (European System of Accounts – ESA2010) and Eurostat official statistics as well as GTAP submission requirement.

In addition, a recently launched joint 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. Splitting the services sectors by modes of supply

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 prepared an initiative that has as its ultimate goal a database and modelling extension which will enable an assessment of the impact of trade policy initiatives on services trade by modes of supply. This collaborative project (to which other partners are invited to contribute) will build on ongoing developments in the area of input-output analyses, and recent progress made in service data collection by statistical agencies (notably Eurostat) and the analytical effort of CGE modelling community.

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 is 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.
- 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

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 by using recent I/O tables and further update of existing IO tables;
- Additional sectoral disaggregation (e.g. services sectors, energy-intensive sectors, agricultural and/or bio-based sectors) as well as a split of household fuel by purpose (for example transport and residential in heating, cooking, lighting) and improvement of the domestic support data. Furthermore, it would be very useful to have estimates of forestry land as well as carbon stock.
- 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

Di Comite, F., Kancs, D., Lecca, P. (2018). Modeling agglomeration and dispersion in space: The role of labor migration, capital mobility and vertical linkages, *Review of International Economics*, <https://doi.org/10.1111/roie.12313>

Kancs, D., Lecca, P. (2018). Long-term social, economic and fiscal effects of immigration into the EU: The role of the integration policy, *World Economy*, <https://doi.org/10.1111/twec.12637>

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

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*, (forthcoming).

Philippidis, G., Waschik, R. (2018) Melitz Meets Milk: The Impact of Quota Abolition on EU Dairy Export Competitiveness, *Journal of Agricultural Economics*, (forthcoming).

Rose, A., Wei, D., Miller, N., & Vandyck, T. (2017). Equity, emissions allowance trading and the Paris agreement on climate change, *Economics of Disasters and Climate Change*, 1(3), 203-232.

Rose, A., Wei, D., Miller, N., Vandyck, T., & Flachsland, C. (2018). Policy Brief—Achieving Paris Climate Agreement Pledges: Alternative Designs for Linking Emissions Trading Systems, *Review of Environmental Economics and Policy*, 12(1), 170-182.

Vandyck, T., Kitous, A., Saveyn, B., Keramidas, K., Rey Los Santos, L. and Wojtowicz, K. (2018). Economic Exposure to Oil Price Shocks and the Fragility of Oil-Exporting Countries. *Energies*, 11, 827; doi:10.3390/en11040827.

Vrontisi, Z. et al. (2018). Enhancing global climate policy ambition towards a 1.5C stabilization: a short-term multi-model assessment, *Environ. Res. Lett.* 13 044039.

Reports and working papers

Boulanger, P., Philippidis, G., Urban, K. (2017). Assessing potential coupling factors of European decoupled payments with the Modular Agricultural GeNeral Equilibrium Tool (MAGNET), Joint Research Centre Technical Report, EUR 28626 EN. Luxembourg (Luxembourg): Publications Office of the European Union; 2017. JRC104276

Kitous, A., Keramidas, K., Vandyck, T., Saveyn, B., Van Dingenen, R., Spadaro, J., Holland, M. (2017). "Global Energy and Climate Outlook 2017: How climate policies improve air quality", JRC Science for Policy Report, Joint Research Centre, JRC107944, doi: 10.2760/474356.

Kutlina-Dimitrova, Z. (2017). Can we put a price on extending the scope of the GPA? First quantitative assessment, DG TRADE Chief Economist Notes 2017-1, Directorate General for Trade, European Commission.

Kutlina-Dimitrova, Z. (2018). The economic effects of a GPA plus agreement: The impact of BRICS, GTAP conference paper, forthcoming.

Kutlina-Dimitrova, Z. and Lakatos, C. (2017). The Global Costs of Protectionism, World Bank Policy Research Working Paper 8277.

M'barek, R., Barreiro-Hurle, J., Boulanger, P., Caivano, A., Ciaian, P., Dudu, H., Espinosa, M., Fellman, T., Ferrari, E., Gomez y Plana, S., Corrin Gonzalez, C., Himics, M., Louhichi, K., Perni, A., Philippidis, G., Salputra, G., Witzke, P., Genovese, G. (2017). Scenar2030 - Pathways for the European And Agriculture and Food Sector Beyond 2020, Joint Research Centre, European Commission, EUR 28797 EN, Publications Office of the European Union, Luxembourg.

Matusiak, M. and Kleibrink, A. (ed.) Supporting an Innovation Agenda for the Western Balkans: Tools and Methodologies, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-81870-7, doi:10.2760/48162.

Philippidis, G., Helming, J., Tabeau, A. (2017). Model linkage between CAPRI and MAGNET: An exploratory assessment, Joint Research Centre Technical Report, EUR 28625 EN. Luxembourg (Luxembourg): Publications Office of the European Union; JRC106676 [http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106595/kj-na-28625-en-n .pdf](http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106595/kj-na-28625-en-n.pdf).

Shutes, L., Philippidis, G., M'barek, R., Ronzon, T., Ferrari, E., van Meijl, H. (2017). SDGs in the global MAGNET model for policy coherence analysis, Research Brief, European Commission-Joint Research Centre. JRC108799, available at: <http://publications.jrc.ec.europa.eu/repository/handle/JRC108799>.

Tabeau, A., Helming, J., Philippidis, G. (2017) Land Supply Elasticities, Overview of available estimates and recommended values for MAGNET, Joint Research Centre Technical Report, EUR 28626 EN. Luxembourg (Luxembourg): Publications Office of the European Union; 2017. JRC106676 <http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106592/kj-na-28626-en-n.pdf>.