

GTAP Board Report 2016

European Commission

The European Commission and its different services are active users of the GTAP database and other products provided by the GTAP Centre. This report highlights GTAP-related activities for the period 2015-2016 and 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, GLOBE and GEM-E3, for the calibration of the regional CGE model RHOMOLO and as a source of data for multiplier analysis, in particular to analyse issues related to the bio-economy through backward, forward and employment multipliers. A newly developed Dynamic CGE model with ICT and R&D driven endogenous growth uses the GTAP database as well. These models are used for policy support to DG CLIMA, DG AGRI, DG ENV, DG ENER, DG DEVCO, DG REGIO, etc.

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-Canada FTA, etc). DG TRADE has also initiated and supported the GTAP Public Procurement data base extension and modelling modification project. The project has been successfully completed and paves the way for policy assessments in an area of growing importance.

As a joint project DG TRADE, DG JRC and ESTAT (as advisory partner) started working together on improving the EU28 Input-Output database in GTAP, by providing a set of Input-Output Tables for the 28 Member States for the year 2010 under the new European System of Accounts (ESA2010). In addition, the EU-GTAP project will also provide fully-fledged matrices of Taxes less Subsidies on Products. An analysis of the effects of the ESA95-ESA10 shift on IO tables will also be reported. The base year will be 2010.

DG ENER, DG MOVE and DG CLIMA regularly develop projections of energy and transport trends and greenhouse gas emissions to 2050. These so-called "Reference scenarios", are shared with EU Member States and serve as benchmark for evaluating alternative policy options in Impact Assessments. This process involves consultants' work using the GEM-E3 model inter alia for developing sectoral value added projections for EU Member States. The GEM-E3 model draws on the GTAP database.

Priority areas

Different services of the European Commission that are actively using the GTAP database as an input in their daily activities highlighted different areas of priority 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 GTA database. More insights and additional documentation as to why the GTAP database may deviate from the values published in the National Accounts would be valuable for users.
- The GTAP database could play a pivotal role in the follow-up of the Paris Agreement, given the key data needed for climate-related CGE analysis. This follow-up work might need additional requirements such as further sectoral disaggregation, forest cover and management, updates of CO₂ and nonCO₂ gasses (incl. land use).
- 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 to make them more up to date with current economic reality would be very relevant.

- 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.
- Additional sectoral (e.g. energy-intensive sectors, further disaggregation of the transport equipment sector) and regional disaggregation (e.g. Bosnia Herzegovina, Serbia, Algeria and Libya) and improving the IO of other GTAP countries (such as Turkey). The higher level of technological detail in the power sector (e.g. coal-fired, gas-fired, wind, solar, hydro, nuclear, etc.) is already widely used for energy and climate questions on an international and national level.

3. Other issues

Several Commission services would be interested in the following issues: a better representation of the institutional accounts and their transfers within the GTAP database (particular attention to government and taxation); Increasing attention towards the so-called "bio-economy"; biofuel, 2nd generation biofuel, bio-energy, bio-plastic etc.; an update and time-series extension of the GTAP migration data base; improvement of data for African countries by using recent I/O tables and other recent available data sources such as farm and household surveys etc. as well as improvement of intra-African trade and tariff data; a better and more detailed inclusion of different forestry activities into the GTAP database

Selected publications

Scientific Articles

Boulanger P, Dudu H, Ferrari E, Philippidis G (2016). Russian Roulette at the Trade Table: A Specific Factors CGE Analysis of an Agri-food Import Ban. *Journal of Agricultural Economics* 67(2): 272-291.

Britz W, Pérez-Dominguez I, Badri NG (2015). Analyzing Results from Agricultural Large-scale Economic Simulation Models: Recent Progress and the Way Ahead. *German Journal of Agricultural Economics* 64 (2): 107-119.

Delincé J, Ciaian P, Witzke H-P (2015). Economic impacts of climate change on agriculture: the AgMIP approach. *Journal of Applied Remote Sensing* 9(1).

Kutlina-Dimitrova, Z. and Lakatos, C. (2014), Assessing the economic impacts of the EU-Singapore FTA with a dynamic general equilibrium model, *International Economics and Economic Policy* 11(3), pp 277-291.

Osman R, Ferrari E, McDonald S (2015). Constructing a SAM for Egypt (2008/09) Introducing Water and Irrigation Seasonality. *Journal of Development and Economic Policies* 17 (1): 5-29.

Vrontisi Zoi, Jan Abrell, Frederik Neuwahl, Bert Saveyn, and Fabian Wagner (2016). Economic impacts of EU clean air policies assessed in a CGE framework. *Environmental Science & Policy*, Volume 55, Part 1, January 2016, Pages 54–64.

JRC Reports (Publications Office of the European Union)

Christensen, M. A. (2015) A CGE model with ICT and R&D-driven endogenous growth: A detailed model description, JRC Technical Report, JRC97908.

Christensen, M. A. (2015) The Economic Impact of Increasing Public Support to ICT R&D: A Modelling Approach, JRC Technical Report, JRC97907.

Christensen, M. A. (2015) A CGE model with ICT and R&D-driven endogenous growth: A general description, JRC Technical Report, JRC97902.

Kitous A., Saveyn B., Keramidas K., Vandyck T., Rey Los Santos L., Wojtowicz K. (2016). Impact of low oil prices on oil exporting countries. JRC-IPTS Working Papers, Institute for Prospective and Technological Studies, Joint Research Centre.

Labat, A., Kitous, A., Perry, M., Saveyn, B., Vandyck, T., and Vrontisi, Z. (2015). "GECO2015 Global Energy and Climate Outlook: Road to Paris. Assessment of Low Emission Levels under World Action Integrating National Contributions," JRC-IPTS Working Papers JRC95892, Institute for Prospective and Technological Studies, Joint Research Centre.

M'Barek R, Delincé J (editors) (2015). iMAP, an integrated Modelling Platform for Agro-economic Commodity and Policy Analysis – New developments and policy support 2012-14. JRC Technical Report, EUR 27197.

Philippidis G, M'Barek R, Ferrari E (2016). Drivers of the European Bioeconomy in Transition (BioEconomy2030) – an exploratory, model-based assessment, JRC Science for Policy Report, EUR 27563.

Sanjuán López A, Resano Ezcaray H (2015). Gravity estimations to correct the 'small shares stay small' bias in economic models. The example of Mercosur and EU agri-food trade. JRC Science and Policy Report, EUR 27264.

Vrontisi, Z., Kitous, A., Saveyn, B., and Vandyck, T. (2015), Impact of low oil prices on the EU Economy, JRC-IPTS Working Papers, Institute for Prospective and Technological Studies, Joint Research Centre.

Conference Presentations

Boulanger P, Dudu H, Ferrari E, Philippidis G. The cost of import prohibition for political reason: CGE analysis of the Russian ban on agri-food products. At 18th Annual Conference on Global Economic Analysis, June 17-19, 2015, Melbourne, Australia.

Boulanger P, Philippidis G. 2020 Common Agricultural Policy in Spain – General equilibrium effects of a EU28 budget deal. At Xth Congreso Nacional de Economía Agraria, September 9-11, 2015, Córdoba, Spain.

Boulanger P, Philippidis G, Jensen HG. EU agricultural domestic support in GTAP: a proposal for an alternative approach. At 18th Annual Conference on Global Economic Analysis, June 17-19, 2015, Melbourne, Australia. Revisited framework of agricultural domestic support for CGE modelling – The case of the European Union. At 2nd MAD Workshop – Macroeconomics of Agriculture and Development, November 19-20, 2015, Bordeaux, France.

Boulanger P, Kavallari A, M'barek R, Rau ML, Rutten M. Options to improve food security in North Africa: CGE modelling of deeper trade and investment integration with the European Union. At 29th International Association of Agricultural Economists Conference, August 9-14, 2015, Milan, Italy.

Britz W, Dudu H, Ferrari E. Modelling food waste and food waste reduction in a CGE framework. At 29th International Association of Agricultural Economists Conference, August 9-14, 2015, Milan, Italy.

Kutlina-Dimitrova, Z. and Narayanan, B. (2015), The economic impact of the Russian import ban, GTAP 2015 Conference Paper.

Osman R, Ferrari E, McDonald S. Water Quality Assessment: a SAM/CGE Framework for Egypt. At 29th International Association of Agricultural Economists Conference, August 9-14, 2015, Milan, Italy.

Saveyn, B. and Vandyck, T. (2015). Global Energy and Climate Outlook: Road to Paris. UNFCCC 21st Conference of the Parties, Paris (3 and 11 December)

Vandyck, Toon, Bert Saveyn, Zoi Vrontisi, Alban Kitous, Ariane Labat and Miles Perry (2015). Global Energy and Climate Outlook: Road to Paris - Assessment of Low Emission Levels under World Action Integrating National Contributions. At 18th Annual Conference on Global Economic Analysis, June 17-19, 2015, Melbourne, Australia.

Scientific Events

Seminar on Modelling for Policy Analysis. Organized by JRC and Tegemeo Institute, April 27, 2016, Nairobi, Kenya.

Workshop on Modelling Impacts of national policies on Kenyan economy. Organised by JRC, LEI-WUR and Alterra-WUR, April 28, 2016, Nairobi, Kenya.

Official EU publications

European Commission (2015), *The Paris Protocol – A blueprint for tackling global climate change beyond 2020*, SWD (2015)17.