Global Trade Analysis Project
https://www.gtap.agecon.purdue.edu/

This paper is from the
GTAP Annual Conference on Global Economic Analysis
https://www.gtap.agecon.purdue.edu/events/conferences/default.asp

Revisiting Agricultural Domestic Support in the GTAP Data Base

Angel H. Aguiar, Pierre H. Boulanger, Kirsten Boysen-Urban, Hans G. Jensen, George Philippidis

JEL classifications: C68, C80, Q17, Q18

DRAFT – Please do not quote
Paper to be presented at the 22nd Annual Conference in Global Economic Analysis
"Challenges to Global, Social, and Economic Growth", June 19-21, 2019, Warsaw, Poland

Background

The GTAP Data Base is the main data source used for global applied trade analysis, especially with computable general equilibrium (CGE) modelling. In its last incarnation (GTAP data version 9) it contains complete gross bilateral trade, transport and protection data for 140 regions and 57 sectors (3 reference years: 2004, 2007 and 2011). Among other updates and novelties, the version 10 (upcoming release planned mid-2019) will expand the time coverage to 2014.

A comprehensive database on agricultural domestic support is key for any meaningful agri-food policy CGE analysis. In the GTAP database, the representation of agricultural domestic support payments originates from the OECD Producer Support Estimate (PSE). The method used to incorporate PSE elements into the GTAP Data Base has been standardized so that the same approach has been used for all countries/regions listed in the OECD PSE database. While the EU is classified as one region in the PSE database, complementary work by JRC provides EU information by member country.

Defined as "*the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income*", the PSE captures 469 billion euros (2013-15). However the PSE does not capture all agricultural public support. If consumers are either supported or taxed, this would be captured by the Consumer Support Estimate (CSE) with potential rebound effects on the agricultural sector. There is also the General Services Support Estimate (GSSE), which includes "*budgetary expenditure that creates enabling conditions for the primary agricultural sector through development of private or public services, institutions and infrastructure regardless of their objectives and impacts on farm production and income, or consumption of farm products*". The GSSE reached 69 billion euros during the same period of 2013-2015, but do not include any payments to individual producers (e.g., information and promotion activities, cooperation for development of new products, processes and technologies, etc.). Both the consumer and the general services support estimates are not currently included in the GTAP Data Base.

This research work aims to determine the importance of embracing domestic support going beyond the PSE. It proposes an alternative representation of domestic support and quantifies effects induced by such changes.

Research methodology

We use OECD time series data for OECD and non-OECD countries (EU member states are considered individually). Among the non-OECD countries are 11 emerging economies (Brazil, People's Republic of China, Colombia, Costa Rica, Indonesia, Kazakhstan, the Philippines, Russian Federation, South Africa, Ukraine and Viet Nam) for the years 2004, 2007, 2011 and 2014.

Based on the above data, we first provide a descriptive analysis of the change in magnitude and nature of public support over the period 2004-2014.

Second, coherent with exiting PSE allocation and GTAP specificities, we propose a more comprehensive representation of support covering not only the PSE, but also part of CSE (e.g., food stamps such as Supplemental Nutrition Assistance Program (SNAP)) and GSSE (e.g., marketing and promotion subsidies). More specifically we classify further CSE and GSSE policies according to different payment categories as well as their influence on production and consumption decisions and match them to GTAP commodities and factors (adjustment of tax instrument in GTAP). Based on this structure we adjust the value flows and price linkage equations in the GTAP model.

Third, to understand consequences of adopting an alternative approach, we compare eliminating the two different Data Bases, and assess the results for the EU, US and China. The GTAP v9a is used for the modelling simulation, for the year 2011.

If time allows, a sensitivity analysis of allocation of support will be added with emphasis on GTAP subsidy wedges and payment classifications. It is expected further work will replicate the allocation for single years 2004, 2007 and 2014 (with special care on stable classification of PSE, CSE and GSSE payments over time). Particular attention will be paid to not amalgamate data and modelling issues (e.g. treatment of decoupled payments), and to be easily integrated within the GTAP v10 (year 2014).

Results and discussion

The current representation of domestic support in the GTAP database does not capture all agricultural support. Unilateral change in the GTAP accounting convention would lead to data discrepancies with other countries/regions (e.g., existing work on EU support).

Altogether, the PSE, CSE and GSSE cover all support specific to agriculture, even if they appear incomplete with some inconsistent regional and commodity coverage. Expanding agricultural support in the GTAP database does have some implication for output and price results when conducting policy analysis.

There is a need to agree on a systematic approach to represent different types of policy instruments (without relying on a subjective allocation) and to avoid double accounting (e.g., with the information already accounted for by the countries' Input Output Tables).

This research work might be seen as the first step towards a more comprehensive representation of the changing nature and magnitude of agricultural domestic support into the GTAP database.

References

Aguiar, Angel, Badri Narayanan, & Robert McDougall. "An Overview of the GTAP 9 Data Base." Journal of Global Economic Analysis 1, no. 1 (June 3,2016): 181-208. https://jgea.org/resources/jgea/ojs/index.php/jgea/article/view/23

Boulanger, P., Philippidis, G., Jensen, H.G., 2015. EU agricultural domestic support in GTAP: a proposal for an alternative approach, paper presented at the 18th Annual Conference on Global Economic Analysis, Melbourne, Australia. https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=4702

OECD, 2008. OECD's Producer Support Estimate and related indicators of Agricultural Support. Concept, Calculation, Interpretation and Use (The PSE manual), OECD publishing, Paris. http://www.oecd.org/agriculture/agricultural-policies/41121738.pdf

OECD, 2017. Agricultural Policy Monitoring and Evaluation, OECD publishing, Paris. http://dx.doi.org/10.1787/agr_pol-2017-en

Urban, K., Jensen, H.G., Brockmeier, M., 2014. Extending the GTAP Data Base and Model to Cover Domestic Support Issues using the EU as Example, GTAP Technical Paper No. 35, Purdue University, West Lafayette, Indiana. https://www.gtap.agecon.purdue.edu/resources/download/8176.pdf