



Improving the quality of quantitative analysis of global economic issues within an economy-wide framework

Greetings from GTAP-Central!

With the arrival of a number of vaccines at the end of 2020, there was a note of optimism at the beginning of 2021 that control of the pandemic was in sight. This has proven to be only partially true—with many things returning to near normal, but as the current omicron outbreak is proving, we will most likely be dealing with the pandemic for quite some time. The economic effects of the pandemic are also likely to be felt over the coming year, with significant impacts on supply chains, trade, labor markets, and macroeconomic factors. Similarly, the global community is having trouble rising to the longer-term challenge of climate change with a sufficiently decisive and broad-reaching set of policies. There were some modest achievements reached at the COP 26 meeting in Glasgow in November and many countries have made verbal commitments to reach net zero emissions by 2050 or 2060, but concrete proposals, to date, are unlikely to meet the requirements to limit temperature change to 2°C or the more ambitious target of 1.5°C. Members of the GTAP community are at the heart of many of the global economic analyses being undertaken on these issues and we are proud to support their efforts.

The Center's operations, like many other institutions around the world, started seeing a semblance of normality in the last few months. The staff are working regularly from our offices at the university and we have many meetings being held in person—though often in a hybrid format. However, as travel remains a challenge, the annual board meeting and conference were held strictly online in 2021, as were the standard and dynamic GTAP Short Courses. The past year proved to be less disruptive to our work than the first pandemic year, 2020, as we adjusted to the new environment and the logistics of online meetings improved significantly.

Allow me to highlight some of the Center's key achievements in 2021:

- Improvements and additions to the GTAP 10 Data Base, which include a new [nutrition database](#) based on FAO's food balance sheets and an update of the non-CO₂ satellite account that includes process emissions and CO₂ emissions linked to land-use. We plan to complement the latter with marginal abatement cost (MAC) curves, which are often used to mitigate process emissions.
- The second pre-release of version 11 for the GTAP Advisory Board members. The new pre-release includes several new and updated input-output tables, revisions to tariffs, agricultural factor shares and support to domestic agriculture, and incorporation of the IEA's

energy data. We are grateful to be partnering with the UN Economic Commission for Africa to increase the coverage of national of input-output tables within Africa.

- Work is progressing on improving certain modules of the GTAP Data Base: (1) complementing the remittances (GMIG) and profit flows (GDyn) with flows of official development assistance (ODA) to improve the balance of payments module; (2) incorporating the Trade in Services data by Mode of Supply (TiSMoS) and Balanced International Trade in Services (BaTIS), hosted at the WTO, to improve the bilateral flows of services trade; (3) mainstreaming the land use and cover data into the GTAP build procedure; and (4) incorporating biofuels data—pioneered by Farzad Tahiripour and colleagues—as a new Satellite Data Set.
- The Center is making available the GTAP Data Base in two additional formats. GAMS users are able to download the GTAP Data Base using the GDX format. The GDX versions are based on the new standard convention for the GTAP Data Base that is described in [Corong et al. 2017](#). In order to facilitate the use of the GTAP Data Base by the New Quantitative Trade Modeling (NQTM) community, the data are also being made available in CSV format with the core data (including the MRIO extension) in a standard Input-Output table (IOT) format at basic prices. Auxiliary files are provided to unpack aggregate rows in the IOT, such as sales, factor, export and import taxes.
- In order to complement much of the work the Center is doing on climate change, further highlighted below, we are in the process of improving various extensions to the standard GTAP Model including new versions of GTAP-E (energy) with power, modeling carbon border adjustment measures, incorporating these versions in GTAP-RD (recursive dynamic). Eventually, this extended version of GTAP-RD will also include the GTAP-AEZ framework, along with standardized climate change-related shocks, thereby allowing interested GTAP users to gain access to an integrated assessment modeling framework.
- For several years the Center has made available a version of the so-called Shared Socio-Economic Pathways (SSP) database, which is used by the integrated assessment modeling community (IAMC), and others, for long-term projections of population and GDP—the projections cover the period 2010-2100 using five distinct storylines. In partnership with the IAMC, we are updating the SSP database to take into account observed changes in the global economy over the 2010-2020 period and to incorporate the medium-term projections from the IMF. These updates will be merged with the existing SSP projections. In a second phase, the original providers of the SSP projections will be reviewing and re-estimating the projections over the next 6 months, taking into account recent information and the more in-depth updates are expected to be made publicly available before the end of 2022.
- The [Journal of Global Economic Analysis](#) (JGEA) will have two published issues in 2021 with the second forthcoming yet in December. The June issue had articles on methods for incorporating non-tariff measures, a data balancing algorithm, and an application of the GTAP-HS model to the fruits, vegetable and nuts sector. The second issue will include an

article on the air pollution database with an application, a methodological paper on modeling trade in a CGE model with a focus on corner solutions and a study that builds in a financial module to the GTAP CGE model and explores the impacts of financial decoupling between the U.S. and China.

- The Center hosted 3 seminars in the [GTAP Virtual Seminar Series](#). The April seminar was preceded by a [launch of the Festschrift volume in honor of Tom Hertel's contributions](#) titled [“Policy Analysis and Modeling of the Global Economy.”](#) The first virtual seminar in 2022 is scheduled for January 25 and titled “Finance in a global CGE model: the effects of financial decoupling between the U.S. and China” with a presentation by Peter Dixon.

The Center had a very active research agenda in 2021. Tom Hertel’s NSF-funded [GLASSNET](#) project, which was inaugurated in 2020, went full bore this past year—highlighted by GLASSNET week in May. This project aims to link networks across the globe working on sustainability issues related to land and water resources. It now encompasses ten networks, representing a variety of disciplines. GTAP is one of these networks and GLASSNET is exploring ways to better integrate other disciplines into the work which our community is undertaking on topics including climate change, biodiversity, water quality and resource scarcity.

Even though, as mentioned above, there are as yet few strong policy actions to limit climate change, there has been a strong uptick in the demand for analyses of potential mitigation policies—largely focused on country-specific measures given the structure of the Paris Agreement, and complementary policies such as Carbon Border Adjustment Mechanisms (CBAM). We have also been involved in research focused on temperature and heat stress for workers and a World Bank project on the circular economy. For the latter, the GTAP Data Base split certain key sectors, for example steel making, into steel produced from primary ores and steel produced from recycled materials. The final study from the Energy Modeling Forum exercise (EMF-36) was published in [Energy Economics](#). On the trade front, we have (a) wrapped up work on the new econometric estimates of import demand and export supply elasticities at the HS-6 level, which were demonstrated in an application of the GTAP-HS model, (b) worked jointly with the World Bank on various scenarios for global value chains (GVCs) and (c) worked with the WTO on a database and model for foreign direct investment and foreign affiliate sales. We have also started a new project funded by the USDA and in cooperation with Tom Rutherford and colleagues at the University of Wisconsin-Madison. The objective of the project is to ‘merge’ the WiNDC database, which is a 50 state (+DC) of the U.S. economy, with GTAP and to develop a regionalized version of the GTAP Model.

As in 2020, all courses delivered by GTAP-U were held online—including the standard and dynamic short courses. We are still looking to improve the online experience for these courses, but it is hard to replicate the in-person interaction, in particular due to the different time zones. The regular GTAP 101 and PTA courses were held in 2021, twice for the former and once for the latter. The 2022 [Short Course](#) will be held at Purdue from 8-12 August (with the online portion starting 30 May). Applications are being accepted through 6 March 2022. The first session of [GTAP 101](#) will be offered from 21 March – 8 May 2022, with applications open through 2 January 2022. [GTAP PTA](#) will be offered from 27 June – 5 August, applications will be accepted from 3 January through 3 April. Potential students should monitor the [GTAP website](#), [GTAP-L Mailing List](#), and [GTAP social media](#) for additional information.

The 24th Annual Conference on Global Economic Analysis was held online again in 2021. The foreseen venue was Colorado State University in Fort Collins, hosted locally by Professor Amanda Countryman. We have mutually decided to maintain this venue for 2024. Registration was again higher than average likely because of the lower cost of the online format. During the conference, the Center was very pleased to award the 2021 Alan A. Powell Award to Mondher Mimouni from the International Trade Centre (ITC) in Geneva. Mondher and his colleagues provide invaluable inputs for the build of the GTAP Data Base, notably the estimates of bilateral applied tariffs including ad-valorem equivalents of non-ad-valorem tariffs and quotas. The ITC also hosts a wonderful online tool known as the [Market Access Map](#), which provides for interactive viewing of bilateral trade policies. In addition, four well-known members of the GTAP Network were selected to be Research Fellows for the period: 2021-2024: George Philippidis (CITA, Government of Aragón), Maureen Rimmer (Centre of Policy Studies, Victoria University), Mustapha Sadni Jallab (World Trade Organization) and Niven Winchester (Auckland University of Technology). The new Wallace E. Tyner Award, created in Wally's name in honor of his legacy of interdisciplinary research, was awarded to two early career researchers: Socrates Majune (University of Nairobi) and Yue Wang (New Zealand Forest Research Institute). The Ken Pearson Award was given to Tarik Marques Do Prado Tanure (Federal University of Parana UFPR), and the Alex Meeraus / Thomas Rutherford Award was given to Abdulaziz Mosa (Wolkite University).

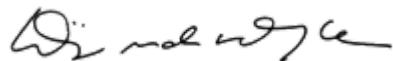
We are still hopeful to hold the 2022 Annual Conference in Kigali, with our co-hosts from UNECA—a final decision will be made by the end of February 2022. Whether it is in Kigali or online, please remember to [submit](#) your abstracts and organized session proposals by 15 January! You can already mark your calendar for the 2023 conference to be held in Bordeaux, co-hosted with the Université de Bordeaux, 14-16 June 2023.

The GTAP Network continues to grow, with over 24,000 members in 179 countries. We encourage you to follow GTAP on [social media](#) and to visit the [GTAP website](#), which contains news about the network, upcoming events and courses, and an ever-increasing number of papers and references of critical importance to our research and work. We also encourage you to update your profile and submit your papers, programs, and tips for exploiting the database and enhancing our models.

Short-, medium- and long-term challenges remain acute as we end 2021, all of which require dispassionate, thorough, and well-founded analysis that spans multiple dimensions and disciplines. In the past 12 months we have seen a surge in job postings on gtap-l, but supply is relatively constrained. One of our challenges as a community will be to ensure that there are enough skilled researchers to fill the growing needs of research institutions and policy agencies. Please encourage the students and other young people you work with to consider a career in this field!

While we face these challenges, allow me to extend best wishes for a healthy, happy, and productive 2022 from the Center for Global Trade Analysis at Purdue University.

Warm regards,



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The centerpiece of the Global Trade Analysis Project is the [GTAP Data Base](#), a fully documented, publicly available global database containing complete bilateral trade information, transport and protection linkages. The GTAP Data Base represents the world economy and is utilized by thousands worldwide as a key input into most applied general equilibrium (AGE) analysis of global economic issues.

GTAP Data Base Highlights

The Center began 2021 with the release of the following satellite and extensions based on GTAP 10A:

- Migration (GMIG2)
- Power (GTAP-Power)
- Dynamic (GDYN)
- Energy (GTAP-E)
- GTAP based on FAO targeting (GTAP-APT)
- Multi Region Input Output (GTAP-MRIO)
- Land Use and Cover (GTAP-AEZ)

Towards the end of 2020, the Center delivered an interim release (10.1) to GTAP Advisory Board members and data contributors, which included 6 new countries into GTAP (Iraq, Lebanon, Serbia, Sudan, Syria, and West Bank). Within the first half of 2021, board members and data contributors also received the updated extensions listed above, including NCO₂ emissions and air pollutants.

In November of 2021, pre-release 2 of GTAP 11 was shared with board members and data contributors for feedback. This version features 2017 as the latest reference year and includes updates to energy data from the IEA, agricultural domestic support based on OECD and EUROSTAT information, as well as updates to the agricultural factor shares and revised import tariffs sourced from ITC's MacMAP.

Early in 2022, the Center will make a couple of new releases available to GTAP 10 subscribers, one that considers energy subsidies, and the second, that introduces nutritional accounts to GTAP 10A.

Currently, GTAP 11 distinguishes 131 individual countries, plus the usual 20 aggregated regions for a total of 151 regions. New countries represent an expansion on the African and Middle Eastern regions due to the efforts by the UNECA and Center researchers, respectively. New countries in

Africa are Chad, Comoros, Congo, and Gabon. There are also numerous updates of the regional statistics with more expected in pre-release 3, which will be the last before the final public release by the end of the 2022.



The [*Journal of Global Economic Analysis*](#) provides an open access, peer-reviewed platform for publication and dissemination of innovations in applied general equilibrium (AGE) modeling, publishes developments in theory, data, statistical analysis, methods, and teaching, enhances the credibility of AGE modeling by requiring replication of results during the peer-review process and, when possible, publication of new model code and data on the journal's website, and builds on and extends the high-impact, peer-reviewed GTAP Technical Paper Series.



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Advances in Methods and Theory

- [A Comparison of Approaches to Modelling Non-Tariff Measures](#)
Terrie Walmsley, Anna Strutt
- [Comparing Penalty Functions in Balancing and Dis-aggregating Social Accounting Matrices](#)
Wolfgang Britz

Advances in Data and Parameters

- [Disaggregating the Vegetables, Fruits and Nuts Sector to the Tariff Line in the GTAP-HS Framework](#)
Maksym Chepeliev, Alla Golub, Thomas Hertel, Wajihah Saeed, Jayson Beckman

Vol 6, No 2 (2021)

Forthcoming in December

The [GTAP Working Paper Series](#) reports research in progress by Center for Global Trade Analysis staff which is of potential relevance to the broader GTAP community.

- [Distributional Impacts of Carbon Pricing Policies under Paris Agreement: Inter and Intra-Regional Perspectives](#)

Maksym Chepeliev, Israel Osorio Rodarte, Dominique van der Mensbrugghe
GTAP Working Paper No. 88

- **Detailed Trade Policy Simulations Using a Global General Equilibrium Model**

Angel Aguiar, Erwin Corong, Dominique van der Mensbrugghe
GTAP Working Paper No. 89

- **Incorporating Nutritional Accounts in the GTAP Data Base**

Maksym Chepeliev
GTAP Working Paper No. 90



[GTAP-University \(GTAP-U\)](#) is the formal education initiative of the Global Trade Analysis Project and builds on the Center for Global Trade Analysis' decades of teaching experience in the field of global economic analysis. The goal of GTAP-U is to expand access and improve educational and career opportunities for students and professionals, worldwide.

- **Simple-G Short Course**

"*Multi-Scale Analysis of Sustainability Simple-G Short Course*"
February 14 - March 18, 2022

- **GTAP 101 Course**

"*Introduction to Computable General Equilibrium Modeling in the GTAP Framework*"
March 21 - May 8, 2022
September 5 - October 23, 2022

- **GTAP Short Course**

"*Theory and Applications of Computable General Equilibrium Analysis with the GTAP Model*"
May 30 - August 12, 2022

- **GTAP PTA Course**

"*Applied Policy Analysis: Course on Preferential Trade Agreements*"
June 27 - August 5, 2022

- **GTAP-HET Course**

"*Applied Policy Analysis with Advanced Trade Theories*"
October 24 - December 11, 2022



Many participants remark that a highlight of GTAP events is the opportunity to get to know other members of the GTAP research community and form collaborative research relationships.

- **GTAP Advisory Board Meeting**

June 6-7, 2022 (Kigali, Rwanda)

- **25th Annual Conference on Global Economic Analysis**

"Accelerating Economic Transformation, Diversification and Job Creation"

June 8-10, 2022 (Kigali, Rwanda)

- **GTAP Virtual Seminar Series**

Check the website for the quarterly schedule.

Finance in a global CGE model: the effects of financial decoupling between the U.S. and China

Peter Dixon, Centre of Policy Studies, Victoria University

January 25, 2022

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