Greetings from GTAP-Central!

Message from the Director

Dominique van der Mensbrugghe
Research Professor
Director of GTAP

With high hopes of a semblance of a return to normality at the beginning of 2022, the year did not turn out as expected. Supply side disruptions resulting from the persistent effects of Covid-19, combined with stimulative economic policies generated a sustained rise in prices around the world, which were exacerbated by the decision of Russia to invade Ukraine—the largest war on European soil since 1945, with unfathomable destruction and suffering. These events all conspired to make 2022 a very challenging year for our global community.

In the short- and medium-term, the global economy will be subject to rising interest rates—abruptly halting a relatively long period of very low rates, with the anticipation of slower growth in output and employment. For the longer-term impacts, we can anticipate a re-shaping of the global value chains, with—at a minimum—a re-orientation of bilateral trade, and in some sectors, perhaps an aggregate decline in trade as countries implement policies to 're-shore' production.

Within this context of near-term economic uncertainty, the global community is confronted with the longer-term challenges of a transition to a net-zero emission economy and the broader protection of the environment and bio-diversity. Major conferences were held on both topics, the Conference of the Parties meeting (COP27), held in Egypt in November and the UN's Biodiversity Conference, held in Montreal in December. The ultimate outcome of these meetings in terms of concrete actions to meet their objectives is uncertain. Emissions continue their ineluctable rise and the challenges of maintaining biodiversity are rising around the world. There has been more positive news on the technology front, with investments in renewable energy rising rapidly and significant research and development in newer and more esoteric technologies such as hydrogen and the end-of-the-year breakthrough in fusion energy. The vast GTAP network is working on all of these topics, along with and many others, and we thank you for your important contributions.

In support of your work, allow me to highlight some of the Center's most important achievements in 2022:

- The release of the public version of version 11 is imminent. The GTAP Advisory Board members have had pre-release 4 for a number of weeks and the Center is putting the final touches on the public release. The new version will have a new reference year of 2017 in addition to 2004, 2007, 2011 and 2014. Some 20 new countries have been added to the database—mostly in Sub-Saharan Africa with the strong support of UNECA—taking the number of countries to 141 from the previous 121. In addition, the core input-output data for some 39 countries have been updated. Full details will be published in the December issue of the *Journal of Global Economic Analysis* (JGEA).

- GTAP v11 will incorporate a number of data improvements: updated agricultural factor shares, use of FAO data for agricultural production targeting, changes in the accounting of energy balances and

carbon emissions, use of new data for the sourcing of trade in services, and changes in the procedures and data to calculate employment by labor type across activities.

- Work is continuing on other data modules: (1) a more complete rendering of the balance of payments accounts and domestic savings; (2) services trade by mode; and (3) biofuels.

- The past year has also seen the Center work on a new version of the database that focuses on the so-called 'circular' economy. This has involved splitting the mining sector, adding new technologies to sectors such as steel-, non-ferrous metals- and paper-making, and looking more intensively at recycling activities.

- Work is ongoing on developing an integrated assessment version of the GTAP model, GTAP-IAM, which will extend the energy, power and land use version of the GTAP model in the recursive dynamic framework and will include a climate and damages module. A version of the model is being used to look at complementary policies—such as carbon border adjustment measures (CBAM) being considered by countries with stringent emission policies.

- The Center has prepared a version of the Shared Socio Economic (SSP) pathways—used extensively by the integrated assessment community for long-term projections of population and output—that integrates the original SSP database with a 2010 reference year with historical observations through 2020 and IMF's medium-term projections through 2026. Several numerical methods are used to merge the recent historical trends with the long-run trends of the original SSP narratives. The OECD is preparing a more thorough update of the SSPs (in conjunction with updated demographic projections from IIASA). In addition to taking into account the recent historical trends, the OECD is updating the model parameters and will re-run their model to provide new SSP projections. The updated SSP database will be released in 2023.

- The Center has published two more issues of the highly ranked, peer-reviewed *Journal of Global Economic Analysis* (JGEA) and has also held its virtual seminar series.

The Center's research engagement continues to be strong. Much of the focus has been on energy, emissions, mitigation and complementary policies such as the aforementioned CBAM. Another strand has focused on the 'circular' economy with its interactions with carbon mitigation policies and policies to promote 'circularity'. The initial focus was mostly on metals and plastics. This has recently been expanded to include cement and the construction sector—looking at so-called 'green' buildings. Other projects include an economic impact assessment of the World Food Programme's activities in East Africa, the potential re-shaping of global value chains, implications of the war in Ukraine on the global economy and the interactions of climate mitigation policies with trade. We have ongoing work on diets, waste and nutrition, new energy technologies and their interactions with the agricultural sector and sub-regional modeling with the GTAP model. In addition, there is the ongoing and expanding GLASSNET project spearheaded by Tom Hertel, with a focus on multi-disciplinarity and global-to-local-to-global linkages, including a forthcoming special issue of the journal *Environmental Research Letters*.

As in 2020 and 2021, GTAP-U courses were delivered online in 2022. The GTAP 101 Course was held twice and the GTAP PTA and GTAP Short Courses, both once. The GLASSNET group also offered a course in global gridded economic modeling using the SIMPLE-G framework. For specifics on our 2023 course offerings, please review the GTAP-U section further below. Potential students should monitor the GTAP-U website, GTAP-L Mailing List, and GTAP social media for additional information.

Despite our optimism at the end of last year, with the Omicron variant still quite virulent in February, when we had to make our final commitment to the Kigali venue, we reverted to an online-only format for the 25th Annual Conference on Global Economic Analysis. It was a difficult call to make, but we made a mutual commitment with our co-hosts at the UNECA to recast the Kigali venue for 2025. During the 2022 conference, the Center was very pleased to award the 2022 Alan A. Powell Award to Janine Pelikan from the Thünen Institute of Market Analysis. Janine has been a long-time member of the GTAP network and is one of the driving forces behind the TASTE software, as well as contributing to research using GTAP-based models. In addition, five well-known members of the GTAP Network were selected to be Research Fellows for the period: 2022-2025: Alessandro Antimiani (DG-Trade, European Commission), Heleen Bartelings (Wageningen Economic Research), Wolfgang Britz (University of Bonn), James Giesecke (Centre of Policy Studies, Victoria University) and Maros Ivanic (Economic Research Service, USDA). The Wallace E. Tyner Award, created in Wally's name to honor his legacy doing interdisciplinary research, was awarded to Hendrik Mahlkow (Kiel Institute for the World Economy). The Ken Pearson Award was given to Mohammad Rahman (University of Waikato & National University of Singapore), and the Alex Meeraus / Thomas Rutherford Award was given to Talent Nesongano (Competition and Tariff Commission, Zimbabwe).

The 2023 GTAP Conference will be held 14-16 June 2023 in Bordeaux, France in partnership with the Université de Bordeaux and the Bordeaux School of Economics. Please remember to submit your abstracts and
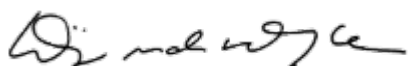
organized session proposals **by 15 January**! Early career researcher travel funding and a student scholars program will also be offered. You can also mark your calendar for the 2024 conference to be held in Fort Collins, Colorado, co-hosted with the Colorado State University, 5-7 June 2024.

The GTAP Network continues to grow, with over 26,000 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.

As our work continues to be crucial to informed decision-making, I am appealing to all of you to facilitate a well-functioning supply pipeline of junior researchers as the number of job advertisements on GTAP-L appears to be far outstripping supply. Much of the demand is currently concentrated in Europe and North America, but we also need to keep in mind the needs and challenges in other regions where the supply of skilled researchers is severely restricted.

We can hope for better prospects in 2023 despite the turmoil the world is currently confronting. With these hopes, allow me to extend best wishes for a healthy, happy and productive 2023 from the Center for Global Trade Analysis at Purdue University.

Warm regards,

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GTAP Data Base

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.

Coming soon!

The Center for Global Trade Analysis spent 2022 finalizing the GTAP 11 Data Base. This latest version reflects five reference years (2004, 2007, 2011, 2014, and 2017), with the global economy described by 160 regions (141 individual countries and 19 aggregate regions). Individual countries account for 99% of Global Gross

Domestic Product and 96% of global population. Relative to version 10, there has been an increase of 20 individual countries, mainly from Central Africa. Thirty-nine other input-output tables were also updated during the GTAP 11 cycle.

Several new features are included in GTAP 11. Agricultural production targeting is supplemented with the UN's Food and Agriculture Organization information to complement previous treatment that was based only on the OECD's Producer Support Estimates. In addition to the more extensive treatment of agricultural production targeting in GTAP 11, energy subsidies became part of the standard release. Sourcing of services trade data was also updated and further refinements to the treatment of energy and emissions data were made.

Further details and documentation on GTAP 11 will be provided in a forthcoming paper in the _Journal of Global Economic Analysis_, as well as on the GTAP website.

When available, notification about the public release of GTAP 11 will be emailed to all past subscribers, as well as the GTAP-L Mailing List, and posted on GTAP's social media.

Following the release of GTAP 11, the Center will concentrate on delivering the following satellite and extensions:
- Energy (GTAP-E)
- International Migration (GMIG2)
- Power generation (GTAP-Power)
- Dynamic (GDYN)
- Multi Region Input Output (GTAP-MRIO)
- Land Use and Cover (GTAP-AEZ)
- Food balance sheets
- Air pollution and non-CO2 emissions
- Bilateral time-series trade data

GTAP Research

The GTAP Working Paper and Research Memoranda Series report research in progress by Center for Global Trade Analysis staff which is of potential relevance to the broader GTAP community. The following pieces were added in 2022.

Cutting Russia's Fossil Fuel Exports: Short-Term Pain for Long-Term Gain
by Maksym Chepeliev, Thomas Hertel, and Dominique van der Mensbrugghe
GTAP Working Paper No. 91

A Revised CO$_2$ Emissions Database for GTAP
by Maksym Chepeliev
GTAP Research Memorandum No. 37

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 Data and Parameters
Incorporating Nutritional Accounts to the GTAP Data Base
Maksym Chepeliev

Disaggregating Agro-Food Sectors in the GTAP Data Base
Wolfgang Britz

Advances in Methods and Theory
Endogenous Capital Utilization in CGE Models: A Mongolian Application with the PEP-1-1 Model
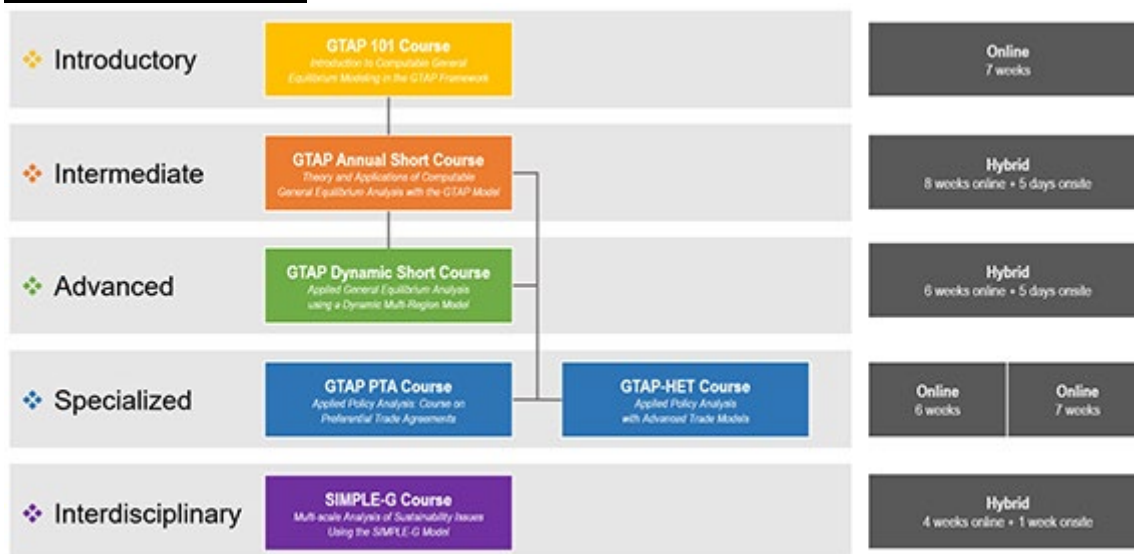Ragchaasuren Galindev, Bernard Decaluwe

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Forthcoming!

GTAP-U Educational Offerings

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.

GTAP-U Course Catalog

2023 Course Schedule

2023-1 GTAP 101 Course
"Introduction to Computable General Equilibrium Modeling in the GTAP Framework"
Online Course
March 20 – May 7, 2023   (*Apply by January 1*)

30th Annual Short Course in Global Trade Analysis
"Theory and Applications of Computable General Equilibrium Analysis with the GTAP Model"
Hybrid Course (Online + Residential phase at Purdue University)
June 5 - August 7, 2023   (*Apply by March 5*)

2023 Short Course in Dynamic Global Trade Analysis
"Applied General Equilibrium Analysis using a Dynamic Multi-Region Model"

Hybrid Course (Online + Residential phase at Purdue University)
August 14 - October 13, 2023   (*Apply January 16 - May 14*)

2023-2 GTAP 101 Course
"Introduction to Computable General Equilibrium Modeling in the GTAP Framework"
Online Course
September 4 – October 22, 2023   (*Apply March 13 - June 18*)

2023 GTAP Firm Heterogeneity (GTAP-HET) Course
"Applied Policy Analysis with Advanced Trade Theories"
Online Course
October 23 – December 10, 2023   (*Apply May 1 - August 6*)

GTAP Events

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.

2023 GTAP Event Schedule

GTAP Advisory Board Meeting
In-person Meeting (Bordeaux, France)
June 12-13, 2023

26th Annual Conference on Global Economic Analysis
"Broadening Engagement in a Resilient and Sustainable International Trading System"
In-person Conference (Bordeaux, France)
June 14-16, 2023   (*Submissions due January 15*)

GTAP Virtual Seminar Series
Online Seminars (check website for quarterly schedule)

New price-based bilateral ad-valorem equivalent estimates of non-tariff measures & Approaches to modelling non-tariff measures
Online Seminar
January 24, 2023, 7:00-8:00pm EST (UTC-5)   (*Register by January 22*)

Follow GTAP on social media!