

GTAP Board Report 2021-2022
Organisation for Economic Cooperation and Research (OECD)

The GTAP databases are important inputs into two OECD CGE models: The ENV-Linkages model in the Environment directorate and METRO model of the Trade and Agriculture Directorate. The GTAP database version 9.2 and 10 as well as GTAP's carbon emissions databases are one of a few database inputs into the OECD dynamic environmental-economic CGE model, ENV-Linkages. The main GTAP database version 10 as well as the associated migration satellite database (GMIG) are used as the basis of the METRO model database, the in-house CGE trade model.

Both models are used to produce OECD reports and papers. The ENV-Linkages model has been used to assess the economic consequences of air pollution policies and to create an Outlook on plastics to 2060. The METRO model has been used in various trade policy applications, resulting in contributions to the OECD's Economic Outlook, country surveys and various working papers.

OECD Environment Directorate

Projects and reports

In the past year, the ENV-Linkages model has been used to focus on: air pollution, circular economy, and the transition to a low-carbon economy.

Circular economy

The ENV-Linkages model has been used to estimate current and projected amounts of plastic production, use, waste as well as environmental impacts related to the plastics lifecycle. Additionally, the model has been used to study the environmental benefits and economic consequences of policy scenarios that aim at increasing the circularity of plastics in the economy and at reducing the amounts of plastics that ends up in the environment.

The outcome of the project consists in two "Global Plastic Outlook":

- One recently published report that takes stock on the current state of plastics use, waste and environmental impacts:
OECD (2022), *Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/de747aef-en>.
- One forthcoming report that presents projections and policy scenarios to 2060:
OECD (2022, forthcoming), *Global Plastics Outlook: Policy scenarios to 2060*, OECD Publishing, Paris.

These reports are based on a version of ENV-Linkages enhanced to take into account 14 different plastic polymer categories, attributed to 14 different applications. Plastics use is linked to the GTAP 10 Social Accounting Matrix, through the sectoral demand for the rpp plastic commodity, produced by primary and secondary technologies. Volumes of plastics are

then used to calculate generated waste, based on product lifespans of different applications. The waste generated is further broken down by waste treatment, i.e. recycled (collected for recycling), incinerated, landfilled, mismanaged and littered waste.

Additionally, the ENV-Linkages model has been used to contribute to a country specific project on the transition to a circular economy in Italy. The project is ongoing and to be finished in 2023.

The team plans to continue working on the transition to the circular economy and on plastics in the coming years, but with focus on specific regions and/or countries.

Air pollution

The OECD ENV-Linkages model, together with IIASA's IIASA GAINS model and the European Commission's TM5-FASST model, has been used to study the economic benefits from air pollution policies. These publications are based on the GTAP 9 database. Ongoing work focuses on Arctic Council countries while a forthcoming report focused on North-East Asia:

- OECD (2022, forthcoming), The economic benefits of international co-operation to improve air quality in Northeast Asia: A focus on Japan, Korea and China, *Environment Working Papers*, OECD Publishing, Paris.

Transition to net zero emissions

The ENV-Linkages model is being used for a new project on the net-zero transition. The policy scenarios rely on the 2021 World Energy Outlook of the International Energy Agency. The model uses the GTAP 10 database as well as the GTAP 10 satellite emission database, which is used together with other emission sources (e.g. IEA). A report is under preparation and will be presented at the GTAP conference this year.

OECD Trade and Agriculture Directorate

Database

The METRO model database is derived from the GTAP 11L17 database extended with trade flows disaggregates by use categories derived from the OECD and UN sources. Bilateral remittance information from the GTAP satellite data GMIG2 is also included.

UN Comtrade is used to calculate split shares for the 45 agriculture and manufacturing sectors. The OECD Inter-Country Input-Output Model provides use information for the 20 services sectors. The OECD ICIO data, however, is available only for a subset of countries. Accordingly, the 151 regions in GTAP are aggregated to match the 65 regions available in the OECD data. The standard METRO model database, therefore, distinguishes 65 regions, 65 sectors and 4 use-categories.

Publications and papers incorporating METRO model analyses

The model has been used for various trade policy assessments, resulting in policy briefs and working papers, several of which were in partnership with colleagues in other OECD Directorates. Highlights of the last year include analyses on the impact of a UK exit from the European Union, structural effects of the COVID-19 pandemic, and cross border labour mobility. The full list of 2020-2021 publications and papers incorporating METRO analysis follows.

1. Arriola, C., P. Kowalski and F. van Tongeren (2022), "Understanding structural effects of COVID-19 on the global economy: First steps", *OECD Trade Policy Papers*, No. 261, OECD Publishing, Paris, <https://doi.org/10.1787/f6a9ef88-en>.
2. Mourougane, A., S. Benz and F. Gonzales (2021), "Services trade in the United Kingdom and the global economy", *OECD Trade Policy Papers*, No. 257, OECD Publishing, Paris, <https://doi.org/10.1787/b602b468-en>.
3. Smith, D., P. Kowalski and F. van Tongeren (2022), "Modelling trade policy scenarios: Macroeconomic and trade effects of restrictions in cross border labour mobility", *OECD Trade Policy Papers*, No. 259, OECD Publishing, Paris, <https://doi.org/10.1787/b37fa34f-en>.
4. van Tongeren, F., et al. (2021), "Trade impacts of the Trade and Cooperation Agreement between the European Union and the United Kingdom", *OECD Economics Department Working Papers*, No. 1698, OECD Publishing, Paris, <https://doi.org/10.1787/eeeea3ec-en>.
5. OECD (2021), *OECD Economic Surveys: European Union 2021*, OECD Publishing, Paris, <https://doi.org/10.1787/a77ab220-en>.
6. OECD (2022), *OECD Economic Surveys: Tunisia 2022*, OECD Publishing, Paris, <https://doi.org/10.1787/7f9459cf-en>.

Forthcoming publications

7. "Who would bear the burden of embargoes on imports of Russian Oil? An OECD simulation", OECD Policy Brief.
8. *OECD Trade and Gender Review of New Zealand*, OECD Publishing.
9. "Modelling trade policy scenarios: Different horses for different courses", OECD Trade Policy Paper.
10. "Post-Covid trade scenarios and priorities for Latin America", OECD Publishing
11. "Value chains and post-COVID recovery in Korea", OECD Publishing

Other Activities related to the METRO model

The Secretariat updated the model database using GTAP version 11 pre-release 2 in early 2022. The new database is a preliminary version as we are waiting on remittances and labour data from GTAP and ImpactECON which are scheduled to be released later this year.

Ongoing work

The economic effects of the COVID-19 pandemic and recent Russian aggression on Ukraine has been and their impacts on supply chain continues to be a central theme of METRO work. This builds on the results of earlier OECD Metro model-based works on efficiency and risks in global value chains (OECD 2021) and on structural effects of COVID-19 on the global

economy (Arriola, C., P. Kowalski and F. van Tongeren, 2022). It undertakes exploratory modelling research on how shocks of a different nature may combine in the global economy and cause stress on specific products, trade routes or transport modes.

The Trade and Agriculture Directorate is also undertaking the development of an extended version of the METRO model dedicated to finer analysis of the agricultural sector. This new model version, called METRO-PEM, will be built on a more detailed sectoral representation, embed detailed agricultural policy features linked to the OECD PSE database, and incorporate agri-environmental indicators related to climate change, land and natural resources. The model calibration will be replicating the behaviour of the PEM model formerly used in support to the Agricultural Policy Monitoring and Evaluation report series.

References

OECD (2021), “Global value chains: Efficiency and risks in the context of COVID-19”, https://read.oecd-ilibrary.org/view/?ref=1060_1060357-mi890957m9&title=Global-value-chains-Efficiency-and-risks-in-the-context-of-COVID-19