

GTAP Board Report 2020-2021

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 is used to project materials use to 2060 as well as Resources efficient and circular economy policy to 2040. The METRO model has been used to assess the impact on trade of various policy measures included the OECD's Economic Outlook, country surveys and working papers.

OECD Environment Directorate

Projects and reports

In the past year, the ENV-Linkages model has been used to focus on: air pollution, the transition towards a circular economy, and the environmental impacts of covid. Additionally the team is currently working on plastics.

Air pollution

The OECD ENV-Linkages model has been used, 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 North-East Asia, while a recently published report focuses on Arctic Council countries:

- OECD (2021), *The Economic Benefits of Air Quality Improvements in Arctic Council Countries*, OECD Publishing, Paris, <https://doi.org/10.1787/9c46037d-en>.

Circular economy

Concerning the work on circular economy, the model has been used to study the effects of a Material Tax reforms to stimulate resource efficiency and the transition to a more circular economy policies, relying on the baseline scenario of the "Global material resources Outlook to 2060" (OECD,2019). The outcome of the project consists in three OECD reports that focus on different aspects:

- One report on the consequences of the Material Tax reform:

Bibas, R., J. Chateau and E. Lanzi (2021), "Policy scenarios for a transition to a more resource efficient and circular economy", OECD Environment Working Papers, No. 169, OECD Publishing, Paris, <https://doi.org/10.1787/c1f3c8d0-en>.

- One report on job market consequences:
Chateau, J. and E. Mavroedi (2020), "The jobs potential of a transition towards a resource efficient and circular economy", *OECD Environment Working Papers*, No. 167, OECD Publishing, Paris, <https://doi.org/10.1787/28e768df-en>.
- One report on international trade consequences:
Dellink, R. (2020), "The consequences of a more resource efficient and circular economy for international trade patterns: A modelling assessment", *OECD Environment Working Papers*, No. 165, OECD Publishing, Paris, <https://doi.org/10.1787/fa01b672-en>.

Additionally, the ENV-Linkages model has been used to contribute to country-specific projects to provide information that would facilitate the transition to a circular economy (EU SRRS projects). The focus was on Czech Republic, Hungary and Slovakia.

These reports are based on a version of ENV-Linkages enhanced to take into account 60 types of material uses as well as a split of GTAP 9.2 Databases to take into account 9 new sectors relevant to recycling as well as primary and secondary metal processing (for Iron and steel, Aluminium, Copper and Other nonferrous metals) that were split from GTAP based on EXIOBASE information.

The team plans to continue working on the transition to the circular economy in the coming years, but relying on GTAP 10.

Covid

The ENV-Linkages model has also been used to assess the long-term consequences of the Covid-19 pandemic and government response measures. This work partially builds on the Covid-assessment with the Metro model. The outcomes of this analysis will be used to update the baseline projection in future projects. The associated publication is:

- Dellink, R. et al. (2021), "The long-term implications of the Covid-19 pandemic and recovery measures on environmental pressures: A quantitative exploration", OECD Environment Working Papers, No. 176, OECD Publishing, Paris, <https://dx.doi.org/10.1787/123dfd4f-en>.

Ongoing and future work

- Ongoing preparation of plastic projections to 2060 using the latest sectoral disaggregation of the GTAP 10 database (e.g. "CRP" disaggregation) together with a split of various plastic/polymer uses.
- Net-zero emission scenarios, relying on the GTAP 2010 database as well as the GTAP 10 satellite emission database, which is used together with other emission sources (e.g. IEA)

OECD Trade and Agriculture Directorate

Database

The METRO model database is derived from the GTAP 10L14 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 15 services sectors. The OECD ICIO data, however, is available only for a subset of countries. Accordingly, the 141 regions in GTAP are aggregated to match the 64 regions available in the OECD data. The METRO model database, therefore, distinguishes 64 regions, 65 sectors and 4 use-categories.

Publications and papers incorporating METRO model analyses

The model has been used to assess the economic impact of various policy measures resulting in policy briefs and working papers, several of which were in partnership with colleagues in other OECD Directorates. Highlights include analyses on the impact of a UK exit from the European Union, GVC risks in the context of COVID-19, and Digital Services Taxes and retaliatory tariffs. The full list of 2020-2021 publications and papers incorporating METRO analysis follows.

1. Arriola, C., Benz, S., Mourougane, A., van Tongeren, F.. (2020), "The trade impact of the UK's exit from the EU Single Market", OECD Economics Department Working Papers, No. 1631, OECD Publishing, Paris, <https://doi.org/10.1787/682c2995-en>.
2. Arriola, C., Guilloux-Nefussi, S., Koh, S., Kowalski, P., Rusticelli, E. and van Tongeren, F. (2020), "Efficiency and risks in global value chains in the context of COVID-19", *OECD Economics Department Working Papers*, No. 1637, OECD Publishing, Paris, <https://doi.org/10.1787/3e4b7ecf-en>.
3. Arriola, C., Przemysaw, K., van Tongeren, F. (2020) "Localising value chains in the post-COVID world would add to the economic losses and make domestic economies more vulnerable," VoxEU, 15 November 2020. <https://voxeu.org/article/localising-value-chains-after-covid-would-add-economic-losses-and-make-domestic-economies-more-vulnerable>
4. Joumard, I., C. Arriola and M. Dek (2020), "Challenges and opportunities of India's enhanced participation in the global economy", OECD Economics Department Working Papers, No. 1597, OECD Publishing, Paris, <https://doi.org/10.1787/a6facd16-en>.
5. Luu, N., Woloszko, N., Causa, O., Arriola, C., van Tongeren, F. and Johansson, Åsa (2020), "Mapping trade to household budget survey: A conversion framework for assessing the distributional impact of trade policies", *OECD Trade Policy Papers*, No. 244, OECD Publishing, Paris, <https://doi.org/10.1787/5fc6181b-en>.
6. OECD (2020), *Tax Challenges Arising from Digitalisation – Economic Impact Assessment: Inclusive Framework on BEPS*, OECD/G20 Base Erosion and Profit Shifting Project, OECD Publishing, Paris, <https://doi.org/10.1787/0e3cc2d4-en>.
7. OECD (2020), *OECD Economic Surveys: Brazil 2020*, OECD Publishing, Paris, <https://doi.org/10.1787/250240ad-en>.

8. OECD (2020), *OECD Economic Surveys: Thailand 2020: Economic Assessment*, OECD Publishing, Paris, <https://doi.org/10.1787/ad2e50fa-en>.
9. OECD (2020), *OECD Economic Surveys: United Kingdom 2020*, OECD Publishing, Paris, <https://doi.org/10.1787/2f684241-en>.
10. OECD (2020) “Shocks, risks and global value chains: insights from the OECD METRO model,” *OECD Policy Brief*, June 2020. <https://issuu.com/oecd.publishing/docs/metro-gvc-final>

Other Activities related to the METRO model

1. **New model version:** In November 2020, a new version of the METRO model as well as updated documentation were made publically available. There are three major differences between METRO model version 3 and the previous model version: 1) there is a new land allocation module to better represent land supply; 2) the natural resources factor is reclassified as land in the forest sector; and 3) factor market modelling was adapted to incorporate the new module.
2. The Secretariat plans to update the model database using GTAP version 11 later this year. The METRO team is waiting for the finalisation of the OECD inter-country input-output table, which is a key input into the database.
3. **Estimates of AVE of NTMs:** OECD has also recently published estimates of ad valorem equivalents of non-tariff measures to be used with the METRO model. Estimates are at the region and sector level (GTAP version 9), and were calculated from the estimations described in Cadot et al (2018), which describes the method to calculate price effects from the estimated coefficients of a gravity equation. Later this year, will publish updated estimates based on at the GTAP version 10 level and new AVE estimates by OECD (Gourdon et al, 2020).
4. **Ongoing work**
 - a. The economic effects of the COVID-19 pandemic continues to be a central theme of METRO work. We are updating the quantitative impact assessment of the COVID-19 pandemic produced in the summer and fall of 2020. This new model simulation incorporates information on what “actually” happened in 2020 into the model to produce a “baseline” that includes the COVID-19 effects and policy measures. This baseline will be used a starting point for further analyses on the economic recovery from COVID-19.
 - b. The OECD secretariat has started a stream of work that aims to gain a better understanding of the differences in results between CGE models, like METRO, and macroeconomic models. The project will also formulate a set of guidelines on the best ways to combine the use of multiple models in an analysis.

References

Cadot, O., J. Gouron and F. van Tongeren (2018), “Estimating Ad Valorem Equivalents of Non-Tariff Measures: Combining Price-Based and Quantity-Based Approaches”, *OECD Trade Policy Paper, No. 215*, OECD Publishing, <https://dx.doi.org/10.1787/f3cd5bdc-e>

Gourdon, J., S. Stone and F. van Tongeren (2020), "Non-tariff measures in agriculture", *OECD Food, Agriculture and Fisheries Papers*, No. 147, OECD Publishing, Paris, <https://doi.org/10.1787/81933f03-en>.