# Analysing sectoral trade costs over time

The purpose of the exercise is to identify how global merchandise trade conditions have changed between 1995 and 2017 across various sectors. The following approach allows an estimation of how these trade conditions (henceforth: trade costs) have changed in relative terms.

The following empirical setup is applied:

Exportsijkt = Supplyikt \* Demandjkt \* Fixed\_trade\_costsijk \* Trade\_costsijkt

The subscript i defines the origin country, j the destination country, k the sector, and t the time dimension. Depending on the setup, t may be chosen to constitute individual years 1995 through to 2017 or – in order to smooth out annual fluctuations – some form of moving average or 4/5-year average. Ideally, all three time setups will be performed to test the robustness of the estimates. The sector dimension will be first chosen to the 2-digit HS code level for simplicity reasons but may later be adjusted to CPC Rev. 2.1, for better compatibility with GTA trade coverage data. Furthermore, depending on data availability, the model will be first performed for the G20 countries but may later be expanded to the largest possible amount of countries. In terms of data restrictions, all years are available except S. Africa before 2000, Russia in 1995, and Saudi Arabia in 1997.

The model has specified as the dependent variable export flows between each country for a given sector at a given time t. This will be regressed on three separate fixed effects. The first one, defined as Supplyikt, is meant to capture the sectoral production factors over time in the origin country. Meanwhile, Demandjkt may be interpreted as its consumption equivalent in the destination country. The third fixed effects, Fixed\_trade\_costsijk, may be interpreted as the average trade costs between a given country pair in a given sector over the chosen time interval. In that sense, this component is meant to capture some form of time-invariant trade costs, which may include distance, language differences, colonial ties, and all the other variables usually applied in a gravity framework. The remaining variation is then interpreted as sectoral, country pair-specific trade costs, which change over time. Given the fixed effects setup, these trade costs are centered on zero and can therefore not be interpreted as such in absolute terms. They may, however, be interpreted in relative terms for each sector, i.e. across time and across country pairs (since we do not have country pair fixed effects).

In terms of the policy application of this model, combinations which see high trade costs may be interpreted as being the furthest away from a level-playing field, and may thus pose, in relative terms, the highest gains from trade liberalization efforts. Also, by looking at the average trade cost (first moment) over time – possibly after normalization to account for the increase in trade over time – we can see whether trade distortions have in fact increased (or perhaps decreased) over time. Furthermore, by looking at the distribution and skewness of the trade costs (2nd and 3rd moments), we can see to what degree the level-playing field has changed for individual countries across time in each sector k.

In conclusion, the findings of the model may be used at two stages of the GTA 24 report. On the one hand, aggregate statistics on the trade costs may provide evidence on whether trade conditions have deteriorated over time by looking at the average trade costs over time and their dispersion/skewness. On the other hand, given their high dimensionality, the estimated trade costs may be used to identify certain patterns in country groups and sectors, where trade costs have increased the most and thus where multilateral liberalization is most needed.