

## Construction of the Trade Data for the GTAP Data Base

Topic: Supply, Use and IO Tables: Different approaches to reconcile world trade asymmetries (I)

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In the GTAP Data Base, countries are connected through bilateral trade. The construction of the trade data for the GTAP Data Base brings together trade statistics for merchandise and services trade data from different sources. The main source for bilateral trade data is the United Nations COMTRADE data. However this covers only merchandise trade (trade in goods not services, but including electricity). Accordingly, we need another data source for services. In GTAP 8, we use UN service trade data and EUROSTAT's international trade in services (Narayanan, et al., 2012).

In the GTAP model, an accounting identity exists whereby the value of imports at cif prices minus the value of transportation services equals the value of exports of exports at fob prices. For a given bilateral transaction, the reported import value can be substantially less than, or several times greater than the reported export value. Thus, reported trade statistics in their "raw" form are not suitable for the GTAP data base.

Furthermore, the reliability of trade data affects credibility of model results. The fact that large discrepancies exist in the reported trade statistics suggests that there is some degree of uncertainty attached to the trade structure. Uncertainty associated with any component of the initial base data is troubling given that it is a permanent fixture in the GTAP model. Then the question becomes, how to minimize these trade asymmetries?

Starting in GTAP version 7, the reconciliation procedure used in previous versions of the GTAP Data Base (Gehlhar, 1996) was enhanced by adding an optimization procedure to obtain more accurate trade results for China and Hong Kong. The Gehlhar method to reconcile bilateral merchandise trade data for the GTAP Data Base Trade reconciliation is a decision to accept or reject reported trade flows or a decision to compromise by adjusting data using a weighting scheme.

However, the largest discrepancies in bilateral trade are the result of re-export activity. A large part of China's trade passes through Hong Kong, which earns substantial revenue from the difference between import and re-export prices. We account for this revenue as an export of trade services from Hong Kong to the countries of destination of the merchandise. In GTAP 8, we also account for re-exports for the Netherlands.

The GTAP Data Base also contains data on international trade margins, that is, the services used or costs incurred in moving goods from point of export to point of import. Margin services are considered exports of the country that supplies the service, and imports of the country that receives the merchandise to which they are applied to. Accordingly, they are included in the services trade statistics.

Another special case is travelers' expenditures. The services trade statistics treat travelers' expenditures as a distinct commodity, but in the GTAP data structure, they are counted as trade in

the goods and services actually purchased. Purchases in one country by residents of another country are considered exports from the first country to the second. This includes tourism, but also such things as expenditures incurred in short-term employment overseas.

The result of this construction process is a reconciled trade data set that can be used for economic analysis in a general equilibrium type of model.

#### References

1)Gehlhar, M.J., 1996, Reconciling Bilateral Trade data for Use in GTAP, GTAP Technical Paper No. 10

Narayanan, G., Badri, Angel Aguiar and Robert McDougall, Eds. 2012. Global Trade, Assistance, and Production: The GTAP 8 Data Base, Center for Global Trade Analysis, Purdue University

2)Wang Z, M. Gehlhar, and S. Yao. "A Globally Consistent Framework for Reliability-Based Trade Statistics Reconciliation in the Presence of an Entrepot," *China Economic Review*, 21 (2010), 161–189.