

Armington elasticities in CGE models: a sensitivity analysis

The importance of Armington elasticities for computable general equilibrium (CGE) modelling of trade policy initiatives is indisputable among economists and applied trade policy analysts. The Armington structure of a model lies in the core of translating the impact of trade policy changes via taxes, tariffs or any other trade cost into quantitative responses coming out of the CGE such as output, trade flows, welfare and other variables. As a straight forward example in a standard CGE setting, a decline in the price of a foreign good, will lead to two quantitative impacts: a substitution to the expense of other similar imported goods and a substitution at the cost of domestically produced goods. A modeller's decision on the size of these elasticities may hence be crucial for the outcome of any simulation results.

In recent years there have been substantial advances in the development and fine-tuning of CGE models which nowadays may feature monopolistic competition, heterogeneous firms and households, sourcing by economic agent, explicit value-added decomposition and others. The use of CGE modelling as well has become the work horse of trade policy analysis worldwide. At the same time, advances as regard the estimation of key modelling parameters such as the Armington elasticities have not substantiated at the same pace. For example, the default Armington elasticities in the GTAP model date back to estimates by Hertel et al. from 2007 based on cross-sectional econometric analysis. The estimates used previously in the GTAP model relied on Jomini et al. (1994) Alaouze et al. (1977) obtained in a time series analysis.

Apart from the fact that these elasticities are outdated, and based on different econometric frameworks it is of a great importance to have a sense of how their size impacts the simulation results. Against this background, the current paper aims at filling in the gap on the importance of Armington elasticities for trade policy simulations. Our work is similar to the one by Domingues and Haddad (2005) who perform various sensitivity analyses around trade elasticities in a trade policy scenario of concluding the Free Trade Area of the Americas with the SPARTA model. We use however the latest dynamic version of the GTAP model and develop scenarios under which to explore the behaviour of key economic variables under varying Armington elasticities. Furthermore, the paper takes into account evidence from the econometric literature which shows that: (i) short-run Armington elasticities are significantly lower compared to long-run estimates, (ii) Armington elasticities are the larger the higher the level of product disaggregation, and (iii) cross-sectional estimations deliver higher Armington than time-series approaches. Considering this, the authors will estimate the impact of trade policy liberalisation scenarios of regional trade agreements by deviating from GTAP default Armington elasticities by 1 and 2 standard deviations. Furthermore, the authors will consider the time path impact on the simulations results by simulating lower Armington elasticities in the short run and higher in the long-run. Finally, we aim to use different product aggregations to deliver insights on the importance of commodity granularity for simulations results of trade policy initiatives.