

Tariffs, Exchange rate and Price Elasticities in International Trade

Topic: Issue in modelling international trade

Author: Rossella Bardazzi

Co-Authors: Leonardo Ghezzi

The issue of trade elasticities has been investigated by a recent stream of empirical research as protectionist policies have become popular in the agenda of policymakers. Many studies have estimated elasticities of trade to changes in costs, in exchange rates and in tariffs using different types of data and theoretical models. In general, there is no consensus on the value of these parameters and several international elasticity puzzles emerge. One is due to the difference in estimates depending on the type of data: trade elasticities are larger when based on microdata and smaller if estimated on aggregate data. Another puzzle derives from the assumption that, in most international trade models, the trade elasticities to costs, exchange rates and tariffs should be the same while empirical studies have shown that they differ (Benassy-Quéré et al., 2018; Fontagné et al., 2018). Most empirical studies focus on either exchange rate or tariffs changes, and they use a reduced-form approach with single equation estimations. In this paper, we aim to contribute to the scarce literature that compares the effects on trade flows due to a change in costs, to a currency devaluation or to a protectionist policy with a structural multi-sectoral and multi-country model.

To explore this issue empirically, we use a Bilateral Trade Model (BTM) developed at INFORUM (Interindustry Forecasting at the University of Maryland) and a system of national models. As described in Bardazzi and Ghezzi (2018), the main features of the BTM are (i) a dataset of bilateral trade flows built using UN-Comtrade and Eurostat Comext data, (ii) a detailed disaggregation of commodity classifications, (iii) econometric estimation of import shares, and (iv) a linkage with national multi-sectoral models. A high level of disaggregation of trade flows is particularly useful to fully capture the complex interrelations between economies, to investigate issues of international competitiveness, and to simulate the detailed aspects of trade policies which are often tailored to specific commodity categories. Unlike other multi-country models where trade shares are exogenously assumed, in the BTM import shares are endogenous and estimated econometrically as a function of a set of explanatory variables at the commodity level. Finally, the BTM system linking national models enables understanding of the transmission channels of shocks via international trade to detailed industries at the national level. In this linking system, flows of commodities produced in country i and consumed in country j are affected by (i) changes in the import-to-domestic-purchase ratio in country j ; (ii) changes in the share of country i in country j 's imports; (iii) changes in the level of output of both countries. Therefore, the overall linking system of BTM and the national multisectoral models allows to estimate direct and indirect feedbacks between the economies included in the model through international trade flows. This modelling approach differs from traditional Multi-Regional Input-Output models (MRIO) built according the Chenery-Moses approach because it is truly dynamic: the amount of total foreign demand collected by a national model is not just the result of an exogenous shock on the total global trade but it is a combination of this effect and of the behaviour of the national economy in terms of investment and relative price/productivity.

All these features of the modelling approach represent the novelty of our research in estimating the trade elasticities.

We run the international system of models under different scenarios to calculate trade elasticities. We first run the BTM as a stand-alone model under the assumption of a change in exchange rates between different countries and an increase of tariffs between the same countries. Results of these simulations produce the first direct effects of each policy on bilateral trade flows and the related

trade elasticities. Then, the full linking system is run under the same policy scenarios, to take into account the effects of these changes in exports on national economies and include these feedbacks in the BTM. This second step produces another set of trade elasticities which reflect not only the direct but also the indirect effects for both policies.

Bardazzi R., and L.Ghezzi (2018), "Trade, competitiveness and investment: an empirical assessment", *Economic Systems Research*, 30:4, 497-520.

Bonassy-Quadré, A., Bussière, M., & Wibaux, P. (2018). "Trade and currency weapons", CESIFO working paper, 7112, 2018.

Fontagné, L., Martin, P., & Orefice, G. (2018). The international elasticity puzzle is worse than you think. *Journal of International Economics*, 115, 115-129.