BATModel

better agri-food trade modelling for policy analysis

Data and Indicators for Global Value Chain Analysis

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The international fragmentation of production has increased countries' and firms' specialization to the level of tasks or stages of the production process (the "great unbundling"). With production units increasingly focusing on specific tasks rather than on the entire production process, there is a need to combine and coordinate all the different activities carried out at the international level. This includes locating those tasks where it is most efficient and trading the related intermediate products for further processing and assembly: modern global trade is in "tasks" rather than "goods" (Grossman & Rossi-Hansberg, 2008). This structural change in world production and international trade has brought about new implications and gains and created new winners and losers. This new paradigm also changed how economists and policymakers think (or should think) about trade and trade policy issues. Thanks to trade liberalization and technological advancements, the retail and food industries became globalized, and the agri-food sector was greatly impacted by these transformations, establishing the so-called agri-food global value chain (GVC). In the agri-food GVC, perhaps even more than in some other sectors, the globalization process was associated with the market concentration and the diffusion of private standards often imposed by large corporations or simply necessary as a condition to guarantee specific quality requirements and integrate into the international supply chain. The result of this process has been an increased merchants' and agribusiness market strength within GVCs, which in turn created issues in terms of welfare.

Against this backdrop, the complexity of GVCs cannot be fully gauged with standard statistics such as gross imports and exports; there is a need for specifically devised data and measures that appropriately track GVC activity. Even if the literature on GVCs is nowadays extensive and expanding, there is still much to learn about GVCs and much that available measures need to be included. Several aspects of GVCs still need to be fully understood and embedded into trade policy discussions and models.

Work package 4 of the BATMODEL project deals precisely with these problems by: (1) gathering better data, calculating better GVC indicators, and providing indicators for trade models; (2) conducting econometric analyses of key GVC components and their disaggregated welfare effects; and (3) incorporating the new GVC data and econometric findings on key GVC components in trade models to enhance simulations and more realistic policy evaluations.

Crucial statistical tools for GVC analysis are multiregional input-output (IO) tables. These tables reconstruct the inter and intra-sectoral trade within and between countries, providing an accurate picture of world production, demand linkages, and intermediate transactions. The main disadvantage of the multiregional IO tables currently available is that the sectoral breakdown needs to be more aggregated to allow for a precise characterization and understanding of specific value chains. Our work provides an innovative contribution to this kind of data. We use export, import, and firm-level databases, and combine their information to improve the quality of the IO data used in the computation of trade in value-added indicators, one of the main measures of GVC activity. Firm-level data helps to produce improved estimates of the allocation of imported inputs across sectors and to more directly investigate the role played by export-oriented agri-food firms in shaping a country's participation in GVCs. Our research group devised an innovative methodology to integrate this data into standard IO tables,

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increasing their quality and ability to track GVC activity. We computed improved GVC indicators depicting countries' positioning and participation based on the new data. These data represent a valuable source of information for economic policy-oriented analysis.

With more precise measures of GVCs activity, we investigated the interaction between tariffs and the position of EU countries in GVCs, using protection indices. We show how, in a world where international trade involves multiple border crossings and tariffs are applied to gross imports, the effective tariff rate is cumulative and disproportionately impacts trade costs. In a GVC context, tariffs depend on domestic and foreign contents of final goods.

Another research question that we address with our data regards the performance of agri-food firms participating in GVCs. The use of contracts and private standards by retailers and food companies affects the participation and performance of firms throughout the chain. However, different types of GVCs, and suppliers may be in a downside position within the chain. French firm-level data on certification with IFS private standards allows separating firms in GVCs controlled by retailers from other agri-food producers. With these data, we investigate whether participation in retailer-led GVCs increases suppliers' income and whether suppliers benefit from moving to higher value-added activities.

In other related studies, we analyze the performance of small farmers and the issue of market power. We identify the determinants of competitiveness (productivity, sales, and technology) and integration in GVCs of small farmers in developing countries. Moreover, we investigate how farmers', processors', wholesalers', and retailers' markups, a measure of market power, are affected by trade policies.

Lastly, our new, improved data on GVCs is embedded into general computational equilibrium (CGE) models by developing a GVC-module for MAGNET. This addition enhances trade policy analyses, simulations, and counterfactual analyses allowing us to evaluate the impact of tariff changes, trade agreements, and other shocks inside and outside the GVC sectors across different production locations.

Overall, the work done by the research group of work package 4 of the BATMODEL project represents an advancement in our understanding of agri-food GVCs supported by better data for better policy analysis.

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