

Micro-based indicators of GVC participation and positioning

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With the growth and spread of international linkages, the production processes are fragmented and dispersed among many different locations in various countries. More than 50% of trade in goods takes place in intermediate products, implying that traditional trade statistics based on gross flows do not provide accurate information on the division of labour at the world level. From one side, the value added exported by a country does not coincide with the value of that country's exports because exports contain value added from other countries; from the other side, imports have a domestic content given by the contribution of domestic firms exporting intermediate inputs which are processed abroad and then imported back. In other terms, the gross recording of trade flows does not account for backward/forward trade, i.e., trade in value added between two countries occurring via a third country.

Accordingly, there is widespread recognition that fragmentation of global production requires measurement of trade in Value Added (VA), which accounts for how slices of value embedded in goods or services are added at each step of increasingly international manufacturing processes within Global Value Chains (GVCs). The current standard for GVC analysis at the macro level relies on the global Inter-Country Input-Output (ICIO) accounting. An ICIO table harmonizes national input-output (IO) tables for multiple regions, and links trade flows directly from producers to importing firms and consumers in each region. Since the early 2000s, various research initiatives have developed different ICIO databases in response to policy needs and scientific aims (e.g., TiVA, WIOD, EORA, GTAP and GTAP-MRIO).

Although the use of statistics based on an ICIO accounting has become more routine for analysing key areas of global governance (e.g., international trade and governance, the link between the environment and the economy, the impact of globalization on labour markets) (Tukker and Dietzenbacher, 2013), there is no harmonization among different global databases (Jones et al., 2014). The construction of a global ICIO requires a huge amount of data, often suffering from time lag, and above all, a high level of harmonization, consolidation and adaptation of different data sources. Specific policy needs and scientific aims underlying the global ICIOs, data sources, the country coverage, the period of the data available, the level of detail for industries and products and the methodological choices in the compilation process, all are ingredients that have led to the development of different ICIO systems, constructed by various approaches.

The literature outlines large differences in the figures depicted by different databases, both at the country and sector levels (see, for example, Jones et al., 2014; Fusacchia et al., 2022; Kutlina-Dimitrova et al., 2022). This suggests that more efforts would be required in the direction of a commonly agreed methodology to meet the statistical challenges in measuring the GVC-related trade. In this vein, efforts to provide a micro-foundation in the construction of global ICIO (e.g., by using firm-level data to directly inform and refine the construction of the proportionality weights) would be likely to benefit researchers in this field. Although these improvements are unlikely to be feasible at the world level as there remain significant

obstacles to linking micro data across countries, they are feasible for individual countries (Antràs and Chor, 2021).

Importantly, the use of microdata allows advancements with respect to one of the main assumptions in the conventional ICIO system, namely that imported inputs are usually allocated across sectors in the same proportion as domestic goods, and the proportionality assumption is naturally applied to total imports, so inputs from all bilateral trade partners are treated in the same way (so-called, “import comparability”) (Johnson, 2017). Indeed, empirical evidence shows that internationalization activities and GVC participation patterns are strongly related to specific firm characteristics, which are in turn sources of technological differences in production processes.

In this direction, our contribution aims to improve input-output data based on the GTAP Data Base by disaggregating IO tables for Italy, thus tracking GVC linkages at higher resolution. To this aim, we combine export, import, and production firm-level databases to improve estimates of the sourcing and allocation of imported inputs across sectors thus enhancing the quality of data used for the computation of trade in VA indicators. The resulting integrated database is used to compute improved GVC-related indicators characterizing the participation and positioning of Italian firms in global networks.

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