Global Value Chains Indicators: A Review of Methods and Data Available to Researchers

Davide Rigo

1 Introduction

There is a recent body of literature which aims at better understanding the fragmentation of production and trade in the context of global value chains (GVCs) by allocating value added to the countries where it is created. This exercise is important for two main reasons. First, to accurately measure and assess countries' participation in GVCs. Conventional gross trade statistics tally the gross value of goods at each border crossing, rather than the net value added between border crossings. This results in the so called "double-counting", meaning that conventional trade statistics overstate the country's domestic contribution to its exports. Second, multi-country production networks imply that intermediate goods can travel to their final destination by third countries, distorting bilateral trade flows. More in general, the potential policy implications of all the aspects mentioned above are clearly significant.[1]

2 Methods

A series of recent papers have thus introduced accounting frameworks for decomposing gross exports relying on inter-country input-output tables. The first paper to propose a full decomposition of a country's gross exports into domestic value added, foreign value added (i.e. the contribution of foreign countries) and double-counted terms is Koopman et al. (2014) (KWW). However, this decomposition received criticisms for lacking intuition and being

[1] At this link several case studies on the trade policy implications of global value chains.

imprecise in measuring the foreign components. To solve for the latter issue, Miroudot and Ye (2020) and Borin and Mancini (2019) introduced two decomposition to precisely measure these components.

In addition, Los et al. (2016) and Los and Timmer (2020) proposed an alternative unified framework for measuring how much domestic value added is included in a country's exports. Their so-called "hypothetical extraction" derives the domestic value added by comparing two scenarios: the actual country's GDP and the country's GDP after setting international trade to zero (i.e. by extracting the trade flows). The difference between these two components will thus result in the domestic value added in a country's exports. While this methodology is more intuitive than KWW, one important limitation is that it does not allow to decompose a country's gross exports into the foreign value added and double-counted components.

In general, bilateral exporter-importer relations and the sectoral dimensions of trade flows are overlooked in these works. Instead, when studying the implications of GVCs for policy purposes, it is important to consider the position of a country (or sector) within the production chain and to identify its direct upstream and downstream trade partners. Borin and Mancini (2017) thus developed a decomposition of bilateral exports that is largely consistent with the KWW approach and can be extended to consider the sectoral dimension.

To conclude, this active body of literature has not yet agreed on what the best method is for decomposing bilateral trade flows and for measuring countries' participation in GVCs. Instead, it seems that there is no unique correct methodology to address all possible empirical questions and different questions call for distinct approaches.

3 Data

To implement the previous methodologies the researcher would need inter-country-input-output (ICIO) tables which are available from the following databases.[2]

- The World Input Output Database (WIOD) covering 43 countries (and a model for the rest of the world), for the period 2000-2014 and 56 sectors. This database also provides the underlying national input-output

[2]For a complete list of databases check this link.

tables and regional aggregations of the ICIO tables. This database also includes data on employment (number of workers and educational attainment), capital stocks, gross output, value added, energy use, CO2 emissions and emissions to air at the industry level. More information at the following link.

- The OECD database provides ICIO tables for 64 economies covering OECD, EU28, G20, most East and South-east Asian economies and a selection of South American countries. The years covered are from 2005 to 2015 (an older version goes from 1995 to 2011) and the industry list includes 36 sectors. More information at the following link. Moreover, the OECD provides ICIO tables split according to ownership (distinguishing between domestic-owned and foreign-owned firms) for 59 countries, 34 sectors from 2005 to 2016. More information at the following link.

- The EORA database provides the widest coverage of countries including ICIO tables for 190 countries, from 1990 to 2015, with information on environmental and socio-economic variables. More information at the following link.

Alternatively, the OECD provides *ready-to-use* GVC indicators relying on different methodologies.[3] A first group of indicators is based on the perspective of the country where the value added originates (e.g. "foreign value added content of gross exports"), a second group of the country that ultimately absorbs the value added in its final demand (e.g. "domestic value added embodied in foreign final demand"). While having two perspectives allows to choose the most appropriate approach to the purpose of the analysis, it becomes difficult to tailor the indicator to the researchers' needs. As a result, these indicators are not enough for addressing all potential research questions faced by researchers, especially in measuring bilateral trends across countries and industries.

[3]Download the indicators at this link. Instead, if you are interested in the underlying methodology check this Stata package.

References

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