

Global supply chain participation measured through interregional feedbacks

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In this paper we propose to use the concept of Miller's (1966, 1969) "interregional feedback" for measuring GSC participation. The interregional feedback measures the induced intermediate export from country A to country B for producing inputs for the final demand in country A. We argue that the feedbacks reflect a country's participation in the global chain. If country A strongly depends on inputs from other countries while at the same time other countries strongly depend on inputs from A, the dependence is mutual or interdependent. Compared to other countries, country A would be characterized as midstream. Its participation in the global chain is then considerable and country A will show relatively large feedbacks. Our indicator defines the countries' participation in GSCs as the share of the feedback effect in the output (or value added, or emissions) generated by the multiregional input-output model. This is the backward-looking version of the indicator (with dependencies on inputs). We also develop a forward-looking version that focuses on the output dependencies. It turns out that both indicators are the same, addressing our intuition that the position in the stream (i.e. the degree of upstreamness or downstreamness) should not differ between the two perspectives.

The indicator depends on the final demand vector that is used. For measuring GSC participation of a single industry, it makes sense to take the unit vector. To measure a country's GSC participation, it makes sense to take the actual final demands. Yet, one could vary and look for the final demand vector that maximizes the GSC participation. This is what is done with the so-called least upper bound of the participation indicator, which gives us a general idea of countries' potential to participate in the GSC.

To test the air, we calculate the GSC participation indicators using global multiregional input-output tables for the period 1995-2020. Our results show large values for the indicators in cases of much interdependence and industries with much potential for increasing GSC participation are midstream.