Drivers of mutual content (production and ownership) in Chinese, EU, and US production

Topic: Trade and Global Value Chains Policies
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Policy makers are increasingly recognising the vulnerabilities in relying on other countries for essential products such as food, energy and medicines. The Japan earthquake and subsequent tsunami of 2011 had sizeable immediate consequences since producers had only limited substitutes for supply from Japan. The COVID-19 pandemic brought attention to export bans on crucial items like medicines and face masks. Later, Europeâ€™s dependence on Russian natural gas became clear.

Traditional analysis focuses on the countries that produce in a given global value chain (GVC), revealing possible bottlenecks. The government of a producing country may exert influence over the supply chain via trade. Governments may also influence supply chains via foreign investments. Suppose firms from country A own firms in country B that produce for country C. By exerting influence, the government of country A might affect the supply chain of country C. It is therefore relevant knowing firms from which countries own part of your supply chains. Many countries already implemented screening frameworks for foreign investments in their domestic critical infrastructure and technologies. However, they do not collect information about ownership in the supply chain.

The novelty of the paper is performing GVC analysis based not only on the country of production, but also on the country of ownership of production. It allows answering several research questions. For example, how much production in a given industry in a given country consists of value added produced in country A or produced outside country A under ownership of firms from country A? How does this involvement of country A develop over time? What are factors behind the developments and can they be influenced by policies?

This is illustrated with an analysis for the three major global traders, namely China, the United States and the European Union. First, it quantifies the value added embodied in production of one trader that was either created in the domestic economy of the other trader or under ownership of from by that other trader. For example, how much value added embodied in the production of EU car industry was created in China and how much of it was under Chinese ownership elsewhere in the world. This uses standard input-output analysis. Second, the change during 2000-2019 is calculated. Third, factors driving these changes are calculated using a structural decomposition analysis. Some factors can be influenced by policies, such as direct imports and direct investments. Other factors, namely different trade patterns outside the own country/region, different investment patters outside the own country/region, general (de)fragmentation of GVCs and technological developments, cannot or only with great difficulties be influenced by policies.

The data for global value chain analysis are the input-output tables from the Asian Development Bank in constant prices. The data about ownership, by producing industry by producing country by country of ownership, are from the OECD AAMNE (Analytical Activity of MultiNational Enterprises) database.

An example of the results: USA related content in EU manufacturing of coke and petroleum products rose from 6.6 percent in 2000 to 10.2 percent in 2019. In the latter year, value added produced in the USA ultimately ending up in EU manufacturing of coke and petroleum products was 5.0 percent of total value added embodied in production for final use by this industry. Value added produced outside the USA under USA ownership amounted to 5.2 percent of the total value added

embodied. The USA related content rose 3.6 percent during 2000-2019. This change was decomposed into factors. Changes in USA trade with the EU, USA ownership in the EU, and â€œthe restâ€• amounted to 1.0 percentage point, 2.9 percentage point and -0.3 percentage point of the total change, respectively. Looking at other industries as well shows that the size of factors that can be influenced by policies is generally large.