Where Did the Processing Export Relocate to? An Optimization-Method-based Identification

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As the bellwether of global production relocation, capturing the international relocation of processing trade in the recent past would shed light on the current complicated production location reconfiguration. However, directly identifying the host economies of processing production is challenging because of the lack of data (countries across the world rarely distinguish the processing trade from ordinary trade). To overcome this challenge, the paper proves that the continuously decreasing DVASHGE is a sufficient condition for identifying whether a low-cost country is the host country of processing exports relocation, and put forward the idea of identifying the host economies according to their DVASHGE. On the other hand, measuring the DVASHGE based on the national or world input-output tables is not suitable for the paper due to the significant time lag of input-output data, the lack of data in low-income economies, and the lack of global processing trade statistics which will bias the results. Thus, the paper proposed a constrained weighted least squares optimization for unfolding the changes of DVASHGE in each specific economy.
In the empirical section, the paper selected 19 developing economies as the candidates for the host economy of processing production and conducted the empirical analysis of their DVASHGE. The empirical findings indicate that, since the global financial crisis in 2008, Vietnamâ€™s DVASHGE has been continuously declining from about 0.60 during 2009-2012 to 0.50 during 2018-2020, confirming that Vietnam is the typical host economy of the processing production in recent years. Moreover, among the 19 candidates, Vietnam and the Philippines in Southeast Asia, Colombia in South America, and Tunisia in North Africa are the host economies of processing production; while Turkey in the Middle East also exhibits some numeric features for receiving such relocation, to some extent. Those economies also correspond to the extensions of three major regional production networks, i.e., the Asian production network centered on China, the American production network centered on the USA, and the European production network centered on Germany.
In the robustness check section, the paper has proved that the changes of the DVASHGE solutions remain robust and similar to that of the actual value, even if the macro-economic data is from different sources or the reference value is biased. However, it is important to note that the numerical results of the DVASHGE solutions presented in this paper are estimators and cannot replace the TiVA indicators measured based on input-output tables. In other words, the paper does not intend to substitute the input-output-based measurements with the proposed model. Instead, we believe that these two methods are essential complements since our DVASHGE solutions can provide an important reference for the GVC studies centered on input-output-based TiVA indicators.
In conclusion, this paper serves as an important starting point by introducing an approach to identify the host economies of processing production. Moreover, what characteristics makes them the host economies? What are the policy implications in the supply chain management and the GVC governance? These questions will be explored in our further researches.