

## **Impacts of Russia-Ukraine conflict on Russian states and their recovery pathway**

Topic: Input-Output Analyses and Input-Output Modelling of Disasters - I

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The Russia-Ukraine conflict since February 2022 has intensified geopolitical frictions and most OECD countries have announced punishing sanctions against Russia. Restrictions imposed by these countries on Russia's commodities export would result in economic losses through global supply chains. Especially, Europe is the region affected most, meanwhile, Russia would suffer economic losses as well. Existing studies have attempted to discuss the effects of the Russia-Ukraine conflict on the economy from European countries' view, however, no study quantitatively evaluates economic losses burdened by Russia, let alone at the regional scale in Russia. Given the important role of Russia in the world's top energy and food supplies, a bad economic level in Russia can also threaten the energy security and the economic stability of other countries through the supply chains. Considering the close relations among global countries, it is necessary to quantify the regional economic losses in Russia to stress the importance of cooperation in trade globalization.

In this context, our study first constructs the multi-regional input-output (MRIO) table for 85 districts of Russia in 59 economic sectors by employing hybrid methods. Then, we further link Russian MRIO with global MRIO from GTAP to trace the supply chain and understand the spillover effects induced by other countries' sanctions across Russian regions. Finally, we use the disaster impact model which is an extension of the adaptive regional input-output (ARIO) model to simulate the propagation of sanctions induced by the European Union, United Kingdom, United States, Canada, Japan, and Ukraine on the Russian regional economy during the one-year conflict since February 2022. Moreover, we simulate the economic losses under different sanction durations by setting a series of scenarios. The study helps mitigating geopolitical frictions and promoting cooperation to keep trade smooth is needed to avoid supply-chains-induced economic losses in globalization.