Multi-regional Input-output Dataset for the UK from 2017 to 2022

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As the sixth largest economy in the world, the United Kingdom plays a pivotal role in global production networks. However, there are long-lasting economic gaps among different regions of the UK. Most of the previous research on the UK's domestic interregional characteristics remains insufficient, lacking industrial resolution. In the face of increasingly frequent challenges and impacts such as Brexit, the COVID-19 pandemic, the refugee waves and the Russo-Ukrainian War, it is essential to construct a detailed regional economic database for the UK for government officials and researchers. The multi-regional input-output (MRIO) model is widely recognized as an ideal tool for tracing regional heterogeneity and the structure of production and supply chain. Unfortunately, existing MRIO databases focus more on the international level, treating the UK as a single economy. One of the pioneers in unraveling the UK's regional details is the EUREGIO database team. They compiled a NUTS 2-level MRIO dataset for all EU countries from 2000 to 2010. Recently, scholars extended this dataset to 2018. However, the latest dataset still relies on outdated trade structure data in 2013 and only includes 10 broad industry categories, which limits its usability.

In this study, we construct a time-series of UK MRIO tables from 2017 to 2022 with 12 International Territorial Level 1 (ITL1) regions, 105 sectors, and 6 final demand categories. To maintain data consistency, we only use publicly available data from the UK Office for National Statistics (ONS), which includes national input-output tables, regional value-added and regional import-export data. We also utilize the latest interregional trade data of 2019 and 2020 released by the ONS in 2025. It contains detailed breakdowns by industries, which shed light on the changes of domestic trade structure before and after Brexit. Our MRIO compilation process features a hybrid entropy-based method. First, we utilize the structural information from the national table to fill in missing values in the regional data and disaggregate them to match the target 105 sectors. Next, 12 single-region input-output tables are constructed by taking national input coefficients as initial values and applying a maximum entropy framework. For each sector and each region, we estimate their local supply, domestic supply to other regions, local demand, and domestic demand for other regions under a series of mathematical constraints. Subsequently, we use the gravity model and the recent ONS domestic trade data to generate the interregional trade matrix. Finally, the trade matrix is integrated with the single-region tables to form the complete MRIO.

Our UK MRIO dataset can reveal the evolution of domestic supply chains during the process of Brexit and the pandemic. With its detailed sectoral classification, it provides a robust foundation for a wide range of in-depth studies on regional inequality, environmental issues, and their spillover effects. Since all underlying data are regularly published by the ONS and the trade data are recent, this dataset also has the advantage of being easily updated in the coming years. It also gives us an intermediate result to compile a more detailed table at UK's ITL2 level or a nested multi-scale MRIO table with the help of mainstream global MRIO databases.