

The economic interdependence of industries: a network science approach

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Economic input-output (EIO) models represent, in mathematical form, the monetary transactions between industry sectors. They specify what goods and services (output) are consumed by other industries (input) and can be transformed into production networks.

This study focuses on the interdependence of different industries and wishes to examine how sectors support each other in growth by modelling production networks from EIO models. The research questions include whether the production networks have a defined topology, whether it changes in time, and which top industries stay the same.

We develop and explore the detail-level network of 405 sectors. For data sources, we use the newest US Input-Output Accounts Data from 2007 and 2012. We examine their topology and centrality metrics under various thresholds for what represents a supporting link between two industries.

The aggregate-level data distorts the analysis of production networks. Our research argues that we must analyse detail-level models with a high number of sub-sectors to understand the most accurate structure of the network of industries. We find that the production network is susceptible to a defined threshold and that the field of sectors is asymmetric.