

## Boosting Economic Competitiveness: The Industrial Clusters in Input-Output Networks

Topic: Methodological aspects of input-output analysis

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Porter (1998) suggested an importance of forming regional industrial “clusters” and pointed out that it is an indispensable source to promote regional competitiveness, innovation, and growth. Countries facing the deindustrialization and the decline of local industries aim to enhance the national competitiveness by improving business environment through forming the industrial clusters. The countries have to identify economically-important industries to promote the territorial and extensive industrial clusters. The inter-industrial relationship consists of huge and complicated network and it makes difficult to analyze a comprehensive structure for the formation of clusters. Many previous studies analyzed an actual network structure (e.g., communication network, traffic network, etc.) by using the graph theory. In the input-output analysis, Liang et al. (2016) applied the concept of betweenness centrality to the IO-based supply-chain network and developed a structural path betweenness with a focus of multi-production layers. As in the spirit of Liang et al. (2016), this study defined a new concept of “clusterness” and developed a novel method to identify economically-critical industries in terms of clusterness considering the multi-layer graphs originated from the nature of inter-industrial network. We used the EXIOBASE and calculated the clusterness scores with a focus of the Japanese industries. The result shows that industries related to steel production had the higher clusterness scores, and it indicates the Japanese steel industries played a central role in forming larger clusters in the global supply-chains. Relevant economic policies for enhancing domestic industrial clusters associated with Japanese steel industry and incorporating this high-clusterness industry into global supply chain boost domestic economy through the linkage in industrial clusters.