

## **Unit Structure Analysis of Oil Price Pressure: The Case of Japan**

Topic: Input-output analysis for policy making II (Chair: Candi Clouse, Cleveland State University)

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Crude oil prices have increased by 40% during the period between 2015 and 2022. Thus, the Japanese economy has clearly experienced a rapid increase in the crude oil prices due to the global oil supply insecurity caused by the Russian aggression against Ukraine. It is important to note that the rapid oil price increase has a significant impact on the production cost of industries because they directly and indirectly use crude oil via supply chains. This study focuses on cost pass-through describing that a business entity changes the price of goods or services in response to a change in the energy cost of producing them. To model the cost pass-through via product supply chains, we develop a new cost-pushed unit structure approach that is capable of describing an adjacency matrix by weighting the energy cost increases embedded in transactions between each sector. We then applied cluster analysis to the adjacency matrix to find industry groups with overconcentrated energy cost increased in the supply chain network. From the results based on the 2005, 2011, and 2015-linked input-output tables, we found that the pressure on Japanese economy due to rising oil prices decreased considerably. Furthermore, we observed that fishing-related cluster had the highest effect of the pressure caused by increase in oil prices during the study period. Based on the cluster results identified in this study, policy makers should define a priority for aiding supply chain groups with higher oil price pressure.