# Conventional Input-Output models to estimate economic damage of earthquakes.

Topic: An Input-Output Analysis for Disaster Damage: A Case Study on the Tokyo Epicentral Earthquake (Chair: Kiyoshi Fujikawa, Aichi Gakuin University)
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This presentation is the first presentation in the organized session, â€œAn Input-Output Analysis for Disaster Damage: A Case Study on the Tokyo Epicentral Earthquakeâ€•.
An earthquake of magnitude seven or greater in the southern Kanto region, including Tokyo, is expected to cause more direct damage than the Great East Japan Earthquake in 2011. A reduction in economic activity in Tokyo would cause significant economic damage to the rest of the country since Tokyo is the center of logistics. This session will focus on such indirect damage, where Tokyo is assumed as the disaster area and exogenous to measure the production decrease caused by the disaster in Tokyo. The entire Japan is divided into two regions, Tokyo and the rest of Japan, and we estimate the extent to which the damage in Tokyo extends beyond Tokyo based on Tokyo metropolitan two-regional Input-Output table.
In this presentation, we present a demand-oriented model, a supply-oriented model, and a hybrid demand. This presentation is important in the sense that the results obtained can be compared with those obtained with other models in the same session although the ideas of these models are relatively well known and the models themselves do not have much novelty. In the demand-oriented model, the exogenous variable is the decrease in intermediate demand from Tokyo due to the production decrease in Tokyo. The resulting decrease in production outside of Tokyo is the damage caused by the earthquake. In other words, this is the backward linkage effect of the decrease in production in Tokyo, which is estimated by Leontief model. In the supply-oriented model, we apply the Ghosh model, in which production is determined as the sum of inputs (intermediate goods and value added). What is considered fixed in this model is the allocation coefficient from one industry to others. The Tokyo disaster reduces inputs to the rest of the country. The model measures the forward linkage effect of the decrease in production in Tokyo, which is then considered as the damage. The hybrid model uses both. In the first step, the forward linkage effect expressed by the Gauche model is activated, and from the second step, the backward linkage effect by the Leontief model is activated.â€ƒ