Resource allocation model for estimation of 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 third presentation in the organized session, â€œAn Input-Output Analysis for Disaster Damage: A Case Study on the Tokyo Epicentral Earthquakeâ€•
This presentation deals with supply constraints of intermediate goods such as raw materials and components due to Tokyo epicentral earthquake based on Tokyo metropolitan two-regional Input-Output table, which is similar to the previous presentation. However, this presentation analyzes the case where supply constraints are addressed by adjusting the demand quantity, in contrast to the previous report which estimates earthquake damage by estimating the decrease in production when a bottleneck occurs in intermediate goods input. When we call the demand options available to an economy is â€œthe demandable setâ€•, then the occurrence of supply constraints on intermediate goods means a shrink of the demandable set. In this case, it is a policy decision which part of the shrunk demandable area should be selected, in other words, for which products the intermediate good resources should be allocated. It depends on the criteria (objective functions) for policy decisions. Examples of objective functions include maximizing GDP, maximizing consumer utility, or minimizing change from the status quo.
This model is an application of the linear programming. In a traditional input-output analysis, the quantity of final demand is an exogenous variable and the quantity of output to supply it is determined; in this resource allocation model, the quantity of output is an exogenous variable and the quantity of final demand that can be supplied by it is calculated in reverse. In the model in the previous presentation, earthquake damage is estimated by the change in the production volume, but in this model, earthquake damage is estimated by the change in the objective function. The idea of this model is new and has never been presented at an international conference before, and we believe it is important to introduce this model at IIOA because of its significant academic contribution.