

ECONOMIC LOSS ASSESSMENT OF TRANSPORT INFRASTRUCTURE DAMAGE BY EARTHQUAKES

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In Japan, it is thought that heavy earthquakes will hit metropolitan areas within this century in which large population and assets are aggregated. The losses of 81 trillion yen (750 billion dollars) is estimated on the worst scenario that three major earthquakes –Tokai, To-Nankai and Nankai, occur simultaneously. The great impact of such earthquakes causes then economic damages to both the suffered and non-suffered areas. This paper intends to show a framework to assess the spatial and economic impacts of transport infrastructure damage from catastrophic earthquakes.

Employing a spatial computable general equilibrium (SCGE) model, which considers two types of inter-regional flow and transportation modes (i.e. business trip by train and commodity flow by autotruck), it can be seen how much transport-related economic losses arrive at each region through inter-industrial and inter-regional relationships of economy.

Several points are taken into account in modeling. Disaster is in essentials local events, and economic losses arrive disproportionately at regions. This causes us to use short-term equilibrium concept to find the equilibrium states after a disaster. Also, transportation network is explicitly considered in computation process to obtain transport cost from transport infrastructure damage.

As results of scenario analyses, regional economic losses are calculated. Consequently some perspective on risk management will be obtained so that transportation network becomes redundant to disaster. For example, we may know which network links are important than others. It will lead to prioritization of reinforcement or recovery policies.