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Risk Assessment and Pricing of Natural Hazards: Earthquake Case

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Abstract

The potential impacts of natural hazards are enormous. In such catastrophes the economies and human lives are exposed to unpredictable losses. Probabilistic modeling of such hazards require long term historical information which enables researchers to determine the potential risk for certain periods. However, even though its increasing trend in the frequency of such events, the factors influencing the magnitude of the losses are diverse and many. Earthquakes are the most severe one as its occurrence and severity are not predictable compared to meteorological hazards. This study gives an overview of risk assessment approaches in determining the likelihood of such an event, and then explains, in specific, probabilistic seismic analysis approach to assess the risk. Loss estimation and risk transfer methods which are commonly used in practice are presented. A Bayesian approach is applied to estimate the economical loss caused by an earthquake to determine the risk premium. The proposed approach is employed to Turkish earthquake data for a certain region and compared to the rates depicted by Turkish Catastrophe Insurance Pool (TCIP-DASK).

Keywords: *Earthquake risk, TCIP, Bayesian modeling, risk premium*

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