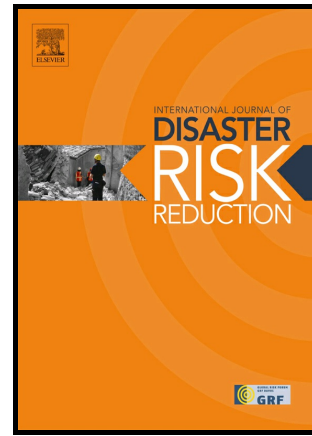


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Estimating and Comparing Economic Consequences of Multiple Threats: A Reduced-Form Computable General Equilibrium Approach *

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Abstract

Policymakers and analysts in homeland security and emergency management need standardized estimates of the economic impacts to allocate resources to reduce losses across multiple threat types including terrorism events, natural disasters, and technological accidents. To date, mainly single-threat analyses have been conducted, using a wide variety of methods. This article proposes a multi-threat analytical framework based on computable general equilibrium (CGE) modeling. CGE-generated GDP impacts are calculated using Monte Carlo simulations of key drivers of disaster losses, creating synthetic data for regression analysis of causal factors influencing results. This approach improves the overall accuracy of modeling, facilitates multi-hazard comparison of economic impacts, and allows for decomposition of direct and general equilibrium impacts. The decomposed results across five threat types confirm the importance of behavioral and economic resilience factors, which are rarely modeled, differ substantially across various threat types, and are critical in risk management. Results from this approach allow policymakers to rapidly and easily evaluate the magnitude of numerous threats and efficiently allocate budgets across interdiction, mitigation and resilience options.

Keywords

Multi-Hazard Analysis, Macroeconomic Consequences, Computable General Equilibrium Analysis, Reduced-Form Modeling, Behavioral Response, Resilience

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