

Research Synopsis

Project 8b: Regional Economic Impact Analysis with Computable General Equilibrium Models (Rose)

This project involves the extension and application of a state of the art model to analyze the economic impacts of terrorist attack at the individual business, market, and regional economy levels.

Modeling Area: Economic Assessment

Application Areas: All

Principal Investigator: Adam Rose

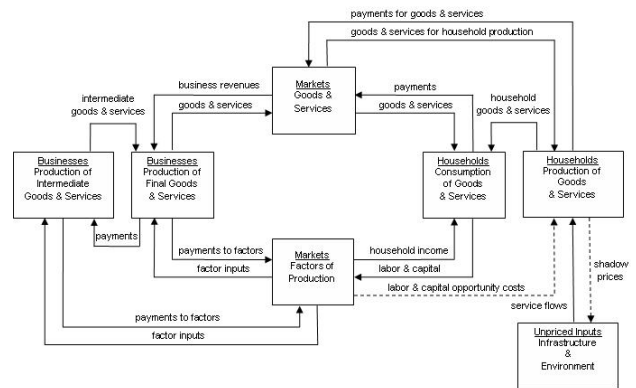
Institution: Penn State University

Other Investigators: Gbadebo Oladosu (Oak Ridge National Laboratory), Shu-Yi Liao (National Chung Hsing University)

Student Research Assistants: Dan Wei (Penn State)

Brief Description:

Computable general equilibrium (CGE) analysis is the state of the art tool for analyzing the economic impacts of terrorist attacks on individual businesses, markets, and the regional economy. This project will build on conceptual extensions of CGE modeling in Year 2 through the empirical construction of household production functions that will make it possible to evaluate the impact of terrorist attacks on residences, which consume about 30% of the electricity and 40% of the water services in the economy. The project will continue to extend CGE modeling empirically by sharpening the accuracy of the measurement of resilience to attacks. Also, the model will be enhanced by a GIS overlay of utility systems. Simulations will be performed with the enhanced model to examine the impacts of major water service disruption and of an anthrax attack in Los Angeles.



Extended economic model for use in CGE

Objectives:

The goals of this project are to: 1) further refine a computable general equilibrium (CGE) model developed to analyze the regional economic impacts of terrorist attacks, and 2) to apply the model to various case studies.

Major Products and Customers:

The Los Angeles CGE Model tool will be useful to the Business Community and City County Officials. The Case Study Analyses will be useful to Utility Managers, the Business Community, and Emergency Management Officials.

Interfaces to other CREATE Projects:

This project will broaden the range of impacts that can be evaluated by CREATE researchers, and provide insights to key policy-makers. The results of the modeling and analysis of households in a CGE context will be transferable somewhat to the I-O models developed by CREATE.

Interfaces to non-CREATE Projects:

This work complements research funded by the Multidisciplinary Center for Earthquake Engineering Research on economic impacts of utility disruptions caused by natural hazards, and analyses by DHS (especially TSA) on indirect impacts of terrorist attacks.

Technical Approach:

This project will capitalize on the principal investigator's recent refinements of CGE analysis, such as the collection of new empirical data, development of algorithms for their use in recalibrating key model parameters, modeling of disequilibria, decomposition of direct and indirect impacts, and its application to measuring economic resilience to disasters. Key steps for the coming year include updating and extending the CGE model, applying it to case studies, and developing lessons learned that can be shared with the USC economic analysis team and policy-makers.

Major Milestones and Dates:

1. Update LA CGE Model – December 2006
2. Construct Household Production Functions – January 2007
3. Complete GIS overlays of utility systems – March 2007
4. Conduct policy analyses – August 2007