Economy-wide Consequences of Electricity Supply Disruptions: Analytical General Equilibrium Analyses

Ian Sue Wing, Dept of Earth and Environment, Boston Universitye, 617-869-4623, isw@bu.edu
Adam Rose, Price School pf Public Policy, Unjiversity of Southern California, 814-777-6789, adam.rose@usc.edu

Overview

Electricity service providers take many steps to increase the reliability of their systems through *mitigation* that reduces the frequency and magnitude of potential disruptions, primarily in the form of strengthening individual pieces of equipment and protecting system connectivity against outages. At the same time, direct and indirect electricity customers pursue a range of measures to reduce their losses once the disruption begins, which are termed *resilience*. This paper will present the development of a computable general equilibrium model for this purpose. The paper will also include an example showcasing the use of the model to conduct numerical assessments using the shocks and economic parameterizations from actual electric service disruptions.

Methods

The CGE model combines "bottom-up" aspects of mitigation and resilience with "top-down" characterizations of the service area economy. The core the model is a set of nested constant elasticity of substitution (CES) production functions.

Results

Analysis of cost-effectiveness of various mitagiaojn and resleince strategies to reduce the direct and inderct encomic losses form elctricty outages.

Conclusions

Pending

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