

Abstract

Insurance and retrofit are potentially effective but underutilized mechanisms to manage natural disaster risk (Mileti 1999). This project uses a North Carolina case study of residential buildings in North Carolina that includes a detailed, empirically based representation of the building inventory, risk, insurance, and retrofit strategies to examine voluntary choices between insuring, retrofitting, or doing nothing. Using an expected utility framework, changes in optimal choices in response to changes in retrofit cost, risk-based insurance premiums, and risk attitudes are investigated. Individual loss distribution functions that are specific to location and structural characteristics influence whether to optimally insure and/or retrofit or not. Findings include the conclusion that subsidizing retrofits has the potential to move the uninsured towards some form of risk reduction and is potentially cost effective. The analysis is novel in linking expected utility-maximizing homeowner decisions regionally to detailed hurricane loss and retrofit modeling.

Citation

Shan X., J. Peng, Y. Kesete, Y. Gao, R. Davidson, J. Kruse, and L. K. Nozick, "Market Insurance and Self-insurance through Retrofit: analysis for hurricane risk in North Carolina", *Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 3(1):04016012, 2017.