



Making Insurance and Retrofit Work Together

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with huge thanks to:

Prof. Jamie Kruse, Prof. Linda Nozick, and Prof. Joe Trainor

*Role of Disaster Insurance in Improving Resilience: An Expert Meeting
Earthquake Insurance Panel 2*

July 10, 2015



1. We need both insurance and retrofit

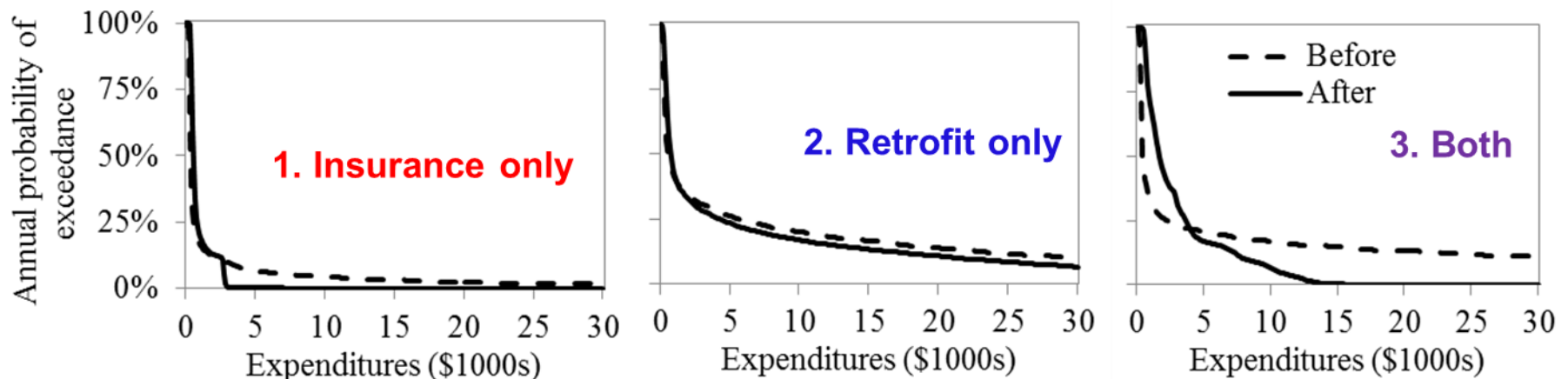
INSURANCE

- Spreads economic loss
- Provides \$ for recovery
- Removes tail of loss dist.

RETROFIT

- Reduces economic loss
- Reduces casualties
- Lowers loss distribution

Interactions





Christchurch, NZ example

- Heavily insured. 80% paid by insurance.
- 17 events with 500k+ residential claims over 2 years
- Land covered

BENEFITS

- Facilitating major rebuild
- \$12B paid by insurance

CHALLENGES

- Extra demolitions (CBD)
- Apportionment
- Human resource needs
- Changes during rebuild
- Psychological effects
- Disruption during rebuild



1. We need both insurance and retrofit

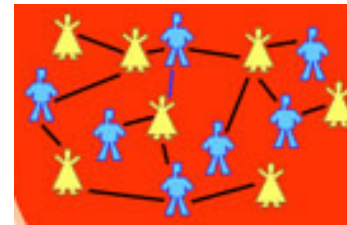
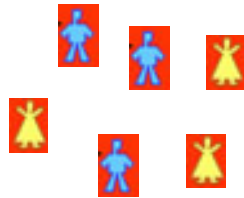
ECONOMIC PERSPECTIVE

Damage covered by insurance = No damage

COMMUNITY RESILIENCE PERSPECTIVE

Damage covered by insurance <<< No damage

2. Points to consider in policies & programs



- Balance system-individual views
 - Each stakeholder acts in own interest → societal result
 - Interactions among stakeholders
- Insurance and retrofit linked
- Depends on magnitude, nature of risk and possible retrofits
- Normative and descriptive aspects



Factors affecting homeowner decision-making

HOMEOWNER ATTRIBUTES

- Psychological
- Hazard experience
- Caregiver responsibility
- Demographics

HOME ATTRIBUTES

- Appropriate retrofits
- Value
- Attachment to place

RISK

- Model-estimated
- Perceived
- Likelihood
- Consequences
- Framing

ADJUSTMENT ATTRIBUTES

- Cost in dollars, time, effort
- Efficacy in protecting property/people
- Usefulness for other purposes

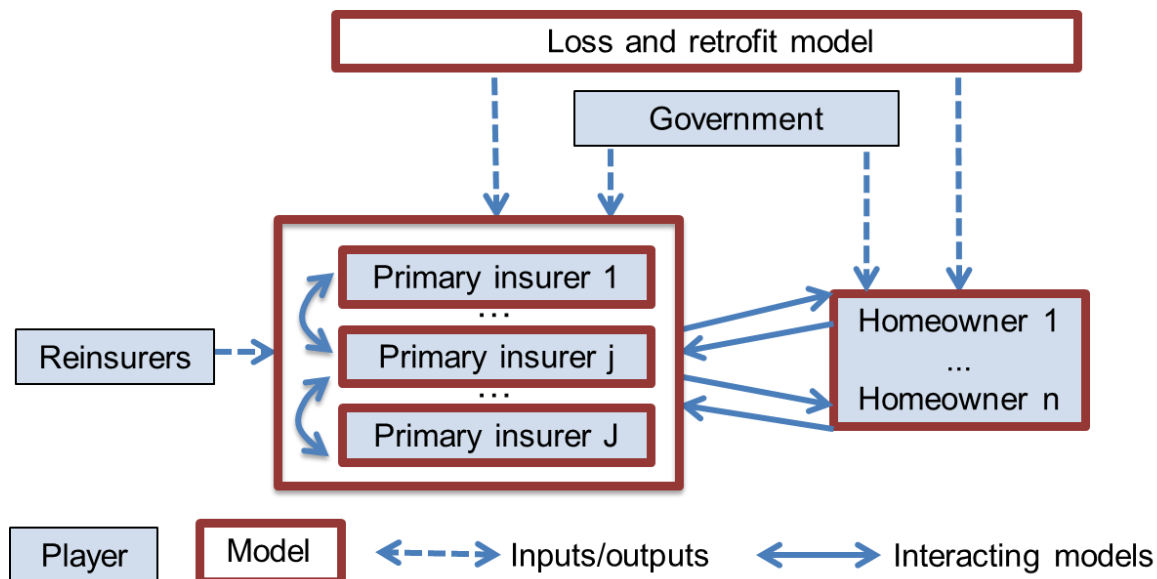
COMMUNITY/SOCIAL

- Neighbors' actions
- Responsibility to prepare
- Expected response by others
- Community mitigation

*Multiple disciplines
Heterogeneous
1st engage*

3. Aim to design policies and programs that benefit everyone

- Do there have to be winners and losers? Sacrifices for societal good?
- Maybe not
 - Can reduce total losses → In everyone's interest
 - Exploit different objectives, constraints, abilities

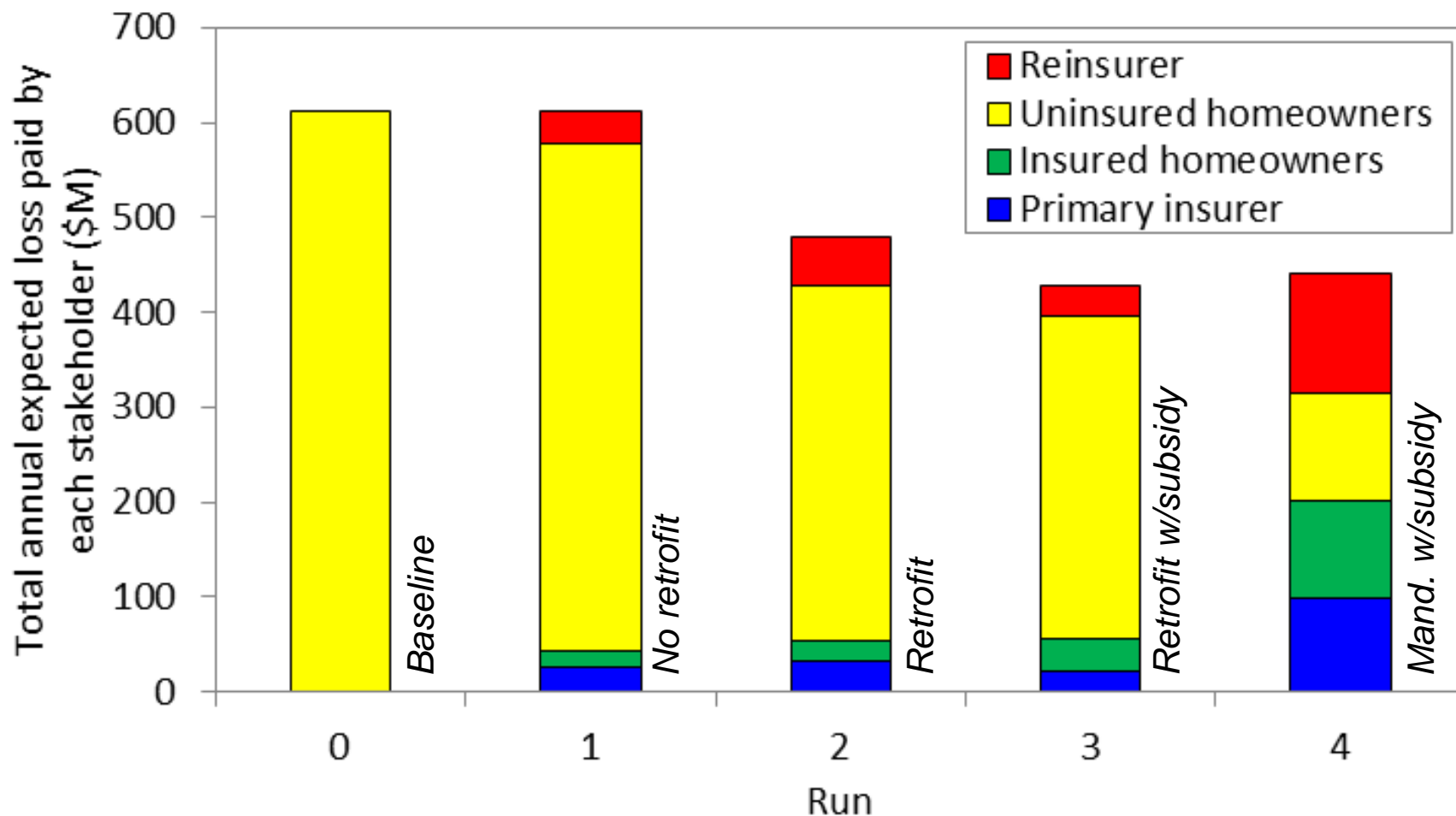




- 1 No retrofit
- 2 Retrofit
- 3 Retrofit w/subsidy
- 4 Mand. ins. w/subsidy

Societal perspective

Who pays?

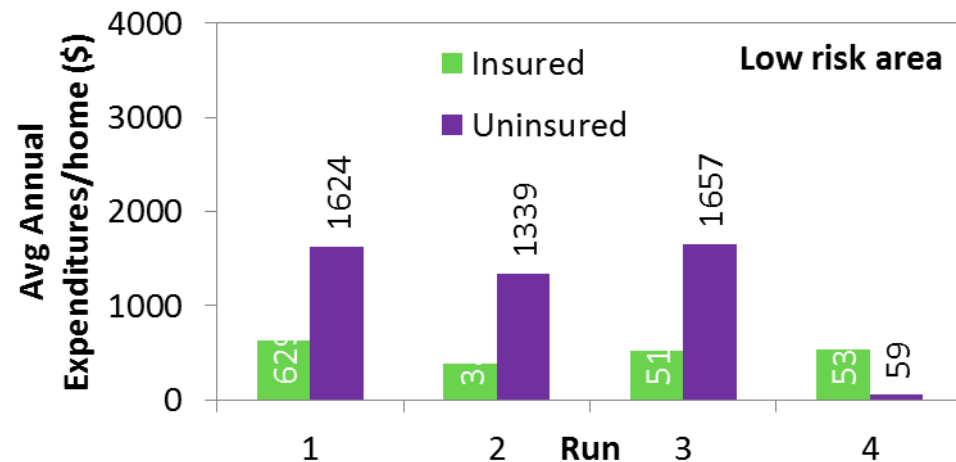
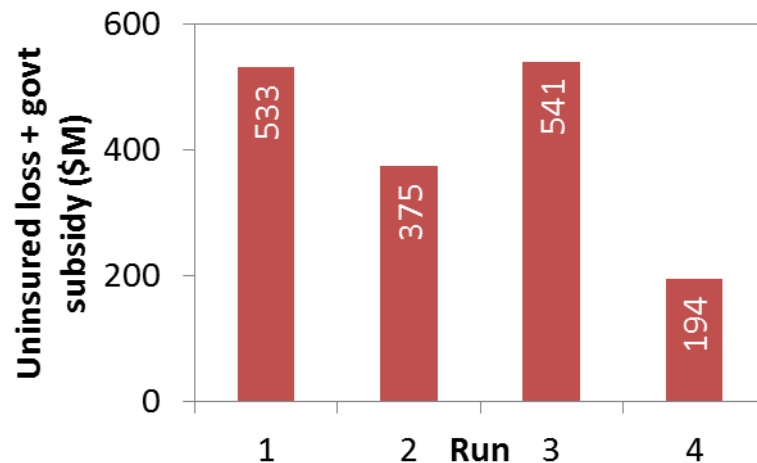
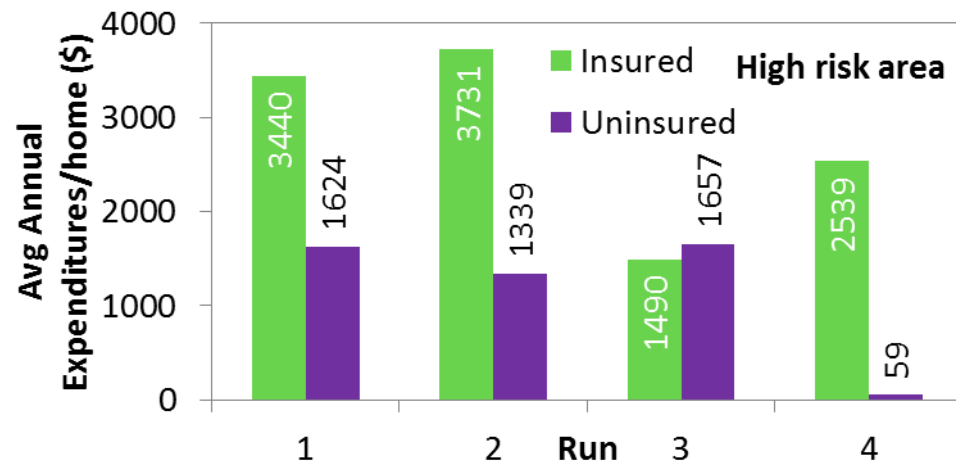
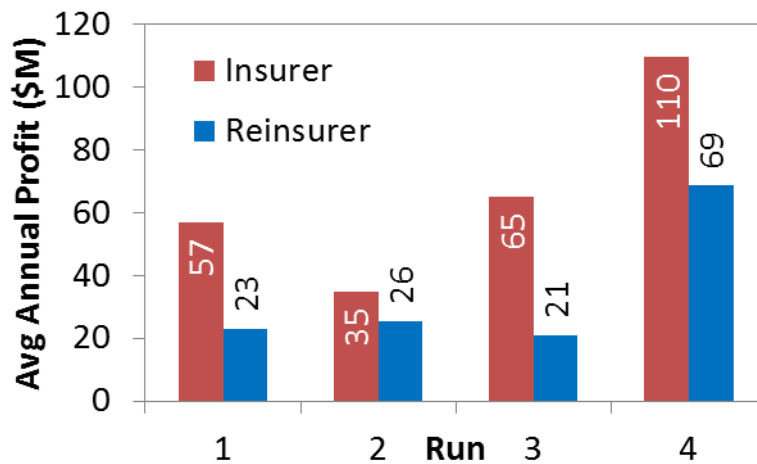




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Stakeholder perspectives

In each group's interest





Acknowledgements



- Peng et al. 2014. Modeling the integrated roles of insurance and retrofit in managing natural disaster risk: a multi-stakeholder perspective. ***Natural Hazards*** 74, 1043-1068.
- Kesete et al. 2014. Modeling insurer–homeowner interactions in managing natural disaster risk. ***Risk Analysis*** 34(6), 1040-1055.
- Gao Y. et al. Modeling competition in a market for natural catastrophe insurance, ***Journal of Insurance Issues***, in press.