Shirai (2023): Effects of Levee Systems and Optimal Policy Targeting

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Summary

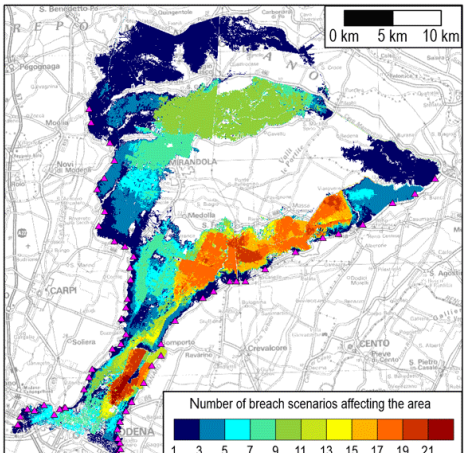
- Impact evaluation of levee systems
  - Levees lower flood risks in counties with larger flood risks
- Optimal policy targeting for levee systems
  - Actual allocation is 33 to 63% of optimal
  - Externalities makes it difficult to achieve the optimal allocation

Identification: Government cost-benefit analysis

> *For instance, the report of the Mississippi River below Cape Girardeau discusses the construction of levees, comparing the benefit of the land value per acre with the construction cost of levees per acre. USACE calculates the benefit of land value using the frequency of overflow and the depth of floods. If the average future losses of land to be protected are higher than the levee construction cost, the report concludes that the construction of the levee is economically justified.*

- Source of identification?
- Losses $>$ costs as (fuzzy) RD

Identification: Hydrologic model



- Predicted benefits for non-targeted, downstream areas
- Could compare more-treated and less-treated places
- https://nhess.copernicus.org/articles/20/59/2020/

Identification: Propensity score matching

Because the pre-treatment variables based on the 1910s are not enough to remove the imbalances, I also use five outcome values in level and lagged.

- If outcomes are correlated, then matching on outcomes of interest

Optimal targeting: Ex-ante vs. ex-post

- Known distribution, but stochastic realizations
- Unknown distribution, but best possible prediction
- What is known, and what is unknown?

Optimal targeting: Government objective function

- Do governments target the average or worst scenario?
- Do governments care about distributional effects?

- Are decisions made federally or locally?
- Are there political distortions?