

# Climate Adaptation in Housing Markets

Allan Hsiao  
Stanford University

October 10, 2024



## Big challenges for coastal cities by 2100

- Two great papers on housing
  - Crucial role of adaptation
- Recurring themes with connections to Jakarta
  - Dynamics, equilibrium, and capitalization
  - (Political economy)

## Jakarta (Hsiao 2023)

- By 2050, 35% below sea level
  - Land subsidence + sea level rise
  - Proposed sea wall at up to \$40B
- How does government intervention complicate adaptation?

## Coastal moral hazard

- Defense bails out development if government is time-inconsistent
  - Delays inland migration at high social cost
- Dynamic spatial model of development and defense
  - Estimated with granular data for Jakarta

# 1. Dynamics

- **Expectations matter** but are hard to model and estimate
- In Venice and the US, expectations over worsening risk
  - Work with prices and information, remaining agnostic on expectation formation
- In Jakarta, time inconsistency generates moral hazard
  - For estimation, expectations embedded in prices

## 2. Equilibrium

- Flood risk affects **entire market** in equilibrium
- In Venice and the US, potential SUTVA violations
  - Spillovers on control group
  - Rely on an implicit model (including cross-market)
- In Jakarta, explicit model of equilibrium
  - At cost of specific structure and assumptions

### 3. Capitalization

- Housing prices may not reflect **social welfare**
- In Venice, real estate markets work
  - High-frequency data and quasi-experiment quantify capitalization
- In the US, real estate markets do not work
  - Because of informational frictions
- In Jakarta, real estate markets work
  - Housing prices capture the subsidy of government protection
  - But do not reflect public costs

## 4. Political economy

- Uneven **distributional effects** spatial heterogeneity in exposure
- In Venice and the US, varying degrees of political friction
  - Slow implementation in Venice
  - Limited political divide in the US (but information hurts high-risk places)
- In Jakarta, political frictions drive coastal moral hazard
  - Distributionally, local benefits at national cost