Climate Change and the Spatial Distribution of Socioeconomic Vulnerability in Flood Prone Coastal Regions

Yu Jeong Lee Advised by Professor Stephen Redding

Princeton Griswold Center for Economic Policy Studies

Motivation

1. Coastal flooding events are increasing in intensity and frequency *increasing stakes, changing risk horizons*

Projected sea level rise of 10-12 inches in the next thirty years, increasing high damage flooding frequency by x10

- 2. Federal natural disaster recovery programs and policies prioritize homeowners and owner-occupied properties
- disproportionate concentration of risk among tenants

Renter flood insurance comprises just 2% of the National Flood Insurance Program which only covers valuables*

3. Existing studies on flood risk do not differentiate between property owners and tenants

unclear how flood risk affects tenants in particular

Research Question & Contribution to Literature

Who lives in flood-prone coastal regions and why?

- (1) How does coastal flooding affect housing prices?
- (2) Who pays these prices to live in flood prone areas?

The effect of flood risk on coastal housing values is heavily debated in the literature due to differences in:

- (1) Geographic focus and state-level information disclosure policies
- (2) Type of risk preference model used (Prospect Theory/ Loss Aversion, Bayesian Updating)
- (3) Choice of related covariates (belief in climate change, partisan affiliation, etc.)
- (4) Choice of exogenous variables (weather, vertical land motion, coastal proximity, etc.)



Disclosure Rankings



US Census Tract Boundaries





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Primary Contributions to the literature:

- (1) Proposing homeownership as an alternative proxy for revealed risk preferences, bypassing inconsistencies associated with the modeling of different risk profiles and preferences
- (2) Incorporating information disclosure requirements into evaluating the price effects of flooding

Methodology

Dataset:

Combination of 4 administrative datasets and 1 survey dataset examining 21 coastal states at the census tract level, excluding Hawaii and Alaska from 2010-2016. (*n* = 457,286)

Causal Mediation Analysis

- Isolate the effect of flood risk on prices, from the effect of flood risk on an individual's housing choice decision (to rent or to buy)
- (2) Identify to what extent prices mediate the housing choice decision



Key Results

Price Effect of Flood Risk

- Homeowners discount flood risk more heavily than do renters
 - Property values ~ 31.0%
 - Rent prices ~ 13.4%
- Mandatory disclosure significantly decreases property values by up to 43% and rent prices by 33.9%

Price Effects: Pacific Northwest



Key Results

Residential Sorting Effect of Flood Risk

- Flood risk increases homeownership rates; effect is **not** mediated by prices
- Price largely mediates rentership but not homeownership
- Mandatory information disclosure magnifies inequities in flood risk exposure

RACE	Price fully mediates the effect of flood risk on the racial composition of homeowners and tenants. Mandatory disclosure increases the share of POC by up to 83%.
AGE	Price largely mediates the effect of flood risk for tenants of all ages, while having a consistently negative effect for homeowners. Mandatory disclosure increases the share of young homeowners and senior tenants .
EDUCATION	Inconsistent findings. Mandatory disclosure decreases the share of college educated residents by up to 23.5%.

Policy Implications

- 1. Potential housing discrimination arising from inconsistencies in information disclosure requirements
- 2. Challenges to implementing climate resilient policies given the incentives and disincentives arising from asset-oriented recovery programs as opposed to people-oriented policies
- 3. Composition and stickiness of the labor market/ industries based in coastal regions

QUARTZ Q BLUELINED How new flood risk maps could undermine marginalized neighborhoods Culture Lifestyle $\mathbf{G} =$ News Opinion Sport on about flooding can also introduc

'It's happening now': how rising sea levels are causing a US migration crisis