Banking Sector Resilience to Extreme Weather Events

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*The views stated herein are those of the authors and are not necessarily the views of the Chicago Fed or the the Federal Reserve System.

A high-level overview

- How does extreme weather affect borrower financial outcomes and the banking sector?
  - SMEs and corporate borrowers face reduction in cash flow (Brown, Gustafson, and Ivanov 2021).
  - Increases in bankruptcy among households (Billings, Gallagher, and Ricketts 2022).
  - Borrower credit demand increases, banks accommodate borrowers (Berg and Schrader 2012; Cortes and Strahan 2017; Schüwer, Lambert, and North 2019; Ivanov, Macchiavelli, and Santos 2022).
  - Banks increase demand for risk sharing (Ouazad and Kahn 2022).
- Natural disasters and the local economy (Tran and Wilson 2023):
  - Short-term reductions in employment and wages.
  - Increase in total/per-capita income and house prices over the 8 years following the disaster

Our session

- Extreme Wildfires, Distant Air Pollution, and Household Financial Health
  - Xudong An, Stuart Gabriel, and Nitzan Tzur-Ilan
- Natural Disasters, Local Bank Market Share, and Economic Recovery
  - Justin Gallagher and Daniel Hartley
- As Dry as a Bone: How do Banks Cope with Droughts?
  - Michael Brei, Oskar Kowalewski, Piotr Spiewanowski, Eric Strobl

Extreme Wildfires, Distant Air Pollution, and Household Financial Health

- Explores the direct and indirect effects of wildfires on household financial outcomes:
  - Indirect effects of exposure to smoke/air pollution:
    - Higher spending, borrowing, and loan delinquency.
  - Direct effects in burn area:
    - Higher financial distress among renters
    - No effect among homeowners.
    - Higher net migration and reduction in house prices.

Extreme Wildfires, Distant Air Pollution, and Household Financial Health

- Large adverse financial consequences of wildfires for households:
  - Implications for financial institutions in affected areas.
  - Disaster recovery.
- Wildfires and bank lending:
  - Paper finds substantial increases in credit card activity extended by large banks.
  - Prime borrowers increase spending, low credit score borrowers reduce repayment.
  - How do local, fintech, and payday lenders respond to these events?
  - Is there any evidence of risk sharing among financial intermediaries?

Extreme Wildfires, Distant Air Pollution, and Household Financial Health

- How does FEMA funding after wildfires affect household financial condition?
  - The delinquency increases seem permanent, partial mitigating effects of FEMA funding?
  - The distribution of recovery funds and delinquencies across the risk spectrum.
- Repeated events and the shape of event study responses:
  - Quantify the extent to which households face repeated wildfire exposure.
  - Permanent recoveries (loan delinquencies or borrowing) in the absence of repeated events?
  - Extend time dimension of the panel back to 2010?

Natural Disasters, Local Bank Market Share, and Economic Recovery

- Explores whether local (community) banks increase lending following natural disasters:
  - Counties with high share of local banks exhibit lower lending after disasters.
  - Moral hazard concerns may limit credit availability.
  - Lower wages and population growth in the 8 years following disasters.
- Attempts to isolate lending growth from endogenous credit conditions:
  - Uses interstate banking deregulation in the 1980s and the 1990s to do so.
  - Large reduction in bank credit as a result of fewer new home loans.

Natural Disasters, Local Bank Market Share, and Economic Recovery

- Linear projections approach appealing to examine the response to natural disasters:
  - Examine pre-trends and dynamic effects in more detail.
  - Focus on the simpler specification without instrumenting local banks share.
  - How do repeated disasters enter the specification?
- Bank deregulation may not be orthogonal to local economic conditions:
  - Deregulation more likely whenever income inequality higher (Baker, Larcker, and Young 2022).
  - Examine other sources of variation in local bank share.
    - Exploit heterogeneity in industry distribution across counties.
    - Some industries more reliant on local banks.

Natural Disasters, Local Bank Market Share, and Economic Recovery

- Important implications for the role of local banks in disaster recovery:
  - Local borrowing demand is high whenever local banks are constrained.
  - Findings imply limited role for FEMA funding.
  - Increase disaster aid to counties with high local bank share?

As Dry as a Bone: How do Banks Cope with Droughts?

- New business and farm loans fall sharply around after drought events
- Government disaster loans help alleviate the reduction in bank credit supply.
- Banks simultaneously increase lending to individuals and households.
- These precautionary patterns are stronger for smaller banks.

As Dry as a Bone: How do Banks Cope with Droughts?

- Findings imply banks have different response to droughts than to other disasters:
  - Helpful to understand banks' responses in event time.
  - Anticipation effects seem likely given the warmer temperatures in the past two decades.
- Government loans after designated drought events:
  - Explain how the loans are disbursed.
  - Deposits may mechanically increase if disbursement happens through the banking sector.
- Examine the role of credit unions and fintech lenders.

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