

Weathering the Storm: Sectoral Economic and Inflationary Effects of Floods and the Role of Adaptation

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Summary

- ▶ Paper studies the impact of floods and subsequent government expenditure in adaptation capital on output and prices in England
 - ▶ **Problem:** Lack of exogeneity of flood events to economic activity + Endogeneity of adaptation capital
 - ▶ **Solution:** Precipitation z-scores as instrument for floods in LP-IV (Jordà)
- ▶ Focus on industry heterogeneities and propagation of the weather shock through production network:
 - ▶ Aggregate GDP \Downarrow by $>1\%$ after 2 years
 - ▶ Manufacturing and trade output \Downarrow immediately
 - ▶ Sectoral inflation also affected
- ▶ Investment in adaptation (**local authority expenditure on flood defences**) mitigates economic impact of flooding via reducing likelihood of flooding

Contributions

- ▶ Quantification of macroeconomic effects of climate events beyond a single sector (e.g. agriculture) or single group of agents (e.g. households)
- ▶ Examination of potential benefits of adaptation benefits - highlighting *ex-ante* mitigation impact
- ▶ Data on flood defences
 - ▶ Identifies adaptation infrastructure already in place
 - ▶ Time-series of expenditure to identify investment

Comments

- ▶ Alternative instruments
- ▶ Non-linear dynamics resulting from extreme flood events
- ▶ Sector-specific adaptation effectiveness

#1 Alternative Instruments

- ▶ Soil moisture and groundwater saturation - relevant in identifying the increased likelihood of flooding in year t after severe flooding in year $t - 1$ (NRFA + COSMOS-UK)
- ▶ Sea-level rise and increased likelihood of flooding due to storm surges - U.K. tide gauge data

#2 Nonlinear dynamics resulting from extreme flood events

- ▶ Authors identify 3 years with spikes in floods (2000, 2002, and 2007)
- ▶ Possible nonlinear dynamics from precipitation events causing large flash floods (South Yorkshire 2019) - property damage and damage to crucial adaptation infrastructure (Yale Climate Connections, 2024)
 - ▶ Include quadratic transformations of precipitation z-scores
 - ▶ Impact of floods in areas where adaptation infrastructure exceeds a certain threshold after the flood \Rightarrow possible proxy for repairs to flood defences

Other comments

- ▶ Use sector-specific adaptation investments to further highlight increasing (stagnant) resilience of certain sectors
- ▶ Increasing order of adaptation effectiveness as investments in flood defences grow - time-varying effects of adaptation
- ▶ A flood/precipitation event can affect multiple regions - correct for spatially clustered standard errors

Conclusion

- ▶ Interesting paper with relevant policy-implications
- ▶ Expanding analysis to possible sea-level rise related flooding events and feedback between large flooding events and flood defence damages might sharpen the results further