The Impact of Natural Disasters on Education: Evidence from Standardized Testing

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Goal

I attempt to answer two questions:

- **What is the effect of natural disasters on academic achievement as measured by standardized test scores?**
- What is the role of federal disaster assistance? Which counties apply for assistance?

Data

- **Natural disasters**:
  - Federal Emergency Management Agency (FEMA) declarations
  - Storms from the National Weather Service (NWS)
  - Work in progress: Data on heat waves
- **Public Assistance applications and payments** from FEMA
- **Standardized testing outcomes** from the Stanford Education Data Archive (SEDA):
  - Cohort standardized average scores by county in Mathematics & Reading Language Arts
  - Grades 3 through 8 for schoolyears 2008/2009 to 2017/2018

Empirical Strategy

- Event-study design:

$$y_{i,t,g} = \beta_{-5} D_{i,t-5} + \sum_{l=-4, l \neq -1}^{8} \beta_l D_{i,t-l} + \alpha_i + \lambda_t + \zeta_g + \varepsilon_{i,t,g}$$

- Heterogenous treatment effects $\implies$ simple TWFE is inadequate (de Chaisemartin and D'Haultfœuille, 2020)
- Solution: Interaction-Weighted Estimator by Sun and Abraham (2021)
- Identifying Assumptions: Parallel Trends & No Anticipatory Behavior

References

de Chaisemartin, C. and D'Haultfœuille, X. (2020). Two-way fixed effects estimators with heterogeneous treatment effects. *American Economic Review*, 110(9):2964–96.

Sun, L. and Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 225(2):175–199.