

# The impact of flood events on not-for-profit organisations

by

Phan Duy-Anh, Anthony Scott, David Johnston, Trong-Anh Trinh

Discussion by

Ha Nguyen<sup>1,2,3</sup>

<sup>1</sup> Telethon Kids Institute, <sup>2</sup> The University of Western Australia,

<sup>3</sup> ARC Centre of Excellence for Children and Families over the Life Course

**4<sup>th</sup> Australian Workshop on Public Finance**  
Tax and Transfer Policy Institute, 13-14 June 2024

# Recap

**Aim:** to identify the causal impact of the 2010/11 Queensland floods on not-for-profit organizations

## **Empirical model:**

Data: Business Longitudinal Analysis Data Environment (BLADE) linked to flood maps

Flood exposure measure: an organization is “affected” if locating in a mesh block inundated by the floods, and “unaffected” if otherwise

Outcome variables: exit and performance variables (capital expenses, non-capital expenses, labour expenses, total revenue, full-time equivalent employment)

## Sample:

- Organizations located in Greater Brisbane area, were active since 2008/09 FY (i.e., two years prior to the flood event)
- Final sample: ~12,000 organizations (2,046 unique organizations) from 2008/09 to 2016/17 FY

Econometric model: Difference-in-Difference (DID); controlling for individual and year fixed effects; clustering at the mesh block and industry level

## **Main findings:**

- Floods have a negative impact in reducing non-capital expenditures and employment; but no significant impact on exit, capital expenditure, labour expenditure and total revenue
- More pronounced impacts for religious, smaller or younger organizations

# A very nice paper

## 1. Exploring an interesting and important research question

- Increasing natural disaster risks: important to understand the impacts and coping mechanisms
- Well documented important roles of not-for-profit organizations:
  - Their substantial economic contributions: 11% of employment (2018), 4.8% of GDP
  - Their supportive roles in good and bad times
- Lack of strong theoretical and empirical evidence on how not-for-profit organizations perform when they are affected by natural disasters

## 2. Employing high-quality data and robust empirical models

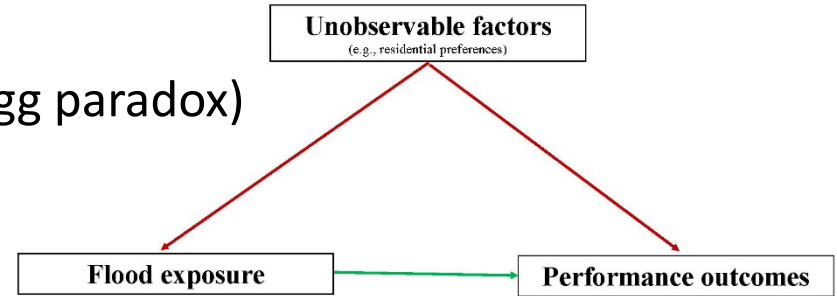
**2.1. High quality data:** Panel administrative data from BLADE linked to flood maps at a granular geographical level

- Panel data observe the same organizations before and after the floods
- Administrative data mitigate mis-measurement issues
- Mesh block identifier facilitates a more precise assignment of treatment/control groups (e.g., than a postcode level identifier)

## 2.2. Robust empirical models:

### Three major challenges to establish causality in observational studies:

- i. Reverse causality (i.e., the chicken or egg paradox)
  - ii. Measurement errors
- Flood exposure:
    - Exogenously measured using geophysical or meteorological metrics, as advocated by Dell *et al.* (2014); Botzen *et al.* (2019).
    - Not affected by human behaviours (like self-reported material and psychological damages or locating in a declared natural disaster region)
  - Outcome variables: Admin data mitigate reporting errors
- iii. Unobservable factors correlating with both Flood exposure and Performance outcomes
- The DID model controls for time-invariant unobservable factors



## **2.2. Robust empirical models: (cont.)**

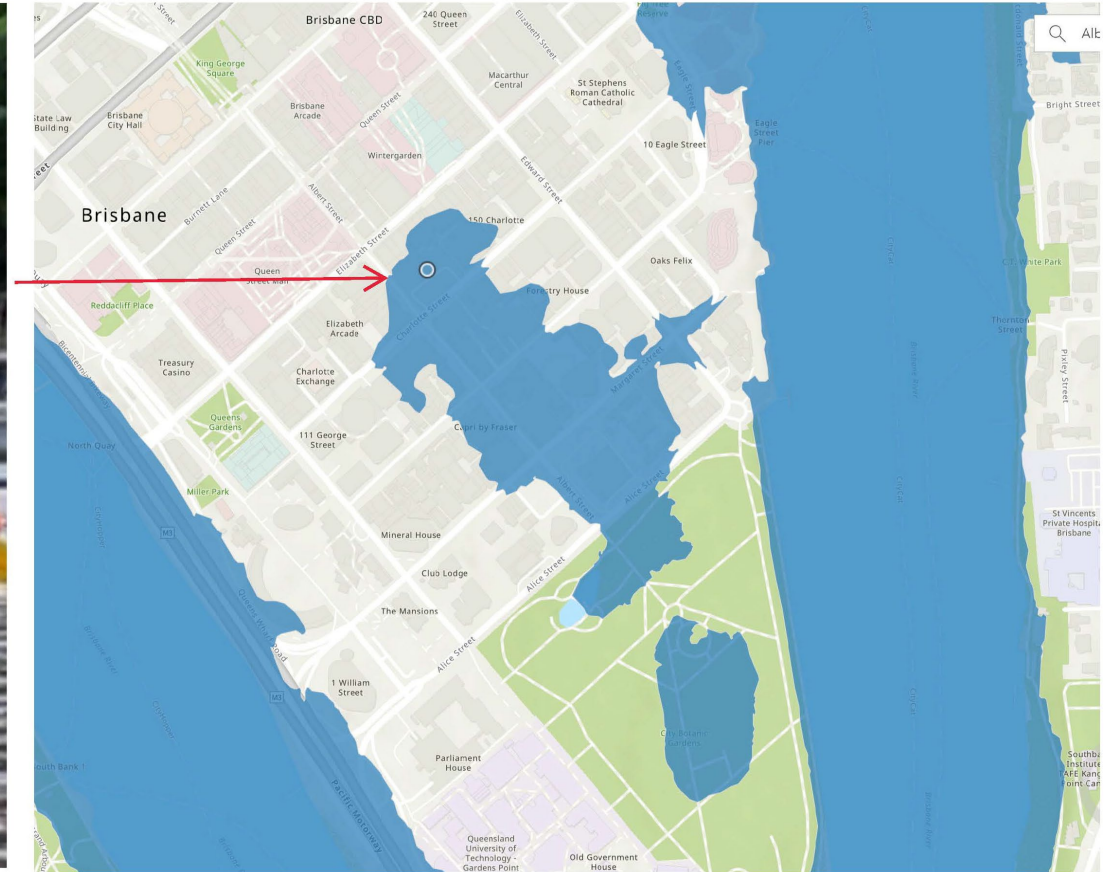
- A Difference-In-Difference model applied to admin data addresses three main challenges, facilitating a causal interpretation of the estimates
- Other robust econometric techniques:
  - Poisson Quasi-Maximum Likelihood to estimate DID model where outcomes have a mass zero issue
  - Event Study/Dynamic analysis which validates parallel trend assumption
  - Difference-In-Difference Propensity Score Matching: Compare with not-for-profit organizations in other cities.

**I have other two major comments (one methodological and one policy-oriented) and one minor comment**

# Is mesh block detailed enough to precisely capture flood exposure?



Albert Street, Brisbane CBD, 13 January 2011  
Source: Brisbanetimes.com.au



Flood map around Alber street, Brisbane CBD, January 2011  
Source: Brisbane City Council

Observation: Mesh block, while being the finest geographical identifier available in BLADE, may not be detailed enough to precisely capture flood exposure for some organizations

# Is mesh block detailed enough to precisely capture flood exposure? (cont.)

## Potential measurement issues:

- Using mesh block as the location identifier may mis-identify some unaffected organizations into the treated group (i.e., as flood affected organizations)
- The severity of flood exposure for each organization is ambiguous: e.g., some areas were inundated longer

## Potential solution:

1. Flood exposure measure based on the percentage of mesh block is flooded
2. Distance from the flood affected mesh block centroid to Brisbane riverbanks, assuming that mesh blocks closer to the riverbank are more likely to be more severely affected.
3. Daily (panel) flood maps for the same mesh block: How many days flooded

# How to help the helpers?

1. Is there any other coping strategies they can use to help themselves?
    - Flood insurance? (e.g., households with prior residential insurance did not migrate in response to cyclones (Nguyen & Mitrou 2024))
    - Relocation to higher grounds? (e.g., only households without prior residential insurance migrate (Nguyen & Mitrou 2024))
  2. Where should extra funding (if available) be targeted?
    - Help them rebuild?
    - Provide them with funding to help other flood affected individuals?
- We need to know more about the potential mechanisms behind the identified reduction in operation
- Other related evidence: Tornado-unaaffected individuals increase charitable donations while tornado-affected individuals don't decrease donations after deadly tornadoes in the US (Deryugina & Marx 2021)



## One minor comment

### 1. How to deal with organizations with multiple branches?

- Is the number of such organizations sufficient for a separate analysis?
- These organizations may better cope with floods due to a greater possibility to diversify risks

# Summary

## 1. Overall, a very nice paper:

- Exploring a new and important research question
- Employing high quality data and robust methods
- Presenting novel and potentially important findings

## 2. Some potential improvements:

- Employing alternative flood exposure measures
- Exploring potential mechanisms through which floods reduce expenditure and revenue or potential coping strategies.

# Thank you!

**Contact:**

**Ha Nguyen**

[Ha.Nguyen@telethonkids.org.au](mailto:Ha.Nguyen@telethonkids.org.au)

## References

Botzen, W.J.W., Deschenes, O., Sanders, M., 2019. The Economic Impacts of Natural Disasters: A Review of Models and Empirical Studies. *Review of Environmental Economics and Policy* 13, 167-188

Dell, M., Jones, B.F., Olken, B.A., 2014. What Do We Learn from the Weather? The New Climate–Economy Literature. *Journal of Economic Literature* 52, 740-798

Deryugina, T., Marx, B.M., 2021. Is the Supply of Charitable Donations Fixed? Evidence from Deadly Tornadoes. *American Economic Review: Insights* 3, 383-98

Nguyen, H.T., Mitrou, F., 2024. Residential responses to cyclones: New evidence from Australia. *Global Labor Organization (GLO) Discussion Paper No. 1426*