EFFECTS OF NATURAL DISASTERS ON SECTORAL ECONOMIC DEVELOPMENT: EVIDENCE FROM AUSTRALIA

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USING A UNIQUE DATASET OBSERVED OVER 1990-2014, WE ESTIMATE THE IMPACT OF NATURAL DISASTERS ON SECTOR-SPECIFIC ECONOMIC GROWTH OF AUSTRALIA AT BOTH STATE AND NATIONAL LEVELS

1. INTRODUCTION

- Recently, the frequency of natural disasters increases globally and Australia is not an exception. A growth body of research highlights such natural events as a cause of economic downturn.
- According to the standard neoclassical growth theory, natural disasters destroy capital that lead to reduce total output of an economy. Subsequently, an increased investment replenishes capital, and eventually, output goes back to its previous level.
- Alternatively, capital destruction allows the economy to replace outdated equipment and structures that can even boost the output to grow beyond its previous level.
- This paper estimates the localised disaster-specific effect on each sector of Australian economy. This supports policymakers ranking the sectors in terms of their vulnerability and design economic policies accordingly.

2. RELATED LITERATURE

The incipient literature on the nexus between natural shocks and economic development remains inconclusive (Cavallo and Noy, 2010). In particular, economics literature is divided into three categories in terms of findings. Some observed that natural disasters bring:

- ***negative effect:*** Rasmussen (2004), Cavallo et al. (2010), Cuaresma et al. (2008), Leiter, Oberhofer and Raschky (2009), Raddatz (2007 and 2009), Noy (2009), and Strobl (2011).
- ***positive effect:*** Skidmore and Toya (2002), Leiter et al. (2009), Loayza et al. (2012), and Fomby et al. (2013).
- ***no effect:*** Caselli and Malhotra (2004), Albala-Bertrand (1993), and Cavallo et al. (2013).

We have identified five reasons behind such mixed findings:

- ***Different samples:*** Almost all are at cross-country settings focusing on different regions;
- ***Aggregated output:*** mostly disasters hit a particular sector rather than the whole economy;
- ***Localised events:*** Disasters are local, and their effects are not felt at national level;

3. WHY AUSTRALIA?

- Given its spatial size, it is unlikely that a disaster event will hit the whole Australia at once. This ensures that natural disasters are *local events* in Australia.
- Working with all countries together often criticises for its failure to address heterogeneous institutions across nations. Studying Australia overcomes this issue.
- Bureau of Meteorology, Australia has a very rich spatially enabled historical data on rainfall and temperature. This facilitates constructing data on climatic extremes, which are the primal sources of natural disasters.

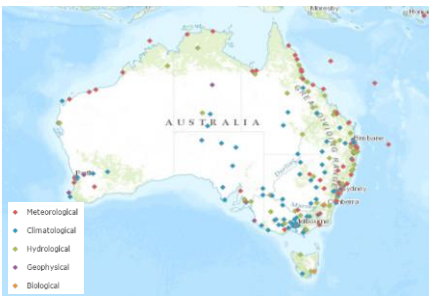

Figure : Natural Disaster Events in Australia, 1900-2014

4. ESTIMATION METHOD

- We use a difference-in-differences (DD) estimation approach with continuous shocks. That is, we identify total outputs for all the years when a specific disaster occurs and compare them with the annual outputs when such disaster does not hit the economy.

5. KEY RESULTS

- The effects of natural disasters are not significant at national level. Rather, such effects are highly catastrophic for the local economy of Australia.
- Australia experiences both positive and negative effects of natural disasters
- At state level, floods affect both infrastructure and social sectors; bushfires affect production sector positively, but it affects infrastructure sector negatively; finally, droughts affect production sector negatively
- Different disasters affect different economic sectors differently. Hence, the insights obtained with over-aggregation can be misleading in the context of Australia.

6. POLICY IMPLICATIONS

- Policies related to disaster risk reduction (DRR) should not be generic, as one policy does not fit all; rather they should be designed in considering their potential effects on the Australian economy *by disaster* and *by sector*.

N.B.: References are available on request.
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