Governmental Relief Efforts for Typhoon Exposure in China

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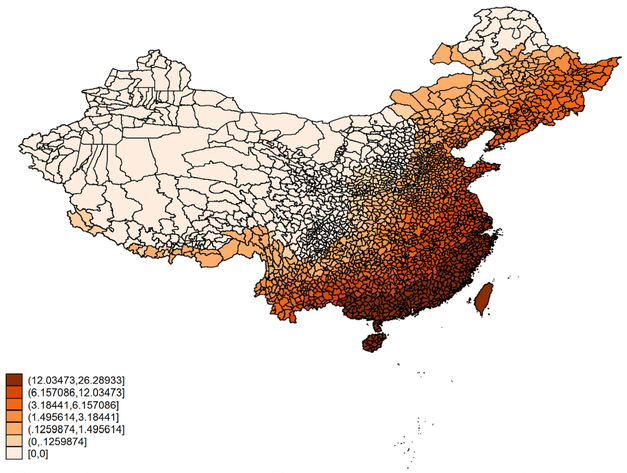
Motivation

Typhoon Exposure Indicated by Average Max Wind Speed



Coastal areas in China are subject to frequent typhoon risks between May and October annually. Governmental disaster relief is the main existing disaster relief effort besides private insurance in rural and semi-rural areas. Due to variable disaster response capacity of local governments, Inter-governmental fiscal transfers enable risk sharing across the nation and allow local regions, especially poor regions to cope with typhoon risks.

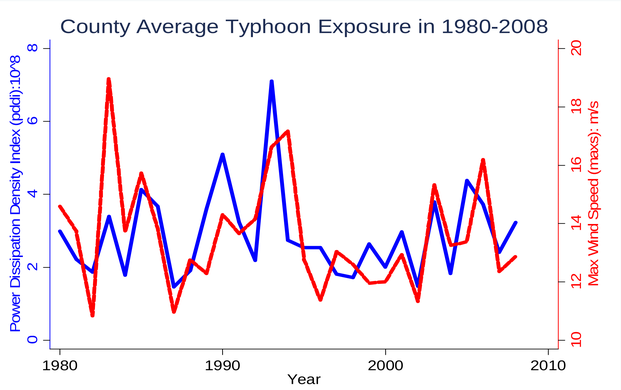


Figure 1. County average typhoon exposure trend in China (1980-2008)

Methodology

This paper econometrically analyzed the relationship between disaster exposure, local economic outcomes and inter-governmental transfers using county level statistical data from 1993 to 2008.

Results

– Overall inter-governmental transfers efficiently helped local counties to reduce the negative economic impacts of typhoon risks.

Inter-governmental transfers responded to current year typhoon shock significantly (7% increase for one average typhoon hit with maximum wind speed at 10m/s), while local governmental increased the expenditure on disaster relief (13%). The overall relief efforts balanced damages quite efficiently, reflecting from the fact that per capita GDP were not significantly impacted by typhoon exposure risks.

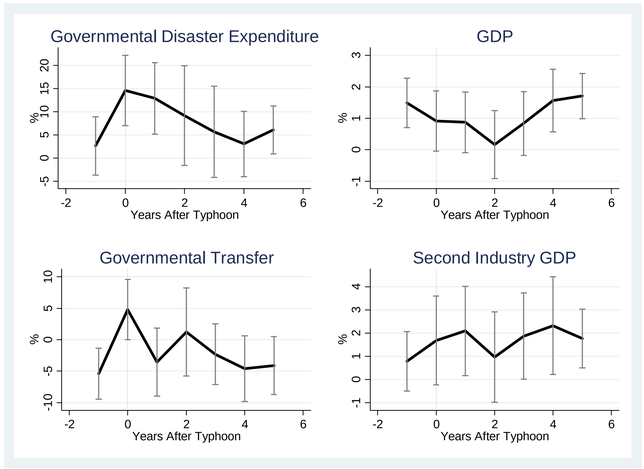


Figure 2. GDP impacts and relief efforts in county governments for typhoon exposure

– The transfer relief efforts increased significantly for large typhoon shocks with average maximum wind speed above 15m/s (figure 3).

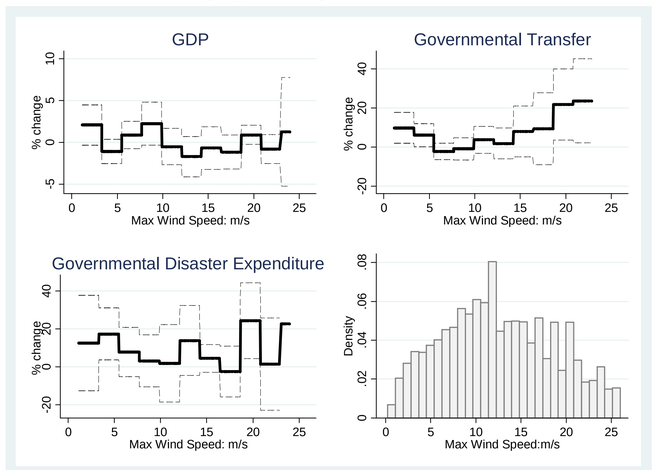


Figure 3. Typhoon transfer intensity and GDP outcome relating to economic level

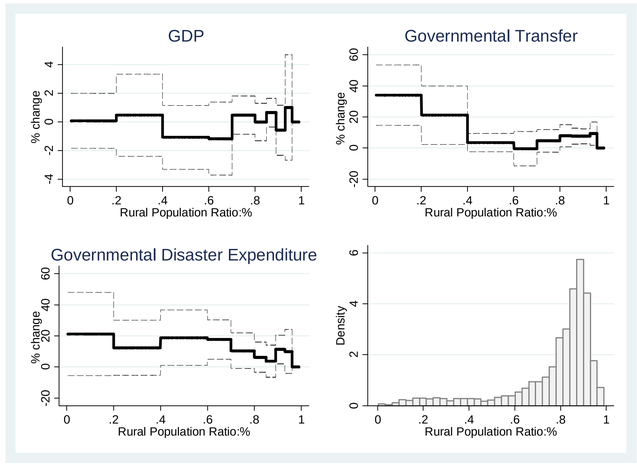


Figure 4. Typhoon transfer intensity and GDP outcome relating to typhoon exposure level

– The transfer relief efforts responded to typhoon shocks in both relatively urbanized counties and very rural counties (but not in semi-urbanized counties). But the transfer response was much larger in urban counties than rural counties.

Urban counties received extra transfer by more than 20% conditional on the occurrence of Typhoon with average maximum wind speed at 10m/s, while rural counties received an increase of transfer by around 10% for the similar typhoon risk exposure.

Conclusion

Inter-governmental fiscal transfer responded to the current year typhoon shocks in local counties in China, with an increase of 7% for an average typhoon exposure to meet the local disaster relief demand. However, the transfer typhoon-response varied greatly across regions. Counties with high typhoon exposure intensity above a certain threshold received more transfer, while urban areas received more transfer than rural areas when being exposed to similar typhoon risks. The general economic outcome, represented by per capita GDP, were not affected by typhoon risks, even though the effects on specific industries were different.

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