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Disaster Operations Management: an Empirical Study from Thailand

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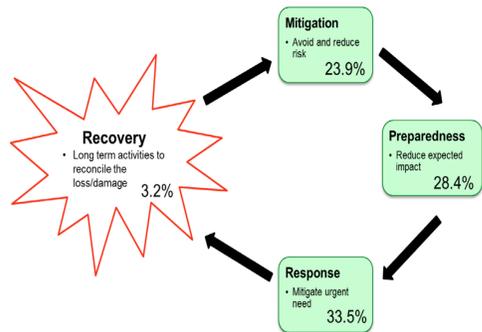
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OBJECTIVES

This paper presents an exploratory analysis using a regression model for initiating operation strategies and policy implications regarding humanitarian operations and crisis management. Since resources are scarce, at a strategic level it is important to understand where to start when planning for the recovery process.

MOTIVATION



RESEARCH QUESTION

How flooding affects per capita income in areas with different levels of industrialization?

Hypothesis:

The lower the level of industrialization in an area, the worse off people (lower per capita income) are following the occurrence of flood

METHODS

- Gathered a series of observations for both prior to and subsequent of flood from the National Statistical Office of Thailand (NSO) and the Department of Disaster Prevention and Mitigation (DDPM)
- Regression analyses were formed to find an effect of flood on per capita income at different levels of industrialization

FUTURE RESEARCH

- Future research could include other relevant variables to capture the agricultural or service perspective and further refine the effects of flooding on per capita income
- We will explore at a more detail level, specifically how much we should invest in "pre" and "during" flood to improve the effectiveness of the recovery process (cost and benefit).

NATURAL EXPERIMENT

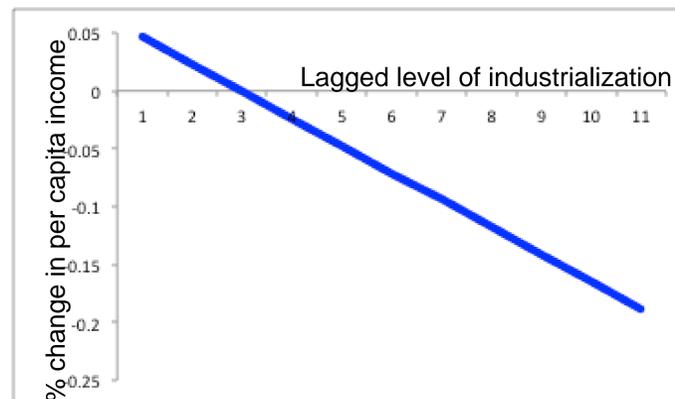
$$Y_{i,t} = \delta_0 + \delta_1 Flood_{i,t-1} + \delta_2 Industrialization_{i,t-1} + \delta_3 (lag_Interaction_{i,t-1}) + \delta_4 Flood_{i,t} + \delta_5 Industrialization_{i,t} + \delta_6 (Interaction_{i,t}) + \delta_7 year\ dummies + \delta_8 75\ province\ dummies + \epsilon_{i,t}$$

$Y_{i,t}$ is the natural logarithm of the per capita income of province i at time t
Flood _{$i,t-1$} is a dummy variable for flood of province i at time $t-1$
Industrialization _{$i,t-1$} is the level of industrialization of province i at time $t-1$
lag_Interaction _{$i,t-1$} is an interaction variable ($Flood_{i,t-1} * Industrialization_{i,t-1}$)
year dummies is a dummy variable specifying years 2006 to 2012
75 province Dummies is a dummy variable specifying 75 provinces

CONCLUSIONS

- Residents in rural areas appear to be more resilient in the face of natural disasters
- As the level of industrialization increases, it takes longer to rebuild, replant, and replace the losses from natural disasters
- In highly industrialized areas, the accompanying complex infrastructure, city planning and high performance machinery are more difficult to recover
- More attention is needed for residents in highly industrialized areas

RESULTS



$$\frac{\Delta Y_{p,t}}{\Delta F_{p,t-1}} = \delta_1 + \delta_3 * Industrialization_{i,t-1}$$



$$\frac{\Delta Y_{p,i}}{\Delta F_{p,i}} = \delta_4 + \delta_6 * Industrialization_{i,t}$$

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