Modelling the Effects of Successive Disasters: A Dynamic Inoperability Input-Output Approach

Topic: Input-Output analysis of disasters II
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Input-output models have proven useful for understanding the impacts of isolated disasters. However, available literature sources on modeling the effects of successive disastrous events are relatively sparse. In this work, we consider such events, because another natural disaster can strike while a country is still recovering from a previous disruptive event. These events may come in the form of a series of meteorological disturbances during a hurricane or typhoon season, or an earthquake triggering a tsunami. In the case of the Philippines, seven of the ten most destructive typhoons occurred in the last five years. Aside from typhoons, its location along the Pacific Ring of Fire makes it predisposed to earthquakes and volcanic eruptions. This paper seeks to illustrate the impact of the occurrence of consecutive natural disasters to an economy using the dynamic inoperability input-output models (DIIM). We consider the case of the Central Philippines in 2013, which suffered a 7.2 magnitude earthquake in the island of Bohol, and one month later was hit by Typhoon Haiyan, the strongest recorded typhoon to make landfall in world history. Our calculations show that a sequence of shocks can create a compounded impact that propagates through an economy. The results of this study can be useful for formulating policies with respect to ensuring disaster preparedness, and optimizing disaster recovery.