

Inoperability Extended Multisectoral Model (IEMM) for Interdependent Systems: The UK case

Topic: Disaster Analysis I

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This paper extends the concept of Inoperability Input Output Model (IIM), which characterizes interdependencies among sectors in the economy and analyzes initial disruptions to a set of sectors and the resulting ripple effects. The proposed extension discusses the methodology of Inoperability Extended Multisectoral Model (IEMM) for disruptive events in interdependent systems. As IIM is based on the traditional input output analysis which lacks of Keynesian income multiplicative effect, more precisely in the Keynesian analysis production side is completely omitted. Our proposed model is inspired by the Miyazawa approach (Miyazawa, 1970), which extends input output analysis by considering various income groups with different Keynesian disaggregated consumption functions. This extension offers a more detailed picture of the endogenous final demand formation. By integrating the concept of Inoperability into the extended multisectoral model will makes it possible to analyse in great details that how demand reduction inoperability effects other interdependent systems. Our proposed model is based on the Social Accounting Matrix (SAM) approach and the economic process is represented as a circular flow. This study focuses particularly on the air transport disruptions in the aftermath of Iceland volcano eruption in (2010). A case study will be discussed for the United Kingdom (UK) air transport sector to estimate higher order effects and total impacts of this event.