Economic Modeling of Extreme Events

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Economic Modeling, Extreme Events and Risk Analysis

- Macro-economic models, e.g. Input-Output (I-O) or Computable General Equilibrium (CGE) model as tools estimating socioeconomic impacts, man-made or natural disasters.

- Application of input-output analysis to the study of economic impacts has led to a number of discoveries and innovations.
Economic Modeling, Extreme Events and Risk Analysis (Continued)

INPUT DATA → SCENARIOS

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ECONOMIC MODEL
Economic Modeling, Extreme Events and Risk Analysis (Continued)

Traditional single-region I-O approach

- No spatial information
- No resilience or substitution effects identified

Why?

- Data problems
- Methodological difficulties
Traditional U.S. I-O and Expansion

Figure 1. Four Types of U.S. Input-Output Systems
NIEMO Contributions

1. Data Problems
   - Developed conversion bridges between various U.S. industry code systems.
   - Developed two methodologies to complete trade flow data between states for non-service and service sectors.

2. Methodological Difficulties
   - MRIO developed and applied: National Interstate Economic Model (NIEMO).
   - Elaborated economic theory on usefulness of supply-driven approach and construction of supply-driven I-O models.
   - Developed method combining price-elasticities and I-O modeling: Price-sensitive supply-driven I-O models.
   - Explored of temporal aspects of I-O model: FlexIO and FlexNIEMO.
Figure 3.
NIEMO Modeling and Development process
Further Research

![Diagram showing NIEMO and its future research directions](image)

**Figure 4. NIEMO and Its Future**