An Overview of Systemic Risk Analysis Challenges

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Domain Challenges (1)

**Financial and Economic Challenges, at the level of:**

- **Firms**
  - Leverage
  - Contingency
  - Losses / defaults / credit risk
  - Asset-liability structure

- **Financial Network**
  - Interconnection
  - Interlocking governance
  - Industrial organization
  - Centralization

- **Financial System**
  - Liquidity
  - Concentrated exposures
  - Macroeconomic imbalances
  - Herding and price bubbles
  - Endogeneity of hazards
  - Business cycles
Domain Challenges (2)

**Informational Challenges:**
- Inadequate knowledge, due to
  - Uncertainty and ambiguity
  - Risk and randomness
  - Unstable data generation
- Model risk
  - Error propagation
  - “Flaw of averages”
- Data security, privacy, encryption

**Operational Challenges:**
- Time measurement
- Granularity of measurement
- Data supply chains and fragmentation
- Identification and alignment
Incentive Problems:
- Asymmetric loss function for decision makers
- Safe harbor
- Moral hazard
- Competing priorities

Bureaucratic Constraints:
- Bandwidth constraints
- Task demand overload
- Data volumes
- Skills and experience

Behavioral Issues:
- Bounded rationality, satisficing
- Biases
- Leadership failures
- Oversimplification
Organizational Perspectives:

♦ Sensemaking / tactical roles
  • “Sharp end” of the problem
  • Fine-grained, exploratory analysis
  • Potentially tight deadlines

♦ Decisionmaking / operational roles
  • Formal decision processes
  • Solid analysis and strong documentation
  • Distillation of broad exploratory analysis

♦ Rulemaking / strategic roles
  • “Dull end” of the problem
  • Formal rulemaking and legislative processes
  • Notice and comment periods
  • Authority requirements and public scrutiny
  • Solid analysis and strong documentation
  • Distillation of broad exploratory analysis
Functional Perspectives:

- Core infrastructure
  - Trusted frameworks for interpretation
    - Data validation
    - Data integration
    - Data standards
    - Straight-through processing
    - Testing and documented risk measures
  - Knowledge access
  - Specialized institutional expertise
  - Presentation technology, dashboards


Functional Perspectives – Activities in Event Time:

- Early warning and advance monitoring
  - Model selection; ambiguity recognition
  - Event detection; identification; reification
  - Stress tests and reverse stress tests
  - Uncertainty measurement
  - What-if analysis
  - Risk topography

- Crisis monitoring and management
  - Situational awareness
  - Triage and escalation
  - Coordination – assessment / diagnosis / response
  - Outlier detection and classification
  - Dimensionality reduction
  - Resolution enhancement
  - Human-computer interaction / ergonomics

- Forensic analysis and accountability
  - Strategic focus; deliberation, diligence, reputation
  - Transparency; publication; narrative development
  - Historical context; event comparison; hypothesis development
  - Archiving; recordkeeping