



# **An Overview of Systemic Risk Analysis Challenges**

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## *Disclaimer*

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## ***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***

### ***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***