IS423
Financial Markets Processes and Technology

Operational Risk in Financial Institutions

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Introduction, Definition, & History

• What is **Op Risk**?
  – “the danger of unexpected losses from a firm’s operational activities, which includes internal procedures, people, and systems”
  – No industry-wide definition exists
    • Each institution has its own operational setting
  – Technology / IT systems
    • Communications, IT security, Hard/software

• What’s the background?
  – Perhaps the oldest risk which financial industry faces
  – 1999, Basel Committee on Banking Supervision
    • Recognized as a legitimate issue by regulatory
    • “…such risks (op risk) are too important not to be treated separately within the capital framework”
What are the Issues & Problems?

• Even the technically-perfect IT systems can fail
  – Lack of training, skills, and communication for users

• Island systems and solutions within an institution
  – Systems are not standardized across regions and financial product lines

• Concern of cost limits IT systems improvement
  – High costs and limited access to right skills / resources outweigh the benefits
  – Complexity on managing and developing IT systems \(\rightarrow\) troublesome

• No core system backup
  – Lead to system downtime & reduce system availability
What are the Issues & Problems?

- **Nature of the financial markets**
  - Complex products, massive data volume, fast paced
  - Result in complex IT environment & error-prone algorithms

- **Lack of reassessment & stress tests** on a regular basis
  - Recurring mistakes plus new mistakes found → lead to failure in real operation

- **IT security & protection**
  - Firewall, access control, computer viruses, hackers (internal/external)
  - May lead to monetary and reputational losses

- **Financial sector’s history of acquisitions and mergers**
  - Partial/temporary improvements & system integration lead to imperfect infrastructure
  - Lack of detailed review of existing systems before integration for merger
OM Gruppen: supplier and maintenance vendor for HKATS

• The bug
  – Attempt to handle complex combinations of combo orders → lead to an infinite loop in transaction → disable HKATS
  – Trading in HSI futures and options, MSCI China Free Index future and Dow Jones Industrial Average future contracts brought to a standstill
  – Dead battery in back-up trading system was blamed for halt in future and options trading that lasted for an hour

• Implications
  – Traders believe problem is rooted in the system’s inability to support large volumes
  – “everytime we have a busy day the system crashes...that’s why we’re not showing that much liquidity, because people just cannot trust the system” – head of equity derivatives at Fimat, HK
  – Public believes HKEx should improve system with upgrades, added functionality, and the ability to handle large volumes
Example #2: LSE Breakdown (2007)

London Stock Exchange Group

- The bug
  - Infolect data delivery system interrupted $\rightarrow$ disseminating data to the market failed $\rightarrow$ prices were unreliable
  - closing delayed for 90 mins
  - Traders have to wait until the next morning to ask clients whether to settle trades
  - Worldwide impact $\rightarrow$ the Dow Jones industrial average closed down 360.90 points
- Implications
  - Data transmission interruption shouldn’t occur since basic contingency planning should include connectivity testing
  - Failure impacted both primary and backup systems
  - System’s fault or management’s fault?
What are the Solutions?

• Rigorous Stress Testing
  o For systems to be in place after merger
  o Streamlined & Integrated
  o IT migration
  o Well-planned testing procedure

• Automation
  o Increases throughput & decreases latency
  o Able to minimize manual tasks
  o Example: Time is essential in a bank. Staff will be able to handle other important tasks by not repeating steps to test a process.

• Communication
  o Business Analyst to work closely with IT team to avoid system failure.
What are the Solutions?

• Outsource
  o Outsource partner increases benefits from IT resilience and reduce time taken to achieve such goals
  o Make risk management more affordable
    o Sourcing from partner provides usage-based pricing
  o Access to advanced technology platforms, tools, testing environments, large pool of expertise, and end-to-end control
  o Allows the firm to focus on core activities & gain efficiency

• Disaster Recovery Plan
  o Companies invest millions for DR plan to tackle natural disaster issues to avoid large losses
  o Objective is to ensure that business still functions in case of system failure.
Example #1: IBM & Settlement House

• Outsourcing to IBM
  o For operational risk advice & service due to its reputation

• Illustrates how company collaborated with IBM to design, develop & manage IT applications/infrastructure that supports foreign exchange process

• Benefits & End Result:
  o Reduction in risk, led to Forex dealers operating with improved credit risks.
  o Reliable, enterprise-wide systems that significantly reduce costs
Example #2: CBOT & Disaster Recovery

Chicago Board of Trade (CBOT)

• Preparation for disaster:
  o Separate data center in another building to provide redundancies & fail-over to critical systems.
  o Subscription with recovery provider for Prices, Wall displays and QVN in a limited Disaster Recovery capacity

• After 911 occurs:
  o Modified their Disaster Recovery Plan
  o Increases the stages taken to ensure systems can still work after disruptions
  o Created Risk Management Group
What is the Future?

• IBM - Project eLiza
  o Multi-million long term & impressive project
  o Systems can heal themselves when there’s a failure
    ➢ Self – Configuration
    ➢ Self – Optimizing
    ➢ Self – Protecting
  o Able to function for decades without failing without human intervention
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Thank you!

Q & A