



Yale University Risk Management Overview Financial Services

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Today's Points

- 1.Importance of risk management - the GFC and its lasting impact
- 2.Globalization and resiliency - more questions than answers
- 3.Financial crime - a growing industry

3 Notable Bank Failures

- **Continental Illinois National Bank and Trust Company (1984)**

- Technically did not fail, government bailed it out seeing it too big to fail.
- Massive loan losses mainly in the oil and gas sectors
- 10-day run on the bank in 1984, losing 30% of its funding
- FDIC guaranteed all the bank's creditors, lent Continental \$2 Billion. Then took over 80% of ownership and fired bank's management
- **Issue: poor risk management**

- **Washington Mutual - largest US bank failure (2008)**

- Assets: \$300 Billion, \$188 Billion in deposits
- Failed because: pursuit of subprime mortgages, kept them on their books, housing prices declined, resulted in run on the bank with \$16 billion in deposits withdrawn over 10 days in Sept. 2008.
- JPM bought bank for \$1.9 billion
- **Issue: poor risk management**

- **First Republic Bank - 2nd largest US bank failure (2023)**

- Followed Silicon Valley Bank failure (3rd largest in US history) and Signature Bank (4th largest) within days of SVB failure - many of same issues
- Relied on uninsured deposits (64% of assets)
- Provided its majority high net worth clients preferential loan rates which resulted in losses when Fed raised interest rates
- Depositors lost confidence in bank, led to bank run
- **Issue: rapid growth, poor risk management**

Importance of Risk Management

Great Financial Crisis (GFC) - 2007-08 and beyond

May be the greatest “learning from example” of the need for risk management

- Started as inability of certain mortgage owners to repay their loans – subprime mortgages
- Was a failure of risk management, but with a lot of other contributing events, many unrelated but when combined were the “perfect storm”.
- At least 20 contributing factors
- Regulators and industry participants were both at fault

Which Firms Fare Better in Crisis

Four firm-wide risk management practices were noted by a government senior supervisor's group **that differentiated the performance of firms that fared better in crisis times** versus those who did not. These practices are still applicable.

- 1. An effective firm-wide risk identification and analysis program**
- 2. A consistent application of independent and rigorous valuation practices across the firm**
- 3. Effective management of funding liquidity capital, and the balance sheet**
- 4. Informative and responsive risk measurement and management reporting and practices**

2024's Top Financial Services Industry Risks

| Risk | 2024 | 2023 | Change |
|---|------|------|--------|
| Cyber risk: information security | 1 | 1 | None |
| Cyber risk: IT disruption | 2 | 3 | Up 1 |
| Third-party risk | 3 | 4 | Up 1 |
| Regulatory compliance | 4 | 2 | Down 2 |
| Change management | 5 | 7 | Up 2 |
| Resilience risk | 6 | 5 | Down 1 |
| Geopolitical risk | 7 | 8 | Up 1 |
| Execution and process errors | 8 | 6 | Down 2 |
| External fraud | 9 | 11 | Up 2 |
| Conduct risk | 10 | 10 | None |

Source: Risk.net

Presents Many More Questions than Answers

Globalization – Benefits & Challenges

What is globalization? One definition: it is the spread of products, services, people, and activities across national borders and across cultures.

Some benefits and challenges

- Facilitates capital flows for investment and economic growth, but also amplifies the risk of financial crises rapidly spreading across borders
- Expanded customer bases, but increased competition
- Increased choice, higher quality products, economies of scale, increased capital flows, increased labor mobility and improved international relations
- But organizations now need to deal with new, unique or unclear compliance, control and inadequate market knowledge issues

Global Interconnectedness (BoE/GARP Global Risk Forum - 2023)

Structural vulnerabilities in the financial ecosystem

- **Is the financial ecosystem sufficiently mapped and understood?**
- **Due to increasing global interconnectedness, shocks to the financial system are more easily transmitted from one part of the system to another.** Are we able to adequately identify, trace, assess, model, and measure possible multiple points of failure, especially when normal risk metrics do not signal concerns?
- **Is operational resilience within the financial system sufficient?**
 - The financial system is increasingly dependent on non-financial, including digital, service providers and vendors, e.g., software, payments, cloud, accounting, cyber security, crypto compliance monitoring and others. **Do we have a good understanding of the dependencies, interconnectedness, and concentration risks of and to this service provider ecosystem?** How resilient is the financial system to major shocks from that part of the ecosystem?

Geopolitical Risks (BoE/GARP Global Risk Forum - 2023)

Risks of Geopolitical Fragmentation to Global Financial Markets. After more than a half century of global economic integration, **the world is experiencing increased fragmentation driven principally by geopolitics.**

- In an environment where politics and security concerns are increasingly important, **how would firms measure, monitor, and assess the risks and responses associated with decoupling and rising doubts about globalization?**
- What **financial stability risks are associated with the increasing geoeconomic fragmentation**, and how can they be identified, measured, and monitored?
- **What scenario analysis and stress testing approaches should be developed and adopted to assess and measure geopolitical shock transmission to financial institutions?**

AI/ML Issues To Address (BoE/GARP Global Risk Forum - 2023)

Machine Learning, emerging technologies, and risk management

- Technological innovation is increasing at an exponential rate, but has raised questions about understanding, transparency and explaining results.
 - **How can companies and regulators adjust to this speed of change?**
 - **How can regulators and company boards become comfortable with black box models?**
- How should firms design and approach policies to **guard against the risks of bias, discrimination, and unethical behavior in dealing with emerging technologies?**
- Who makes the decision as to what is ethical behavior?
- Decentralized finance, stablecoins backed by commercial paper, payments, distributive ledger technology, crypto asset lenders and their integration with the real economy currently presents somewhat modest risks to financial stability but are also lightly or not regulated. **How do we monitor and measure a shift in DeFi from low to high risk? What, if anything should be done to ensure greater transparency?**

Innovative technology, cyber risks and digital fraud

- As institutions increasingly rely on **third party service providers** (such as tech firms) to perform business activities, how do firms assess, manage, and mitigate concentrated risk arising from their reliance on third-party service providers, when they are headquartered overseas and/or regulated by a prudential authority?
- What are the **major thematic gaps, inconsistencies, or vulnerabilities** that firms identified as part of their ongoing assessment **of third-party risk management**?
- How are firms **managing cyber risks related to the use of third-party service providers**?
- Data sharing is an effective measure to prevent digital fraud detection. How can firms strike a **balance between information sharing of data among institutions and data privacy regulations**, particularly for cross-border transactions?

Resiliency – Basic Principles of Operational Resilience

- 1. Continuity of business services versus systems and processes**
- 2. Setting impact tolerances**
- 3. Managing response to operational disruption**

Sources:

- BIS Principles for Operational Resilience (2021)
- Bank of England, Prudential Regulation Authority, Statement of Policy, Operational resilience (2021)

Using Generative AI for Risk Management and Resiliency

First wave of adoption: regulatory compliance, financial crime, credit risk, modeling and data analytics, cyber risk, and climate risk.

Three current use case types. All have roles in key responsibilities of risk and compliance

- 1. Virtual expert:** a user can ask a question and receive a generated summary answer that's built from long-form documents and unstructured data.
- 2. Manual process automation:** gen AI performs time-consuming tasks.
- 3. Code acceleration:** gen AI updates or translates old code or writes entirely new code.

Examples of where it's currently being used

- **Regulatory compliance**
- **Financial Crime**
- **Credit Risk**
- **Modeling and data analytics**
- **Cyber risk**

Source:
McKinsey on Risk & Resilience



Financial Crimes Intelligence & Insights (FCi²)

FCi² Core Issues Addressed

- **Proactive** (anticipate/identify) **versus reactive** (confirmed crime) - levels playing field with bad actors
- **Uses technology to its fullest** - includes artificial intelligence and external data sources
- **Federated search function eliminates need to export data** from FI to 3rd party databank
- **Assured confidentiality** - privacy enhancing technologies (PETs)
- **Fast guaranteed responses** - automated responses are infinitely faster (in minutes) and guaranteed = earlier identification of bad actors/activities
- **Flexible** - can swiftly address changing typologies and crime fighting landscape
- **Legally supported** (US) platform, can quickly become cross-border assuming legal approvals

FCi² Automated Information Flows

314 (a)

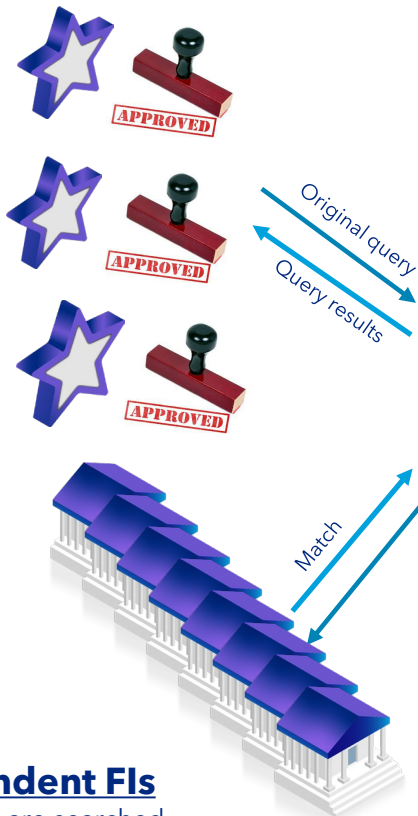
314(a & b)

314(b)

Law Enforcement

1

Under 314(a) LE initiates query by submitting encrypted query to Hub



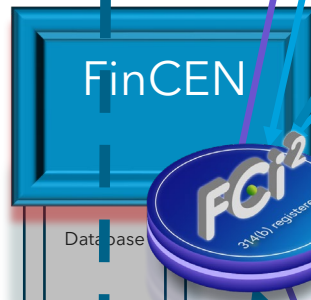
314(a) Respondent FIs

databases are searched, FIs with matches automatically sent to Hub which sends the information to LE originating the query

314(a) Respondent



FCi² automatically (instantaneously) facilitates communication between "matched" institutions, can assist in coordinating an investigation and/or automate agreed SARs filing



Matched query

Encrypted query

314(a) Respondent

Encrypted score

314(a) Respondent



3rd Party Data Sources

Added to search results to enrich information flows and provide additional inputs toward identifying possible bad actors.

Examples:

- Dark web information
- Fraud indicators such as IP addresses, compromised credentials

1

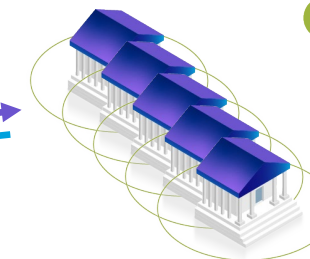


Financial Institution A initiates a query under 314(b) relating to a suspicious account/activity

2

FCi² distributes encrypted query to all FIs in network, maintains record-keeping and audit trail. Scores automatically generated from FI responses and sent to Hub.

3



FCi² aggregates all encrypted responses and returns aggregate score to Financial Institution A.

4

Waterfall Queries (WQ) Automatically Generated

If agreed score threshold met, waterfall queries are automatically sent only to FIs where the person/entity has been identified as being connected. Results sent to all connected FIs.

5

If WQ Threshold Score Is Met:

- Possible joint investigation initiated by FCi².
- Possible (joint and automated) SAR initiated by FCi².



GARP Certification Programs

Financial Risk Manager Certification

FRM Exam Part I

- Foundations of Risk Management
- Quantitative Analysis
- Financial Markets and Products
- Valuation and Risk Models

FRM Exam Part II

- Market Risk Measurement and Management
- Credit Risk Measurement and Management
- Operation Risk and Resilience
- Liquidity and Treasury Risk Measurement and Management
- Risk Management and Investment Management
- Current Issues in Financial Markets

Certificate in Risk and Artificial Intelligence - Fall 2024

Module 1: Introduction

- History of AI
- AI and Risk Management
- Course Overview

Module 2: Tools & Techniques

- Ch. 1: Introduction to Tools & Techniques
- Ch. 2: Unsupervised Learning
- Ch. 3: Supervised Learning - Part 1
- Ch. 4: Supervised Learning - Part 2
- Ch. 5: Semi-supervised and Reinforcement Learning
- Ch. 6: Natural Language Processing
- Ch. 7: Supervised Learning - Model Estimation
- Ch. 8: Supervised Learning - Model Performance Evaluation
- Ch. 9: Generative AI

Module 3: Risk and Risk Factors

- Algorithmic Bias and Fairness
- Explainability, Interpretability, and Transparency
- Autonomy and Manipulation
- Safety and Well-Being
- Reputational Risk
- Existential Risk
- Global Trends, Challenges and Risks

Module 4: Responsible & Ethical AI

- Introduction to Practical Ethics
- Ethical Frameworks
- What can AI Ethics Learn from Medical Ethics?
- Principles of AI Ethics
- Tackling the Challenges of AI with Ethics
- Privacy and Cybersecurity
- Regulatory Landscape

Module 5: AI Governance

- Data Governance
- Model Governance
- Model Validation

Module 6: Case Studies

- CS 1: Predicting Returns
- CS 2: Classifying Defaults
- CS 3: Credit Scoring
- CS 4: Macroeconomic Forecasting
- CS 5: Portfolio Management
- CS 6: Dynamic Hedging
- CS 7: Market Risk
- CS 8: Generative AI

Sustainability & Climate Risk Certificate

Chapter 1: Foundations of Climate Change: What Is Climate Change?

Chapter 2: Sustainability

Chapter 3: Climate Change Risk

Chapter 4: Sustainability and Climate Policy, Culture, and Governance

Chapter 5: Green and Sustainable Finance: Markets and Instruments

Chapter 6: Climate Risk Measurement and Management

Chapter 7: Climate Models and Scenario Analysis

Chapter 8: NetZero

Chapter 9: Climate & Nature Risk Assessment

Chapter 10: Transition Planning & Carbon Reporting

Optional climate practical applied learning

- GARP Climate Risk Game Simulation
- Greenhouse Gas Tracking & Reporting
- Risk Assessment
- Risk Prioritization



About GARP | The Global Association of Risk Professionals is a non-partisan, not-for-profit membership organization focused on elevating the practice of risk management. GARP offers the leading global certification for risk managers in the Financial Risk Manager (FRM®), as well as the Sustainability and Climate Risk (SCR®) Certificate and ongoing educational opportunities through Continuing Professional Development. Through the GARP Benchmarking Initiative and GARP Risk Institute, GARP sponsors research in risk management and promotes collaboration among practitioners, academics, and regulators.

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