



Cambridge Centre for Risk Studies
Advisory Board Research Showcase – 23 January 2018

Cambridge Centre for Risk Studies Welcome & Research Overview

Centre for
Risk Studies



Professor Danny Ralph
Academic Director
Cambridge Centre for Risk Studies

CCRS Research Overview Agenda

09:30-11:00

Session I – Emerging and Systemic Risk Research

Welcome and CCRS Research Overview

Prof Danny Ralph

Global Risk Index for 2018

Jessica Tsang

Geopolitical Risk and Catastrophe Threats

James Bourdeau

Assessment of Approaches to Cyber Terrorism

Tamara Evan

Cyber Threat: Hackonomics

Andrew Smith

2018 Cyber Risk Landscape

Jennifer Daffron

11:00-11:30

Coffee Break

11:30-13:00

Session II – Corporate Risk and Insurance Landscape

Applications of Corporate Risk Profiling

Andrew Skelton

Please Mind the (Protection) Gap: Role of Insurance in Economic Recovery

Arjun Mahalingam

Multi-Threat Risk Analysis and Insurance

Jennifer Copic

GEAC: Multi-Line Insurance Exposure Data Schema

Kayla Strong

12:30-13:00

Session III – Integrated and Future Research

An Integrated Platform for Risk Research

Simon Ruffle

Future Directions of the Cambridge Centre for Risk Studies

Andrew Coburn

Research Supporters

Cambridge Centre for Risk Studies



McKinsey&Company



WillisTowersWatson



Cambridge Centre for Risk Studies Research Team

Centre for Risk Studies Executive Team



Prof Danny Ralph
Academic Director



Dr Michelle Tuveson
Executive Director



Dr Andrew Coburn
*Director of
Advisory Board*



Simon Ruffle
*Director of Research
& Innovation*

Centre for Risk Studies Research Team



Jennifer Copic
Research Associate



Dr Jennifer Daffron
Research Associate



Dr Edward Oughton
Research Associate



Dr Jay Chan Do Jung
Risk Researcher



Dr Scott Kelly
Senior Risk Researcher



Eireann Leverett
Senior Risk Researcher



Dr Duncan Needham
Senior Risk Researcher



Dr Andrew Skelton
Senior Risk Researcher



James Bourdeau
Research Assistant



Oliver Carpenter
Research Assistant



Tamara Evan
Research Assistant



Kelly Quantrill
Research Assistant



Arjun Mahalingam
Research Assistant



Olivia Majumdar
Research Assistant



Andrew Smith
Research Assistant



Kayla Strong
Research Assistant



Jessica Tsang
Research Assistant



Lee Coppack
Senior Advisor



Jayne Tooke
Centre Administrator

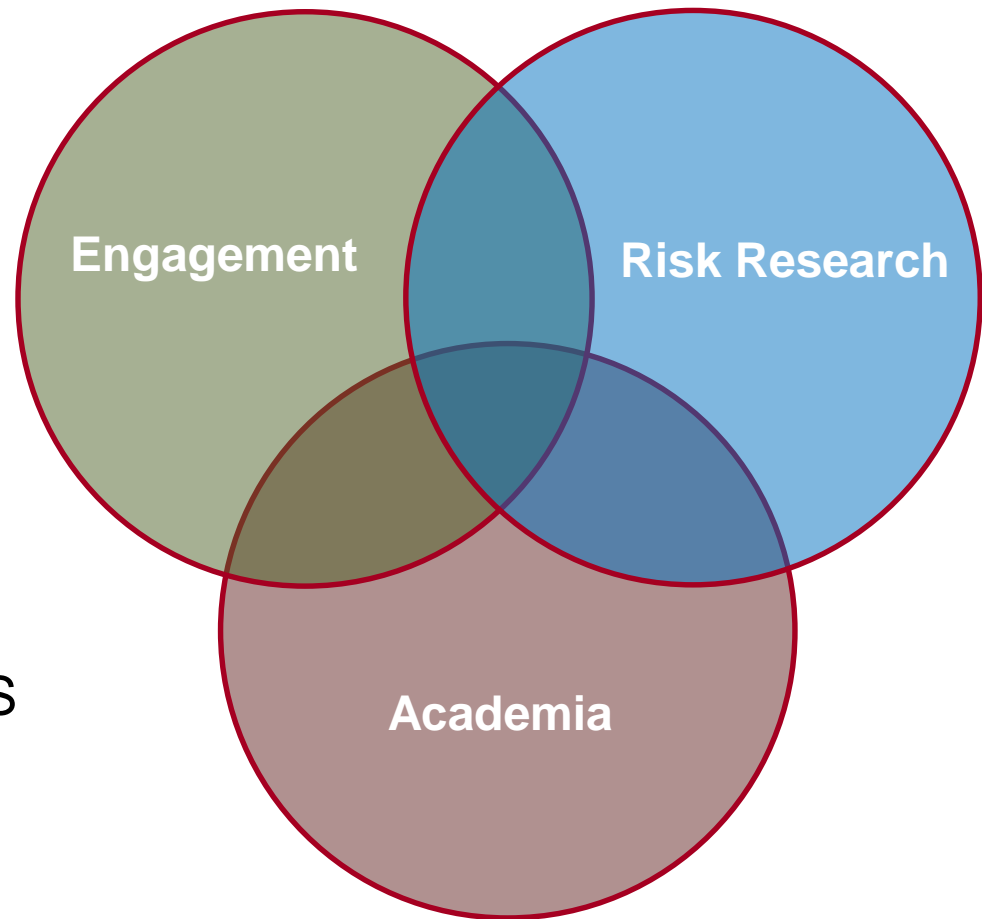


Centre for Risk Studies Mission Statement

**To be the world's leading academic centre
for research into systemic risk
in business, the economy, and society**

Centre for Risk Studies Strategy Summary

- **Engagement** – Collaboration, Dissemination, Feedback
 - Collaborating with business and government leaders
 - Summit, seminars, workshops, briefings
 - Cambridge CRO Council; Board & Executive Series
- **Risk Research** - Methodologies for solving risk problems
 - Cambridge Global Risk Index
 - Cambridge Risk Framework
 - Cyber Catastrophe Risk
- **Academia** – Contributing to CJBS Community
 - CJBS teaching programmes: MBA Elective in Risk Management
 - Cambridge - McKinseyRisk Prize
 - Research Excellence Framework support and publications



Catastrophic Failures of Complex Systems

- Motivated to understand
 - Catastrophe modeling and extreme risk analytics
 - Failure of complex systems and networks
 - Science of resilience to catastrophic failures
- To answer questions such as:

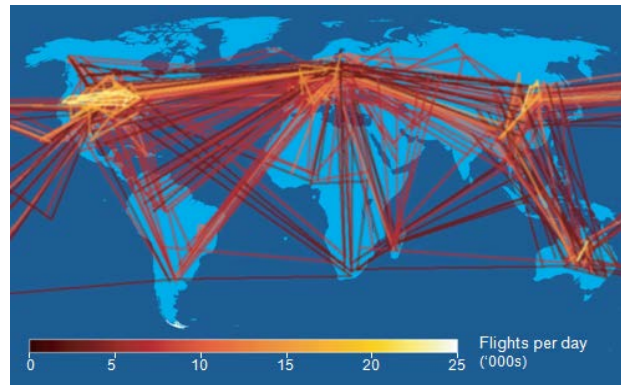
How would

[Regional War] affect [Bilateral Trade] and impact [Global Economy]?

Regional Conflict **Scenario**



System@Risk: Air Travel Network



Loss metrics



Beyond NatCat: Cambridge Taxonomy of Threats

Financial Shock



Market Crash



Sovereign Default



Bank Run

Trade Dispute



Labour Dispute



Trade Sanctions



Cartel Pressure



Nationalization



Tariff War

Geopolitical Conflict



Conventional War



Asymmetric War



External Force



Civil War



Nuclear War

Political Violence



Terrorism



Separatism



Organized Crime



Assassination



Social Unrest

Natural Catastrophe



Earthquake



Windstorm



Volcanic Eruption



Flood



Tsunami

Climatic Catastrophe



Drought



Freeze



Tornado & Hail



Electric Storm



Heatwave

Environmental Catastrophe



Sea Level Rise



Ocean System Change



Wildfire

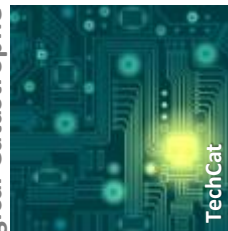


Pollution Event



Atmospheric System Change

Technological Catastrophe



Nuclear Meltdown



Industrial Accident



Cyber Catastrophe



Technological Accident



Infrastructure Failure

Disease Outbreak



Human Epidemic



Animal Epidemic



Waterborne Epidemic



Zoonosis



Plant Epidemic

Humanitarian Crisis



Famine



Water Supply Failure



Child Poverty



Welfare System Failure



Refugee Crisis

Externality



Meteorite



Solar Storm



Space Threat



Ozone Layer Collapse



Satellite System Failure

Other



Other



Other



Other



Other



Other

GDP@Risk as a metric for comparing impacts

GDP
Projection

*Economic
Model*

Threat
Vulnerability

*Evidence
Base*

Resilience
Model

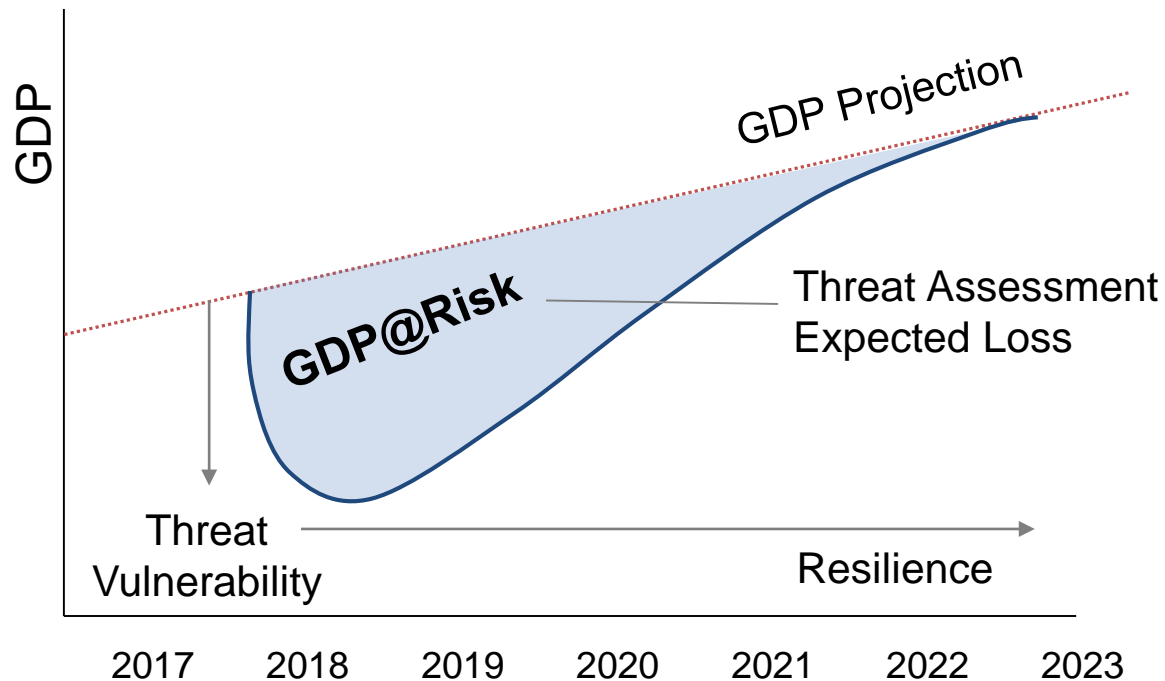
*Evidence
Base*

Threat
Assessment

*Evidence
Base*

Expected
Loss

*Simplify
calculation*



Live Research Tracks

Multi-threat analysis



- Insurance
 - Multi-Line Insurance Exposure Data Schema
 - Insurance Purchasing Risk Profile
- Corporate
 - Corporate Risk of Ruin & Tail Risk Management
 - Industry Enterprise Risk Management Needs
- World
 - Cambridge Global Risk Index

Cyber Risk



- Risk in the Cyber Supply Chain
- Cyber Terror Insurance Risk Assessment
- Cyber Accumulation Scenarios
- Cyber Risk Scenarios for Pacific Rim

Trend Risk



- Geopolitical Risk
 - Demographic Political Shocks
- Insurance Gap in Developing Nations

Selected 2017 events



- UN/CCRS Risks and Benefits of Artificial Intelligence and Robotics workshop (Cambridge, Jan)
- RMS/CCRS Cyber Risk Landscape Seminars (London, New York, May)
- 2017 Risk Summit 'Managing Risk in a Smarter World' (Cambridge, Jun)
- RMS/CCRS Probabilistic Cyber Insurance Loss Estimation Workshop (Cambridge, Jul)
- Praedicat/RMS/CCRS Best Practices in Scenario Development and Usage: Present and Future (Cambridge, Jul)
- RMS/CCRS Global Exposure and Accumulation Clash (GEAC) Workshop (New York, Sep)
- Pool Re/CCRS *Cyber Terrorism: Assessment of the Threat to Insurance* report launch (London, Nov)
- AIG/CCRS *Multi-Threat Risk Analysis and Insurance Growth Opportunities* report virtual launch (Cambridge, Dec)

Outputs in Preparation

Publications in 2018



Probabilistic Cyber Loss
Survey of Insurance and Cyber
Specialist Expertise on Loss Likelihood



2018 Global Risk Index
Lloyd's City Risk Index 2018 launch



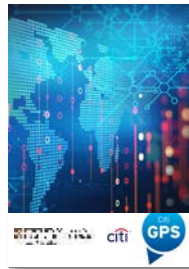
2018 Cyber Risk Landscape
Trends and recent incidents in cyber risk
for risk management



Multi-Line Insurance Exposure
Data Schema version 1.0



NatCat FinCat
Financial market impacts from extreme
natural catastrophe events



**Understanding & Navigating Global
Risks In A Hyper-Connected World**
Citi Global Perspectives and Solutions



Scenario Best Practice Guide
Guide to the development and use of
scenarios in business decision-making



Cyber Risk Whitepaper Series

- Company-specific cyber risk rating
- Hackonomics: Cyber threat actors
- Cloud Service Provider Risk

Centre for Risk Studies Research Strategy Development

Single Catastrophe
Scenario Stress Test

Integrated
Catastrophe
framework

Cambridge Global
Risk Analytics

Business-ready sectoral APIs

Ecosystem of Leading
Organisations in ERM

A. Integrated Risk Assessment (Project Pandora, Global Risk Outlook, GEAC)

Systemic Cyber
Catastrophe
Scenario

Cyber
Attack
Scenarios

Affirmative Cyber
Insurance
Accumulation

Multi -Line Insurance
Accumulation

Cyber-Physical
Catastrophes

Cyber-Physical
Terror Catastrophe

B. Risks and the Digital Economy (Cyber Threats, Digital Infrastructure)

Geopolitics

Digital Developments

Rise of Liability

C. Trend Risks

Single Catastrophe
Scenario Stress Test

Stress Tests for
Investment Portfolio

Insurance

Underwriting
Accumulation
Portfolio

Corporate

Risk Profiling
Risk Reporting

D. Understanding Corporate Risks

Jan 17

TODAY

Use Cases Around Tail Risks and Top Risks

