

Cambridge Judge Business School

Centre for Risk Studies 6th Risk Summit

RISK TESTING: STRESSING THE BOUNDARIES

22-23 June 2015

Cambridge Judge Business School
University of Cambridge

Centre for
Risk Studies



UNIVERSITY OF
CAMBRIDGE
Judge Business School

Meeting partners

Principal knowledge partner:

McKinsey & Company

Sustaining meeting partner:

HSBC 

Programme partners:



Meeting partner:



Centre supporters:



Academic collaborators:



Institute of Catastrophe Risk Management

| | |
|---|----|
| Overview | 2 |
| Research Showcase Agenda | 4 |
| 6th Risk Summit: Programme and Agenda | 6 |
| Cambridge - McKinsey Risk Prize 2015 | 12 |
| Speaker Biographies | 14 |
| Engagement Activities of Cambridge | |
| Centre for Risk Studies | 35 |
| Current Team and Resources | 38 |
| Centre for Risk Studies Research Agenda | 40 |
| Research Application Areas | 43 |
| Centre for Risk Studies Publications | 44 |

Organising Committee

Chair

Dr Michelle Tuveson, Executive Director, Cambridge Centre for Risk Studies

Members

Dr Andrew Coburn, Director of Advisory Board, Cambridge Centre for Risk Studies

Anna-Marie Greenaway, VP Science and Technology BP-Cambridge, BP plc

Dr Sven Heiligtag, Principal, McKinsey & Company

Alan Laubsch, Director and Head of Risk Products, FNA

Professor Daniel Ralph, Academic Director, Cambridge Centre for Risk Studies, University of Cambridge Judge Business School & Professor of Operations Research

Simon Ruffle, Director of Technology Research & Innovation, Cambridge Centre for Risk Studies

Manan Shah, Programme Manager, Lockheed Martin

Alan Smith, Global Head of Risk Strategy & Senior Executive Officer of Group Risk, HSBC Holdings PLC

In June 2015 the Cambridge Centre for Risk Studies will bring together leaders and decision makers from businesses, governments, academia and NGOs to explore salient topics in risk management. The summit will be held at the University of Cambridge Judge Business School, followed by a conference dinner at St John's College, Cambridge.

This year's summit *Risk Testing: Stressing the Boundaries* takes the topical theme of applying stress tests to financial institutions, business management, and other operations. The past few years of requiring banks in all the major jurisdictions of the world to perform different sets of stress tests has proved controversial and has prompted questions about the objectives and techniques of stress testing. The conference addresses current thinking about how to develop better stress tests that make our financial services – and our overall society – safer, including learning from how stress tests are used in other disciplines and setting 'risk tests' that reflect likelihood and realistic narratives as well as severity benchmarks.

Keynote speakers will address a number of different viewpoints around stress testing, the issues of understanding systemic risk, and improving the resilience of our society and our economic system. Panels of specialists, including regulators, practitioners, and analysts will debate the business benefits of stress testing as a practice.

Speakers include professionals involved in implementing stress tests, regulators who oversee stress tests, academics, commentators, and experts from a range of different industries.



Pre-conference session

Day 1: Monday 22 June 2015

| | |
|--------------|--|
| 09:00- 14:30 | Special Topics Seminar |
| 09:00 | Registration Opens |
| 09:30 | Session 1: The Emerging Risk Landscape A Multi-Threat View of Risk Professor Daniel Ralph, Academic Director, Cambridge Centre for Risk Studies |
| 10:00 | Catastrophics: the economics of catastrophes Dr Scott Kelly, Research Associate, Cambridge Centre for Risk Studies |
| 10:20 | Identifying & Managing Emerging Risks Nick Beecroft, Emerging Risks, Lloyd's |
| 10:40 | Coffee Break |
| 11:30 | Session 2: Financial Catastrophe Risk Understanding Financial Catastrophes Dr Andrew Coburn, Director of Advisory Board, Cambridge Centre for Risk Studies |
| 11:40 | Learning from Historical Financial Crises Dr Duncan Needham, Director, Centre for Financial History |
| 12:00 | The Cambridge Model of Banking Contagion Dr Olaf Bochmann, Research Associate, Cambridge Centre for Risk Studies |

Pre-conference session

Day 1: Monday 22 June 2015

- 12:20 **Financial Cartography**
Dr Kimmo Soramäki, Founder & CEO,
Financial Network Analytics
-
- 12:40 Lunch
-
- 13:30 **Session 3: Cyber Catastrophe - an
interlinked Systemic Risk**
- Understanding Cyber Risk**
Simon Ruffle, Director of Technology
Research and Innovation, Cambridge
Centre for Risk Studies
-
- 13:50 **Developing Cyber Catastrophe
Scenarios**
Éireann Leverett, Research Associate,
Cambridge Centre for Risk Studies
-
- 14:10 **Issues of Managing Cyber Risk in
Business**
tbc
-
- 14:30 **End of research showcase and pre-
conference session**
-

Risk Testing: Stressing the Boundaries
Programme and Agenda

Day 1: Monday 22 June 2015 *continued*

- | | |
|--------------|--|
| 15:30-16:00 | Risk Summit registration |
| 16:00- 16:15 | Risk Summit welcome Dr Michelle Tuveson , Executive Director, Cambridge Centre for Risk Studies |
| 16:15-17:00 | Plenary Session 1: Ring Fencing Systemic Risk Keynote: Coherent Stress Testing Dr Riccardo Rebonato , Author & Global Head of Rates and FX Analytics, PIMCO |
| 17:00-18:00 | Risk Summit Day 1 Panel: Views on the Notion of a Stressed Financial System Moderated by: Andrew Freeman , Risk Fellow, Cambridge Centre for Risk Studies and Director, Finance Foundation <ul style="list-style-type: none"> • Piers Haben, Director, European Banking Authority Oversight • Professor Daniel Ralph, Academic Director, Cambridge Centre for Risk Studies and Professor of Operations Research, University of Cambridge Judge Business School • Dr Riccardo Rebonato, Author, Head of Rates and FX Analytics, PIMCO • Professor Venkat Venkatasubramanian, Co-Director, Center for the Management of Systemic Risk (CMSR) and Samuel Ruben-Peter G. Viele Professor of Engineering, Columbia University • Dr Joyce Vorholt, Expert Principal, McKinsey & Company |
-

Risk Testing: Stressing the Boundaries*Programme and Agenda*

Day 1: Monday 22 June 2015 *continued*

18:00-19:00 **Drinks reception**
at St John's College, Cambridge

19:00-21:30 **Risk Summit dinner**
at St John's College, Cambridge

Risk Testing: Stressing the Boundaries*Programme and Agenda***Day 2: Tuesday 23 June 2015**

9:00-9:30 Coffee and registration

9:30-11:00 **Plenary Session 2: Enhancing the Understanding of Risk**
Chair: Dr Andrew Coburn, Director of the Advisory Board, Cambridge Centre for Risk Studies and Senior Vice President, RMS

9:30-10:00 **Historical Perspective of Financial Regulation**
Rasheed Saleuddin, Author & Advisor, West Face Capital

10:00-10:30 **When Failure Is Not an Option: Risk and National Security**
Brad Pietras, Vice President, UK Engineering and Technology, Lockheed Martin Corporation

10:30-11:00 **Thinking the Unthinkable in Stress Tests (or Avoiding the Tyranny of the Historical Regression)**
Ian Shipley, Partner, Oliver Wyman

11:00-11:30 Coffee Break

11:30-13:00 **Plenary Session 3: Business Application and Value**
Chair: Simon Ruffle, Director of Technology Research & Innovation, Cambridge Centre for Risk Studies

11:30-12:00 **Becoming a Stress-Testing Ready Organisation**
Dr Aleksander Petrov, Partner, McKinsey & Company

Risk Testing: Stressing the Boundaries

Programme and Agenda

Day 2: Tuesday 23 June 2015 *continued*

- 12:00-12:30 **Harnessing the Benefits of Stress Testing: A Regulatory Perspective**
Dr Alison Scott, Acting Technical Head of Division for Stress Testing, Bank of England
- 12:30-13:00 *Panel Discussion:*
Stress Tests and Evidence for Business Value
 Moderated by: **Alan Laubsch**, Director and VP Risk Products, FNA
- **Dr Alan Cathcart**, Head of Stress Testing Strategy and Policy, HSBC
 - **Roger G. Chen**, Vice President, Office of Risk Management, New York Life Insurance
 - **Dr Sergey Ivliev**, Deputy CEO, Prognoz
 - **Professor Neil Lindsay**, Senior Advisor to the Counter-Terrorism Science and Technology Centre, Defence Science and Technology Laboratory
- 13:00-14:00 Lunch at Cambridge Judge Business School
- 14:00-16:00 **Plenary Session 4: Confronting Risk Testing Challenges**
Chair: **Dr Sven Heiligtag**, Principal, McKinsey & Company
- 14:00-14:10 **McKinsey Risk Prize announcement**
- 14:10-14:40 **Commodities Perspective of Regulation**
Dr Frank Amend, Head of Market Analysis, RWE AG

Risk Testing: Stressing the Boundaries*Programme and Agenda***Day 2: Tuesday 23 June 2015** *continued*14:40-15:10 **Shareholder Resolutions for Carbon Risks**

Gardiner Hill, Director Carbon Solutions, BP Group Technology

15:10-16:00 **The “Risk” Debate**

Chair: **Keren Uziyel**, Editor, Economist & Country Risk Manager, Economist Intelligence Unit

Debate motion: **This house believes that stress testing is a key enabler to the management of future financial crises.**

In the ‘Cambridge-style’ debate, the format will feature motions in support or opposition of the house motion. Attendees will participate in a pre-debate vote on the motion. Panellists will present an opening statement followed by questions from the audience. In conclusion, each panellist will deliver a closing argument and all participants will provide a final vote.

For the debate motion:

- **Matthew Grant**, General Manager, Model & Data Products, RMS
- **Ed Jenkins**, CRO Global Banking and Markets & Global Head of Model Risk Governance, HSBC

Against the debate motion:

- **Brad Fischtrom**, Managing Director, Enterprise Risk Management, AIG
- **Dr Bill Janeway**, Senior Advisor, Warburg Pincus

Risk Testing: Stressing the Boundaries*Programme and Agenda*

Day 2: Tuesday 23 June 2015 *continued*

16:00-16:15

Summary & Conclusions

Professor Daniel Ralph, Academic
Director, Cambridge Centre for Risk
Studies and Professor of Operations
Research, University of Cambridge
Judge Business School

Cambridge - McKinsey Risk Prize Overview

The Cambridge Centre for Risk Studies, in conjunction with McKinsey & Company, is pleased to award the “Cambridge - McKinsey Risk Prize”. This award recognises the best submission on risk management by a current student at the University of Cambridge Judge Business School.

Judges include members of McKinsey’s Global Risk Practice, the Editor-in-Chief of the McKinsey Working Papers, and members of the Cambridge Centre for Risk Studies at the Cambridge Judge Business School.



Cambridge - McKinsey Risk Prize 2015 Finalists

- **Ramgopal Rajan, CJBS MBA Candidate:** Reducing coordination risks around communication infrastructure protection during disasters: an Alberta floods case study
- **Martin Sonntag, CJBS MBA Candidate:** Production and supply chain induced health risks in the fruit juice industry
- **Siobhan Sweeney, CJBS MBA Candidate:** The creation of the Contrarian Director and their role in achieving workable board independence and better risk oversight



JUDGE BUSINESS SCHOOL



**Dr Frank Amend**

Global Head of Market Analysis, RWE

RWE is a utility headquartered in Germany that serves 25million customers across Europe and Turkey. RWE has fully embraced the transition to decentral, sustainable energy supplies and the efficient use of energy resources. RWE's installed capacity base of currently around 50GW ensures that concerns on affordability and security-of-supply will not de-rail this transition.

As commercial analysts, Frank and his team provide insights on market, regulatory, and technological developments for tactical and strategic decision making across RWE. This includes trading and hedging recommendations, market impact assessments, and strategic guidance on the positioning of RWE.

Frank holds a Doctorate in Finance from University St. Gallen/ Switzerland and a joint degree in business administration and engineering from University Darmstadt/Germany.

**Nick Beecroft**

Manager, Emerging Risks, Lloyd's

Nick Beecroft is Manager, Emerging Risks and Research at Lloyd's. His team is responsible for providing foresight and actionable analysis on emerging risks, working with partners in the research community to provide forward-looking insight and to reduce uncertainty concerning new and rapidly changing risks. Key outputs are thought leadership reports, scenarios for stress-testing and insight to inform innovation strategy. Before joining Lloyd's, Nick spent the majority of his career as an Intelligence Officer in the Royal Air Force. Appointments included attachments to central

government in a counter-terrorism role and to the British Army, where he was responsible for operational planning and mentoring of local forces on deployed operations.



Dr Olaf Bochmann

Risk Associate, Cambridge Centre for Risk Studies

Olaf Bochmann is a postdoctoral research associate at the Centre for Risk Studies. He was previously a postdoctoral fellow at the University Oxford, and he holds a PhD from the University of Leuven. His research mainly focuses on systemic risk and financial stability, as well as complex networks and agent based modelling.



Dr Alan Cathcart

Head of Stress Testing Strategy and Policy, HSBC Holdings

Alan is Head of Strategy and Policy in the Global Stress Testing Division at HSBC and is closely involved in all aspects of HSBC enterprise wide stress testing programme. Before joining HSBC in January 2012, he worked in the specialist risk division of the UK Financial Services Authority from its inception in 1998; his various roles at the FSA included stress testing, capital management, credit modelling, and market risk. He worked extensively on stress testing during the financial crisis. Prior to the FSA, He worked at the Bank of England in a number of roles from 1987 to 1998. He holds a PhD in mathematics.

**Roger Chen**

Head of Stress Testing Strategy and Policy, HSBC Holdings

Roger G. Chen is Vice President at New York Life Insurance Company, where he reports directly to the Chief Risk Officer and Chief Actuary. He is responsible for coordinating enterprise-wide risk management activities and risk governance processes, including financial risk management and stress testing. He is the Secretary of New York Life's Risk Steering Committee and chairs the company's Financial Risk Working Group and Stress Testing Working Group. He leads initiatives to continually enhance and strengthen the company's risk management framework, methodologies, policies, and standards.

Prior to joining New York Life, Roger was a Senior Manager in Ernst & Young's Financial Services Risk Management advisory practice, where he managed delivery of credit risk and capital management advisory services to institutional clients in the banking and capital markets, insurance, and government sectors.

Roger received a BS in Mathematical and Computational Science from Stanford University and an MBA in Finance from UCLA Anderson School of Management. He is a CFA charterholder and holds the Professional Risk Manager (PRM) designation. Roger is a member of the Editorial Board of the Journal of Risk Management in Financial Institutions.

**Dr Andrew Coburn**

Director of Advisory Board, Cambridge Centre for Risk Studies

Andrew Coburn manages the External Advisory Board of the Centre for Risk Studies, coordinating the inputs

of consumers of research into the Centre's risk agenda. Andrew is the principal coordinator of the research programme on 'System Shock' at the Centre.

Andrew is one of the leading contributors to the creation of the class of catastrophe models that over the past 20 years has come to be an accepted part both of business management in financial services and of public policy making for societal risk. He has extensive experience in developing models and using them for business decision support. Andrew has also provided research inputs into government policy, such as House of Congress legislation on terrorism risk management policy and urban planning for disaster mitigation in Mexico, Metro Manila, and Southern Italy.

Dr Andrew Coburn is a member of the senior management of Risk Management Solutions, the leading provider of catastrophe risk models to the insurance industry.



Brad Fischtrom

Managing Director, Head of Scenario Development and Stress Testing, AIG Commercial Insurance

Brad Fischtrom is Managing Director, Head of Scenario Development and Stress Testing for AIG Property Casualty. He is accountable for designing, quantifying and reporting realistic disaster scenarios and regulatory-driven stress tests as part of AIG's Enterprise Risk Management (ERM) framework. Brad's team is also responsible for innovation in the areas of emerging risk management and development of data and risk measurement tools for insurance risk aggregation. Prior to joining AIG in 2010, he has held positions at Towers Watson and Aon Risk Services.

Brad holds a Bachelor of Science Degree in Finance from the University of Richmond Robins School of

Business, and he is an Associate in Risk Management (ARM) and Chartered Property Casualty Underwriter (CPCU).

**Matthew Grant**

Group Executive, Global Client Development, RMS

Matthew Grant is General Manager of the RMS Models and Data Business. He is responsible for the growth of RMS core business and ensuring the continued support of our existing client base. He oversees product management for the RMS modelling businesses and has responsibility for our Capital markets team and corporate marketing. Matthew leads the RMS London office and reports directly to Hemant Shah, RMS CEO.

Upon completing a degree in Mechanical Engineering, Matthew began his career in data communications, followed by a period of developing safety risk cases and emergency plans for the offshore and nuclear industries. He opened the London office for EQECAT in 1992, leaving to found the RMS International operations in 1996. In his 19 years at RMS, Matthew has worked with over 100 re/insurance companies and broker. Today over 200 people work in the London office.

**Piers Haben**

Director of Oversight, European Banking Authority

Piers Haben is the Director of Oversight at the European Banking Authority (EBA). Piers is responsible for the EBA's work on EU-wide stress testing and risk assessments, the efficient functioning of colleges of supervisors and forging a common supervisory culture, as well as common supervisory reporting and transparency. Prior to joining the EBA, Piers worked for

the UK Financial Services Authority where he held a number of roles in prudential policy and supervision, including leading the FSA's policy work on stress testing and supervisory review of firms under Pillar 2. Piers has widespread international experience including as a member of the Basel Committee's Supervision and Implementation Group, work in the Financial Stability Forum and advising the South African Reserve Bank.



Dr Sven Heiligtag

Principal, McKinsey & Company

Sven Heiligtag is a principal in McKinsey's Risk practice and the global leader of the firm's Corporate Risk Service line. Since joining the firm's Hamburg office in 2001, Sven has worked for clients in over 20 countries. Sven works primarily with clients from the energy and natural resources space and focuses strategic risk/return management and market and commercial risk, e.g., strategic portfolio management, scenario-based decision making, establishing trading and risk management strategies, organisational processes and governance mechanisms. Sven is leading McKinsey's corporate enterprise risk management survey as well as its commercial performance survey focus on trading and risk management approaches for market related risks. Next to his risk work, Sven is serving a variety of clients from the energy and natural resources space across the board on strategic, organisation, efficiency, corporate finance and leadership topics. Prior to joining McKinsey, Sven completed a PhD in chemistry at the University of Hamburg.

**Gardiner Hill**

Director Carbon Solutions, BP Group Technology

Gardiner Hill is the Director of Carbon Solutions in the Group Technology Function of BP and is an Advisor to the BP group on CO₂ Capture and Storage (CCS) technology, policy and regulations. He is also the manager responsible for the BP Princeton Carbon Mitigation Initiative (CMI) at Princeton University. In addition to this, Gardiner is Vice-Chair of the EU Technology Platform for Zero Emissions Fossil Fuel Power (ZEP), Industry Co-Chair of the CO₂ Capture and Storage European Industrial Initiative (CCS EII) and sits on the Executive Board of the London based Industry Association for CO₂ Capture and Storage (CCSA). Prior to this Gardiner spent time working in Alternative Energy and in BP Exploration and Production Company working Field Development and Technology Manager roles, covering all the petrotechnical, sub-surface, drilling and wells disciplines. Mr. Hill possesses more than 25 years of technical and managerial experience that is directly relevant to technology, business and project management. He holds MSc. and BSc. degrees in petroleum and civil engineering respectively, from Herriot-Watt University in Scotland.

**Dr Sergey Ivliev**

Deputy CEO, Prognoz

Sergey Ivliev is a Deputy CEO at Prognoz – the largest Russian-based business intelligence company, where he is responsible for development of the risk platform for financial institutions and regulators, quantitative financial research and university relations.

He is also a Regional Director of PRMIA in Russia and principal organizer of annual Perm Winter School on

Risk Management – “the coolest risk event”, as well as PRMIA Russia Risk Seminars: IRB Day, Market Risk Day, Stress testing Day, etc.

Dr. Ivliev is an Associate Professor of the Department of Information Systems and Mathematical Methods in Economics at the Perm State University where he founded the Master in Finance & IT Program (MiFIT). Sergey’s academic research focuses on the financial market microstructure, HFT, quantitative risk management. He is an editor of the Springer volumes Market Risk and Financial Markets Modeling (2012), Financial Econometrics and Empirical Market Microstructure (2015), author of the book “Market risk management: methodology, practice, recommendations” (Reglament-Media) and member of the editorial board of the Journal of Network Theory in Finance.



Dr William Janeway

Senior Advisor, Warburg Pincus

William H. Janeway is Senior Advisor at Warburg Pincus. He joined Warburg Pincus in 1988 and was responsible for building the information technology investment practice. Previously, he was executive vice president and director at Eberstadt Fleming. Dr. Janeway is a director of Magnet Systems, Nuance Communications, O’Reilly Media, and a member of the Board of Managers of Roubini Global Economics.

Dr. Janeway is Chairman of the Board of Trustees of Cambridge in America, University of Cambridge and a Member of the Board of Managers of the Cambridge Endowment for Research in Finance (CERF). Dr. Janeway is a member of the board of directors of the Social Science Research Council and the board of governors of the Institute for New Economic Thinking

and of the Advisory Boards of the Princeton Bendheim Center for Finance and the MIT-Sloan Finance Group. He is the author of *Doing Capitalism in the Innovation Economy: Markets Speculation and the State*, published by Cambridge University Press in October 2012.

Dr. Janeway received his doctorate in economics from Cambridge University where he was a Marshall Scholar. He was valedictorian of the class of 1965 at Princeton University.

**Ed Jenkins**

CRO Global Banking and Markets & Global Head of Model Risk Governance, HSBC

Ed Jenkins is the Chief Risk Officer of Global Banking and Markets and the Global Head of Model Risk Governance. He joined HSBC in 2008 as the Chief Accounting Officer of GB&M.

His extensive and varied experience in financial services includes five years with JPMorgan, in the Front Office as a Credit Hybrids trader and as the Global Head of Equities Valuation Control, and prior to that eight years with PricewaterhouseCoopers where he provided accounting and risk consultancy to investment banking and utilities clients.

Ed graduated with first-class honours in mathematics from the University of Cambridge and he is a Fellow of the Institute of Chartered Accountants in England and Wales.

**Dr Scott Kelly**

Senior Risk Associate, Cambridge Centre for Risk Studies

Scott Kelly is a post-doctoral research associate in the Centre for Risk Studies. He holds research posts in the Centre for Climate Change Mitigation Research (4CMR) in the Department of Land Economy and the Electricity Policy Research Group in the Judge Business School at the University of Cambridge. He is a Junior Research Fellow of Darwin College.

At the Centre for Risk Studies Scott leads the research on macroeconomic modelling. Within the centre, macroeconomic models are used to describe the global and regional impacts that occur as a result of different risk scenarios developed as part of the Cambridge Risk Framework. Research includes estimating the economic impact of exogenous shocks and their propagation in global networks. Specific research areas include the analysis of international trade, supply chain analysis, sector analysis and the estimation of supply chain risk.

Prior to joining the Centre for Risk Studies research included modelling the macroeconomic impact of disasters, the economics of infrastructure, complex systems modelling, input output analysis, econometrics, energy systems modelling and sustainable development. Specialising in applied modelling approaches, expertise has been developed in a variety of different statistical techniques such as multiple linear regression, panel methods and structural equation modelling. More recently knowledge has been developed in the application input-output models, social network analysis and agent based models.

**Alan Laubsch**

Director and VP Risk Products, FNA

Alan has over two decades of risk management experience, and has advised major global banks, asset managers, and sovereign institutions on market and credit risk. A founding member of the RiskMetrics Group, his expertise encompasses next-generation risk management practices including early warning methodologies and stress testing. A former VP at JPMorgan's Risk Advisory Group in New York, he joined that firm in 1993 after receiving a B.S. in Industrial Engineering from Stanford University. Active in the global risk community, Alan is a frequent speaker at industry and banking forums and recently launched an online "Advanced Stress Testing" course with PRMIA. Alan also contributes to high-profile financial publications such as the Asia Wall Street Journal.

**Éireann Leverett**

Risk Researcher, Cambridge Centre for Risk Studies

Éireann Leverett has studied psychology, philosophy, artificial intelligence, software engineering, and computer security at various times in his life. He holds a BEng from Edinburgh University and an MPhil from the University of Cambridge in Advanced Computer Science. He still enjoys punting at Darwin College when he has the time.

At the Centre for Risk Studies his research focuses upon technological disasters and the economic impacts of computer security failures or accidents. He has experience of compromising the security of organisations, and assisting them to improve their security postures through a variety of short and long term methods. He is interested in computer security at scale, security economics, systems security,

incident response, critical infrastructure protection, safety, firmware signing, exploit markets, vulnerability management, quality assurance, indicators of compromise, modelling, networks, risk, visualisations, and zero knowledge proofs. He is a frequent public speaker on these subjects.



Professor Neil Lindsay

Senior Advisor to the Counter-Terrorism Science and Technology Centre, Defence Science and Technology Laboratory

Neil Lindsay works in DSTL, the organisation providing scientific and technical support to the Ministry of Defence. Following a period of in-depth materials research, Neil has undertaken a number of senior roles within DSTL beginning with Chief Scientist (Naval Systems). Maintaining scientific rigour and technical quality, encouraging curiosity, whilst meeting the requirements of demanding customers, both above and below the waves, was a challenge but hugely rewarding. For the last six years Neil has developed innovative systems-based techniques to understand and counter complex enterprises and threats, supporting a range of UK operational commitments overseas.

Neil has recently completed a period as a National Security Fellow within the Centre for Science and Policy at Cambridge. He has identified the potential for Government to exploit more fully exciting technical developments within academia, in particular to counter the threat posed by improvised explosive devices. This work has highlighted some interesting future lines of enquiry forming the basic platform for a Policy Fellowship, posing a generic question: "How does Government identify, recirculate and thereby better exploit the widest range of developments in academia?" This work explores human, life and social

sciences in addition to the physical sciences and engineering.

Additionally, Neil has examined how new systems approaches can support the development of future Government policy and to determine better the impact of policy in complex and sensitive areas such as energy, food, climate and environment, and the preservation of strategic national resources.

Neil has a BSc in Metallurgy & Materials Technology from the University of Aston, a PhD in Materials Science from the University of Bath, an MBA from the UK Defence Academy/Cranfield Business School, and is a Visiting Professor at the Faculty of Engineering at Loughborough University.



Dr Duncan Needham

Director, Centre for Financial History, University of Cambridge

Duncan Needham is an Associate of the Centre for Risk Studies, a Lecturer in the Faculty of History, Director of the Centre for Financial History, and a Research Fellow of Darwin College, Cambridge.

After completing his first degree at the London School of Economics, and a Masters at Cass Business School, Duncan worked at Credit Suisse Financial Products and JP Morgan, where he ran the banks and financials desk, trading bonds and credit default swaps. He then spent four years running Cairn Capital's Investment Grade Collateralised Debt Obligation business, before returning to academia in 2008 to complete his MPhil and then PhD in Economic History.

His volume *"UK Monetary Policy from Devaluation to Thatcher, 1967-82"* was published by Palgrave Macmillan in 2014.

**Dr Aleksander Petrov**

Partner, McKinsey

Aleksander Petrov is a Partner at McKinsey and leader of the London Risk Advanced Analytics Group. He has broad experience in capital markets, derivatives pricing and portfolio management, supporting clients on a variety of risk topics focused on asset analysis, stress testing and real estate. Prior to joining McKinsey & Company in 2009, Aleksander Petrov spent approximately ten years in various quantitative and trading roles within the European fixed income and structured finance industry.

His career highlights include:

- Supporting robust bank performance in Greek and Cypriot institutions in bottom-up stress testing reviews, quantitative development of portfolio analytical tools and management presentations
- Support in EBA comprehensive assessment process in Italian banks, review of internal modeling architecture, development of macro-economic satellite model
- Model validation review project for macro-economic forecasting and asset cash flow models in US financial institutions; support in the CCAR stress test
- Support in a top-down stress testing analysis of the Portuguese banking system; review/update of internal models and business plan forecasts; review of CRE portfolio models
- Major risk analysis of trading book in CRD3 context at a German bank
- Implementation of portfolio disposition strategy for a large cash and synthetic structured finance

portfolio at a US financial institution; RMBS and CMBS model reviews and asset analysis

He holds a PhD in Finance from the University of Vienna, Austria, specialising in Equity Derivatives with Stochastic Volatility. He was a research associate at the London School of Economics and is a CFA charter holder. He has held teaching assistantship positions at the University of Vienna and Sofia.



Brad Pietras

Vice President, UK Engineering and Technology,
Lockheed Martin Corporation

Bradley W. Pietras is Vice President, UK Engineering and Technology, Lockheed Martin Corporate Engineering, Technology, and Operations for the Lockheed Martin Corporation and is responsible for corporate research and development and engineering initiatives in the UK focused on business growth and customer relations.

From 2007 to 2010, he led the corporate Nanotechnology Initiative that resulted in the creation of Applied Nanostructured Solutions, LLC and the introduction of advanced carbon nanotube-based materials in multiple Lockheed Martin products including the F-35 Joint Strike Fighter, the Terminal High Altitude Area Defence (THAAD) system, EQ-36 Radar, and the Juno spacecraft.

He holds a Bachelor's of Science degree in Physics from the Rochester Institute of Technology and a Master's of Science degree in Neuroscience from the College of Engineering at Syracuse University. Mr. Pietras has been a visiting scientist at the National Institutes of Health in the United States and is a visiting researcher at University College London. He is presently a PhD candidate in Neuroscience at the University of Maryland's School of Medicine in Baltimore and his

research pertains to the mathematical and neural foundations of decision-making and reinforcement learning.

Mr Pietras has served on the boards of directors for Zyvex Performance Materials, Nextreme Thermal, Cambridge University's Centre for Energy Studies, and Syracuse University's Centre for Advanced Systems and Engineering and is a member of the American Institute of Aeronautics and Astronautics.



Professor Daniel Ralph

Academic Director, Centre for Risk Studies and Professor of Operations Research, University of Cambridge Judge Business School

Professor Danny Ralph is a Founder and Director of the Centre for Risk Studies, Professor of Operations Research at Cambridge Judge Business School, and a Fellow of Churchill College.

Danny received his PhD in 1990 from the University of Wisconsin Madison. He was a faculty member of the Mathematics & Statistics Department at the University of Melbourne before coming to Cambridge University for a joint appointment in the Engineering Department and Cambridge Judge Business School.

Danny's research interests include optimisation methods, equilibrium models for electricity markets, and risk in business decision making. He is Editor-in-Chief of Mathematical Programming (Series B).

**Dr Riccardo Rebonato**

Author & Global Head of Rates and FX Analytics, PIMCO

Riccardo Rebonato is Head of Rates and FX Analytics at PIMCO. Previously, he was global head of market risk and global head of the Quantitative Research Team at the RBS and Head of the Complex Derivatives Trading Desk and Research Group at Barclays Capital. He sits on the board of directors of the ISDA and the board of trustees for the Global Association of Risk professionals (GARP). Dr Rebonato has authored several books on interest rate modeling and risk management.

He holds a doctorate in nuclear engineering and a PhD in condensed matter physics/science of materials from Stony Brook University, NY.

**Simon Ruffle**

Director of Technology Research & Innovation, Centre for Risk Studies

Simon is the Director of Technology Research and Innovation in the Centre for Risk Studies, Judge Business School, University of Cambridge where he is a member of the Centre's Executive Team. He has a key coordinating role in the Centre's research programme and leads several research projects including the Cambridge Risk Framework, the Global Risk Atlas and the Cyber Threat research track.

Originally studying architecture at Cambridge, Simon has spent most of his career in the insurance industry, developing software for natural hazards risk. He has worked on risk pricing for primary insurers, catastrophe modelling for reinsurers, and has been involved in placing catastrophe bonds in the capital markets. He has many years of experience in software development, relational databases and geospatial analysis and has worked in a variety of organisations from start-ups to multinationals.

**Rasheed Saleuddin**

Author & Advisor, West Face Capital

Rasheed Saleuddin, CFA, is a veteran securitized product investor currently advising on European and US securitization investments at West Face Capital, a \$2.7 billion Canadian special situations hedge fund. He is the author of *Regulating Securitized Products: A Post-Crisis Guide* (forthcoming). He holds graduate degrees from the University of Cambridge (Economic History) and London School of Economics (Regulation) and is currently a PhD student funded by the Cambridge Endowment for Research in Finance (CERF), researching US commodity markets and their regulation during the Interwar years (1920-1938) at Corpus Christi College, Cambridge.

**Dr Alison Scott**

Acting Technical Head of Division for Stress Testing, Bank of England

Alison Scott is Acting Technical Head of Division for Stress Testing within the Prudential Regulation Authority at the Bank of England. Alison leads and co-ordinates much of the analytics for the micro-prudential stress testing undertaken by the Bank of England and is part of the team setting up the UK's stress testing framework. She has been with the PRA (previously the FSA) since 2004 and worked in a variety of regulatory roles looking at capital and credit risk management within banks, including Basel 2 implementation and the setting of banks' individual capital guidance. Prior to joining the FSA, Alison worked for Oliver Wyman on a variety of risk projects focused on Basel 2 implementation and economic capital. Alison holds PhD in Chemical Engineering from the University of Cambridge.

**Ian Shipley**

Partner, Oliver Wyman

Since joining Oliver Wyman in 2001, Ian has led a range of work in the intersection of risk analysis, risk governance, valuation and transaction related consulting throughout Europe in all areas of financial services. Prior to that Ian gained a Master's degree in Engineering Economics and Management from Oxford University.

Ian has supported a range of regulators and multi-laterals in carrying out systematic reviews of the solvency of banks as well as providing support in dealing with the downstream consequences (recapitalisation processes, broader policy considerations). This work included supporting the ECB in the recent Comprehensive Assessment as well as a number of other European Central banks directly.

Ian is an expert in the valuation and forecasting of loss for a wide range of asset classes (from retail through to structured credit / ABS portfolio etc.) for both accounting and economic purposes. The outputs of the work have been used both for regulatory purposes as well as to support banks in strategic decision making, such as wind down strategies. Ian has also carried out similar work for investors in due diligence processes.

More generally, Ian supports financial services clients with a range of finance and risk management questions including:

- Development of provisioning models for banks and advising regulators on provisioning guidelines
- Development and validation of economic capital and regulatory capital models
- Development of risk appetite frameworks

- Improving risk governance of large, complex businesses.

**Dr Kimmo Soramäki**

Founder & CEO, Financial Network Analytics

Kimmo Soramäki is the Founder and CEO of Financial Network Analytics and Editor-in-Chief of the Journal of Network Theory in Finance. Before founding FNA in 2010, he worked for 15 years in policy-making, advisory and multidisciplinary research roles at several central banks - including the European Central Bank and the Federal Reserve Bank of New York. His research has focused on the interconnectedness of financial systems and on systemic risk. He has published in academic journals in the areas of economics, statistical mechanics and operations research and is a frequent speaker at industry and academic conferences. Kimmo holds a Doctor of Science in Operations Research and a Master of Science in Finance.

**Dr Michelle Tuveson**

Executive Director, Centre for Risk Studies

Michelle Tuveson is a Founder and Executive Director at the Cambridge Centre for Risk Studies hosted at the University of Cambridge Judge Business School. Her responsibilities include the overall executive leadership at the Centre. This includes developing partnership relationships with corporations, governments, and other academic centres. Dr Tuveson leads the Cambridge CRO Council and she chairs the organising committee for the Cambridge Risk Centre's Annual Risk Summits. She is one of the lead organisers of the Aspen Crisis and Risk Forum. She is an advisor to the World Economic Forum's 2015 Global Risk Report and a contributor to the Financial Times Special Report on Risk Management. She is also an advisor to a number

of corporations and boards as well as a frequent conference speaker.

Dr Tuveson has worked in corporations within the technology sector with her most recent position in the Emerging Markets Group at Lockheed Martin. Prior to that, she held positions with management strategy firm Booz Allen & Hamilton, and US R&D organisation MITRE Corporation. Dr Tuveson's academic research focusses on the application of simulation models to study risk governance structures associated with the role of the Chief Risk Officer. She was awarded by the Career Communications Group, Inc. as a Technology Star for Women in Science, Technology, Engineering and Maths (STEM). She earned her BS in Engineering from the Massachusetts Institute of Technology, MS in Applied Math from Johns Hopkins University, and PhD in Engineering from the University of Cambridge. She is a member of Christ's College Cambridge.

**Keren Uziyel**

Editor, Economist & Country Risk Manager, Economist Intelligence Unit

Keren Uziyel is a member of the London-based team of Middle East and Africa analysts. Keren grew up in the UK but has also lived in Israel, Turkey, Austria and Switzerland. Keren holds a BA in Philosophy, Politics and Economics and a MPhil in Modern Middle Eastern Studies from Oxford University. Before joining the Economist Intelligence Unit in 1998 she worked as an analyst covering fixed income for UBS in Switzerland, with a focus on emerging markets. In addition to her regional responsibilities, Keren is also a Country Risk Service manager, helping with the development of the product and ensuring the consistent quality of output, including compliance of Country Risk Service data and publications with EU regulatory requirements

on ratings products for her team. She has also worked on product development related to the company's Country Forecasting Services and in overseeing the robustness of the Country Forecast reports across several regions.



Professor Venkat Venkatasubramanian

Co-Director, Center for the Management of Systemic Risk (CMSR) and Samuel Ruben-Peter G. Viele Professor of Engineering, Columbia University

Professor Venkat Venkatasubramanian is Samuel Ruben-Peter G. Viele Professor of Engineering in the Department of Chemical Engineering, Professor of Computer Science (Affiliate), and Professor of Industrial Engineering and Operations Research (Affiliate) at Columbia University in the City of New York. He earned his Ph. D. in Chemical Engineering at Cornell, M.S. in Physics at Vanderbilt, and B. Tech. in Chemical Engineering at the University of Madras, India. Venkat worked as a Research Associate in Artificial Intelligence in the School of Computer Science at Carnegie-Mellon University. He taught at Purdue University for 23 years, before returning to Columbia in 2011. At Columbia, Venkat directs the research efforts of several graduate students and co-workers in the Complex Resilient Intelligent Systems Laboratory. He is also the founding Co-Director of the Center for the Management of Systemic Risk, a transdisciplinary center focused on understanding how complex systems fail in order to prevent or mitigate such failures in the future. Venkat's research contributions have been in the areas of process fault diagnosis and risk management in complex systems, materials discovery through design and informatics, and pharmaceutical engineering using knowledge-based systems, neural networks, genetic algorithms, mathematical programming and statistical approaches.

Prof. Venkatasubramanian received the Norris Shreve Award for Outstanding Teaching in Chemical Engineering three times at Purdue University. He won the Computing in Chemical Engineering Award from AIChE in 2009 and was elected a Fellow of AIChE in 2011. Also in 2011, the College of Engineering at Purdue University recognized his outstanding contributions with the Research Excellence Award. He currently serves as an Editor for Computers and Chemical Engineering for the topical area of cyberinfrastructure, informatics and intelligent systems. Venkat's other interests include comparative theology, classical music, and cricket.

**Dr Joyce Vorholt**

Expert Principal, McKinsey & Company

Joyce Clark is an Expert Principal in McKinsey & Company's Düsseldorf office. She serves Financial Institutions and Industrials across industries primarily on risk management matters. Joyce is a member of the Global Risk Management Practice and leads our McKinsey Risk Diagnostics and Benchmarking offering. The focus of her work has been Enterprise Risk Management, Risk Appetite & Strategy, Risk & Compliance Organization, Control Frameworks.

Prior to joining McKinsey & Company, Joyce has worked as assistant manager for KPMG AG in Frankfurt and Santiago de Chile as expert for financial instruments on audit and advisory projects as well as for the Department of Professional Practice (Centre of Competence) She studied Applied Mathematics at the Technical University of Clausthal and holds a PhD in Accounting (Hedging Concepts) from WHU - Otto Beisheim School of Management, Vallendar.

6th Risk Summit: Speaker biographies

Corrections and additions

With apologies, we note that Ed Jenkin's job title has been misprinted.

His accurate title should read:

Ed Jenkins, Chief Risk Officer (HSBC), Global Banking and Markets

Please note that Dr Mia de Kuijper will be participating in the Panel Discussion at 12:30pm on 23 June during Plenary Session 3.



Dr Mia de Kuijper
CEO, Cambridge Global Partners

Dr Mia de Kuijper is the CEO of the strategy advisory firm Cambridge Global Partners and a contributor to Duke Corporate Education as a member of their Global Learning Resource Network. Dr de Kuijper has extensive experience in building and managing global companies.

She has been a corporate leader as well as a senior banker on Wall Street. She provides strategic and economic advisory to international clients, focusing on technology and telecommunications, consumer products, natural resources and commodities, funds management and finance. She also teaches and coaches academic and corporate audiences on corporate strategy, M&A, investing, strategic use of networks, effective management of global organizations, modern business models, international competitiveness, scenario planning, and innovation; including at Cambridge University, Harvard and at the IIM-Ahmadabad in India.

Dr de Kuijper has been a Senior Managing Director in investment banking on Wall Street, where she made a

career in Morgan Stanley and Credit Suisse First Boston and has also held senior management positions at Royal Dutch Shell, PepsiCo, and AT&T. At Pepsi-Cola International, her roles included Chief Strategist, Global Head of M&A, and CFO. She has played a leading role in the establishment of Pepsi-Cola in China, India and Brazil. At AT&T, she was at the forefront of AT&T's internet investments, wireless, and network strategy. Previously, she was a strategy consultant at Bain & Co. and at McKinsey.

She was the founding Co-Dean of the Duisenberg School of Finance in Amsterdam, Holland and has advised the World Bank, the IMF and the Ford Foundation. Mia also serves on the Alumni Council of the Harvard University Graduate School of Arts and Sciences.



Visualisation of the Cambridge Banking Model

23 September 2014

Financial Risk and Network Theory

Cambridge Centre for Risk Studies Seminar, in collaboration with *Journal of Network Theory in Finance*.

20 November 2014

London Risk Briefing: Ebola and Pandemic Risk

16 December 2014

London Risk Briefing: Cyber Catastrophe Risk

13 January 2015

Centre for Risk Studies Advisory Board Meeting

Research strategy review by the members of the Centre for Risk Studies Advisory Board.

15 January 2015

**Cambridge CRO Council "Leading Ideas in Risk"
Roundtable: Through the Financial Crime Lens:
Impacts & Risks to the Global Economy.**

Globalisation has increased opportunities for the globalisation of crime as evident within the financial crime arena. This has posed big challenges for businesses. This roundtable will be comprised of senior risk executives from a variety of sectors within the financial services industry to allow for a broad-based discussion.

22 January 2015

London Risk Briefing: Social Unrest Risk

19 February 2015

London Risk Briefing: Geopolitical Conflict Risk

3 March 2015

The 2015 Cambridge - McKinsey Risk Prize

The Centre for Risk Studies, in conjunction with McKinsey & Company, is pleased to announce the 2015

annual risk prize. An award will be given for the best submission on risk management by a current student at the University of Cambridge Judge Business School.

12-17 April 2015

Executive Education in Risk Management: Aspiring Chief Risk Officer Programme

Delivery of a leading edge programme for risk professionals covering salient and timely topics based on the Centre's external engagements with risk experts across a wide range of sectors and institutions.

30 April 2015

New York Risk Briefing: Financial Risk Scenarios: Could Your Portfolio Hold Up?

Presented by the University of Cambridge Centre for Risk Studies, in partnership with Cambridge in America, in New York City.

20 May 2015

London Risk Briefing: Financial Catastrophe Stress Tests for Investment Portfolios

22-23 June 2015

Cambridge Centre for Risk Studies 6th Annual Risk Summit Conference

Risk Testing: Stressing the Boundaries

In Summit brings together leaders and decision makers from businesses, governments, academia and NGOs to explore salient topics in risk management. The event will be held at the University of Cambridge Judge Business School, followed by a conference dinner at St John's College, Cambridge.

<http://www.risk.jbs.cam.ac.uk/news/events/risksummits/risksummit2015.html>

28-29 July 2015

Aspen Crisis and Risk Forum, Aspen, CO

Cambridge Centre for Risk Studies with its partners in business and academia will address governance issues faced by boards. This forum explores the growing demands on directors to make risk management among their top priorities.

9 September 2015

Financial Risk and Network Theory

Cambridge Centre for Risk Studies Seminar, in collaboration with *Journal of Network Theory in Finance*.
http://www.risk.jbs.cam.ac.uk/news/events/other/2015/150909_financialriskandnetworktheory.html

Executive Team

Professor Daniel Ralph, Academic Director

Dr Michelle Tuveson, Executive Director

Dr Andrew Coburn, Director of Advisory Board

Simon Ruffle, Director of Technology Research and Innovation

Research Team

Dr Scott Kelly, Senior Risk Associate

Dr Olaf Bochmann, Risk Associate

Dr Andrew Skelton, Risk Associate

Éireann Leverett, Senior Risk Researcher

Dr Andrew Chaplin, Risk Researcher

Dr Duncan Needham, Risk Researcher

Dr Edward Oughton, Risk Researcher

Dr Louise Pryor, Senior Risk Researcher

Jaclyn Zhiyi Yeo, Risk Researcher

Dr Eugene Nedev, Research Affiliate

Jennifer Copic, Research Assistant

Tamara Evan, Research Assistant

Dr Ali Shaghghi, Research Assistant

Associates

Lee Coppack, Senior Advisor, Insurance & Risk Media

Andrew Freeman, Risk Fellow

Professor Andrew Punter, Senior Advisor, Insurance Applications

Dr Ruth Whaley, Senior Advisor, Corporations and Boards

Administration

Crystal Mbanefo, Events & Operations Manager

Ruth Newman, Web Editor

Cambridge Judge Business School, Finance, Legal and Administration Offices



Taxonomy of Threats of the Cambridge Risk Framework

The research programme of the Centre for Risk Studies focusses on business applications of management science to reduce risk. A number of interlinked research themes are being explored. They share a common approach and risk analysis structure – the Cambridge Risk Framework – which enables a range of threats, scenarios, and consequences to be analysed on networks of business and economic relationships. In 2015, we will continue to development in several research areas.

Research Application Areas

Research application areas explored through the Cambridge Risk Framework are described in more detail in the next pages of this briefing. For 2015, we envision focussing on three primary research application areas:

- A. Multi-Threat Economic Risk:** Understanding and quantifying the risk to the economy and international business activities from catastrophe scenarios from all of the threat types in our taxonomy.
- B. Financial Catastrophe Risk:** Using the Cambridge Risk Framework to explore the consequences of financial shocks for practitioners managing tail risk in the financial services and investment industry.
- C. Cyber Catastrophe Risk:** Developing a more rigorous framework for the evaluation of systemic cyber risk as one of the most significant emerging risk threat classes in the taxonomy.

Developing the Cambridge Risk Framework

In addition to pursuing specific research application area, we propose to continue developing the Cambridge Risk Framework, allocating some resources to enabling the framework, improving methodologies,

compiling datasets, developing the research platform and toolkit, and exploring other application areas for the research.

Methodology Development: Catastronomics

The economic consequences of major catastrophic shocks of different types are not well understood. The Centre has strong relationships with economists and specialists in macroeconomic analysis. In 2015 we propose to devote specific internal resources to improving methodologies of catastrophonomics and how economic shocks translate into market impacts on asset values in an investment portfolio.

Additional Application Areas

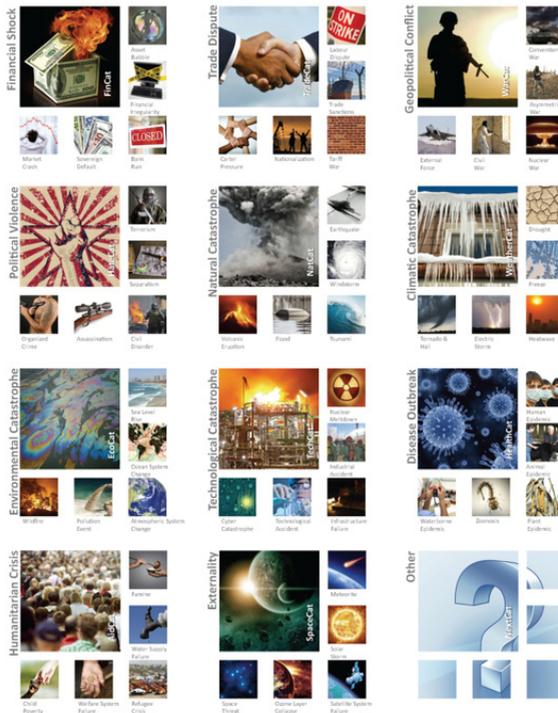
In addition to our major application areas, we address research topics that are aligned with our objectives of populating the Cambridge Risk Framework in particular threat specializations, or otherwise used in business decision-making. Topics currently include how climate change risk might affect investment portfolio strategies; improving risk assessments of geopolitical instability; macroeconomic consequences of extreme natural catastrophe events. We also encourage our research associates to pursue their own research topics for part of their time.

Research Platform Infrastructure

The Cambridge Risk Framework makes use of a cloud-based research platform for data compilation, model development, and research output: <http://www.CambridgeRiskFramework.com>. This platform is currently being enhanced to improve its usefulness in the research and presentation of outputs, including enabling research development partners to interact with data and analytics developed at the Centre.

Understanding Complex Business Exposure

We propose to continue populating the Cambridge Risk Framework with datasets about the international economy, business interconnectivity, elements at risk from shocks, and threat information. These datasets represent ‘complex business exposure’ – counterparty relationships, trading flows, supply chains, market dependencies, transportation and communication lines – that are vulnerable to the disruption of business processes. Developing a useful data architecture for this exposure and publishing data schemas for improved adoption of representations of complex business exposure is an important objective for 2015.



Area A: Multi-Threat Economic Risk

In 2015, we propose to extend our 2014 work on world city risk to parameterize a representation of the frequency, severity, and geography of all the threats in the Cambridge Threat Taxonomy. This will provide a simplified probabilistic event set of potential catastrophe scenarios that could cause severe losses for the world economy (e.g. global GDP@Risk of over \$1 trillion) over the next decade. The analysis will provide objective measures of scenario losses and inform a range of risk management decisions.

Area B: Financial Catastrophe Risk

The impact of financial crises on our major institutions and on our economic system has become a great concern for regulators, policy-makers, and practitioners. The design and application of regulatory stress tests to banks has been controversial but is set to become standard practice. The Centre's research looks to provide coherent and structural models of extreme financial crisis scenarios, appropriately reflecting the dynamics of the interconnected financial system, and to position scenarios in a probabilistic context, for use by practitioners managing tail risk in the financial services and investment industry.

Area C: Cyber Catastrophe Risk

The risk of cyber disruption to technology systems is of growing importance in the current business, societal and political landscape. The Centre has focussed on cyber catastrophe risk – the potential for widescale losses to many institutions in a single event – and has proposed correlation mechanisms that can lead to systemic cyber events. These are explored in the development of a range of scenarios for the protection of critical infrastructure, the development of the cyber insurance market, and policy strategies involving multiple stakeholders in creating a safer society.

A Catalogue of Historical Financial Crises

Cambridge Centre for Risk Studies in collaboration with
Cambridge Department of Financial History; July 2015

**Global Property Crash: Financial Catastrophe Stress
Test Scenario**

Cambridge Centre for Risk Studies Cambridge Risk
Framework series; September 2015

**High Inflation World: Financial Catastrophe Stress
Test Scenario**

Cambridge Centre for Risk Studies Cambridge Risk
Framework series; September 2015

**Eurozone Meltdown: Financial Catastrophe Stress
Test Scenario**

Cambridge Centre for Risk Studies Cambridge Risk
Framework series; September 2015

**Dollar Deposited: Financial Catastrophe Stress Test
Scenario**

Cambridge Centre for Risk Studies Cambridge Risk
Framework series; September 2015

**Ebola Contingency Scenario: Analysis of Economic
Impact of Upper Bound Ebola Projections for US
and Europe - Cambridge 'Contingency' Scenario
developed for business preparedness planning**

Kelly, S.; Coburn, A. W.;

Cambridge Centre for Risk Studies Working Paper
2014.02; February 2014

Millennial Uprising Social Unrest Stress Test Scenario

Bowman, G.; Caccioli, F.; Coburn, A. W.; Hartley, R.; Kelly,
S.; Ralph, D.; Ruffle S. J.; Wallace, J.

Cambridge Centre for Risk Studies Cambridge Risk
Framework series; October 2014

China-Japan Geopolitical Conflict Stress Test Scenario

Bowman, G.; Caccioli, F.; Coburn, A. W.; Foulser-Piggot, R.; Kelly, S.; Ralph, D.; Ruffle S. J.;
Cambridge Centre for Risk Studies Cambridge Risk Framework series; June 2014

Sybil Logic Bomb Cyber Catastrophe Stress Test Scenario

Bowman, G.; Caccioli, F.; Coburn, A. W.; Kelly, S.; Leslie, B.; Ralph, D.; Ruffle S. J.
Cambridge Centre for Risk Studies Cambridge Risk Framework series; June 2014

São Paulo Virus Pandemic Stress Test Scenario

Bowman, G.; Caccioli, F.; Chang, M.; Coburn, A. W.; Kelly, S.; Ralph, D.; Ruffle S. J.
Cambridge Centre for Risk Studies Cambridge Risk Framework series; June 2014

All available online at:
<http://cambridgeriskframework.com/page/20>

The 2015 Risk Summit
Risk Testing: Stressing the Boundaries

Cambridge Centre for Risk Studies

Cambridge Judge Business School
University of Cambridge
Trumpington Street
Cambridge
CB2 1AG

T: +44 (0) 1223 768386

F: +44 (0) 1223 339701

enquiries.risk@jbs.cam.ac.uk

www.risk.jbs.cam.ac.uk

Join our LinkedIn group at Cambridge
Centre for Risk Studies

Follow us @Risk_Cambridge

Join the conversation at #camrisk2015

Office of External Communications

Cambridge Judge Business School
University of Cambridge
Trumpington Street
Cambridge CB2 1AG