

**Cambridge Judge Business School**

Centre for Risk Studies Risk Summit 2017

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# MANAGING RISK IN A SMARTER WORLD

22-23 June 2017

Cambridge Judge Business School

University of Cambridge

Centre for  
**Risk Studies**



**UNIVERSITY OF  
CAMBRIDGE**  
Judge Business School

## Meeting partners

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The Cambridge Centre for Risk Studies gratefully acknowledges its Annual Risk Summit 2017 partners:

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McKinsey & Company

HSBC 

### Meeting partners:



The Centre also acknowledges its research partners and collaborators:

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### Cambridge Risk Summit

#### Chair

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

#### Co-Chairs

**Tamara Evan**, Editorial Associate and Research Assistant, Cambridge Centre for Risk Studies

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

#### Organising Committee Members

**Joanne Aron**, Global and US Head of Risk Governance and Appetite, HSBC

**Andrew Freeman**, Risk Fellow, Cambridge Centre for Risk Studies & Director, The Finance Foundation

**Anna Marie Greenaway**, Director of University Relations, BP

**John Havens**, Executive Director, IEEE Standards on Ethics and Artificial Intelligence

**Dr Sven Heilitag**, Partner, McKinsey & Company

**Alan Laubsch**, Director, Natural Capital Markets, Lykke Corporation

**Dr Susanne Maurenbrecher**, Practice Expert, McKinsey & Company

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

#### Risk Summit Staff

**Soňa Krajciová**, Co-ordinator, Cambridge Centre for Risk Studies

**Olivia Majumdar**, Editorial Assistant, Cambridge Centre for Risk Studies





## Overview

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For the eighth annual Risk Summit, the Cambridge Centre for Risk Studies has brought together leaders and decision makers from businesses, governments, academia and NGOs to examine one of the most salient topics in risk management. The Risk Summit series has become a significant event in the calendar of risk management professionals and industry leaders and tackles the complex issues of the day. Past Summits have explored the themes of corporate risk culture, beneficial stress testing and the role of big data in our modern economy.

This year's summit theme is *Managing Risk in a Smarter World* and, over the next two days, we will explore the overall risks and opportunities for risk managers in today's evolving technological landscape. The greater adoption of automation by the finance and insurance sectors, along with other industries, will have significant impact on public policy, the labour market and privacy and personal data. This topic as well as artificial intelligence, fintech, insurtech, virtual currencies and disintermediation platforms will all be discussed during the Summit within the context of risk science and management.

The chosen image for this year's conference depicts the geometric panels and repeated reflections of a glass building exterior. It was selected to suggest a feeling of advancement, propulsion and emerging new perspectives. The panel of blue sky visible through the roof is mirrored in the glass, indicative of the "blue-sky" thinking that will deliver the technological developments and risks of the future. We must keep challenging the rigidity and convenience of our present definitions in light of the smarter world we encounter with each passing day.



*Pre-conference session*

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**Day 1: Thursday 22 June 2017**

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09:00-14:15	<b>Risk Summit Research Showcase</b>
09:00	<b>Registration opens</b>
09:30	<b>Session 1: Emerging and Systemic Risk Research CRS Research Overview</b> Professor Daniel Ralph, Academic Director, Cambridge Centre for Risk Studies
09:45	<b>Cyber Threat Actors: Hackanomics</b> Andrew Smith, Research Assistant, Cambridge Centre for Risk Studies
10:00	<b>Assessing the Future Risk of Cyber Terrorism</b> Tamara Evan, Research Assistant, Cambridge Centre for Risk Studies
10:15	<b>The Cloud: Architecture and Loss Potential</b> Dr Jen Daffron, Research Associate, Cambridge Centre for Risk Studies
10:30	<b>Benefits of Improving Infrastructure Resilience</b> Dr Edward Oughton, Research Associate, Cambridge Centre for Risk Studies
10:45	Coffee break
11:15	<b>Session 2: Multi-Threat Research The Global Exposure Accumulation &amp; Clash Project: Multi Line Data Schema</b> Kayla Strong, Research Assistant, Cambridge Centre for Risk Studies
11:30	<b>Advancing the Cambridge Global Risk Index</b> Dr Ali Rais Shaghaghi, Research Assistant, Cambridge Centre for Risk Studies
11:45	<b>Can Natural Catastrophes Impact the Financial Markets?</b> Arjun Mahalingham, Research Assistant, Cambridge Centre for Risk Studies
12:00	<b>The Insurance Gap &amp; Post-Catastrophe Recovery</b> Jessica Tsang, Research Assistant, Cambridge Centre for Risk Studies

*Pre-conference session*

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**Day 1: Thursday 22 June 2017** *continued*

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12:15            Lunch

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13:30            **Cambridge Risk Framework API & Dashboard  
Technology**  
Simon Ruffle, Director of Research & Innovation,  
Cambridge Centre for Risk Studies

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13:45            **Towards the Resilient Enterprise: Corporate Risk  
Profiling**  
Dr Michelle Tuveson, Executive Director,  
Cambridge Centre for Risk Studies

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14:00            **Use Cases of Risk Research at CCRS**  
Dr Andrew Coburn, Director of Advisory Board,  
Cambridge Centre for Risk Studies

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## 2017 Risk Summit

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### Managing Risk in a Smarter World

Conference Programme and Agenda

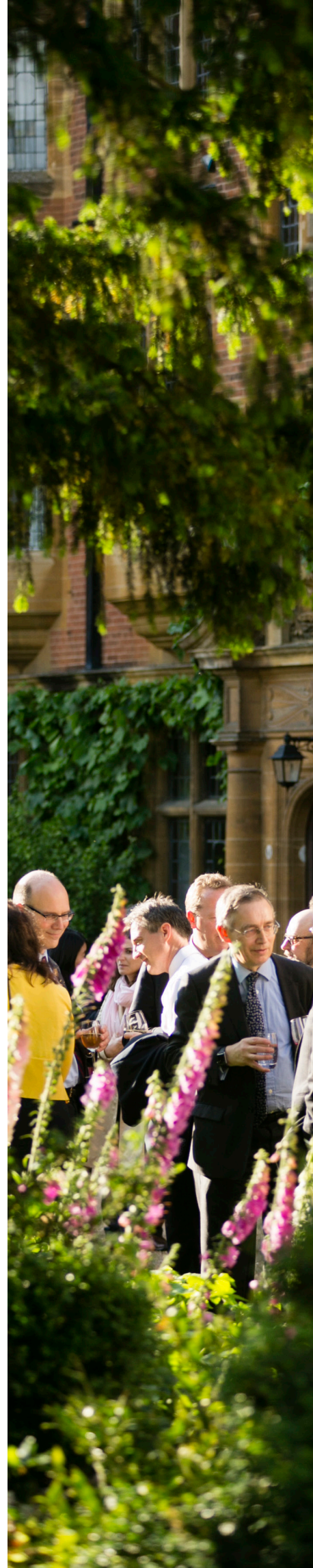
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#### Day 1: Thursday 22 June 2017 *continued*

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15:30-16:00	Registration and coffee/tea
16:00- 16:15	<b>Risk Summit Welcome</b> Dr Michelle Tuveson, Executive Director, Cambridge Centre for Risk Studies
16:15-18:00	<b>Plenary Session 1: What Does a Smart World Look Like?</b> <i>Chair: Andrew Freeman, Risk Fellow, Cambridge Centre for Risk Studies and Director, Finance Foundation</i>
16:15	<b>Keynote: Impact of Technology on Society</b> John Thornhill, Innovation Editor, <i>Financial Times</i>
16:45	<b>A Future That Works: Automation, Employment and Productivity</b> Dr James Manyika, Senior Partner and Director, McKinsey Global Institute
17:05	<i>Panel Discussion:</i> <b>Status and Trends of Automation and Societal Impacts</b> <i>Moderator: Andrew Freeman, Risk Fellow, Cambridge Centre for Risk Studies and Director, Finance Foundation</i> <ul style="list-style-type: none"><li>• <b>Tara Foley</b>, Customer, Change and Innovation Director, Risk Division, Lloyds Banking Group Plc</li><li>• <b>Alan Laubsch</b>, Director, Natural Capital Markets, Lykke</li><li>• <b>Dr James Manyika</b>, Senior Partner and Director, McKinsey Global Institute</li><li>• <b>Professor Daniel Ralph</b>, Academic Director, Cambridge Centre for Risk Studies and Professor of Operations Research, University of Cambridge Judge Business School</li><li>• <b>John Thornhill</b>, Innovation Editor, <i>Financial Times</i></li></ul>
18:30	<b>Networking Reception</b> Clare College, Cambridge
19:30-22:00	<b>Risk Summit Dinner</b> Clare College, Cambridge

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**Managing Risk in a Smarter World***Conference Programme and Agenda***Day 2: Friday 23 June 2017**

09:00	Risk Summit Registration & Coffee
09:30	<b>Risk Summit Welcome and Introductions</b>
09:40-11:00	<b>Plenary Session 2: Status and Trending towards a Smart World</b> <i>Chair: Dr Andrew Coburn, Director of the Advisory Board, Cambridge Centre for Risk Studies and Senior Vice President, RMS</i>
09:40	<b>Keynote: Smarter World vs Smarter Risk: How Technology and Innovation Are Driving Complexity and Risk</b> <i>Professor Christoph H. Loch, Dean, Cambridge Judge Business School</i>
10:10	<b>Embodied Vulnerabilities: Why I am Hacking My Own Heart</b> <i>Dr Marie Moe, Senior Research Assistant, SINTEF Digital</i>
10:35	<b>Ethical Considerations in Artificial Intelligence and Autonomous Systems</b> <i>Kay Firth-Butterfield, Barrister-at-Law, Distinguished Scholar, Robert S. Strauss Centre for International Security and Law, University of Texas, Austin, and Co-Founder, Consortium for Law and Ethics of Artificial Intelligence and Robots</i>
11:00	Coffee Break
11:30-13:00	<b>Plenary Session 3: Implications of Data and Technologies to Business Models</b> <i>Chair: Simon Ruffle, Director of Research and Innovation, Cambridge Centre for Risk Studies</i>
11:30	<b>Future Gazing of Technology from a Liability Perspective</b> <i>Dr Robert Reville, CEO, Praedicat</i>
11:50	<b>Your Digital Personality: A Psychometric Compilation</b> <i>Dr David Stillwell, Deputy Director, Cambridge Psychometric Centre, and Lecturer in Big Data Analytics and Quantitative Social Science, Cambridge Judge Business School</i>



## Managing Risk in a Smarter World

Conference Programme and Agenda

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### Day 2: Friday 23 June 2017 *continued*

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- 12:10      **Panel Discussion: Data privacy vs Value, Security, Privacy and Protection of Data**  
*Moderator: Dr Michelle Tuveson*, Executive Director, Cambridge Centre for Risk Studies
- **Rolf Riemenschneider**, Senior Advisor, Global Risk Practice McKinsey and Former MD of Cybersecurity, Deutsche Bank
  - **Dr David Stillwell**, Deputy Director, Cambridge Psychometric Centre, and Lecturer in Big Data Analytics and Quantitative Social Science, Cambridge Judge Business School
  - **Professor Kern Alexander**, Chair for Banking & Financial Market Regulation, University of Zurich
  - **Dr Jennifer Daffron**, Research Associate, Cambridge Centre for Risk Studies
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- 12:45      **McKinsey Risk Prize Announcement**  
**Dr Sven Heiligtag**, Principal, McKinsey & Company
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- 13:00      **Lunch & Risk Summit Photograph**
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- 14:00-16:15      **Plenary Session 4: What Will Businesses Seek from Financial Services in a Smarter World?**  
*Chair: Philip Brice*, Head of Risk Management, BP Treasury
- 14:00      **Historical Perspective on the Evolution of Currencies and Payment**  
**Dr Anthony C. Hotson**, Associate Member of the History Faculty, University of Oxford, and Research Associate of the Centre for Financial History, University of Cambridge
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- 14:30      **Innovation in Banking and Financial Services**  
**Rémi Bourrette**, Head of Strategic Innovation Investments, HSBC

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**Managing Risk in a Smarter World***Conference Programme and Agenda*

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**Day 2: Friday 23 June 2017** *continued*

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- 15:00-16:00     **Innovation in Banking and Financial Services:  
The Cambridge Risk Debate**  
*Chair: Mark Gilbert, Columnist, Bloomberg Gadfly*  
*Debate motion: This house believes that most important functions of the financial services sector today will change unrecognisably in the next decade due to technology innovation.*
- 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:*
- **Professor Richard Olsen**, CEO, Lykke
  - **Dr Cosimo Pacciani**, CRO, European Stability Mechanism
- Against the debate motion:*
- **Professor Dame Sandra Dawson**, KPMG Professor Emeritus of Management Studies, Cambridge Judge Business School
  - **Tim Jones CBE**, CEO and Co-Founder, Tibado Ltd and former CEO of NEST Pensions
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- 16:00     **Summary and Conclusions**  
**Professor Danny Ralph**, Academic Director, Cambridge Centre for Risk Studies and Professor of Operations for Research, Cambridge Judge Business School
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## Cambridge-McKinsey Risk Prize 2017

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### Cambridge - McKinsey Risk Prize Overview

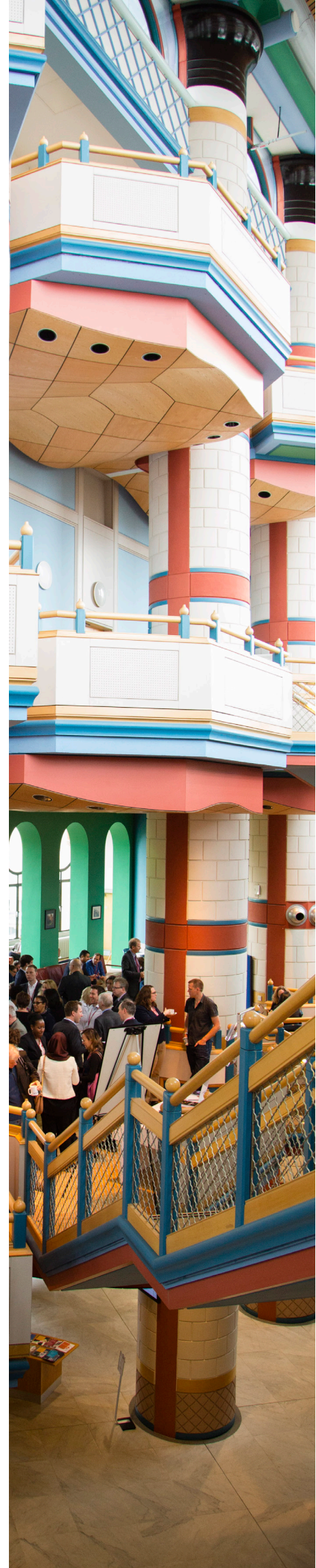
The Cambridge Centre for Risk Studies, in conjunction with McKinsey & Company, is pleased to award the Cambridge - McKinsey Risk Prize. The award recognises the best submission on risk management by a current student at the University of Cambridge Judge Business School or in another department in related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

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.



### Cambridge - McKinsey Risk Prize 2017 Finalists

- **Stuart Barr, CJBS MBA Candidate:** When jeopardy is a risk worth taking: how the Oscars can redefine our understanding of risk
- **Steven Cooney, CJBS MBA Candidate:** "I Think I Can, I Think I Can", can US railroads navigate the decline of the domestic coal industry?
- **Ashish Srivastava, CJBS M. Fin Candidate:** Systemic Liquidity Risk: A Macroeconomic Evaluation

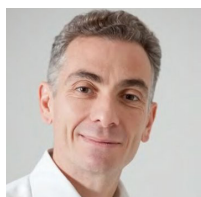


**Professor Kern Alexander**

Chair for Banking & Financial Market Regulation, University of Zurich

Kern Alexander is Chair for Banking & Financial Market Regulation at the University of Zurich. He is a lawyer and economist with a research focus on the regulation of systemic risk in financial markets. His academic publications include co-author of the first book to analyse critically the international regulation of systemic risk in financial markets (*Global Governance of Financial Systems* (OUP 2006) with Dhumale and Eatwell). He is also the author of *Economic Sanctions: Law and Public Policy* (Macmillan, 2009) providing a comprehensive analysis of the regulatory and governance aspects of economic and financial sanctions. He has written extensively on UK market abuse and insider law and regulation, and is co-editor of the *Research Handbook on International Financial Regulation* (Elgar, 2012 with Dhumale) and co-editor with N. Moloney of *Law Reform and Financial Markets* (2011, Elgar).

Kern has authored articles in peer-reviewed journals including the *Journal of International Economic Law*, *European Law Review*, *European Business Organisation Review*, and *Journal of Corporate Law Studies*. He has written several commissioned reports for the European Parliament on financial regulatory reform and the Eurozone sovereign debt crisis and was a Member of the Expert Panel on Financial Services for the European Parliament (2009-2014). He was Specialist Advisor to the British Parliament's Joint Select Committee on the Financial Services Act 2012 and has served as an adviser to the UK Serious Fraud Office on the Libor investigations. He was educated at the Universities of Cornell, Oxford and Cambridge.

**Rémi Bourette**

Head of Strategic Innovation Investments, HSBC

Rémi Bourette heads Strategic Investments within the Innovation group of HSBC. His team invests in young and growing companies, with a view to develop business partnerships. It also manages a portfolio of financial market infrastructure investments. Previously Rémi, was Head of Business Development for HSBC Global Banking and Markets, focusing on the development of new business initiatives.

Rémi joined HSBC France (CCF at the time) in 1994 from the interest derivatives desk of Credit Lyonnais (New York). After 3 years in financial engineering Rémi took responsibility for business development in the asset management division of the bank. He then became Head of Market and Model Risks for HSBC France and a member of its management committee. He moved to London in 2005 for a global role in derivatives risk before joining HSBC Asset Management as Global Head of Investment Solutions.

Rémi graduated from Ecole Polytechnique (Paris – 1988) and Ecole Nationale de L'administration Economique (Paris – 1993). He also holds a Master of Advanced Studies in financial modelling from University Paris 7 and is also a Board member of LCH Clearnet SA, a leading clearing house.



### **Philip Brice**

Head of Risk Management, BP Treasury

Philip Brice is Head of Risk Management within BP Treasury. His responsibilities include managing FX risks across the group, and forecasting the impact of factors such as market volatility on corporate cashflows and on the balance sheet.

He was previously Manager of Equity Capital Markets. Prior to that he spent over 20 years in engineering, R&D and management across all segments of BP. Philip holds an MSc in Finance from LBS, an MEng in Chemical Engineering from Cambridge University and is a certified ERP.



### **Dr Andrew Coburn**

Director of the Advisory Board, Cambridge Centre for Risk Studies and Senior Vice President, RMS

Dr Andrew Coburn is a Founder and the Director of the Advisory Board at the Cambridge Centre for Risk Studies. Andrew is Senior Vice President at Risk Management Solutions (RMS), the leading provider of catastrophe risk models to the insurance industry. Andrew is the principal coordinator of the research programme on the risk of catastrophic collapse of complex systems at the Centre and leads the financial catastrophe research.

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 risk models and using them for business decision support.

Andrew has also provided research inputs into government policy, such as membership of the UK government Blackett Review Panel on strategic shock convened by Sir John Beddington, and U.S. House of Congress legislation on terrorism risk management policy. Andrew is an Editorial Board Member of *Journal of Network Theory in Finance* (publishers Risk.net). He is a Bye-Fellow at Christ's College, Cambridge.



### **Dr Jennifer Daffron**

Research Associate, Cambridge Centre for Risk Studies

Jennifer Daffron completed her PhD in Experimental Psychology at the University of Cambridge in 2017. She was the recipient of a UK Department for Transportation and Centre for Defence Enterprise research grant for her work in aviation threat detection, and has a background in drug addiction research funded by the Cognitive Neuroscience and Technology Initiative of the Veterans Administrational National Centre for Homeless Veterans for her work with the University of Massachusetts Medical School and the College of the Holy Cross on opioid addiction. Jennifer has extensive experience in experimental design, analysis, and communication.

In February 2017, Jennifer joined the Centre for Risk studies, where she uses her background to investigate and model the impact of cyber threat on e-commerce. She has an interest in studying the behaviour aspect of cyber threat posed by insiders.



**Professor Dame Sandra Dawson**

KPMG Professor Emeritus of Management Studies, Cambridge Judge Business School

Dame Sandra Dawson was KPMG Professor of Management Studies at Cambridge Judge Business School from 1995 to 2013, Director of the School from 1995 to 2006 and Master of Sidney Sussex College Cambridge from 1999 to 2009. She was previously at Imperial College, University of London as Professor of Organisational Behaviour.

Dame Sandra Dawson has a wealth of experience and knowledge gained through research, education and financial services in commercial, public and charitable bodies. Current appointments include Senior Independent Non-Executive Director, TSB Bank; Non-executive Director, Winton Capital Group; Trustee/Non-executive Director, Institute for Government; Chairman of the Executive Committee and Trustee, Social Science Research Council USA; and Trustee, American University of Sharjah. Former Non-executive Directorships include Barclays Bank plc, JP Morgan Fleming Claverhouse Investment Trust plc, the Financial Services Authority and Oxfam.

**Kay Firth-Butterfield**

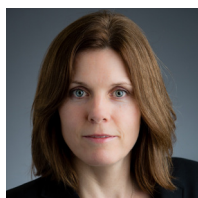
Barrister-at-Law, Distinguished Scholar, Robert S. Strauss Centre for International Security and Law, University of Texas, Austin, and Co-Founder, Consortium for Law and Ethics of Artificial Intelligence and Robotics

Kay Firth-Butterfield is a Barrister-at-Law and part-time judge in the United Kingdom where she has also worked as a mediator, arbitrator, business owner and Professor of Law. In the United States, Kay is Executive Director of AI-Austin and former Chief Officer, and member, of the Lucid.ai Ethics Advisory Panel (EAP). She is a humanitarian with a strong sense of social justice and has advanced degrees in Law and International Relations.

Kay advises governments, think tanks and non-profits about artificial intelligence, law and policy. Kay co-founded the Consortium for Law and Policy of Artificial Intelligence and Robotics at the University of Texas and as an adjunct Professor of Law teaches Artificial Intelligence and Emerging Technologies: Law and Policy. She is a Distinguished Scholar of the Robert E. Strauss Center for International Security and Law.

Kay thinks about and advises on how AI and other emerging technologies will impact business and society, including how business can prepare for that impact in its internal planning and external interaction with customers and other stakeholders and how society will be affected by these technologies. Kay speaks regularly to international audiences addressing many aspects of these challenging changes.





### **Tara Foley**

Customer, Change and Innovation Director, Risk Division, Lloyds Banking Group plc

Tara Foley became the Customer, Change & Innovation Director for Risk Division in May 2016. Reporting to the Group Chief Risk Officer, Tara is responsible for managing Customer Credit & Fraud Decisions, Recoveries Commercial Banking, Risk Infrastructure, Offshore services and Innovation & Change across Risk Division.

Her previous role was Chief Operating Officer for Insurance. Prior to joining LBG in 2008, Tara spent five years at Deutsche Bank, UK, in a number of high-profile roles culminating in the MD role in the COO office for Legal, Risk and Compliance. Tara formerly worked as a consultant at Accenture and Diamond Technology Consultants, where she led multiple projects spanning financial services, telecommunications and technology.

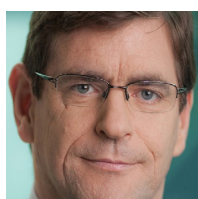
Tara has a degree in Psychology, a Post Graduate Diploma in Business Studies (with a specialisation in Banking and Finance), and an MA in Organisational Psychology from University College Dublin.



### **Andrew Freeman**

Risk Fellow, Cambridge Centre for Risk Studies, and Director, Finance Foundation

Andrew Freeman is the Founder and Managing Director of Cambridge Research Associates, a research and advisory company that specialises in risk-related work for global clients. Over a 25-year career he has written numerous articles and books, first as a journalist on *The Economist* and latterly in his role as a Senior Knowledge Expert in Risk at McKinsey. Between 2009 and 2011 he was Executive Director of the Center for Financial Services at Deloitte LLP, overseeing its research programme on the financial services industry. In 1998 he published *Seeing Tomorrow: Rewriting the Rules of Risk*, co-authored with Ron Dembo, founder of Algorithmics. Andrew is a graduate of Balliol College, Oxford and was also elected a Domus Senior Scholar at Merton College, Oxford.



### **Mark Gilbert**

Columnist, Bloomberg Gadfly

Mark Gilbert joined Bloomberg News in 1991 as a bond reporter. Born in Liverpool, he graduated from King's College, Cambridge, in 1989 with a BA Hons in Philosophy. He was London Bureau Chief from June 2009 until April 2014, when he joined the editorial board of Bloomberg View. He was a finalist in the Commentary category of the U.K. 2006 Business Journalist of the Year awards, and holds a Malcolm Forbes Award for Best Business Story from the Overseas Press Club of America. Mark is the author of *Complicit: How Greed and Collusion Made the Credit Crisis Unstoppable*. He is a member of the Investment Committee at King's College, and plays bass guitar in the as yet undiscovered rock band WWJD.

**Dr Sven Heiligtag**

Principal, McKinsey & Company

Sven Heiligtag is a partner in McKinsey's Hamburg office. He has deep experience in advising clients in the energy and natural-resources industries on challenges in trading, risk management, and corporate finance.

A member of McKinsey's Electric Power & Natural Gas Practice, Sven leads their work on energy trading and risk management in Europe and is also a leader in the Risk Practice. He often speaks at industry conferences and events.

Among his recent projects, Sven supported a leading energy exchange on the development of its commodity strategy at every stage, from the planning process through to implementation. Working with a leading utility, he helped design and set up a trading and risk management survey for European energy players. He has overseen cost- and complexity-improvement programs focused on building capabilities for sustainable impact at German, Swiss, and Scandinavian utilities and helped a number of energy players develop their trading strategy and business and organizational models. He has also led a review of a joint venture between two energy exchanges, focusing on business and governance models, regulatory strategy, strategic footprint, and resource allocation.

Sven has a master's degree in chemistry and a PhD in biochemistry from the University of Hamburg.

**Dr Anthony C. Hotson**

Associate Member of the History Faculty, University of Oxford and Research Associate of the Centre for Financial History, University of Cambridge

Anthony C. Hotson is Deputy Director of the Centre for Financial History and a member of Darwin College, Cambridge. He is an associate member of the History Faculty, University of Oxford. Anthony worked at the Bank of England during the 1980s, including a secondment as assistant commissioner at the newly formed Building Societies Commission. He was employed by McKinsey & Company before joining S.G. Warburg where he worked as a corporate financier and director during the 1990s. Thereafter, he has served as a non-executive director on a number of company boards in the insurance, fund management and banking sectors, as well as pursuing his academic interests.

More recently, Dr Hotson has been a research fellow at the Winton Institute for Monetary History, Oxford. He teaches macroeconomics and financial history, and has recently co-edited a book on the economic policies of the Thatcher government, and another on British financial crises since the nineteenth century.

His book, *Respectable Banking: The Search for Stability in London's Money and Credit Markets since 1695*, will be published by Cambridge University Press later this year. He is a non-executive director of Cenkos Securities plc and chairs a charity, the Wadenhoe Trust.



### **Tim Jones CBE**

CEO and Co-Founder, Tibado Ltd and former CEO of NEST Pensions

Tim Jones is an experienced CEO with specialisms in financial transactions including payment systems, retail banking and pensions. Tim is the former CEO of NEST Pensions in the UK and serves additionally as an Independent Director at ITG Inc., a NYSE listed institutional broker dealer in New York. Earlier in his career, Tim spent seventeen years at NatWest Bank in the UK where, from 1990, he led the development of Mondex digital cash, as well as becoming Chief Executive of Retail Banking in the late 1990s.

Tim is now introducing Tibado, a new global digital cash venture, to which he will be devoting his full attention from 2016 as he concludes his period leading NEST. Tim is married with three grown up children and has homes in East Sussex and London.

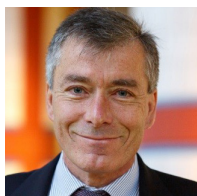


### **Alan Laubsch**

Director, Natural Capital Markets at Lykke

Alan Laubsch is a passionate risk and ecosystems researcher, and a founder of the Natural Capital Alliance (NCA). Alan currently runs the Natural Capital Markets group at Lykke, which provides instant liquidity for Natural Capital Coins without transaction fees. Alan started his career as a researcher in JPMorgan's corporate risk management group in New York, after receiving a degree in Industrial Engineering at Stanford University in 1993. He is one of 25 founding members of the RiskMetrics Group (now part of MSCI), where he authored Risk Management: A Practical Guide (1999).

Alan became fascinated by systemic risk early warning signals with the onset of the US subprime crisis in 2007, eventually developing a next generation framework for Integrated Risk Management. Alan is inspired by evolutionary ecosystems, and his most recent publication is Adaptive Risk Management: Powered by Network Science. Alan's mission is to catalyze a global risk culture to protect the systems that sustain us.



### **Professor Christoph H. Loch**

Director and Professor of Management Studies, Cambridge Judge Business School

Christoph Loch is Dean of Cambridge Judge Business School. Prior to joining the School, Professor Loch was the GlaxoSmithKline Chaired Professor of Corporate Innovation (2006-2011), Professor of Technology and Operations Management (2001-2011) and Assistant and Associate Professor (1994-2001) at INSEAD, Fontainebleau, France. He earned his PhD from the Stanford Graduate School of Business.

**Dr James Manyika**

Senior Partner & Director, McKinsey Global Institute

James Manyika is a senior partner at McKinsey & Company and one of the three global leaders of the McKinsey Global Institute, McKinsey's business and economics research arm. James is also a Board Member of McKinsey's Shareholder Council.

James has led research on the global economy, including on growth and productivity, technology and the digital economy, automation and the future of work, globalisation, and competitiveness. James is one of the leaders of McKinsey's Global High Tech, Media and Telecom Practice. Based in Silicon Valley for 20 years, he has worked with many of the world's leading technology companies and their chief executives on a variety of issues and helped launch several market-shaping innovations, products, and services.

James was appointed by President Obama to serve as Vice Chair of the President's Global Development Council at the White House (2012-2016). He was appointed by US Secretaries of Commerce to the Digital Economy Board (2016) and to the Innovation Advisory Board as part of the Competes ACT (2011). James is on the boards of the Council on Foreign Relations, the Aspen Institute, the John D. and Catherine T. MacArthur Foundation, and the Markle Foundation. He is an advisory board member of the Oxford Internet Institute, MIT's Initiative on the Digital Economy, UC Berkeley's School of Information, and Harvard's Hutchins Center, including the WEB Du Bois Institute for African and African-American Research. He is a non-resident Senior Fellow of the Brookings Institution and a member of the Bretton Woods Committee and the World Economic Forum Council on AI and Robotics.

James was on the engineering faculty at Oxford University, a member of the Robotics Research Lab and Fellow of Balliol College, Oxford University, a visiting scientist at NASA Jet Propulsion Laboratory in Man-Machine Systems, and a faculty exchange fellow at MIT. A Rhodes Scholar and a Smith Rippon Senior Scholar, James holds DPhil, MSc, and MA degrees from Oxford in Robotics and Engineering, Mathematics and Computer Science, and a BSc degree in Electrical Engineering from the University of Zimbabwe.

**Dr Marie Moe**

Senior Research Assistant, SINTEF Digital

Dr Marie Moe cares about public safety and securing systems that may impact human lives. This is why she joined the grassroots organisation "I Am The Cavalry". Marie is a research scientist at SINTEF, the largest independent research organisation in Scandinavia, and has a PhD in information security. She is also an associate professor at the Norwegian University of Science and Technology, where she teaches incident response and contingency planning.

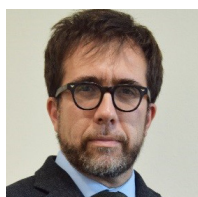
She has experience as a team leader at the Norwegian Cyber Security Centre NorCERT, where she did incident handling of cyberattacks against Norway's critical infrastructure. She has also R&D experience with connected cars technology and she has participated in standardisation work on intelligent transport systems at ETSI. She is currently researching the security of her own personal critical infrastructure, an implanted pacemaker that is generating every single beat of her heart. Marie loves to break crypto protocols, but gets angry when the broken crypto is in her own body.



**Professor Richard Olsen**

Founder and CEO, Lykke

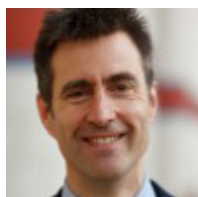
Richard Olsen is the founder and CEO of Lykke, a blockchain Fintech that launches a global regulated marketplace for all asset classes and instruments. He is a pioneer in high frequency finance with extensive entrepreneurial experience and well known for his academic work. Richard was a co-founder of OANDA, a currency information company and market maker in foreign exchange. He is visiting professor at the Centre for Computational Finance and Economic Agents at the University of Essex. His ambition is to transform financial markets into a seamless system without the inefficiencies we currently take for granted.

**Dr Cosimo Pacciani**

Chief Risk Officer, European Stability Mechanism

Cosimo Pacciani has been the Chief Risk Officer for the European Stability Mechanism since 2015. He has joined this key European institution as Senior Credit Officer and Deputy Head of Risk in 2014. Previously, he spent 20 years working in the City of London. He has been for eleven years at Royal Bank of Scotland, where he has been Chief Operating Officer for the Group Credit Risk function and Head of Risk and Compliance for the Asset Protection Scheme, the mechanism established by the British government to rescue the banking system. Previously, at RBS he was Head of Credit Risk for Corporate and Public Institutions in Europe.

He has worked previously in portfolio management at Credit Suisse First Boston and for the London branch of Monte dei Paschi di Siena in London, dealing with derivative products and portfolio management. He holds a PhD from the Faculty of Economic Sciences of the University of Siena and a Masters Degree from the Faculty of Economics of the University of Florence.

**Professor Daniel Ralph**

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

Professor Daniel Ralph is a Founder and Academic Director of the Centre for Risk Studies, Professor of Operations Research at the University of Cambridge Judge Business School, and a Fellow of Churchill College. Daniel's research interests include identification and management of systemic risk, risk aversion in investment, economic equilibria models and optimisation methods. Management stress tests, via selection and construction of catastrophe scenarios, is one focus of his work in the Cambridge Centre for Risk Studies. Another is the role and expression of risk management within organisations. Daniel engages across scientific and social science academia, a variety of commercial and industrial sectors, and government policy making. He was Editor-in-Chief of Mathematical Programming (Series B) from 2007-2013.



**Dr Robert Reville**

President and CEO, Praedicat

Dr Robert T. Reville is the President and Chief Executive Officer of Praedicat, which has developed the world's first forward-looking liability catastrophe model. Prior to co-founding Praedicat, Reville was Senior Economist at the RAND Corporation and a professor at the Pardee RAND Graduate School. At RAND, he conceived and led the liability catastrophe R&D project that provided the foundation for Praedicat. From 2002 to 2008, he was the Director of the RAND Institute for Civil Justice, a research center dedicated to improving public policy related to liability, compensation and insurance. He was also founder and co-director of the RAND Center for Terrorism Risk Management Policy, a policy research center at RAND which published research on terrorism insurance that was influential in congressional debates over the Terrorism Risk Insurance Act. Reville has published extensively on compensation for occupationally disabled workers. He served for two terms on the Board of Scientific Counselors of the National Institute for Occupational Safety and Health, Centres for Disease Control and Prevention. Reville received his PhD in economics from Brown University.



**Rolf Riemenschneider**

Senior Advisor, Global Risk Practice McKinsey and Former MD of cybersecurity, Deutsche Bank

Rolf Riemenschneider joined McKinsey & Company's Frankfurt office in February 2017 as Senior Advisor and a member of the firm's Global Risk Practice. His functional specialties include transformation management, risk management, and business technology. Rolf worked for 19 years at Deutsche Bank in various leadership roles within IT and HR. While at Deutsche Bank, he successfully implemented and led the first Group-wide Chief Information Security Officer (CISO) organisation. In leading global organizations, Rolf worked from Frankfurt, New York, London, and Bangalore. Mr. Riemenschneider holds a degree in commercial information technology from the University of Koblenz-Landau, which he earned with honours.



**Simon Ruffle**

Director of Research and Innovation, Cambridge Centre for Risk Studies

Simon Ruffle is researching a common framework for analysing complex global systemic risk. He coordinates research in the Centre through a unified modelling software platform and develops methods for storing and applying the Centre's Risk Assessment Tools to macro-economic analysis and investment portfolio impact. He is researching how network theory can be applied to understanding the impact of catastrophes in a globalised world, including supply chains, insurance and banking.

Simon has spent most of his career in 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.



### **Dr David Stillwell**

Deputy Director, Cambridge Psychometric Centre and Lecturer in Big Data Analytics and Quantitative Social Science, Cambridge Judge Business School

Dr David Stillwell is Deputy Director of The Psychometrics Centre at the University of Cambridge. He is also Lecturer in Big Data Analytics and Quantitative Social Science at the Cambridge Judge Business School. He obtained his BSc in Psychology at Nottingham in 2007 before progressing to an MSc in Research Methods in 2008. He earned his PhD in Decision Making from the School of Psychology at the University of Nottingham in December 2012.

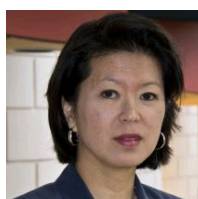
David would describe himself as a computer nerd, but others perceive him rather as a Mark Zuckerberg of Psychometrics. In June 2007, between obtaining his first degree and embarking on his Masters, David began a personal side project designing applications for social networks. The result was the myPersonality Facebook application that allows users to take real psychometric tests and receive feedback on their results. Today myPersonality has collected data from more than 6 million people, and the resulting database has become a priceless academic resource used by numerous researchers all over the world. It is for very good reason that Pacific Standard Magazine in 2014 named him among their 'top 30 thinkers under 30'.



### **John Thornhill**

Innovation Editor, *Financial Times*

John Thornhill is the Innovation Editor at the *Financial Times*, writing a regular column on the impact of technology. He is also the founder of the FT125 forum, which holds monthly events for senior business executives, and host of Tech Tonic, the FT's weekly podcast on technology. John was previously deputy editor and news editor of the FT in London. He has also been Europe editor, Paris bureau chief, Asia editor, Moscow correspondent and Lex columnist.

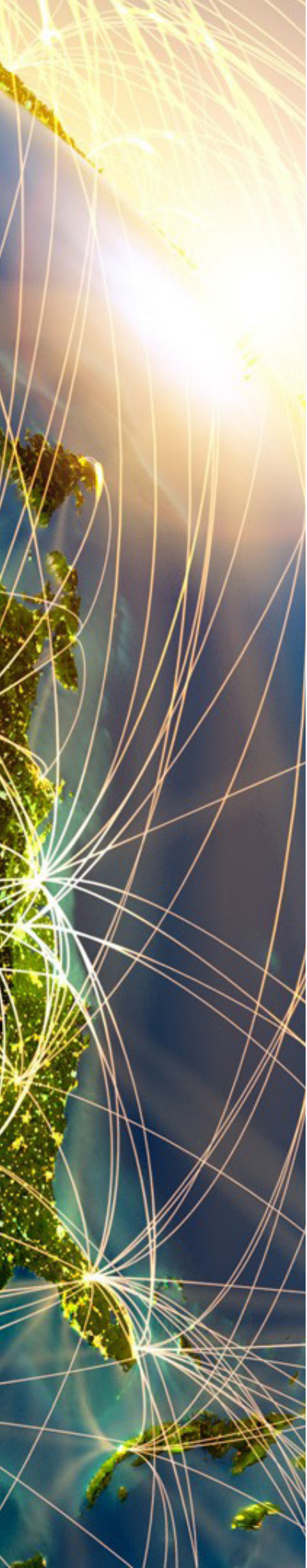


### **Dr Michelle Tuveson**

Executive Director, Cambridge Centre for Risk Studies

Dr Michelle Tuveson is a Founder and Executive Director at the Cambridge Centre for Risk Studies at the University of Cambridge Judge Business School. She brings 20+ years of corporate experience within the technology and consulting sectors to further the development of better risk models for the future. Under Dr Tuveson's tenure, the Centre for Risk Studies has become a leading provider of research and thought leadership in scenario-based modelling of multi-disciplinary risks to businesses. Additionally, she leads the Cambridge Chief Risk Officers Council, chairs the Centre's Annual Risk Summits, is an IEEE Standards Committee Member on the General Principles for Artificial Intelligence, and former advisory board member to the World Economic Forum's Global Risk Report. Her articles have been published by the Financial Times Special Report on Risk Management and the Banking & Financial Services Policy Report (Wolters Kluwer). She earned degrees from MIT and University of Cambridge.





## Cambridge Project Pandora

*Use case for advancing corporate resilience*

The Centre's research in understanding and managing systemic risk includes scenario development, network analysis techniques, and macroeconomic modelling of shock events. The innovative Cambridge Risk Framework analyses a wide range of emerging and less-well understood threats, with a focus on emerging technology risks, and risks of economic and business disruption. These are integrated into our comprehensive new research stream: Project Pandora and the Cambridge Global Risk Outlook.

### Developing the Global Risk Index

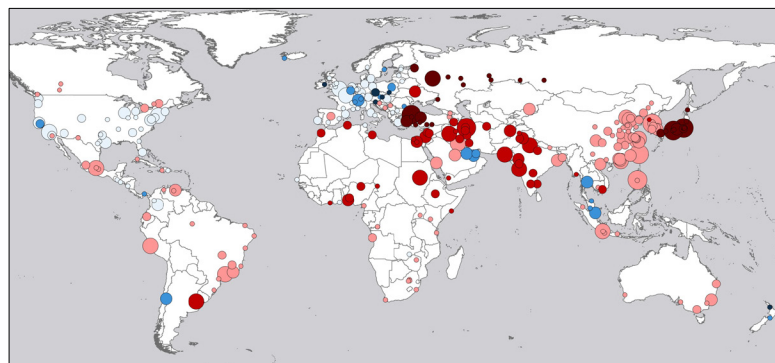
The Cambridge Risk Framework is used to provide a Global Risk Index: a quantitative assessment of the risk of all of the significant systemic shock threats to the global economy.

The Cambridge Global Risk Index uses GDP@Risk assessments to derive economic output loss at city level for the most significant 300 cities of the world, responsible for over half of global GDP. Since its innovation in 2014, the Global Risk Index has served as the backbone of the 2015 Lloyd's City Risk Index and is the basis of 2016's Project Pandora research track.

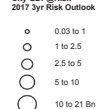
### Project Pandora

The Global Risk Index makes use of an extensive data set of cities, threat maps, and historical precedents for 22 different threats. The resulting model provides a holistic estimate of future catastrophe cost from each of the major threats in our taxonomy for the global economy. We believe this is a major advance in the field of catastrophe studies and provides a platform for 2017 research.

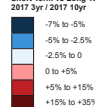
The integration of datasets and multiple threat models constitutes Project Pandora – a specific research track on multi-threat analytics.



City GDP@Risk  
2017 3yr Risk Outlook (\$Bn)



Short Term vs Long Term Risk Outlook  
2017 3yr / 2017 10yr



Cambridge Global Risk Index 2017

Short Term Risk Outlook Variation from Baseline Long Term Outlook  
2017 to 2019 3yr Risk Outlook

GDP@Risk: Probability-weighted expected annual loss in economic output from disruptive shocks from 22 threat categories for 300 leading cities of the world.

Short term Risk Outlook relative to the longer term baseline view of risk, comparing 3yr Risk Outlook to 10 yr Risk Outlook



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*Other research tracks***Emerging and systemic risks**

The Centre for Risk Studies provides research into emerging risks and potential sources of catastrophes that are less well understood.

Ongoing research into cyber risk includes tracking the changing landscape of hacker technologies and motivations, and the potential for correlated cyber attacks causing losses to multiple companies. For insurance companies and others to use cyber stress test scenarios in their business requires standardised data structures, and the Centre plays a data secretariat role in developing data schemas for analytics.

How businesses manage a range of risks to their balance sheets, operations, and investment assets is an important focus of the Centre's research. We work with organisations to apply these research areas to find ways of improving the resilience of an organisation. Expressing the risk metrics for management monitoring, regulatory reporting, and other decision-support is a key area of exploration with our business support partners.

**Cyber risk research**

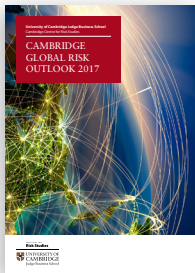
The Cambridge Centre for Risk Studies has been playing a leading role in research into cyber catastrophe risk since its first publications in 2013. The Centre's approach includes developing an understanding of the cyber threat landscape resulting from different technological attack vectors, actors and motivations, and conceptualising potential scenarios of loss. The framework provides a method of assessing the economic and social impact of future cyber attacks. It also captures risk correlation structures and the potential for systemic cyber catastrophes to impact society, insurance companies, and national governments. This covers various mechanisms of cyber loss to the corporate 'cyber' economy.

**Business use cases and project partners**

The Centre for Risk Studies works with selected organisations as part of a multi-year partnership to develop and exploit Project Pandora. The Centre works with a steering committee of research partners representing different aspects of potential business users. This development consortium will shape the applications of the research to meet the needs of their specific use cases. The nature of the partnerships will facilitate the practical usage and benefits of the research outputs towards business applications.

*Highlights from the past year at the Centre for Risk Studies***Understanding the Helios Solar Storm Scenarios**

The Helios Solar Storm Scenario examines the potential business and industry impacts of an extreme space weather event affecting Earth. The scenario's subsequent power-loss amongst value-added activities in the United States is estimated between \$220 billion to \$1.2 trillion across scenario variants. The study finds that the total direct aftershock of the storm may give rise to consequential market disruption with the manufacturing and financial insurance sectors most negatively impacted.

**Cambridge Global Risk Index 2017**

The Centre for Risk Studies launched the Cambridge Global Risk Index to bring business critical elements of the Cambridge Risk Framework into focus. The publication includes an integrated risk outlook for 2017, identifying trillion dollar extreme tail events, better understanding of corporate risk profiling, and identifying opportunities for the insurance industry through risk science.

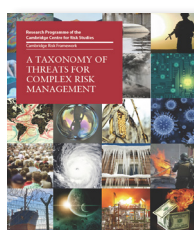
All reports are available for download on the Centre's website.

**Risks and Benefits of Artificial Intelligence and Robotics**

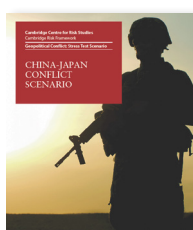
The Centre for Risk Studies hosted a workshop on the *Risks and Benefits of Artificial Intelligence* and Robotics in collaboration with the United Nations.

This workshop sought to deepen knowledge of the risks and benefits associated with the technological revolution currently taking place, with an emphasis on Artificial Intelligence and the Internet of Things. The topics under discussion ranged from quantum computing to the impact AI will have on labour forces to the intersection of AI and law. Workshop participants engaged in a series of brainstorming sessions and practical exercises with eminent engineers, academics and policy makers to explore how technology will shape our future world.

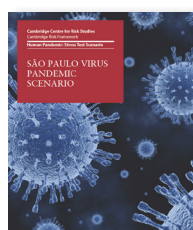
The Cambridge Centre for Risk Studies continues to produce high quality research outputs that further the understanding of emerging risks through workshops, partnerships and new research ventures. In 2017, the Centre's activity has spanned numerous risk research topics including: cyber security, cyber terrorism, geopolitical analysis, scenario development, data schemas and standardisation, risk index development, risk culture and governance, insuring for resilience, insurance purchasing framework strategies, and corporate risk profiling.



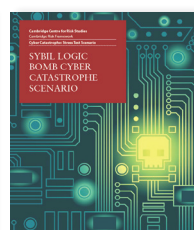
**Taxonomy of Threats**



**Geopolitical Conflict**  
Emerging Risk Scenario



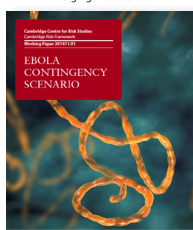
**Pandemic**  
Emerging Risk Scenario



**Cyber Catastrophe**  
Emerging Risk Scenario



**Social Unrest**  
Emerging Risk Scenario



**Ebola**  
Emerging Risk Scenario



**Climate Change**  
Investor Sentiment Shock



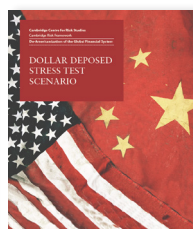
**Global Property Crash**  
Financial Risk Scenario



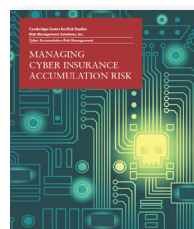
**Eurozone Meltdown**  
Financial Risk Scenario



**High Inflation World**  
Financial Risk Scenario



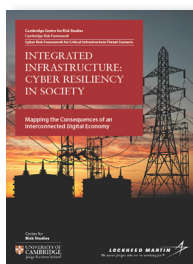
**Dollar Deposited**  
Financial Risk Scenario



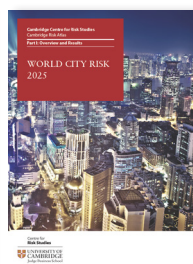
**Cyber Accumulation**  
Insurance Risk Report



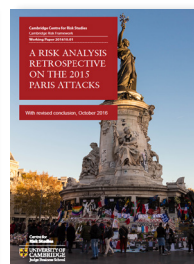
**Business Blackout**  
Lloyd's Emerging Risk Report



**UK Cyber Blackout**  
Lockheed Martin UK co-branded report



**World City Risk 2025**  
Lloyd's co-branded report



**Risk Retrospective on the 2015 Paris Attacks**

At the heart of the Centre is a dynamic, multidisciplinary team of individuals drawn from various fields. The team is responsible for research at the Centre, collaboration with other academic institutions and event management. Through external engagement programmes and partnerships, the Centre also engages with stakeholders from the business community, government policy makers, regulators and industry bodies.

**Executive Team**

**Professor Daniel Ralph**, Academic Director

**Dr Michelle Tuveson**, Executive Director

**Dr Andrew Coburn**, Director of Advisory Board

**Simon Ruffle**, Director of Research and Innovation

**Research Team**

**Jennifer Copic**, Research Associate

**Dr Jennifer Daffron**, Research Associate

**Dr Edward Oughton**, Research Associate

**Dr Andrew Skelton**, Research Associate

**Dr Jay Chan Do Jung**, Risk Researcher

**Dr Scott Kelly**, Senior Risk Researcher

**Éireann Leverett**, Senior Risk Researcher

**Dr Duncan Needham**, Senior Risk Researcher

**James Bourdeau**, Research Assistant

**Tamara Evan**, Research Assistant

**Arjun Mahalingam**, Research Assistant

**Dr Ali Rais Shaghghi**, Research Assistant

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**Kayla Strong**, Research Assistant

**Jessica Tsang**, Research Assistant

**Olivia Majumdar**, Editorial Assistant

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**Lee Coppack**, Senior Advisor, Risk Communication

**Andrew Freeman**, Risk Fellow, Cambridge Centre for Risk Studies and Founder and Managing Director of Cambridge Research Associates

**Matthew Grant**, Senior Advisor, Insurance Markets

**Administration**

**Soňa Krajciová**, Coordinator

**Cambridge Judge Business School**, Finance, Legal and Administration Offices





The 2017 Risk Summit  
Managing Risk in a Smarter World

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Centre for Risk Studies

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