

Centre for Central Banking Studies

Modelling with Big Data and Machine Learning

26–27 November 2018

Jointly organised by the Bank of England, the Federal Reserve Board and the Data Analytics for Finance and Macro Research Centre (DAFM) at King's College London

Location: Moorgate Auditorium, Bank of England, London



BANK OF ENGLAND



Day 1

Monday 26 November 2018

08:00 - 08:45 **Registration and coffee**

08:45 - 09:00 **Opening remarks**

George Kapetanios (Director DAFM, King's College London) and **Paul Robinson** (Head of Advanced Analytics, Bank of England)

09:00 – 10:45 **Session 1: Nowcasting (Chair: Simon Hayes, Bank of England)**

Nowcasting with payments data and machine learning

James Chapman and **Ajit Desai** (Bank of Canada)

Discussant: Juan Antolin-Diaz (London Business School)

Nowcasting GDP with big data from the internet

Luca Onorante (European Central Bank)

Discussant: Chris Redl (Bank of England, DAFM)

Nowcasting with big data: is Google useful in the presence of other information?

Xinyuan Li (London Business School)

Discussant: Ajit Desai (Bank of Canada)

10:45 - 11:15 **Coffee break**

11:15 - 12:15 **Keynote session: *Economic predictions with big data: the illusion of sparsity***

Domenico Giannone (Federal Reserve Bank of New York)

(Chair: George Kapetanios, King's College London, DAFM)

12:15 - 13:15 **Lunch**

13:15 - 15:00 **Session 2: Deep learning (Chair: Andrew Blake, Bank of England)**

Segment-based credit scoring using latent clusters in the variational autoencoder

Rogelio Andrade Mancisidor (University of Tromsø), Michael Kampffmeyer, Kjersti Aas and Robert Jenssen

Discussant: Andres Joseph (Bank of England, DAFM)

Intelligent machines in economics: a macroeconomic application of the LSTM neural network

Rasmus Schier (independent), Roman Jurowetzki and Hamid Raza

Discussant: Özgür Şimşek (University of Bath)

Ensemble deep learning framework for financial time series

Saurabh Misra (University of Maryland) and Bilal Ayyub

Discussant: Özgür Şimşek (University of Bath)

15:00 - 15:30 **Coffee break**

15:30 – 17:15 **Session 3: Machine learning (Chair: Christopher Kurz, Federal Reserve Board)**

Machine learning in the service of policy targeting: the case of public credit guarantees

Monica Andini, Michela Boldrini, **Emanuele Ciani** (Bank of Italy), Guido de Blasio, Alessio D'Ignazio and Andrea Paladini

Discussant: Andrea Tamoni (London School of Economics)

Bond risk premia with machine learning

Daniele Bianchi, Matthias Büchner and **Andrea Tamoni** (London School of Economics)

Discussant: Marcus Buckmann (Bank of England)

Financial crisis prediction with machine learning

Kristina Bluwstein, **Marcus Buckmann** (Bank of England), Andreas Joseph, Miao Kang, Sujit Kapadia and Özgür Şimşek

Discussant: Emanuele Ciani (Bank of Italy)

17:15 - 18:15 **Panel discussion: *Opportunities and risks using Big Data and machine learning* (Chair: Fotis Papailias, King's College London, DAFM)**

Domenico Giannone (Federal Reserve Bank of New York)

Andrew Haldane (Bank of England)

George Kapetanios (King's College London, DAFM)

Paul Ormerod (Volterra Partners & University College London)

Rebecca Riley (Economic Statistics Centre of Excellence)

18:30 - 21:00 **Reception and dinner at 1 Lombard (by invitation only)**

Day 2

Tuesday 27 November 2018

08:30 - 09:00 Registration and coffee

09:00 – 10:45 Session 4: Methodology (Chair: Fotis Papailias, King's College London, DAFM)

Quantile graphical models: prediction and conditional independence with applications to systemic risk

Alexandre Belloni, **Mingli Chen** (University of Warwick), Victor Chernozhukov

Discussant: Miguel Herculano (University of Glasgow)

Growth fragility and systemic risk under model uncertainty

Miguel Herculano (University of Glasgow)

Discussant: Mingli Chen (University of Warwick)

Shapley regressions: a tool for statistical inference on machine learning models

Andreas Joseph (Bank of England, DAFM)

Discussant: Sinem Hacıoglu (Bank of England, DAFM)

10:45 - 11:15 Coffee break

11:15 - 12:15 Keynote session: ***Understanding recessions with algorithmic economics***

Paul Ormerod (Volterra Partners & University College London)

(Chair: **David Bholat**, Bank of England)

12:15 - 13:15 Lunch

13:15 – 15:00 **Session 5: Text analytics (Chair: Chris Redl, Bank of England, DAFM)**

Making text count: text-based indicators of uncertainty sentiment for economic statistics and forecasting

Eleni Kalamara (King's College London), Arthur Turrell, Chris Redl, Sujit Kapadia and George Kapetanios

Discussant: Giuseppe Bruno (Bank of Italy)

The effects of tax changes on economic activity: a narrative approach to frequent anticipations

Sandra García-Uribe (Bank of Spain)

Discussant: Thomas Renault (Panthéon-Sorbonne University)

Breaking the word bank: effects of verbal uncertainty on bank behavior

Paul Soto (Universitat Pompeu Fabra)

Discussant: Christopher Kurz (Federal Reserve Board)

15:00 - 15:30 **Coffee break**

15:30 - 16:40 **Session 6: Novel data sources (Chair: Christopher Kurz, Federal Reserve Board)**

Market manipulation and suspicious stock recommendations on social media

Thomas Renault (Panthéon-Sorbonne University)

Discussant: Sandra García-Uribe (Bank of Spain)

The potential of big housing data: an application to the Italian real-estate market

Michele Loberto, Andrea Luciani and **Marco Pangallo** (University of Oxford)

Discussant: Arzu Uluc (Bank of England)

16:40 - 16:55 **Closing remarks**

Christopher Kurz (Federal Reserve Board)

List of participants

Konstantinos Adamopoulos	Birkbeck, University of London
Najid Ahmad	School of Business, Hunan University of Science and Technology
Dennis Leonardo Alvaro Polack	London School of Economics and Political Science
Nikoleta Anesti	Bank of England
Alev Atak	City University of London
Anish Augustine	King's College London
Andrea Bacilieri	University of Oxford
Jeannine Bailliu	Bank of Canada
Luca Barbaglia	Joint Research Centre European Commission
Emilio Barucci	Politecnico di Milano
David Bholat	Bank of England
Andrew Blake	Bank of England
Svetlana Borovkova	Vrije Universiteit Amsterdam
Giuseppe Bruno	Bank of Italy
Marcus Buckmann	Bank of England
Fabio Caccioli	University College London
Jin Deng Keith Chan	Ofgem
Mingli Chen	University of Warwick
Jeremy Chiu	Bank of England
Rahul Choudhary	PwC
Ariana Christodoulou	London Stock Exchange Group
Ilias Chronopoulos	King's College London
Tatsiana Chunikhina	Belarusian State University/Belinvestbank JSC
Emanuele Ciani	Bank of Italy
Marcus Cobb	Central Bank of Chile
Alex de Haas	De Nederlandsche Bank
Ajit Desai	Bank of Canada
Marina Dolfin	King's College London
Jack Fosten	King's College London
Oana Furtuna	European Central Bank
Giorgia Galeazzi	University of Glasgow
Ana Beatriz Galvão	University of Warwick
Sandra García Uribe	Banco de España
Michael Gardiner	Banking Standards Board
Paola Gasparini	NHS improvement
Domenico Giannone	Federal Reserve Bank of New York
Mark Gilogley	Firststrand
Peter Gostev	RBS
Sylvia Gottschalk	Middlesex University
Sinem Hacioglu	Bank of England
Andrew Haldane	Bank of England

Simon Hajaj Ruby Harmat	Danmarks Nationalbank
Simon Hayes	Bank of England
Miguel Herculano	University of Glasgow
Laura Hill	Office for National Statistics
Yan Hua	Bank of China
Thais Laerkholm Jensen	Danmarks Nationalbank
Sandeep Jhuti	British Gas Insurance
Hyunyoung Jo	King's College London
Zygimantas Jocys	University of Southampton
Andreas Joseph	Bank of England
Eleni Kalamara	King's College London
George Kapetanios	King's College London
Felix Kempf	King's College London
Shabana Kuhi	Aalborg University
Kaushalya Kularatnam	LSEG
Christopher Kurz	Federal Reserve Board
Vincent Labhard	European Central Bank
Kevin Lam	Department for Business, Energy and Industrial Strategy
Hao Lan	King's College London
Jinu Lee	King's College London
Xinyuan Li	London Business School
Mengchu Li	University of Cambridge
Jiong Wei Lua	London School of Economics
Silvia Sze Wai Lui	ONS
Arjun Mahalingam	Bank of England
Rogelio Andrade Mancisidor	University of Tromso
David Martin	Coutts & Co
Geoffrey Megardon	Office for National Statistics
Sathya Mellina	Loughborough University
Saurabh Misra	University of Maryland
Julie Moonga	King's Hospital
Jaume Mora Pedros	Pragsis
Jeremy Morales	King's College London
Carlos Moreno Perez	University of Verona
Alassane Ndour	Indeed
Tien Chuong Nguyen	Queen Mary University
Rickard Nyman	University College London
Daniel Ollerenshaw	ONS
Luca Onorante	European Central Bank
Ali Orazgani	Royal Holloway
Paul Ormerod	Volterra Partners and UCL
Alvaro Ortiz	BBVA Research
Marco Pangallo	University of Oxford
Fotis Papailias	King's College London
Ivan Petrella	Warwick Business School
Maria Poulima	University of Ioannin

Zhongyi Qian	King's College London
Michael Rabba	BNP-Paribas
Amanah Ramadiah	University College London
Anders Ramsten	Tecrar ab
Joerg Reddig	European Central Bank
Chris Redl	Bank of England
Thomas Renault	Panthéon-Sorbonne University
sринi Rentala	RBS
Rebecca Riley	Economic Statistics Centre of Excellence
Paul Robinson	Bank of England
Tomasa Rodrigo	BBVA
Wojciech Rogowski	Narodowy Bank Polski
Paulo Rosario	Prudential
Elena Rudakova	Leeds Building Society
Fabrizio Russo	4most Europe
Ivy Sabuga	City University of London
Martin Saldias	European Central Bank
Juan Alberto Sánchez Hernández	European Central Bank
Rasmus Schier	Independent
Utkarsh Sharma	University of Oxford
Jie Sheng	University of Bristol
Aruhan Shi	University of Warwick
Linda Shuku	King's College London
Carlo Silvano	King's College London
Özgür Şimşek	University of Bath
Christiana Sintou	University of Glasgow
Vladislav Skovorodov	Queen Mary University
Barry Smith	RBS
Graham Smith	RBS
Paul Soto	Univeritat Pompeu Fabra
Silvia Štrbová	National Bank of Slovakia
Tanya Suhoy	Bank of Israel
Zhuowei Sun	Financial Conduct Authority
Zheng Sun	King's College London
Chuanping Sun	Queen Mary University
Gayathri Sundar	Bank of England
Andrea Tamoni	London School of Economics
Ciaren Taylor	Office for National Statistics
Luca Tiozzo Pezzoli	European Commission - Joint Research Centre
Xiao Chuan Tong	King's College London
Fien Twijnstra	De Nederlandsche Bank
Arzu Uluc	Bank of England
Alexia Ventouri	King's College London
Neil Walker	Oxford Economics
Song Wang	Saint Xavier University

M Weale
Liyuan Wei
Meng Xu
Hui Yang
Amaf Yousef
Xiaohua Zeng
Yuwei Zhang
Shunshun Zhang
Victor Zommers

King's College London
Brunel University London
King's Business School
ICL
Vaultex
King's College London
Banking Standards Board
King's College London
Financial Conduct Authority

Forthcoming 2019 CCBS London events

Date	Subject
18 – 20 February	Interaction of monetary and financial stability policy
4 - 6 March	The capital adequacy of banks
11 - 13 March	Managing liquidity and funding risk
25 - 29 March	Forecasting in central banks
1 - 3 April	Central bank operational risk and compliance
9 - 11 April	Business continuity management
29 - 30 April	Workshop for Heads of banking supervision*
13 - 17 May	Advanced analytical tools for financial supervision and risk management
20 - 21 May	Chief Economists' workshop*
30 - 31 May	Research forum on macrofinance*
17 - 21 June	Systemic risk assessment: identification and monitoring
24 - 26 June	Joint CCBS-FRBNY policy forum on the current state of market operations
8 - 9 July	Workshop for Heads of insurance supervision*
18 - 19 July	Understanding and overseeing central counterparties
22 - 30 July	Applied Bayesian econometrics for central bankers
2 -3 September	FinTech Workshop
23 -27 September	R Modelling
30 September – 2 October	Monetary policy and operations
7 - 9 October	Central bank communication in a changing world
14 - 16 October	Risk management and financial supervision
21 - 23 October	Beyond prevention: cyber security and the resilience of the financial sector
28 October – 1 November	The shadow banking system
4 - 5 November	Nowcasting with new data and methods
11 - 13 November	Structure of financial markets
18 - 20 November	Microprudential regulation and supervision
25 November – 6 December	Economic modelling and forecasting

CCBS publications

Monetary policy

State of the art of inflation targeting

Author(s)

Gill Hammond

Economic modelling and forecasting

Applied Bayesian econometrics for central bankers

Author(s)

Andrew Blake and Haroon Mumtaz

Deriving option-implied probability densities for foreign exchange markets

Andrew Blake and Garreth Rule

Monetary operations

Monetary operations

Author(s)

Simon Gray and Nick Talbot

Understanding the central bank balance sheet

Garreth Rule

Liquidity forecasting

Simon Gray

Collateral management in central bank policy operations

Garreth Rule

Issuing central bank securities

Garreth Rule

The above can be downloaded from our website www.bankofengland.co.uk/ccbs



BANK OF ENGLAND

Centre for Central Banking Studies

The CCBS provides an extensive programme of events for central bankers from all over the world. These cover many of the analytical and technical areas of central banking from a practitioner's perspective. Speakers are experts in their field from the Bank of England, the London financial markets, academia and of course the participants themselves.

The seminars and other events are mostly aimed at experienced central bank personnel, who already have expertise in the subject. Participants are often asked to prepare papers beforehand and to give presentations to their course colleagues. This facilitates the sharing of diverse experiences, and contributes to the participative nature of these events, which typically study the different approaches used by central banks around the world. Most seminars include syndicate work and discussions.

Director

Gill Hammond

Senior advisers

David Barr

Andrew Blake

Advisers

Angus Foulis

Christine Jayaseelan

Matthew Pegg

Gabor Pinter

Michael Smart

For event information or queries, please contact

Event administrator:

Sarah Pegg

T: +44 20 3461 5859

Issued by the Centre for Central Banking Studies

Bank of England

Threadneedle Street

London EC2R 8AH

E: ccbsinfo@bankofengland.co.uk

F: +44 20 3461 5860

www.bankofengland.co.uk/ccbs