BANCA D'ITALIA
EUROSISTEMA

Irving Fisher Committee on Central Bank Statistics | BIS

18 October 2021

IFC and Bank of Italy Workshop on "Data Science in Central Banking"

Part 1: Data Science in Central Banking: Machine learning applications

19-22 October 2021, virtual event hosted by the **Bank of Italy**

Programme[1]

Day 1: 19 October 2021

Time (CEST)	Topic	Presenter
14:00 – 14:10	Welcome remarks	**Piero Cipollone**, Bank of Italy
14:10 – 14:40	**Keynote speech**: Monetary Economics and Communication: New Data, New Tools, New and Old Questions	**Michael McMahon**, University of Oxford
14:40 – 15:40	Session 1.1 – Macro-economic modelling using ML techniques	Chair: **Giuseppe Bruno**, Bank of Italy
• Deep Learning Solutions for Dynamic Stochastic General Equilibrium Models		**Mo Ashtari and Vladimir Skavysh**, Bank of Canada
• Getting Insight of Employment Vulnerability from Online News: a Case Study in Indonesia		**Nursidik Heru Praptono** and Alvin Andhika Zulen, Bank Indonesia
• Applications of variational inference in the Bank of Russia		**Sergei Seleznev** and Ramis Khabibullin, Bank of Russia
• Using News Sentiment for Economic Forecasting: A Malaysian Case Study		**Eilyn Chong**, Chiung Ching Ho, Zhong Fei Ong and Hong H Ong, Central Bank of Malaysia
15:40 – 16:25	Session 1.2 – Inflation meets ML	Chair: **Giuseppe Bruno**, Bank of Italy
• Estimating the Effect of Central Bank Independence on Inflation Using Longitudinal Targeted Maximum Likelihood Estimation		**Philipp Baumann**, ETH Zurich, KOF Swiss Economic Institute, Michael Schomaker, UMIT University, Austria, and Enzo Rossi, Swiss National Bank
• Machine learning real-time CPI forecasting		**Mariam Mamedli**, National Research University, Higher School of Economics, Moscow
• Using Twitter Data to gauge Inflation Perception		**Julien Denes**, Bank of France
16:25	Close of day 1	

[1] Timing: 15 minutes per presentation including 2 minutes Q&A

Day 2: 20 October 2021

Time (CEST)	Topic	**Presenter**
14:00 – 15:30	Session 2.1 - ML supporting Central Banks' operations and services to citizens	Chair: **Rafael Schmidt**, Bank for International Settlements
• Cloud Computing Research Collaboration: An Application to Access to Cash and Financial Services		**Danielle Handel** (Stanford University), Anson Ho (Ted Rogers School of Management, Ryerson University), Kim P Huynh (Bank of Canada), David T Jacho-Chavez (Emory University), and **Carson Rea** (Emory University)
• Using Deep Learning Technique to Automate Banknote Defect Classification		**Pucktada Treeratpituk** and Jiradett Kerdsri, Bank of Thailand
• Supervised machine learning for estimating the institutional sectors of legal entities on a large scale		**Francesca Benevolo**, Thomas Gottron, Ilaria Febbo and Nicolò Pegoraro, European Central Bank
• AI tools in outlier detection and missing data imputation		**Tello Serrano and Pablo Jiménez**, Bank of Spain
• Restoration of omissions in the quarterly indicators of financial statements for the Other Financial Institutions in the Bank of Russia		**Alieva Piruza**, **Anna Borisenko**, Petr Milyutin and Denis Koshelev, Bank of Russia
• Fostering European SMEs' internationalization Using Big Data: The BIZMAP Application		**Etienne Kintzler,** Jean-Noel Kien and Theo Nicolas, Bank of France
15:30 – 16:00	Session 2.2 - ML applications in Banking supervision	Chair: **Rafael Schmidt**, Bank for International Settlements
• Supervisory Letter Writing App		**Shum Chi Ken**, Joshua Tan and Mohd Akmal, Central Bank of Malaysia
• The use of AI methods to monitor fintech activities		**Elisabeth Devys**, Bank of France, and Ulf von Kalckreuth, Deutsche Bundesbank
16:00	Close of day 2	

Day 3: 21 October 2021

Time (CEST)	Topic	**Presenter**
14:00 – 15:00	Session 3.1 - Supporting monetary policy with ML	Chair: **Bruno Tissot**, Bank for International Settlements
• Data science opportunities with non-cash transactional payments		**Per Nymand-Andersen**, European Central Bank
• Text data analysis using Latent Dirichlet Allocation: an application to FOMC transcripts		**Hector Carcel Villanova**, International Monetary Fund
• Predicting Foreign Investors' Behavior and Flows Projection in Indonesia Government Bonds Market using Machine Learning		**Anggraini Widjanarti**, **Arinda Dwi Okfantia** and Muhammad Abdul Jabbar, Bank Indonesia
• Classifying payment patterns with artificial neural networks: an autoencoder approach		**Luis Gerardo Gage** and Raúl Morales-Resendiz, Centre for Latin American Monetary Studies (CEMLA)
15:00 – 16:00	Session 3.2 - Financial stability analysis using ML and/or Big Data	Chair: **Bruno Tissot**, Bank for International Settlements
• Disagreement between Human and Machine Predictions		**Daisuke Miyakawa**, Hitotsubashi University Business School, Japan, and Kohei Shintani, Bank of Japan
• The Impairment Costs of Traditional Non-Quantitative Retail Banking Practices pertaining to Residential and Commercial Real Estate Foreclosure Sales and their Effect on Central Bank(s) Policy		**James N Nicol** and Emmanuel Blonkowski, Quant Property Solutions Australia
• Predicting the probability of companies' default based on transactional data with machine learning methods		**Andrey Shevelev**, Bank of Russia
• Monitoring at scale		**Marco D'Errico** and Enrico Apicella, European Central Bank (European Systemic Risk Board Secretariat); Antonio Ciullo, Deloitte; Pedro Marques, European Central Bank (Directorate General Information Systems) and Caroline Übelhör, Google
16:00	Close of day 3	

Day 4: 22 October 2021

Time (CEST)	Topic	**Presenter**
14:00 – 15:00	Session 4.1 - Detecting anomalies in (Big) Data (Part 1)	Chair: **Juri Marcucci**, Bank of Italy
• Machine Learning for Anomaly Detection in Financial Regulatory Data		**Colin Jones**, Maryam Haghighi and James Younker, Bank of Canada
• Machine learning for anomaly detection in datasets with categorical variables and skewed distributions		**Matteo Accornero** and Gianluca Boscariol, European Central Bank
• Anomaly Detection Tools for Big Data		**Shir Kamenetsky Yadan**, Bank of Israel
• Deep learning as a novel validation tool for financial market time series		**Taejin Park** and Magdalena Erdem, Bank for International Settlements
15:00 – 16:00	Session 4.2 - Detecting anomalies in (Big) Data (Part 2)	Chair: **Juri Marcucci**, Bank of Italy
• Anomaly Detection in the Portuguese Central Credit Register		**André Costa, Francisco Fonseca** and Susana Maurício, Bank of Portugal
• Machine learning-based approaches for automatic data validation and outlier control of loan microdata in the Bank of Russia		**Dmitrii Diachkov**, Bank of Russia
• Time series outlier detection, a data-driven approach		**Alexis Maurin**, Bank of England, and Nicola Benatti, European Central Bank
• Unsupervised Outlier Detection: A Prototype for Granular Financial Data		**Nhan-Tam Nguyen**, Deutsche Bundesbank, and co-authors from the Deutsche Bundesbank and the German Research Center for Artificial Intelligence
16:00 – 16:15	Closing remarks	**Alessandro Bonara**, European Central Bank
16:15	End of workshop	