Title of the workshop
SUPTECH I WORKSHOP I. AI, Market Risk in financial Robo-Advisory
Venue
Deutsche Bundesbank, Frankfurt, Germany
Date
10th - 11th, February 2020
Hosting university
Humboldt-Universität zu Berlin
Regulator/supervisor
Deutsche Bundesbank
The speakers
1. Wolfgang Karl Härdle
2. Jochen Papenbrock
3. Rui Ren
4. Stefan Lessmann

Number of participants
13
The main topics:
The main topics include risk management, machine learning and explainable Artificial Intelligence (AI). An innovative risk management tool Financial Risk Meter (FRM) was presented to support supervision and decision-making. Furthermore, the frontiers of machine learning and AI have been under discussion on the workshop.
Use case: Financial Risk Meter, eXplainable AI (XAI) in Credit Risk Management, Network Models to Enhance Automated Cryptocurrency Portfolio Management
The main topics discussed were:
1. Financial Risk Meter
2. eXplainable AI (XAI) in Regulated Financial Services
3. Deep Learning
4. Interpretable Machine Learning

The main results
The results are associated with the topics mentioned above:
1. Risk Management
Financial Risk Meter (FRM) was presented on the workshop, which accounting for links and mutual dependencies between financial institutions

utilising tail event information. Three FRM indices was reported, namely, FRM@Americas, FRM@Europe and FRM@Crypto. FRM is based on Lasso quantile regression designed to capture tail event co-movements. The FRM focus lies on understanding active set data characteristics and the presentation of interdependencies in a network topology. The FRM indices detect systemic risk at selected areas and identify risk factors. Using FRM on a daily basis, we identify companies exhibiting extreme "co-stress", as well as "activators" of stress.

2. Artificial Intelligence

Machine learning is becoming increasingly important in the financial industry. But in many decision-making applications, regulatory and transparency concerns slowed down the industry from embracing these new technologies due to the nature of black box of AI models. To overcome this problem, explainable AI models provide details or reasons to make the functioning of AI clear or easy to understand, thus they are potentially suitable in regulated financial services.

3. Automated Portfolio Management

A novel approach to build efficient cryptocurrency portfolio allocation was clarified. The model is an extension of the traditional Markowitz model which combines Random Matrix Theory and network measures, in order to achieve portfolio weights enhancing portfolios' risk-return profiles. The results show that overall our model overperforms several competing alternatives, maintaining a relatively low level of risk. These outcomes suggest that a sound combination of the proposed models should be employed in order to achieve an efficient cryptocurrency allocation strategy, which could be also used as robo-advisory toolboxes to improve automated financial consultancy.

New insights and main take aways

- The participants agree with most of ideas and consider the possibility that FRM could be used as an alternative for measuring financial risk.
- They also show interest in machine learning and explainable AI. For example, if XAI is able to report the reasoning to make its functioning clearer to understand by humans, it would be potential to improve regulated financial services.

Further remarks

- Services of automated financial consulting are widely spreading.This is particularly true when building portfolios and managing risks, which could the future target markets of robo-advisory.
- The FRM is useful since it boils down to a real number, allowing the authorities to manage the systemic risk effectively and further prepare for upcoming economic recessions. Further, the FRM is potential to help to detect distressed areas in the financial system network consisting of banks and non-banks, and thereby is likely to help prevent spill-overs into the wider financial industry.

Annex. Event photo