

Report on the outcomes of a Short-Term Scientific Mission¹

Action number: CA19130

Grantee name: PELE DANIEL TRAIAN

Details of the STSM

Title: Robust approach for classification of portfolio strategies with cryptocurrencies

Start and end date: 26/09/2022 to 06/10/2022

Description of the work carried out during the STSM

Description of the activities carried out during the STSM. Any deviations from the initial working plan shall also be described in this section.

The Short-term scientific mission grant has supported my visit to work with Dr. Alla Petukhina, University of Applied Sciences for Engineering and Economic (HTW Berlin), for a period of two weeks (September 26 - October 6, 2021). The initial STSM end date was set to October 4, 2022, but due to transport arrangements, the actual end date was October 6, 2022.

During the stay, I presented two talks, and conducted research on a joint project with Dr. Alla Petukhina which focuses on testing of recently developed robust mean-variance optimization approach in Klochkov et al (2021) for multi asset investment universe including alternative assets like cryptocurrencies and commodities.

A summary of the activities undertaken during the visit include:

- We worked research project on „Robustified Markowitz approach for cryptocurrencies”. The proposed research collaborative project is an extension of the previous research project, Klochkov et al. (2021).
- We have prepared a draft of our joint paper to be further submitted in a peer-reviewed academic journal (e.g., Journal of Digital finance or Journal of portfolio management).
- The R code for portfolio 10 allocation algorithms and 27 performance measures (DePrado, 2016) with an application to a dataset on daily prices of cryptocurrencies and traditional assets (89 assets, 20160101-20201231) was updated and is uploaded to https://github.com/danpele/Robust_Markowitz_CC.
- Two talks at the internal research seminar were given:

¹ This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

- a. “Robustified Markowitz approach for cryptocurrencies” (October 4, 2022), at the research seminar of IRTG 1792 “High Dimensional Nonstationary Time Series”, Humboldt University from Berlin, led by Prof. dr. WK Härdle.
- b. “FRM@RO - Financial Risk Meter for the Romanian Stock Market” (October 5, 2022), at the research seminar of HTW Berlin, Department of Financial Mathematics.
- Participation at GARP (Global Association of Risk Professionals) event (September 28, 2022), at Deutsche Bank, event led by Dr. Nathalie Peckham. Topic: “Long-Short-Term Memory Neural Networks in Varying Regimes”, by Prof. dr. Christina Erlwein-Sayer, HTW Berlin.
- Participation at the Phd defense of Kainat Khowaja, at Humboldt University of Berlin (October 4, 2022).

Description of the STSM main achievements and planned follow-up activities

Description and assessment of whether the STSM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

The main achievements of STSM:

- We have a first draft of the paper “Robust approach for classification of portfolio strategies with cryptocurrencies”, which is in line with the objectives of WG1 - Transparency in FinTech and WG2 - Transparent versus Black Box Decision-Support Models in the Financial Industry. Thus, the paper deals with the problem of robust allocation of investment portfolios, where cryptocurrencies are included, considering the heavy-tail characteristics of financial time series.
- The data, code and results are publicly available via www.quantlet.de, ensuring full reproducibility and contributing to open science. This is in line with Deliverable 14 of the action (Key software (codes, packages) developed by each of the Working Groups in line with their objective).
- We are preparing the submission of the paper to a peer-reviewed academic journal, such as: Journal of financial data science, Digital finance, Journal of alternative assets and Quantitative finance.

After this STSM, we plan to continue the cooperation in several ways:

- We intend to sign an Erasmus protocol between HTW Berlin and Bucharest University of Economic Studies, to enhance collaboration in common research areas and to allow exchange of students and professors between the two universities. This is in line with MoU objective Capacity Building 1: “Create an excellent network of researchers in Europe with lasting collaboration beyond the lifetime of the Action”.
- Presentation of results of ongoing research projects at the conferences and research events organised by COST FinAI members, in line with MoU objective Capacity Building 9: “Disseminate the results of the Action’s activities to the scientific community, European institutions and to the general public”.
- Contribute to P2P knowledge platform Quantinar, developed by collaboration of HU Berlin (Professor Härdle) and BUES, in line with MoU objective Capacity Building 3: “Bridging the gap between practitioners from the finance industry, academics and regulators by setting up a common knowledge exchange platform”.