AFAANZ Grant Report

Grant Application 2017-2018

November 8, 2018

1 Name, Position, Contact Details for each applicant

Primary Mid-career Researcher: Dr Vitali Alexeev*, UTS Business School, University of Technology Sydney (UTS), AFAANZ membership # A3722773

2 Project Title

"Warping Time: Improving Efficiency and Effectiveness of Tick-by-tick Data in Portfolio Optimisation.".

3 Updated Project Summary

This project developed a unified framework that allows analysis of unevenly spaced tick-by-tick data. Up to 90 percent of tick-by-tick data is lost during pre-processing of the data to fit existing models in finance applications. Compared to existing methods, the proposed approach avoids unnecessary loss of observations and allows for flexible time shifts by warping the time domain. The resulting framework improves the accuracy of existing models that rely on aggregated equidistant data. A novel portfolio construction method was used to show practical application of the developed framework to showcase improvements in investment decision making process for Australia's pension fund industry and investment professionals.

4 Funds Granted

The amount of $5,000 was granted out of $9,939.60 required for the project.

5 Report on Expenditure of Funds

Please find below detailed report on expenditure of funds against budget items, with variations explained.

Internal university grant was used to partially supplement some of the remaining amounts for budget items that where insufficient to fund from the partial amount awarded by AFAANZ. The AFAANZ grant was used to finance hardware upgrade items required for improved computational efficiency and to facilitate data storage for the project. Expenditure details are provided below:

	Total cost
Hardware purchases: hardware upgrades for improved computational efficiency	$4,838.00
Hardware purchases: hard drive to allow for additional storage of massive tick-by-tick dataset	$145.00
TOTAL PROJECT	**$4,983.00**

6 Outcomes

Working papers

- University of Technology Sydney, Internal working paper was been prepared for dissemination among colleagues in the UTS Business School to facilitate discussion at the Finance Discipline Group seminar series, UTS Business School in February 2018.

The project has been presented at

- Internal seminar at the Finance Discipline Group, UTS Business School, UTS, Sydney, Australia, 2018

- Department of Management, Economics and Quantitative Methods, University of Bergamo, Dec 2017

- Computational and Financial Econometrics conference, University of London, UK, Dec 2017

- Society for Financial Econometrics (SoFiE) Annual Meeting, New York University, New York, USA, 2017

Grant applications

- Development of this project has led to submission of the Discovery Project grant to the Australian Research Counsel (ARC) on February 19, 2018 titled "Lost in asynchronicity: Effective alignment of tick-by-tick data" requesting the total budget from the ARC in the amount of AUD947,621.00. Results and feedback from the ARC are still pending as of the date of preparing this report.

7 Future Intentions for this Project

It is my goal to see through the publication of the article resulted from this project in an A* ranked international journal.

- The paper will be submitted to the **Journal of Baking and Finance** (ABDC rank A*) in February/March 2019.

8 Summary of Outcomes and Benefits

The project has eventuated in 1 working paper, 1 manuscript that is soon to be submitted to an A* ranked journal, 2 conference presentations, 1 invited seminar talk, 1 internal peer review presentation and was a base for the ARC DP 2019 grant application.