



Deliverable 5.3

MSCA-ITN Training for Big Data in Financial Research and Risk Management “BigDataFinance”

Grant Agreement: 675044

This is Deliverable 5.3 of the Work Package 5 (WP5) in “Training for Big Data in Financial Research and Risk Management” (BigDataFinance) Innovative Training Network Marie Skłodowska-Curie project 2015-2019.

Summer School: Introduction to Econometrics and Empirical Modelling of Financial Markets

BigDataFinance network’s training event, “High-Frequency Data Econometrics” was organized between 26-29 September 2016 at Aarhus University (Denmark). The official programme is available here:

<http://creates.au.dk/activities/phd-activities/phd-activities-2016/high-frequency-data-econometrics/>

In addition to BigDataFinance Early Stage Researchers and other network members, the event was also open to external participants, and approximately 20 externals attended. All of the network’s thirteen ESRs attended to the training event, though some of them will officially start working on the 1st October 2016. The Network Coordinator Juho Kanninen also participated in the first two days of the event.

All ESRs, network members and external participants took part in evening activities together, encouraging bonding as a team and the development of personal relationships to facilitate subsequent collaboration throughout the duration of the network.

14th October 2016, Aarhus

Professor Niels Haldrup
Aarhus University

PhD Course in High Frequency Data Econometrics

Course description

The course covers topics from the recent developments in high-frequency econometrics.

We will review the econometrics of non-parametric estimation of the variation of asset prices. This very active literature has been stimulated by the recent advent of complete records of transaction prices, quote data and order books. The interaction of the new data sources with new econometrics methodology is leading to a paradigm shift in one of the most important areas in econometrics: Volatility measurement, modeling and forecasting using high-frequency data.

Careful data cleaning is one of the most important aspects of volatility estimation from high-frequency data. The most challenging problem in this context is dealing with various forms of market frictions, which obscure the latent price from the econometrician. We will characterize types of statistical models of friction and discuss how econometricians have been attempting to overcome them. The main data focus will be on the TAQ data base.

The lectures will be given by: Kim Christensen, Peter Reinhard Hansen and Asger Lunde.

Course agenda

Day 1	<p>Morning session (9-12):</p> <ul style="list-style-type: none">- Lecture (Theory, PRH): Volatility estimation using high frequency data. Realized variance under various forms of noise.- Lecture (Theory, PRH): Volatility estimation using high frequency data. Noise robust estimators. <p>Afternoon session (13-16):</p> <ul style="list-style-type: none">- Lecture (Empirical, AL): TAQ data. Extraction, characteristics, cleaning and properties.- Exercises: TAQ data
Day 2	<p>Morning session (9-12):</p> <ul style="list-style-type: none">- Lecture (Theory, PRH): Multivariate topics. Volatility and covolatility estimation using high frequency data.- Lecture (Theory): <p>Afternoon session (13-16):</p> <ul style="list-style-type: none">- Lecture (Empirical, AL): Simulation of continuous stochastic processes- Exercises: Simulation studies. <p>Course dinner</p>
Day 3	<p>Morning session (9-12):</p> <ul style="list-style-type: none">- Lecture (Theory, PRH): Volatility modeling and forecasting using high frequency data. Realized Garch and related models.- Lecture (Theory, PRH): Volatility modeling and forecasting using high frequency data. Model evaluation. <p>Afternoon session (13-16):</p> <ul style="list-style-type: none">- Exercises: Volatility modeling and forecasting using high frequency data.- Lecture (Empirical, PRH): Factor models utilizing high frequency data
Day 4	<p>Morning session (9-12):</p> <ul style="list-style-type: none">- Lecture (Theory, KC): Volatility estimation in models with jumps: estimators, separation of risk, and jump testing <p>Afternoon session (13-16):</p> <ul style="list-style-type: none">- Lecture (Empirical, KC): Implementation on noisy high-frequency data: Pre-averaging- Exercises: Volatility estimation in models with jumps