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RESEARCH INTERESTS

Econometrics, Nonparametric Statistics, Applied Time Series Analysis

EDUCATION AND AFFILIATIONS

- 2021 - present** *Erasmus School of Economics, Erasmus University Rotterdam*
Assistant Professor
- 2019 - 2021** *Institute of Finance and Statistics, University of Bonn*
Research Fellow
- 2015 - 2021** *Bonn Graduate School of Economics, University of Bonn*
Ph.D. in Economics
Summa cum laude
Supervisors: Prof. Dr. Michael Vogt, Prof. Dr. Alois Kneip
- 2012 - 2014** *National Research University «Higher School of Economics»*
M.Sc. in Economics
GPA – 8.52 out of 10 (8, 9, 10 - excellent)
Rating: 18 out of 266
- 2007 - 2012** *Moscow State University n.a. M.V. Lomonosov*
Diploma with honours in Mathematics
GPA – 4.98 out of 5 (5 - excellent)

PUBLICATIONS

Multiscale Inference and Long-Run Variance Estimation in Nonparametric Regression with Time Series Errors (with Michael Vogt)

Journal of the Royal Statistical Society: Series B, Volume 82, Number 1 (2020), p. 5-37

We develop new multiscale methods to test qualitative hypotheses about the trend function m in the nonparametric regression model $Y_{t,T} = m(t/T) + \varepsilon_t$ with time series errors ε_t . In time series applications, m represents a nonparametric time trend. Practitioners are often interested in whether the trend m has certain shape properties. For example, they would like to know whether m is constant or whether it is increasing or decreasing in certain time intervals. Our multiscale methods enable us to test for such shape properties of the trend m . To perform the methods, we require an estimator of the long-run error variance σ^2 . We propose a new difference-based estimator of σ^2 for the case that $\{\varepsilon_t\}$ belongs to the class of auto-regressive $AR(\infty)$ processes. In the technical part of the paper, we derive asymptotic theory for the proposed multiscale test and the estimator of the long-run error variance. The theory is complemented by a simulation study and an empirical application to climate data.

Nonparametric comparison of epidemic time trends: the case of COVID-19 (with Michael Vogt)

Forthcoming in Journal of Econometrics

The COVID-19 pandemic is one of the most pressing issues at present. A question which is particularly important for governments and policy makers is the following: Does the virus spread in the same way in different countries? Or are there significant differences in the development of the epidemic? In this

paper, we devise new inference methods that allow to detect differences in the development of the COVID-19 epidemic across countries in a statistically rigorous way. In our empirical study, we use the methods to compare the outbreak patterns of the epidemic in a number of European countries.

WORKING PAPERS

Multiscale Testing for Equality of Nonparametric Trend Curves (with Michael Vogt)

The comparison of nonparametric curves is a classic topic in econometrics and statistics. Depending on the specific application, the curves of interest are densities, distribution functions, time trends or regression curves. In this paper, we focus on the comparison of nonparametric trend curves. We develop new multiscale method for testing whether the trend curves are the same across observed time series. Moreover, this method allows us to detect the regions where the differences between the trend curves occur. We illustrate our method with an application to daily price returns for a number of US companies.

GRANTS AND AWARDS

Doctoral Scholarship of the Bonn Graduate School of Economics

2015 - 2019

Research Fellowship, German Research Foundation (DFG)

2019 - 2021

WORKSHOPS AND PRESENTATIONS

- 2021** Vrije Universiteit Amsterdam, University of Amsterdam, Erasmus University Rotterdam, University of Exeter, University of Mannheim, University of Connecticut (invited), HCM Symposium
- 2020** Econometrics and Statistics Seminar, Bonn
- 2019** 12th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2019)
- 2018** 11th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2018)
The 23rd International Conference on Computational Statistics
Econometrics and Statistics Seminar, Bonn
Bonn Mannheim Workshop for PhD students (discussant)
- 2017** BGSE Brown Bag Seminar, Bonn
Bonn Mannheim Workshop for PhD students (discussant)
- 2013** Social Network Analysis Summer School, Saint-Petersburg

WORKSHOPS I (CO-)ORGANISED

Bonn Mannheim Workshop for PhD student, May 2018

REFEREEING

The Econometrics Journal

TEACHING EXPERIENCE

University of Bonn

Lecturer, Computational Statistics (M.Sc.), Summer 2021

Lecturer, Wissenschaftliches Arbeiten (B.Sc.), Winter 2020/2021

TA, Econometrics II for PhD, Summer 2020

TA, Econometrics I for PhD, Winter 2019/2020

TA, Econometrics II for PhD, Summer 2019

TA, Econometrics I for PhD, Winter 2018/2019

TA, Econometrics II for PhD, Summer 2018

TA, Mathematics for Economists (M.Sc.), Winter 2017/2018
National Research University «Higher School of Economics»

TA, Institutional Economics (B.Sc.), Fall 2013

Branch of Moscow State University in Dushanbe, Tajikistan

Lecturer, Calculus (B.Sc.), Fall 2012

Moscow State University

Assistance during the exam, 2011 – 2013

Education Company «Unium», Moscow, Russia

Senior teacher of mathematics, 2009 – 2012

NON-ACADEMIC EXPERIENCE

Nonprofit partnership «Market Council»

Analyst, 2014 – 2015

PACKAGES

R package «Multiscale»

This package implements the multiscale analysis proposed in the papers "Multiscale Inference and Long-Run Variance Estimation in Nonparametric Regression with Time Series Errors" and "Nonparametric comparison of epidemic time trends: the case of COVID-19". Specifically, it allows to test qualitative hypotheses (such as shape properties) about the time trend in a nonparametric regression with time series errors and to compare nonparametric time trends in the context of epidemic modelling. The package as well as the detailed description of its functionality can be found in the following github repository: <https://github.com/marina-khi/multiscale>.

SKILLS

Language efficiency: Russian (native), English (fluent), German (intermediate)

Programming: Advanced skills in R, Git, LaTeX, Python, SAS Base
Intermediate skills in Wolfram Mathematica, Matlab, Jekyll
Basic skills in Stata, EViews

MISCELLANEA

Citizenship: Russian

Hobbies: Books, making TikTok videos, biking and jogging

Marital status: Married