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RESEARCH INTERESTS

Statistics, Econometrics, Nonparametric Statistics, Multiscale Testing, Time Series Analysis, Identification

EDUCATION AND AFFILIATIONS

2019 - present — *Institute of Finance and Statistics, University of Bonn*
Research Fellow

2015 - present — *Bonn Graduate School of Economics, University of Bonn*
Ph.D. candidate in Economics
Expected completion: fall 2021
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 non-parametric regression model $Y_{t,T} = m(t/T) + \varepsilon_t$ with time series errors ε_t. In time series applications, m represents a non-parametric 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(∞) 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.

WORKING PAPERS

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

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, we propose a clustering algorithm to group those time series based on the results of this testing procedure. 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)
since 2019

WORKSHOPS AND PRESENTATIONS

Econometrics and Statistics Seminar
University of Bonn, Germany, Scheduled for September 2020

12th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2019)
London, UK, December 2019

11th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2018)
Pisa, Italy, December 2018

The 23rd International Conference on Computational Statistics
Iasi, Romania, August 2018

Econometrics and Statistics Seminar
University of Bonn, Germany, July 2018

Bonn Mannheim Workshop for PhD students (discussant)
University of Bonn, Germany, May 2018

BGSE Brown Bag Seminar
University of Bonn, Germany, July 2017

Bonn Mannheim Workshop for PhD students (discussant)
University of Mannheim, Germany, May 2017

Social Network Analysis Summer School
Saint Petersburg, Russia, August 2013

TEACHING EXPERIENCE

University of Bonn
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 poroposed 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 nonparametric 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, pandas, SAS Base
Intermediate skills in Wolfram Mathematica, Matlab, Jekyll
Basic skills in Stata, EViews

MISCELANEA

Citizenship: Russian
Hobbies: Books, making TikTok videos, biking and jogging.

REFERENCES

Prof. Dr. Michael Vogt
Ulm University,
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Prof. Dr. Alois Kneip
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