

# MARINA KHISMATULLINA

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<http://marina-khi.github.io>

## RESEARCH INTERESTS

Econometrics, Nonparametric Statistics, Applied Time Series Analysis

## EDUCATION AND AFFILIATIONS

<b>2021 - present</b>	<i>Erasmus School of Economics, Erasmus University Rotterdam</i> Assistant Professor
<b>2019 - 2021</b>	<i>Institute of Finance and Statistics, University of Bonn</i> Research Fellow
<b>2015 - 2021</b>	<i>Bonn Graduate School of Economics, University of Bonn</i> Ph.D. in Economics Summa cum laude Supervisors: Prof. Dr. Michael Vogt, Prof. Dr. Alois Kneip
<b>2012 - 2014</b>	<i>National Research University «Higher School of Economics»</i> M.Sc. in Economics GPA – 8.52 out of 10 (8, 9, 10 - excellent) Rating: 18 out of 266
<b>2007 - 2012</b>	<i>Moscow State University n.a. M.V. Lomonosov</i> 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  $\varepsilon_t$ . 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  $\sigma^2$ . We propose a new difference-based estimator of  $\sigma^2$  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)

We develop new econometric methods for the comparison of nonparametric time trends. In many applications, practitioners are interested in whether the observed time series all have the same time trend. Moreover, they would often like to know which trends are different and in which time intervals they differ. We design a multiscale test to formally approach these questions. Specifically, we develop a test which allows to make rigorous confidence statements about which time trends are different and where (that is, in which time intervals) they differ. Based on our multiscale test, we further develop a clustering algorithm which allows to cluster the observed time series into groups with the same trend. We derive asymptotic theory for our test and clustering methods. The theory is complemented by a simulation study and two applications to house pricing data and GDP growth data.

## **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**

- |             |   |
|-------------|---|
| <b>2022</b> | NESG 2022, COMPSTAT 2022, IASC-ARS Interim Conference (scheduled)   |
| <b>2021</b> | Vrije Universiteit Amsterdam, University of Amsterdam, Erasmus University Rotterdam, University of Exeter, University of Mannheim, University of Connecticut (invited), HCM Symposium (Bonn), Panel Data Workshop (Amsterdam) |
| <b>2020</b> | University of Bonn  |
| <b>2019</b> | CMStatistics 2019   |
| <b>2018</b> | COMPSTAT 2018, CMStatistics 2018, University of Bonn, Bonn-Mannheim Workshop for PhD students (discussant)  |
| <b>2017</b> | BGSE Brown Bag Seminar (Bonn), Bonn-Mannheim Workshop for PhD students (discussant)   |
| <b>2013</b> | Social Network Analysis Summer School, Saint-Petersburg   |

## **REFEREING**

The Econometrics Journal, Journal of Business & Economic Statistics

## **DEPARTMENTAL SERVICE**

Co-organiser of the 2nd International Econometrics PhD conference, November 2022, Erasmus University Rotterdam

Co-organiser of Differential privacy reading group, academic years 2021/2022, 2022/2023, Erasmus University Rotterdam

Member of the recruiting committee, academic years 2019/20 and 2020/21, University of Bonn

Co-organiser of Bonn-Mannheim Workshop for PhD students, May 2018, University of Bonn

Cohort representative, academic year 2015/2016, University of Bonn

Head of the graduation committee, 2012, Moscow State University

Union representative, 2007 - 2012, Moscow State University

## **TEACHING EXPERIENCE**

### **Erasmus University Rotterdam**

Lecturer, Mathematical Methods (B.Sc), academic year 2021/2022

Case supervisor, Seminar Cases in Quantitative Marketing (M.Sc.), academic year 2021/2022

**University of Bonn**

Lecturer, Computational Statistics (M.Sc.), academic year 2020/2021

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

TA, Econometrics II for PhD, academic years 2017/2018, 2018/2019, 2019/2020

TA, Econometrics I for PhD, academic years 2018/2019, 2019/2020

TA, Mathematics for Economists (M.Sc.), academic year 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

**SKILLS**

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

Programming: Advanced skills in R (creator of the package Multiscale), Git, LaTeX, Python, SAS  
Intermediate skills in Wolfram Mathematica, Matlab, Jekyll  
Basic skills in Stata, EViews

**MISCELLANEA**

Citizenship: Russian

Hobbies: Books, microblogging, biking and jogging

Marital status: Married