Curriculum vitae

PERSONAL INFORMATION

Beatrice Foroni

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beatriceforoni.github.io

quantileregressionlab.github.io

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WORK EXPERIENCE

April 2024 - April 2025

Postdoctoral Researcher

University of Pisa - Department of Economics and Management, Pisa, Italy

Estimation and Prediction of Indicators for measuring and monitoring Sustainable Development Goals

April 2023 - April 2024

Postdoctoral Researcher

La Sapienza University - MEMOTEF Department, Faculty of Economics, Rome, Italy

Generalized Dynamic Graphical Models for the impact of the COVID-19 pandemic on financial markets

TEACHING ACTIVITIES

Sept. 2024 - Dec. 2024

Tutoring activity for Advanced Statistics, SECS-S/01

University of Pisa - Department of Economics and Management; Scuola Superiore Sant'Anna, Pisa, Italy

Master of Science in Economics, 40 hours. Taught in English.

Sept. 2024 - Dec. 2024

European Statistical System and Data Production Model, 6CFU

University of Pisa - Department of Economics and Management, Pisa, Italy

Master's Degree in Economics, 48 hours. Taught in English.

May 2024

Course for PhD students of the MEMOTEF Department

La Sapienza University - MEMOTEF Department, Faculty of Economics, Rome, Italy

Financial risk modeling and forecasting using quantile regression methods, 8 hours. Taught in English.

Feb 2024 – May 2024

Teaching Assistant in Econometrics, SECS-S/01

LUISS Guido Carli University, Business Administration bachelor's degree, Rome, Italy

Sept 2023 – Dec 2023

Teaching activity in Statistics, disciplinar sector SECS-S/01

La Sapienza University - MEMOTEF Department, Faculty of Economics, Rome, Italy

Winner of the comparative procedure 1132/2023 for the performance of additional teaching activities for the course of Statistics to master's degree students of the Faculty of Economics.

Feb 2023 – May 2023

Teaching Assistant in Statistics, SECS-S/01

LUISS Guido Carli University, Rome, Italy

Business Administration bachelor's degree

Sept 2021 – Aug 2022

Integrating tutoring and teaching activity for disciplinar sector SECS-S/01, for a total of 40 monthly hours for 12 months

LUISS Guido Carli University, Faculty of Political Science, Rome, Italy

March 2021 – Sept 2021

Integrating tutoring and teaching activity for disciplinar sector SECS-S/01, for a total of 40 hours

La Sapienza University - MEMOTEF Department, Faculty of Economics, Rome, Italy

Winner of the comparative procedure 1223/2020 for the performance of additional teaching activities and tutoring for courses falling within the disciplinary scientific sector SECS-S/01 Statistics.

March 2020 – March 2021

Integrating tutoring and teaching activity for disciplinar sector SECS-S/06, for a total of 40 hours

La Sapienza University - MEMOTEF Department, Faculty of Economics, Rome, Italy

Winner of the comparative procedure 80/2020 for the performance of additional teaching activities and tutoring for courses falling within the disciplinary scientific sector SECS-S/06 Mathematical methods of economics and actuarial and financial sciences.

CONFERENCE PRESENTATIONS

December 2024

Hidden Markov linear quantile graphical model

King's College, London, UK

18th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics2024)

June 2024

Hidden Markov graphical models with generalized hyperbolic distributions: a financial analysis on commodities and green energy indexes

University of Bari Aldo Moro, Bari, Italy

SIS 2024

December 2023

Quantile and expectile copula-based hidden Markov regression models for the analysis of the cryptocurrency market

HTW Berlin, University of Applied Sciences, Berlin, Germany

16th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics2023)

June 2023

Using expectile regression with latent variables for digital assets

UNIVPM, Ancona, Italy

Statistical Learning, Sustainability and Impact Evaluation - SIS 2023

September 2022

Time varying quantile graphical model: a financial perspective

Federico II University, Napoli, Italy

European Conference on Data Analysis - ECDA2022

May 2022

Analyzing the Correlation Structure of Financial Markets Using a Quantile Graphical Model

University of Campania "Luigi Vanvitelli", Caserta, Italy

51ST Scientific Meeting of the Italian Statistical Society - SIS 2022

May 2022 **Time-varying graphical models for financial markets: a quantile approach**

University of Perugia, Perugia, Italy

9th International Conference on Risk Analysis - ICRA 2022

April 2022 **Graphical models for commodities: a quantile approach**

University of Salerno, Salerno, Italy

10th International Hybrid Conference on Mathematical and Statistical Methods for Actuarial Sciences and Finance - MAF 2022

March-April 2022 **Graphical models for commodities: a quantile approach**

University of Tor Vergata, Roma, Italy

XXIII Workshop on Quantitative Finance - QFW2022

May 2021 **Sparse graphical model for joint estimation of conditional quantiles**

University of Pavia, Pavia, Italy

Network Models for Financial Contagion and Systemic Risk.

CONFERENCE ORGANIZATION

22 September 2023 **Member of the Local Organizing Committee of the 1st Workshop on quantile regression in Rome**

Sapienza University of Rome, Rome, Italy

WorkshopQRome - New perspectives of quantile regression in applied sciences.

SUMMER SCHOOLS

June - July 2021 **Network Econometrics**

University Ca' Foscari, Venezia, Italy

Postgraduate Course of Econometrics

July - August 2018 **Strumenti e Tecniche MATLAB per il Calcolo Parallelo, l'Apprendimento Automatico e l'Analisi Massiva dei Dati**

Scuola di Calcolo Scientifico con MATLAB - 2018, University of Palermo

July 2018 **Programmazione e Calcolo Scientifico con MATLAB**

University of Palermo, Palermo, Italy

Scuola di Calcolo Scientifico con MATLAB

GRANTS AND AWARDS

2024 **PhD Contribution Honourable Mention - SIS 2024**

University Aldo Moro, Bari, Italy

PhD Contribution Honourable Mention at the SIS 2024 conference for the work "Hidden Markov graphical models with generalized hyperbolic distributions: a financial analysis on commodities and green energy indexes" (joint with Petrella, L. and Merlo, L.)

2019 - 2022 **PhD Scholarship**

Sapienza University of Rome, Rome, Italy

RESEARCH PROJECTS

2024 **Quantile Regression Lab**

Co-founder of the research group Quantile Regression Lab (quantileregressionlab.github.io)

2023 **Progetti di Ricerca Medi 2023**

Sapienza University of Rome, Rome, Italy

Principal investigator of the research project "Quantile and Expectile Hidden Markov regression models with regime-switching copulas for digital assets", Sapienza University of Rome

2021 **Progetti di Ricerca Medi 2021**

Sapienza University of Rome, Rome, Italy

Member of the research group for the project: "Generalized Dynamic Graphical Models for the impact of the COVID-19 pandemic on financial markets". Principal investigator: Prof. Lea Petrella

EDUCATION AND TRAINING

Nov 2019 – June 2023 **PhD in Models for Economics and Finance, Title: "New Insights on Hidden Markov Models for Time Series Data Analysis "** ISCED 6

Ottimo cum Laude

Sapienza University of Rome, Rome, Italy

- GARCH models
- Graphical Models
- Copula-based models for financial time series Quantile Regression
- Expectile Regression
- Hidden Markov Models

2017–2019 **Master degree in Finance and Insurance**

Summa cum Laude

Sapienza University of Rome, Rome, Italy

2012–2017 **Bachelor's Degree in Mathematics**

Sapienza University of Rome, Rome, Italy

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C2	B2	C1	C2
French	B2	B1	B2	B1	B1
	Diplôme d'études en langue française (DELF) B2				

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

Digital competences

SELF-ASSESSMENT				
Information Processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Proficient user	Proficient user	Proficient user

Digital competences - Self-assessment grid

Computer skills

– competent with most Microsoft Office and Adobe programmes
– R, C++, MAtlab, HTML

Driving licence B

PUBLICATIONS

[1] **Beatrice Foroni**, Luca Merlo, and Lea Petrella. "Hidden Markov Graphical Models with Generalized Hyperbolic Distributions: A Financial Analysis on Commodities and Green Energy Indexes". In: *Methodological and Applied Statistics and Demography IV: SIS 2024, Short Papers, Contributed Sessions 2*. Springer Nature, 2025, pp. 43–48.

[2] **Beatrice Foroni**, Luca Merlo, and Lea Petrella. "Quantile and expectile copula-based hidden Markov regression models for the analysis of the cryptocurrency market." In: *Statistical Modelling* (2024). DOI: `doi:10.1177/1471082X241279513`.

[3] **Beatrice Foroni**, Luca Merlo, and Lea Petrella. "Expectile hidden Markov regression models for analyzing cryptocurrency returns". In: *Statistics and Computing* 34.2 (2024), p. 66.

[4] **Beatrice Foroni**, Giacomo Morelli, and Lea Petrella. "The network of commodity risk". In: *Energy Systems* 15.1 (2024), pp. 167–213.

[5] **Beatrice Foroni**. "New insights on hidden Markov models for time series data analysis". PhD thesis. PhD Thesis, 2023.

[6] **Beatrice Foroni**, Luca Merlo, and Lea Petrella. "Graphical Models for Commodities: A Quantile Approach". In: *Methods and Applications in Fluorescence*. Springer International Publishing, 2022, pp. 253–259.

[7] **Beatrice Foroni**, Luca Merlo, and Lea Petrella. "Using expectile regression with latent variables for digital assets". In: *Book of short papers SIS 2023*. Pearson, 2023, pp. 1309–1314.

[8] **Beatrice Foroni**, Luca Merlo, and Lea Petrella. "Analyzing the Correlation Structure of Financial Markets Using a Quantile Graphical Model". In: *Book of the Short Papers*. Pearson, 2022, pp. 852–857.

[9] **Beatrice Foroni** et al. "GLASSO Estimation of Commodity Risks". In: *Book of Short Papers SIS 2020*. Pearson, 2020, pp. 957–962.

SUBMITTED PAPERS

- 1. **Beatrice Foroni**, Luca Merlo, Lea Petrella. "Hidden Markov graphical models with state-dependent generalized hyperbolic distributions."
  Under Revision for *Canadian Journal of Statistics*, (202X).
- 2. **Beatrice Foroni**, Luca Merlo, Lea Petrella, Nicola Salvati. "Hidden Markov quantile graphical models"
  Under Revision for *Journal of Computational and Graphical Statistics*, (202X).

WORK IN PROGRESS

- 1. Beatrice Foroni, Luca Merlo, Abbas Khalili, Lea Petrella. *Hidden Markov Hubs Graphical Models.*
- 2. Emilio Ferrante, Beatrice Foroni, Luca Merlo, and Lea Petrella. *Hidden Markov nonparanormal graphical models.*
- 3. Sabrina Forte, Beatrice Foroni, Luca Merlo and Lea Petrella. *Spatial Quantile Random Forest with Splines.*