Curriculum vitae

PERSONAL INFORMATION

Luca Merlo

luca.merlo@unier.it

Date of birth 15 April 1995 | Nationality Italian

CURRENT POSITION

2022 – present

Researcher (RTDA) in Statistics

Department of Human Sciences, European University of Rome, Rome, Italy

EDUCATION

April – June 2023

Visiting research scholar

Harvard T.H. Chan School of Public Health - Harvard University, Boston, United States

Research visit under the supervision of Prof. Francesca Dominici

July 2022

Visiting period

University of Pisa, Pisa, Italy

Research visit under the supervision of Prof. Nicola Salvati

2018 – 2022

PhD in Statistical Sciences

Sapienza University of Rome, Rome, Italy

Methodological Statistics curriculum

Final grade: Ottimo Cum Laude

Thesis title: On Quantile Regression Models for Multivariate Data

Supervisor: Prof. Lea Petrella

February – March 2020

Visiting period

University of Southampton, Southampton, United Kingdom

Research visit under the supervision of Prof. Nikos Tzavidis

2016 – 2018

Master's Degree in Finance and Insurance

Sapienza University of Rome, Rome, Italy

LM-16 Finance curriculum

Final grade: 110/110 Cum Laude

Thesis title: Selection of Value at Risk Models for Energy Commodities

Supervisor: Prof. Lea Petrella

Co-supervisor: Prof. Brunero Liseo

2013 – 2016

Bachelor's Degree in Economics

Sapienza University of Rome, Rome, Italy

L-33 Economics Sciences curriculum

Final grade: 110/110 Cum Laude

Thesis title: Introduction to Lp-quantiles

Supervisor: Prof. Lea Petrella

Co-supervisor: Prof. Valeria Bignozzi

September 2015 – January 2016

Erasmus term

Université Catholique de Louvain, Louvain-la-Neuve, Belgium

Six months period in the study program of the Faculty of Economics

GPA: 19/20

TEACHING ACTIVITIES

July 2023

Financial risk modeling and forecasting using quantile regression methods

Sapienza University of Rome, Rome, Italy

Course for PhD students of the MEMOTEF Department at the Faculty of Economics, 10 hours.

2022 – 2023

Machine learning and data analytics

European University of Rome, Rome, Italy

Master's Degree in Economics and Innovation Management, 48 hours. Taught in Italian.

2022 – 2023

Statistics for business

European University of Rome, Rome, Italy

Bachelor's Degree in Economics and Business Management, 12 hours. Taught in English.

2022 – 2023

Statistics for tourism

European University of Rome, Rome, Italy

Bachelor's Degree in Tourism and valorisation of the territory, 8 hours. Taught in Italian.

July 2022

Financial risk modeling and forecasting using quantile regression methods

Sapienza University of Rome, Rome, Italy

Course for PhD students of the MEMOTEF Department at the Faculty of Economics, 10 hours.

March – April 2022

Models for risk and forecasting

Sapienza University of Rome, Rome, Italy

Teaching seminars and support activities for the course "Models for risk and forecasting", Master's Degree in Finance and Insurance, of Prof. Vincenzo Candila. Taught in English.

April 2022

Time series and financial time series

Sapienza University of Rome, Rome, Italy

Teaching seminars on R programming for the course "Time series and financial time series", Master's Degree in Finance and Insurance, of Prof. Lea Petrella. Taught in English.

March – May 2019

Analisi delle serie storiche

Sapienza University of Rome, Rome, Italy

Short course (10 hours) on R programming for the course "Analisi delle serie storiche", CdLM Finanza e Assicurazioni, of Prof. Lea Petrella. Taught in Italian.

January – September 2018

University tutor

Sapienza University of Rome, Rome, Italy

Tutoring and support activities to Bachelor's and Master's Degree students of the Faculty of Economics

WORK EXPERIENCE

November – December 2021

Collaboration contract for research activities

Sapienza University of Rome, Rome, Italy

Winner of the comparative selection procedure (contratto di lavoro autonomo bando 06/2021 prot. n. 0000659, 07/09/2021) for the development and implementation of computational algorithms in quantile regression analysis under the supervision of Prof. Petrella

January – December 2017 **Student Library Assistant**

Sapienza University of Rome, Rome, Italy

GRANTS AND AWARDS

2023 **Best PhD Thesis Award - SIS 2023**

Università Politecnica delle Marche, Ancona, Italy

Honorable Mention for the 2023 Best PhD Thesis Award in Statistics for the dissertation "On quantile regression models for multivariate data".

2023 **Best Young Contribution - SIS 2023**

Università Politecnica delle Marche, Ancona, Italy

Best Young Contribution Award at the SIS 2023 conference for the work "Quantile-based graphical models for continuous and discrete variables" (joint with Petrella, L. and Geraci, M.).

2018 – 2021 **PhD scholarship**

Sapienza University of Rome, Rome, Italy

Three-year PhD scholarship

2015 – 2016 **Merit scholarship for undergraduate students**

Sapienza University of Rome, Rome, Italy

2014 – 2015 **Merit scholarship for undergraduate students**

Sapienza University of Rome, Rome, Italy

2013 – 2014 **Merit scholarship for undergraduate students**

Sapienza University of Rome, Rome, Italy

RESEARCH INTERESTS

- Quantile regression, multivariate quantiles, M-quantiles
- Latent variable models, finite mixture models, graphical models
- EM algorithms
- Statistical models for risk measures and financial data
- Applications to longitudinal, time series and correlated data

FUNDED RESEARCH PROJECTS

2022 **Progetti di Ricerca Medi 2022**

Sapienza University of Rome, Rome, Italy

Member of the research group for the project: "Joint regression modelling of timing and intensity of events". Principal investigator: Prof. Marco Geraci

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

2020 **Progetti di Avvio alla Ricerca 2020**

Sapienza University of Rome, Rome, Italy

Principal investigator of the research project: "Multivariate Mixed Hidden Markov Model for joint estimation of multiple quantiles"

2019 **Progetti di Avvio alla Ricerca 2019**

Sapienza University of Rome, Rome, Italy

Principal investigator of the research project: "Joint VaR and ES forecasting in a multiple quantile regression framework"

CONFERENCE PRESENTATIONS

2023 **Unified unconditional regression for multivariate quantiles, M-quantiles and expectiles**

WorkshopQRome - New perspectives of quantile regression in applied sciences

Sapienza University of Rome, Rome, Italy

Invited talk, 22 September (joint with Petrella, L., Salvati, N. and Tzavidis, N.)

2023 **Quantile-based graphical models for continuous and discrete variables**

StaTalk 2023

Sapienza University of Rome, Rome, Italy

Invited talk, 15 September (joint with Petrella, L. and Geraci, M.)

2023 **Quantile-based graphical models for continuous and discrete variables**

SIS 2023 - Statistical Learning, Sustainability and Impact Evaluation

Università Politecnica delle Marche, Ancona, Italy

Contributed talk, 21-23 June (joint with Petrella, L. and Geraci, M.)

2022 **Quantile mixed hidden Markov models for multivariate longitudinal data: An application to children's SDQ scores**

CMStatistics 2022 - 15th International Conference of the ERCIM WG on Computational and Methodological Statistics

King's College London, London, England

Invited talk, 17-19 December (joint with Petrella, L. and Tzavidis, N.)

2022 **Quantile mixed hidden Markov models for multivariate longitudinal data**

ECDA2022 - European Conference on Data Analysis

University of Naples Federico II, Naples, Italy

Invited talk, 14-16 September (joint with Petrella, L. and Tzavidis, N.)

2022 **Modeling unconditional M-quantiles in a regression framework**

SIS2022 - 51st Scientific Meeting of the Italian Statistical Society

University of Campania Luigi Vanvitelli, Caserta, Italy

Contributed talk, 22-24 June (joint with Petrella, L. and Salvati, N.)

2021 **Forecasting VaR and ES using a joint quantile regression and its implications in portfolio allocation**

CFE 2021 - 15th International Conference on Computational and Financial Econometrics

King's College London, London, England

Invited talk, 18-20 December (joint with Petrella, L., and Raponi, V.)

2021 **Unconditional M-quantile regression**

CLADAG2021 - 13th Scientific Meeting Classification and Data Analysis Group

University of Florence, Florence, Italy

Invited talk, 9-11 September (joint with Petrella, L. and Tzavidis, N.)

2021 **Directional M-quantile regression for multivariate dependent outcomes**

SIS2021 - 50th Scientific meeting of the Italian Statistical Society

University of Pisa, Pisa, Italy

Invited talk, 21-25 June (joint with Petrella, L. and Tzavidis, N.)

2020 **Forecasting multiple VaR and ES using a dynamic joint quantile regression with an application to portfolio optimization**

eMAF2020 - Mathematical and Statistical Methods for Actuarial Sciences and Finance

Ca' Foscari University of Venice, Venice, Italy

Contributed talk, 18-25 September (joint with Petrella, L. and Raponi, V.)

2019 **A two-part finite mixture quantile regression model for semi-continuous longitudinal data**

IES2019 - Statistical Evaluation Systems At $360°$: Techniques, Technologies And New Frontiers

European University of Rome, Rome, Italy

Invited talk, 4-5 July (joint with Maruotti, A. and Petrella, L.)

2019 **Joint VaR and ES forecasting in a multiple quantile regression framework**

SIS2019 - Smart Statistics for Smart Applications

Università Cattolica del Sacro Cuore, Milan, Italy

Poster session, 18-21 June (joint with Petrella, L., and Raponi, V.)

2018 **Selection of Value at Risk Models for Energy Commodities**

XIX Workshop On Quantitative Finance 2018

University Roma Tre, Rome, Italy

Poster session, 24-26 January (joint with Petrella, L., and Laporta, G. A.)

CONFERENCE ORGANIZATION

December 2023 **Organizer of the Invited Session "Recent advances in quantile regression models" at the CMStatistics 2023**

CMStatistics 2023 - 16th International Conference of the ERCIM WG on Computational and Methodological Statistics

HTW Berlin, University of Applied Sciences, Berlin, Germany

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

WorkshopQRome - New perspectives of quantile regression in applied sciences

Sapienza University of Rome, Rome, Italy

CONFERENCE PARTICIPATION

2022 **XXIII Workshop on Quantitative Finance**
University of Rome Tor Vergata, Rome, Italy
31 March - 1 April

2021 **GRASPA 2021**
Sapienza University of Rome, Rome, Italy
7-9 June

2020 **MBC^2 2020 - Models and Learning in Clustering and Classification**
University of Catania, Catania, Italy
30 September

2017 **XVIII Workshop on Quantitative Finance**
Università Cattolica del Sacro Cuore, Milan, Italy
18-21 June

2016 **Workshop on Recent Advances in Quantile and M-quantile Regression**
University of Pisa, Pisa, Italy
21-25 June

PUBLICATIONS

1. Merlo, L., Petrella, L., Tzavidis, N., and Salvati, N., (2023). *Unified unconditional regression for multivariate quantiles, M-quantiles and expectiles*. **Journal of the American Statistical Association**, pp.1-26, doi: 10.1080/01621459.2023.2250512.
2. Merlo, L., Geraci, M., and Petrella, L., (2023). *Quantile-based graphical models for continuous and discrete variables*. **Book of Short Papers SIS 2023** (Proceedings), pp. 1069-1074.
3. Foroni, B., Merlo, L., and Petrella, L., (2023). *Using expectile regression with latent variables for digital assets*. **Book of Short Papers SIS 2023** (Proceedings), pp. 1309-1314.
4. Merlo, Luca, (2022). *On quantile regression models for multivariate data*. **PhD Thesis**, link: http://hdl.handle.net/11573/1613037.
5. Merlo, L., Maruotti, A., Petrella, L., and Punzo, A., (2022). *Quantile hidden semi-Markov models for multivariate time series*. **Statistics and Computing**, 32(4), pp.1-22.
6. Merlo, L., Petrella, L., and Tzavidis, N., (2022). *Quantile mixed hidden Markov models for multivariate longitudinal data: an application to children's Strengths and Difficulties Questionnaire scores*. **Journal of the Royal Statistical Society, Series C (Applied Statistics)**, 71(2), pp. 417-448.
7. Merlo, L., Petrella, L., Tzavidis, N., and Salvati, N., (2022). *Marginal M-quantile regression for multivariate dependent data*. **Computational Statistics & Data Analysis**, 173, 107500, link: https://www.sciencedirect.com/science/article/pii/S0167947322000809.
8. Foroni, B., Merlo, L., and Petrella, L., (2022). *Graphical Models for Commodities: A Quantile Approach*. **Mathematical and Statistical Methods for Actuarial Sciences and Finance - MAF 2022** (Proceedings), pp. 253-259.
9. Merlo, L., Petrella, L., and Raponi, V., (2021). *Forecasting VaR and ES using a joint quantile regression and its implications in portfolio allocation*. **Journal of Banking & Finance**, 133, 106248.
10. Merlo, L., Maruotti, A., and Petrella, L., (2021). *Two-part quantile regression models for semi-continuous longitudinal data: A finite mixture approach*. **Statistical Modelling**, doi: 10.1177/1471082X21993603.
11. Sciacchitano, Salvatore, et al., (2021). *Nonthyroidal illness syndrome (NTIS) in severe COVID-19 patients: role of T3 on the Na/K pump gene expression and on hydroelectrolytic equilibrium*. **Journal of Translational Medicine**, 19(1), pp. 1-18.

12. Scarci, M., et al., (2021). *COVID-19 After Lung Resection in Northern Italy*. **Seminars in Thoracic and Cardiovascular Surgery**, pp. S1043-0679.
13. Merlo, L., Petrella, L., and Tzavidis, N., (2021). *Unconditional M-quantile regression*. **Book of Short Papers CLADAG 2021** (Proceedings), pp. 163-166.
14. Merlo, L., Petrella, L., and Tzavidis, N., (2021). *Directional M-quantile regression for multivariate dependent outcomes*. **Book of Short Papers SIS 2021** (Proceedings), pp. 164-169.
15. Merlo, L., Petrella, L., and Raponi, V., (2021). *Forecasting Multiple VaR and ES Using a Dynamic Joint Quantile Regression with an Application to Portfolio Optimization*. **Mathematical and Statistical Methods for Actuarial Sciences and Finance - eMAF2020** (Proceedings), pp. 349-354.
16. Merlo, L., Petrella, L., and Raponi, V., (2020). *Sectoral decomposition of CO2 world emissions: a joint quantile regression approach*. **International Review of Environmental and Resource Economics**, 14(2-3), pp. 197-239.
17. Merlo, L., Petrella, L., and Tzavidis, N., (2020). *Multivariate Mixed Hidden Markov Model for joint estimation of multiple quantiles*. **Book of Short Papers SIS 2020** (Proceedings), pp. 144-149.
18. Petrella, L., Laporta, A.G. and Merlo, L., (2019). *Cross-country assessment of systemic risk in the European stock market: evidence from a CoVaR analysis*. **Social Indicators Research**, 146(1), pp.169-186.
19. Merlo, L., Maruotti, A., and Petrella, L., (2019). *A two-part finite mixture quantile regression model for semi-continuous longitudinal data*. **Book of Short Papers SIS 2019** (Proceedings), pp. 409-414.
20. Laporta, G. A., Merlo, L., and Petrella, L., (2018). *Selection of Value at Risk models for Energy Commodities*. **Energy Economics**, 74, pp. 628-643.

SUBMITTED PAPERS

1. Foroni, B., Merlo, L., and Petrella, L., (202X). *Expectile hidden Markov regression models for analyzing cryptocurrency returns*. Submitted to **Statistics and Computing** (second revision).
2. Foroni, B., Merlo, L., and Petrella, L., (202X). *Quantile and expectile copula-based hidden Markov regression models for the analysis of the cryptocurrency market*. Submitted to **Journal of Statistical Planning and Inference**.
3. Bignozzi, V., Merlo, L., and Petrella, L., (202X). *On the L_p-quantile identity for the Student t distribution*. Submitted to **Insurance: Mathematics and Economics**.

OTHER ACTIVITIES

Referee for Journal of the Royal Statistical Society, Series C (Applied Statistics); Biometrical Journal; Journal of Classification; METRON; Statistical Methods & Applications; Computational Statistics & Data Analysis; Computational Statistics

2020 – present Member of the Italian Statistical Society (SIS); Member of the young group of the Italian Statistical Society (y-SIS)

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
	First Certificate in English, University of Cambridge, Grade C				
French	B2	B2	B2	B2	B2

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

Computer skills

- Operating Systems: Windows, Linux, macOS
- Typesetting: Microsoft Office Suite, LaTeX
- Scientific and Programming: R, C, C++, MATLAB, Excel