

Leopoldo Catania

Curriculum Vitae

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Employment

2020 - present	Associate Professor	Department of Economics and Business Economics	Aarhus BSS
2017 - 2020	Assistant Professor	Department of Economics and Business Economics	Aarhus BSS

Parental Leave

15/01/2025 - 18/08/2025 (Partial paternity leave at 40% workload)

Education and Qualifications

2014 - 2017	Ph.D. candidate Economics & Finance	University of Rome, "Tor Vergata"
2014 - 2015	Graduate Program	EIEF
2012 - 2014	M.Sc. Finance (110/110 cum laude)	Sapienza University of Rome
2009 - 2012	B.Sc. Economics & Finance	Sapienza University of Rome

Visiting Periods

University of Bologna (2020, 2022, 2024), HEC Montréal (2022), University of Rome, "Tor Vergata" (2018, 2020), Université de Neuchâtel (2016, 2017), University of Cambridge (2017, 2023), Vrije Universiteit (VU) Amsterdam (2016), Vrije Universiteit Brussel (VUB) (2016)

Summary of Scientific Achievements

My scientific focus area includes: Time-series analysis, Financial Econometrics, Latent class models, and Quantitative Risk Management. From Google Scholar: 1645 Citations (since 2021), i10-index 25, H-Index 21. I published 30 research articles. Among other journals, I have published my research in: *Journal of Econometrics* (x3) (IF3.38), *Journal of Business and Economic Statistics* (x2) (IF5.12), *Econometric Theory* (IF 1.51), *Journal of Applied Econometrics* (x2) (IF3.33), *Journal of Financial Econometrics* (IF2.53), *Energy Economics* (IF7.58), *Journal of Statistical Software* (x3) (IF14.57).

To carry out my research I have collaborated with 31 coauthors located in Europe, USA, and Canada.

My research team at Aarhus University is composed by: Frederik Krabbe (Post Doc), Gabriele Mingoli (Post Doc), Giovanni Rizzelli (PhD), Jannik Steenbergen (PhD), and Davide Delfino (PhD).

I am the Principal Investigator for the research project "A new way to estimate probability densities" which was funded by DFF (6'190'564 DKK $\approx$ 830'000 €) in 2023. The project started in January 2024 and lasts until 2027. I hired two postdocs at Aarhus University for 4 years in total. I manage and coordinate my research group on a daily basis.

I have been the Principal Investigator for the research project "The Dynamic Shape of Randomness" which was funded by AUFF (2'500'000 DKK $\approx$ 335'000 €) in 2020 till 2025. The project included the hiring of one Assistant Professor at Aarhus University for four years.

Top Publications

Catania, L., D'Innocenzo, E., Luati, A. (2025), "Unobserved Component Models, Approximate Filters and Dynamic Adaptive Mixture Models", **Journal of Econometrics** (Accepted for publication). WP: <http://dx.doi.org/10.2139/ssrn.5063362>

Catania, L., Rossi, E., and Santucci de Magistris, P. (2025), "Switching Regime Integer Autoregressions", **Econometric Theory**(IF1.51), DOI: 10.1017/S0266466625100182

Catania, L., and Luati, A. (2023), "Semiparametric Modeling of Multiple Quantiles", **Journal of Econometrics**(IF3.58), DOI: 10.1016/j.jeconom.2022.11.002

Catania, L. (2021), "A Stochastic Volatility Model with a General Leverage Specification", **Journal of the Business & Economic Statistics**(IF5.12), DOI: 10.1080/07350015.2020.1855187

Catania, L. and Di Mari, R. and Santucci de Magistris, P., (2021) "Dynamic Discrete Mixtures for High Frequency Prices", **Journal of the Business & Economic Statistics**(IF5.12), DOI: 10.1080/07350015.2020.1840994

Catania, L. and Di Mari R. (2020), "Hierarchical Hidden Markov Models for Multivariate Integer-valued Time-series", **Journal of Econometrics**(IF3.58), DOI: 10.1016/j.jeconom.2020.02.002

Catania, L. (2019), “Dynamic Adaptive Mixture Models with an Application to Volatility and Risk”, **Journal of Financial Econometrics**(IF2.53), DOI: 10.1093/jjfinec/nbz018

Bernardi, M. and Catania, L. (2018), “Switching Generalised Autoregressive Score Copula models with application to systemic risk”, **Journal of Applied Econometrics**(IF3.33) 10.1002/jae.2650

Catania, L. and Billé, A.G. (2017), “Dynamic Spatial Autoregressive Models with Autoregressive and Heteroskedastic Disturbances”, **Journal of Applied Econometrics**(IF3.33), DOI: 10.1002/jae.2565.

Editorial Roles

2026 – present Associate Editor of the Journal of Financial Econometrics

2024 – present Associate Editor of the International Journal of Forecasting

2022 – present Associate Editor of Statistical Methods & Applications (Methods Section)

Referee Activity

Served as referee for: *Applied Economics, Annals of Operations Research, Chapman & Hall/CRC, Computational Statistics and Data Analysis, Digital Finance, ECB, Econometrics Review, Econometrics and Statistics, Empirical Economics, Expert Systems With Applications, International Journal of Computational Economics and Econometrics, International Journal of Forecasting (x8), Journal of Applied Econometrics (x3), Journal of Banking and Finance, Journal of Business & Economic Statistics (x5), Journal of Econometrics (x6), Journal of Econometric Methods, Journal of Empirical Finance, Journal of Financial Econometrics (x7), Journal of Futures Markets, Journal of Time Series Analysis, Journal of Risk and Financial Management, Journal of the American Statistical Association, Journal of Statistical Software, LEDGER, Macroeconomic Dynamics, Quantitative Finance, Risks, Statistical Modelling: An International Journal, Statistics, Statistics & Probability Letters, Statistical Methods and Applications, Studies in Nonlinear Dynamics & Econometrics, The Econometrics Journal, The European Journal of Finance, Physica A.*

Sessions organized in international conferences

2026 CFE 2026: Time-varying parameter models

2022 CFE 2022: Dynamic Multiple Quantile Models

2018 MAF 2018: The Econometric Analysis of Financial Time Series, CFE 2018: The Econometrics of Cryptocurrencies

2017 CFE 2017: Financial Econometrics with R

2016 IWcee16: Financial Markets

Conferences and Talks

2026 CFE 2026(Exp.), SoFiE 2026, NBER-NSF, Aarhus-Rotterdam Workshop, Volatility & Liquidity Workshop Pavia.

2025 SoFiE 2025, ICEEE 2025

2024 8th RCEA Time Series Econometrics Workshop, CFE 2024

2023 ICEEE 2023, 2023 Asia Meeting of the Econometric Society, Robust Econometric Methods in Financial Econometrics

2022 IWEEE2022, QFW2022, R/Finance 2022, IAAE 2020, SoFiE 2022, CFE 2022, Rome-Waseda 2022

2021 SoFiE 2021, NBER-NSF 2021, CFE 2021, Erasmus Research Workshop in Financial Econometrics

2020 IWEEE2020

2019 ICEEE2019, INET Cambridge 2019, SoFiE 2019, Luiss Workshop on Time Series Analysis 2019

2018 CFE2018, HAX 2018, Narodowy Bank Polski Workshop on Forecasting 2018, MBC2 2018, R/Finance 2018, eRum 2018, MAF 2018, 1st IHS

2017 CFE 2017, SoFiE 2017, ISF 2017, ICEEE 2017, RES PhD 2017, R/Finance 2017

2016 CFE 2016, Narodowy Bank Polski Workshop on Forecasting 2016, PRIN Conference 2016, IFS2016, IAAE2016, IWcee16, Belgian Financial Research Forum, MAF 2016

2015 ERCIM 2015, PRIN Workshop 2015, Narodowy Bank Polski Workshop on Forecasting 2015, Bolzano Risk School, 3rd CidE WEEE, 8th SoFiE Conference, 11th BMRC-DEMS

2014 MAF 2014, ERCIM 2014

Seminars

2026 CREST
2024 CREST, Erasmus University
2023 EDHEC Lille, University of Copenhagen
2022 CREST, Groningen University, Heidelberg University
2021 University of Bologna
2019 CREST, University of Bologna
2017 Monash University, UC3M, Erasmus University, Aarhus University
2016 Finance seminars University of Neuchâtel, Tor Vergata Lunch Seminar(x2), Econometrics Seminar (VU)
2015 Tor Vergata Informal Time Series (TVITS)

Teaching experiences

2024 Advanced Time Series Analysis (PhD, Aarhus University)
2023 Causal Inference (B.Sc., Aarhus BSS)
2022, 2024 Advanced Time Series Analysis (PhD, Luiss University)
2018 - 2026 Financial Econometrics (M.Sc., Aarhus BSS),
2018 - 2023 Advanced Financial Econometrics (PhD, Aarhus BSS)
2018 Programming in Quantitative Economics (B.A. Aarhus University)
2017 Time Series Econometrics (M.Sc. Aarhus BSS)
2016 Financial Econometrics - Computer Labs (University of Rome, "Tor Vergata")

Supervision

Main PhD supervisor: D. Delfino, G. Rizzelli, F. Okslund, P. Vallarino, F. Krabbe, J. Steenbergen
PhD co-supervisor: E. Mensali at University of Bologna.
Master students: I have supervised 50+ master students at Aarhus University in the period 2019-2025.

PhD Committee

Mathias Voldum Siggaard (2022, AU), Özge Serbest (2022, AU), Sigurd Nelleman Thorsen (2024, KU), Frederik Vilandt Rasmussen (2025, KU)

External reviewer for PhD students

Keven Bluteau (2019, University of Neuchatel), Marco Patacca (2019, University of Perugia), Sacha Lauria (2020, University of Bologna)

External reviewer for research projects

YUFE Postdoctoral Programme (2022), National Science Centre of Poland SONATA-15 (2020) and PRELUDIUM 16 (2019).

Grants and Awards

2023 DFF2 (PI): "*A new way to estimate probability densities*" 6'190'564 DKK ($\approx$ 830'000 €)
2020 AUFF NOVA (PI): *The Dynamic Shape of Randomness*, 2'500'000 DKK ($\approx$ 335'000 €)
2018 Travel Grant eRum 2018, Travel Grant R/Finance 2018
2017 SAS-IIF Research Award - Methodology, Google summer of code R package "MSGARCH",
ICEEE 2017 Best paper in Financial Econometrics, Travel Grant R/Finance 2017
2016 Google summer of code R package "GAS", Travel Grant IAAE 2016
2014 PhD Scholarship

Institutional Responsibilities

2022 – 2024 Seminar Organizer, Aarhus University.
2019 – present Member of the PhD Committee, LUISS University, Rome, Italy.

Scientific Program Committee

2026 CFE

Membership of Scientific Societies

In the last years I have been a member of the: Danish Finance Institute (DFI), the Econometric Society (ES), Italian Society of Econometrics (SIdE), the Society for Financial Econometrics (SoFiE), the International Association for Applied Econometrics (IAAE), the International Institute of Forecasting (IIF), the Italian Statistical Society (SIS), and the Royal Economic Society (RES).

Computer Code

R packages: MSGARCH (46k downloads), GAS (58k downloads), eDMA (27k downloads), MCS (38k downloads)

Training

- 2016: i) University of Rome “Tor Vergata”, Bayesian Time Series Econometrics, Prof. Dimitris Korobilis, ii) University of Rome “Tor Vergata”, High-Dimensional Covariance Estimation with Applications, Prof. Mohsen Pourahmadi.
- 2015: i) University of Rome “Tor Vergata”, State Space Modeling, Prof. Tommaso Proietti, ii) Bank of Italy, Predictive Modeling and Forecast Evaluation in Financial Markets, Prof. Allan Timmermann, iii) Free University of Bolzano–Bozen, Risk School, Prof. Fabrizio Durante, iv) EIEF, All you want to know about Dynamic Factor Models, Prof. Marco Lippi, v) National Bank of Belgium, SoFiE Financial Econometrics Summer School 2016, Prof. Christian Gouriéroux and Prof. Jean–Michel Zakoïan.
- 2014: i) University of Padua, Time Series Analysis, Prof. Siem Jan Koopman.
- 2013: i) University of Rome “La Sapienza”, International School of Text Mining, Prof. Sergio Bolasco.

Spoken Languages

Italian, English

Selected Publications

- Catania, L. (2026), “Multiple Chains Markov Switching Vector Autoregression”, **Journal of Time Series Analysis**, DOI: 10.1111/jtsa.70061
- Catania, L., Luati, A., and Vallarino, P. (2026), “Economic vulnerability is state dependent”, **Econometric Journal**, DOI: 10.1093/ectj/utag003
- Catania, L., D’Innocenzo, E., Luati, A. (2026), “Unobserved Component Models, Approximate Filters and Dynamic Adaptive Mixture Models”, **Journal of Econometrics**. 10.1016/j.jeconom.2025.106155
- Catania, L., Harvey, A., and Luati, A. (2025), “Robust CDF-Filtering of a Location Parameter”, **Journal of Time Series Analysis**(IF1.6), DOI: 10.1111/jtsa.70026
- Catania, L., Rossi, E., and Santucci de Magistris, P. (2025), “Switching Regime Integer Autoregressions”, **Econometric Theory**(IF1.51), DOI: 10.1017/S0266466625100182
- Belotti, Casini, Catania, Grassi, Perron (2023), “Simultaneous Bandwidths Determination for DK-HAC Estimators and Long-Run Variance Estimation in Nonparametric Settings”, **Econometric Reviews**(IF1.52, cit. 5), DOI: 10.1016/j.jeconom.2022.11.002
- Catania, L., and Luati, A. (2023), “Semiparametric Modeling of Multiple Quantiles”, **Journal of Econometrics**(IF3.58, cit. 13), DOI: 10.1016/j.jeconom.2022.11.002
- Catania, L. (2022), “A Stochastic Volatility Model with a General Leverage Specification”, **Journal of the Business & Economic Statistics**(IF5.24, cit. 16), DOI: 10.1080/07350015.2020.1855187
- Catania, L. and Di Mari, R. and Santucci de Magistris, P., (2022) “Dynamic Discrete Mixtures for High Frequency Prices”, **Journal of the Business & Economic Statistics**(IF5.24, cit. 15), DOI: 10.1080/07350015.2020.1840994
- Catania, L. and Grassi, S. (2022). “Forecasting cryptocurrency volatility”, **International Journal of Forecasting**(IF6.26, cit. 144), DOI: 10.1016/j.ijforecast.2021.06.005
- Catania, L., Luati, A. (2021), “Quasi Maximum Likelihood Estimation of Value at Risk and Expected Shortfall”, **Econometrics and Statistics**(IF1.36, cit. 7), DOI: 10.1016/j.ecosta.2021.08.003
- Catania, L. and Di Mari R. (2021), “Hierarchical Hidden Markov Models for Multivariate Integer-valued Time-series”, **Journal of Econometrics**(IF2.61, cit. 10), 10.1016/j.jeconom.2020.02.002

- Catania, L. (2021), "Dynamic Adaptive Mixture Models with an Application to Volatility and Risk", **Journal of Financial Econometrics**(IF3.28, cit. 15), DOI: 10.1093/jjfinec/nbz018
- Catania, L. and Proietti T. (2020), "Forecasting Volatility with Time-Varying Leverage and Volatility of Volatility Effects", **International Journal of Forecasting**(IF6.26, cit. 19) j.ijforecast.2020.01.003
- Tranberg, B. and Hansen, R.T. and Catania, L. (2020), "Managing Volumetric Risk of Long-term Power Purchase Agreements", **Energy Economics**(IF7.28, cit. 27) DOI: 10.1016/j.eneco.2019.104567
- Bernardi, M. and Catania, L. (2019), "Switching Generalised Autoregressive Score Copula models with application to systemic risk", **Journal of Applied Econometrics**(IF2.84, cit. 80) 10.1002/jae.2650
- Catania, L., Grassi, S. and Ravazzolo F. (2019), "Forecasting Cryptocurrencies Under Model and Parameter Instability", **International Journal of Forecasting**(IF4.22, cit. 175) DOI: 10.1016/j.ijforecast.2018.09.005.
- Ardia, D., Bluteau, K., Boudt, K. and Catania, L. (2018). "Forecasting Risk with Markov-Switching GARCH Models", **International Journal of Forecasting**(IF3.93, cit. 191) DOI: 10.1016/j.ijforecast.2018.05.004.
- Bernardi, M. and Catania, L. (2018), "Portfolio Optimisation Under Flexible Dynamic Dependence Modelling", **Journal of Empirical Finance**(IF1.66, cit. 33) 10.1016/j.jempfin.2018.05.002
- Catania, L. and Billé, A.G. (2017), "Dynamic Spatial Autoregressive Models with Autoregressive and Heteroskedastic Disturbances", **Journal of Applied Econometrics**(IF3.21, cit. 69), DOI: 10.1002/jae.2565.

Other publications

- Catania, L., and Luati, A. (2020), "Robust Estimation of a Location Parameter with the Integrated Hogg Function", **Statistics and Probability Letters**(IF0.88), 10.1016/j.spl.2020.108812
- Catania, L. and Nonejad N. (2020), "Density Forecasts and the Leverage Effect: Some Evidence from Observation and Parameter-Driven Volatility Models ", **European Journal of Finance**(IF1.60), DOI: 10.1080/1351847X.2019.1586744
- Catania, L. and Sandholdt M. (2019), "Bitcoin at High Frequency ", **Journal of Risk and Financial Management**(IF2.53), DOI: 10.3390/jrfm12010036
- Ardia, D., Bluteau, K., Boudt, K., Catania, L. and Trottier, D.A. (2019). "Markov-Switching GARCH Models in R: The MSGARCH Package", **Journal of Statistical Software**(IF29.99), DOI: 10.18637/jss.v091.i04.
- Ardia, D., Boudt, K. and Catania, L. (2019). "Generalized Autoregressive Score Models in R: The GAS Package", **Journal of Statistical Software**(IF29.99) DOI: 10.18637/jss.v088.i06.
- Ardia, D., Boudt, K. and Catania, L. (2018). "Downside Risk Evaluation with the R Package GAS." **R Journal**(IF2.73) DOI: 10.32614/RJ-2018-064.
- Catania, L. and Nonejad, N. (2018), "Dynamic Model Averaging for Practitioners in Economics and Finance: The eDMA Package", **Journal of Statistical Software**(IF22.37) DOI: 10.18637/jss.v084.i11,
- Bernardi, M. and Catania, L. (2018), "The Model Confidence Set package for R", **International Journal of Computational Economics and Econometrics**(IF0.44) DOI: 10.1504/IJCEE.2018.091037
- Bernardi, M. and Catania, L. and Petrella, L. (2017), "Are News Important to Predict the Value-at-Risk ?", **European Journal of Finance**(IF1.08), DOI: 10.1080/1351847X.2015.1106959.
- Bernardi, M. and Catania, L. (2016), "Comparison of Value-at-Risk models using the MCS approach", **Computational Statistics**(IF1.21), DOI:10.1007/s00180-016-0646-6.

Working Papers

Catania, L. and Mingoli G. (202X), “Autoregressive Models with Non-Causal ARCH Volatility”, *R&R Journal of Econometrics*. Available at SSRN: <https://ssrn.com/abstract=6095631>

Catania, L. Harvey, A.C. Krabbe, F. (202X) “A Generalized Filter for Regime Switching Models ”, *Under Review Econometrica*. Available at SSRN: <https://ssrn.com/abstract=7544720>

Catania, L. (202X), “The Leverage Effect and Propagation”, *Under Review Journal of Business and Economic Statistics*. Available at SSRN: <https://ssrn.com/abstract=3662346>

Catania, L. and Steenbergen, J. (202X), “Noise cancelling observation-driven models”, *Under Review Journal of Econometrics*. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.6977999>

Billé, A.G., Blasques, F., and Catania, L. (202X), “Dynamic Spatial Autoregressive Models with Time-Varying Spatial Weighting Matrices”, *Under Review Journal of Time Series Analysis*. Available at SSRN: <http://ssrn.com/abstract=3278789>

Catania, L., Luati, A., and Mikkelsen, E.B. (202X), “Dynamic Multiple Quantile Models”, *Working Paper*. Available at SSRN: <https://ssrn.com/abstract=3727513>

Work in progress

Catania, L. (202X) “A New Way to Specify Dynamic Models ”, *Working Paper*.

Catania, L. (202X) “Generalised Dynamic Additive Quantile models ”, *Working Paper*.

Catania, L., Krabbe, F., and Rahbek A. (202X) “M-Estimators with Random Constraints ”, *Working Paper*.

Catania, L. and Zakoian J.M. (202X), “Contemporaneous Asymmetry in Conditional Heteroskedasticity”, *Working Paper*.

Catania, L., Lange R.-J., and Steenbergen, J. (202X), “Implicit Filters with L1 and L2 Penalized Updates”, *Working Paper*.

Catania, L. and Mingoli G. (202X), “ L_v Consistent Kernel Density Estimation for Two-Sided Linear Processes”, *Working Paper*.

Catania, L. and Rizzelli (202X), “Multivariate Stochastic Volatility Models with Leverage Propagation”, *Working Paper*.

Catania, L., Luati, A., and Mensali, E. (202X), “Joint Value at Risk”, *Working Paper*.

Book contributions

Catania, L., Grassi, S. and Ravazzolo F. (2018) “Predicting the Volatility of Cryptocurrency Time-Series.”, *Mathematical and Statistical Methods for Actuarial Sciences and Finance 2018*. Springer. DOI: 10.1007/978-3-319-89824-7

Permanent Working Papers

Catania, L. (2014), “Dynamic Conditional Volatility Models for Risk Assessment”, *Unpublished manuscript*.