Sara Svaluto-Ferro

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Education and Academic Positions

2021–present **Assistant Professor (RTDB)**, *University of Verona, Department of Economics*, Academic field: Mathematical methods for economics, finance, and actuarial sciences.

2018–2021 **Postdoc**, *University of Vienna, Faculty of Mathematics*, Research group of Prof. C. Cuchiero.

2014–2018 **Doctor of Science ETH in Mathematics**, *ETH Zurich*, supervised by Prof. M. Larsson.

2012–2014 **Master of Science ETH in Mathematics**, *ETH Zurich*, supervised by Prof. J. Muhle-Karbe.

2008–2012 **Bachelor of Science ETH in Mathematics**, *ETH Zurich*, supervised by Prof. W. Farkas.

Teaching

Spring 2023-25 **AI and Finance**, *University of Verona*, English.

Spring 2022-25 **Fundamentals of Financial Mathematics**, *University of Verona*, Italian.

Autumn 2022 **Signature Methods in Finance: Life, Death, and Miracles**, *University of Padua*, English.

Spring 2022 **Mathematics for Economic and Financial Decisions**, *University of Verona*, Italian.

2021-25 **Recurring Seminar on Advanced Stochastic Models**, *University of Vienna*, English.

Spring 2021 **Exercises in Analysis**, *University of Vienna*, Prof. W. Schachinger, English.

Autumn 2020 **Exercises in Introduction to Financial Mathematics**, *University of Vienna*, Prof. C. Cuchiero, English.

Autumn 2015 **Exercises in Mathematical Foundations for Finance**, *ETH Zurich*, Prof. M. Schweizer and Prof. W. Farkas, English.

Autumn 2011 **Exercises in Linear Algebra and Numerical Mathematics**, *ETH Zurich*, German.

Spring 2012 **Exercises in Statistics and Probability Theory**, *ETH Zurich*, German.

Co-organization of Events

June 2025 **AMaMef 2025**, *Verona*, Italy.

December 2022 **Verona Workshop in Financial Mathematics 2022**, *Verona*, Italy.

March 2021–present **Seminar on Machine Learning in Finance**, *Online*, Worldwide.

September 2020 **13th European Summer School in Financial Mathematics**, *Vienna*, Austria.

Research Interests

Stochastic Analysis: Analysis of finite- and infinite-dimensional stochastic processes, both continuous and jump processes, with interesting analytical properties. This includes, in particular, the study of affine and polynomial processes, processes taking values in various spaces of probability measures, stochastic representations of partial differential equations (PDEs), stochastic optimization in infinite-dimensional spaces, stochastic systems of interacting particles, McKean-Vlasov equations, Markov processes, and rough paths. Researching universal structures that allow leveraging known techniques to deduce information on generic stochastic processes, with particular interest in "signature processes."

Applications: *Financial mathematics*, particularly stochastic and rough volatility modeling, large financial markets, stochastic portfolio theory, and systemic risk.

Biomathematics, particularly population genetics.

Additional Activities

2024 **National Scientific Qualification for the Role of Associate Professor**, for the fields "Mathematical Methods for Economics, Finance, and Actuarial Sciences" (13/D4) and "Mathematical Analysis, Probability, and Statistics" (01/A3).

2022–2024 **Editorial Activity**, Guest editor for the special issue titled "Machine Learning in Finance at Mathematical Finance".

2018–present **Refereeing Activity**, Annals of Applied Probability, Electronic Journal of Probability, Finance and Stochastics, Mathematics and Financial Economics, Mathematical Finance, Quantitative Finance, Stochastic Processes and their Applications.

2016–2018 **Group Organizer**, *ETH Zurich*, Organization of the group in Probability Theory, Insurance Mathematics, and Stochastic Finance.

2017 **Winner of the ACQuFRR Financial Mathematics Team Challenge**, *University of Cape Town*, South Africa.

Languages

Italian (Native), English and German (Fluent), French (Basic knowledge)

Computer Skills

Intermediate Python, Mathematica, Matlab

Basic C++

Publications (peer-reviewed), preprints, and theses

Publications

C. Cuchiero, F. Primavera, S. Svaluto-Ferro, *Universal approximation theorems for continuous functions of càdlàg paths and Lévy-type signature models*, Finance and Stochastics, to appear. http://arxiv.org/abs/2208.02293

C. Cuchiero, L. Di Persio, F. Guida, S. Svaluto-Ferro, *Measure-valued processes for energy markets*, Mathematical Finance, 2024. https://doi.org/10.1111/mafi.12452

E. Abi Jaber, C. Cuchiero, L. Pellizzari, S. Pulido, S. Svaluto-Ferro, *Polynomial Volterra processes*, Electronic Journal of Probability, 29, 2024. https://doi.org/10.1214/24-EJP1234

C. Cuchiero, G. Gazzani, J. Möller, S. Svaluto-Ferro, *Joint calibration to SPX and VIX options with signature-based models*, Mathematical Finance, 2024. https://doi.org/10.1111/mafi.12442

C. Cuchiero, L. Di Persio, F. Guida, S. Svaluto-Ferro, *Measure-valued affine and polynomial diffusions*, Stochastic Processes and their Applications, 175, 104392, 2024. https://doi.org/10.1016/j.spa.2024.104392

A. Cox, S. Källblad, M. Larsson, S. Svaluto-Ferro, *Controlled measure-valued martingales: a viscosity solution approach*, Annals of Applied Probability, 34(2), 2024. https://doi.org/10.1214/23-AAP2012

C. Cuchiero, G. Gazzani, S. Svaluto-Ferro, *Signature-based models: theory and calibration*, SIAM Journal on Financial Mathematics, 14(3), 910-957, 2023. https://doi.org/10.1137/22M1512338

C. Cuchiero, S. Rigger, S. Svaluto-Ferro, *Propagation of minimality in the supercooled Stefan problem*, Annals of Applied Probability, 33(2), 1388-1418, 2023. https://doi.org/10.1214/22-AAP1850

C. Cuchiero, S. Svaluto-Ferro, *Infinite dimensional polynomial processes*, Finance and Stochastics, 25(2), 383–426, 2021. https://doi.org/10.1007/s00780-021-00450-x

M. Larsson, S. Svaluto-Ferro, *Existence of probability measure valued jump-diffusions in generalized Wasserstein spaces*, Electronic Journal of Probability, 25, 2020. https://doi.org/10.1214/20-EJP562

C. Cuchiero, M. Larsson, S. Svaluto-Ferro, *Probability measure-valued polynomial diffusions*, Electronic Journal of Probability, 24, 2019. https://doi.org/10.1214/19-EJP290

C. Cuchiero, M. Larsson, S. Svaluto-Ferro, *Polynomial jump-diffusions on the unit simplex*, Annals of Applied Probability, 28(4), 2451-2500, 2018. https://doi.org/10.1214/17-AAP1363

Preprints

C. Cuchiero, J. Teichmann, S. Svaluto-Ferro, *Signature SDEs from an affine and polynomial perspective*, 2023. http://arxiv.org/abs/2302.01362

C. Cuchiero, F. Primavera, S. Svaluto-Ferro, *Holomorphic processes*, 2024. https://arxiv.org/pdf/2411.04238

F. Bandi, R. Renò, S. Svaluto-Ferro, *Local signature-based expansions*, 2025.

Theses

S. Svaluto-Ferro, *Probability measure-valued jump-diffusions in finance and related topics*, Doctoral thesis, 2018. https://doi.org/10.3929/ethz-b-000303781

S. Svaluto-Ferro, *Super-Replication Principle and Fundamental Theorem of Asset Pricing under Transaction Costs*, Master thesis, 2014.

S. Svaluto-Ferro, *Risk Measures and Capital Requirements*, Bachelor thesis, 2012.