MATTEO GARDINI

Curriculum Vitae

Working Experiences

2021 – present   **Quantitative Analyst - Energy Management**, *Eni-Plenitude*, Milan, Market models, risk-metrics computations and derivatives pricing.
- Power markets forward curve construction based on non-arbitrage techniques and *Python* implementation.
- Kiesel's model for energy markets Objected Oriented *Matlab* implementation: calibration, simulation and risk metrics computation.
- *Python* implementation of several historical volatility indexes such as *Parkinson*, *Garman-Klass*, *Rogers-Satchell* and *Yang-Zhang* aiming at quantify the intraday-risk.
- Development and deployment Matlab GUI for risk metrics (VaR, PaR and CVaR) computation.

2022 – present   **Contract professor**, *Department of Economics*, Genoa, General mathematics: theory and exercises.

2017 – 2021   **Quantitative Analyst - Risk Management**, *ERG Spa*, Genoa, Pricing of Energy derivatives, risk-metrics computation and stochastic models development.
- Optimization algorithms applied to Hydro-power and thermoelectric power plants based on linear and dynamic programming techniques. Stochastic modeling for photovoltaic and wind power generation.
- Stochastic modeling using Lévy processes for forward and spot energy markets: calibration and price simulations. Main models are: *Black76*, *Schwartz-Smith*, *Variance Gamma*, *Merton Jump-Diffusion*, *Normal Inverse Gaussian*.
- Risk metrics computation (VaR, ES, Greeks...) with full evaluation technique in a Heat-Jarrow-Morton framework.
- Pricing of energy derivatives such as Virtual Power Plants, Asian, Vanilla, American, swing and spread options. Numerical techniques: Monte Carlo, binomial trees, exact formulas, Fourier methods, finite differences schemes for the PDEs resolution.
- MATLAB development of the Hull-White model applied to EURIBOR rate.

2014 – 2016   **Quantitative Analyst - Bidding and Dispatching**, *A2A Trading*, Milan, Mathematical optimization modeling for hydroelectric and thermoelectric assets of the company. Fundamental models for European electricity market. Relevant activities.
- Numerical optimization model aiming at defining the optimal dispatching strategy for the hydroelectric facilities located in the Alpine region. The original optimization problem has been linearized and the final model is a mixed-integer-linear optimization one which is solved using branch-and-bound techniques.
- MATLAB with GUI development of the Italian day-ahead market algorithm (Euphemia Algorithm).
- Update and validation of different non-linear optimization models typically needed to define a medium/long term strategy for hydroelectric sites.
- Italian energy market players cluster analysis based on a *k-mean algorithm* in order to assess typical bidding strategies of the competitors and identify most active ones.

Education

2018 – 2022   **PhD - Applied Mathematics**, *Self-decomposability and Multidimensional Lévy processes in Finance*, Università degli Studi di Genova.
Thesis: Financial models in continuous time with self-decomposability: application to the pricing of energy derivatives.

2011 – 2013   **Master Degree - Mathematical Engineering**, *Quantitative Finance*, Politecnico di Milano, Milan.
Thesis: Option pricing in regime-switching.

2007 – 2011	**Bachelor Degree - Mathematical Engineering**, Politecnico di Milano, Milan. Thesis: Infinitely divisible matrices
2002 – 2007	**Scientific Diploma**, *Scientific High School Antonio Banfi*, Vimercate.

Training courses and conferences

September 2022	**YAMC**, *Università di Genova*, Genoa, Speaker: The Variance Gamma $++$ Model.
June 2021	**AMaMeF**, *Università di Padova*, Padua, Speaker: A bivariate Normal Inverse Gaussian process with Stochastic Delay.
June 2021	**Modern Stochastics: Theory and Applications V**, *University of Kyiv*, Kyiv, Speaker: Correlated Lévy processes with self-decomposability: applications to energy markets.
February 2021	**Energy Finance Italia 6**, *Università di Brescia*, Brescia, Speaker: A bivariate Normal Inverse Gaussian process with Stochastic Delay.
September 2020	**Conference on High-Dimensional Stochastics**, *Wolfgang Pauli Institute*, Vienna, Speaker: Multidimensional self-decomposable subordinators: simulations and applications.
February 2020	**Energy Finance Italia 5**, *Università di Roma Tre*, Rome, Speaker: Correlating Bivariate Lévy Processes with self-decomposability and applications to Energy markets.
June 2019	**YUIMA: Summer School**, *Università di Padova*, Brixen, Multivariate Lévy processes.
February 2019	**Energy Finance Italia 4**, *Università Milano Bicocca*, Milan.
March 2013	**Emergence in complex systems**, *Telecom ParisTech*, Paris, Genetic Algorithms.

Publications

Journal Articles

2022	**Matteo Gardini, Piergiacomo Sabino and Emanuela Sasso**, The Variance Gamma$++$ Process and Applications to Energy Markets,, in Applied Stochastic Models in Business and Industry.
2022	**Matteo Gardini, Piergiacomo Sabino and Emanuela Sasso**, A bivariate Normal Inverse Gaussian process with stochastic delay: efficient simulations and applications to energy markets, in *Applied Mathematical Finance*.
2021	**Matteo Gardini, Piergiacomo Sabino and Emanuela Sasso**, Correlating Lévy processes with Self-Decomposability: Applications to Energy Markets, in *Decision in Economics and Finance*.

Journal Articles (Under review)

2022	**Matteo Gardini, Piergiacomo Sabino**, Exchange option pricing under variance gamma-like models.

Computer skills

Programming Languages	○ MATLAB, VBA, SQL: Excellent. ○ C++, C, PYTHON: Good. ○ R, CUDA, MPI, OMP: Base.
Others skills	Office 365 Suite, LaTeX

Teaching Assistantship

2020 – 2021	**Brownian Motion and Martingales**, *Università degli studi di Genova*, Genoa, Faculty of Mathematics. Adjoint teacher: simulations and numerical applications to finance.

February 2021 **The Variance Gamma model: an application to Energy Markets**, *Helsinki*, Faculty of Mathematics, External teacher.

2019 – 2020 **Financial Engineering**, *Università degli studi di Genova*, Genoa, Faculty of Mathematics.
Teacher of the course of Financial Engineering: theory and numerical applications.

Master Thesis Supervisor

July 2021 **Fourier methods for option pricing under Lévy models**, *Fiammetta Marino*, Università degli studi di Genova - Faculty of Mathematics.

October 2020 **Financial markets: from continuous to jump diffusion models**, *Chiara Beone*, Università degli studi di Genova - Faculty of Mathematics.

February 2020 **Time changed stochastic models for European derivatives pricing**, *Elisa Cambiaso*, Università degli studi di Genova - Faculty of Mathematics.