

Giuseppina Orefice

oreficegiusy01@gmail.com — +39 3515490909

Linkedin — GitHub

Quantitative Analyst

Introduction

Master's graduate in Financial Risk and Data Analysis with a strong foundation in market risk, quantitative modeling, and data analytics. Passionate about integrating financial theory and coding to build robust frameworks for risk reporting, P&L analysis, and stress testing, especially in dynamic sectors such as energy and commodities. Experience working with high-frequency market data, pricing models, and volatility-based signals to support data-driven decision-making. Proficient in Python and R with a hands-on and adaptable mindset.

Education

Sapienza University of Rome

Rome, Italy

Master's Degree in Financial Risk and Data Analysis

Oct 2023 – July 2025

GPA: 110 cum laude/110 (4.0)

Relevant courses: Quantitative Financial Modelling, Econometrics, Machine Learning and Deep Learning, Time Series, Risk Management, Fixed Income, Probability and Stochastic processes.

Thesis: *"Decoding skew with rough volatility models and machine learning"* The main goal of the dissertation was decoding the ATM Skew using a hybrid approach between rough volatility model (rBergomi) with Hurst exponent less than 0.5 and machine learning (XGBoost).

- Estimation of a multiscale and multifractal Hurst exponent to take into account features of the volatility that change across time; used sp500, crude oil, natural gas futures, Next Era Energy stocks with multi-asset framework, real based approach and working with intraday and high-frequency data;
- Simulated log-price paths using the hybrid scheme for applying the rBergomi. rBergomi was simulated using the multiscale H estimated in the step before for each time to maturity with a calibrated forward curve. For the simulation I have used API as yahoo finance and as stock SPY.
- Construction of a XGBoost for the prediction of the implied volatility using features like VIX, strike, time-to-maturity, greeks and additional Principal Components for capturing hidden insights.
- Performing feature importance and hyperparameter tuning to avoid overfitting. Achieved lower error metrics and high Spearman correlation (0.93 on test set), indicating good generalization ability.
- Using the estimated implied volatilities for capturing the ATM Skew.
- Extracted ATM skew and compared model skew to market skew; proposed systematic signal strategies (risk reversals, hedging).

Università Vanvitelli di Caserta

Caserta, Italy

Bachelor's in Economics and Finance

Sept 2020 – July 2023

GPA: 108/110 (4.0)

Thesis: *"Credit risk management in cooperative credit banks: analysis of bank BCC Terra di Lavoro"*

Certifications

CFA Level I Candidate — Exam scheduled for November

Experience

Credit Risk Analyst Traineeship — BCC Iccrea Bank

Casapulla, Jan 2023 – Mar 2023

- Traineeship during Bachelor's.
- Estimated default probabilities and applied Basel regulations.
- Analyzed risk exposures in the Italian banking system by compiling and interpreting large datasets, providing insights to senior analysts.

Relevant projects (Individual and Group)

For checking them GitHub

Prediction and signal volatility generation

- Prediction of rolling volatility done with CatBoost on crude oil futures; -Signal generation for a trading strategy;
- Currently doing backtest.

Value at Risk and Expected Shortfall

- Estimated VaR using historical simulation, variance-covariance, and Monte Carlo methods.
- Computed Expected Shortfall for risk evaluation.

Options Pricing

- Simulated option prices on commodities using Monte Carlo methods;
- Applied variance reduction techniques (e.g., antithetic variates, control variates) to enhance computational efficiency.

Black-Scholes Model (Group Project)

- Studied theory and calibration of the BSM;
- Computed option Greeks and calibrated IV;
- Applied BSM to simulated stock data and hedging strategies.

Forecasting crude oil price using ARIMA and SARIMAX

- Applied ADF test for stationarity and differencing;
- performed hyperparameter tuning for finding the best coefficients for the application of ARIMA and SARIMAX;
- Forecasting crude oil price using the best model;
- Application of the ensemble learning methods with ARIMA and SARIMAX for capturing hidden insights useful for the practical approach.
- Achieved higher accuracy after tuning.

Estimation of the PD using Random Forest.

- Applying a baseline Random Forest on a dataset of potential defaulters (Consumers and PMI);
- Done techniques of resample to avoid imbalance estimation;
- Applying hyperparameter tuning (Grid Search and Randomized Search) to enhance the performance;
- Performance metrics: AUC-ROC curve, confusion matrix, accuracy, precision, F1 score;
- Final conclusions for credit risk management purposes.

Technical Skills

Programming Languages and Libraries: Python (Advanced - *NumPy, pandas, scikit-learn, TensorFlow/Keras, SciPy, statsmodels, Numba for performance optimization*), R (Intermediate)

Quantitative Modelling and Finance: Black-Scholes (Option Pricing and Hedging), Heston and Rough Bergomi (Stochastic Volatility Modelling), GARCH, ARIMA, VAR (Time Series Analysis and Forecasting).

Mathematical Concepts: Stochastic Calculus, Numerical Methods (Monte Carlo Simulation, Finite Difference), Optimization Techniques.

Risk Modelling: Credit Risk Models, Basel Framework, Value at Risk (VaR), Expected Shortfall (ES), PD, LGD, EAD, Vasicek model, Brier' score, Jeffrey's Prior, Stress Tests for model development and validation under IRB and IFRS 9 frameworks.

Machine Learning and Data Analysis: Supervised Learning (Random Forest, Gradient Boosting, Neural Networks, Support Vector Machines), Unsupervised Learning (K-Means Clustering, PCA).

Techniques: Cross-validation, Hyperparameter Tuning (Grid Search, Randomized Search), Feature Engineering, Model Evaluation.

Portfolio Management: Construction and monitoring of discretionary portfolios, performance metrics, asset allocation strategies, compliance verification (market rules, ethics, internal constraints).

Tools and Platforms: Git (Version Control), Bloomberg Terminal (Hands-on), LaTeX (Technical Documentation), Excel (Advanced for financial modelling), Data Visualization (Matplotlib, Seaborn), SQL (basic)

Soft Skills

Individual Work:

- Strong analytical mindset with the ability to structure and evaluate complex financial information;
- Self-motivated and technically driven, with a proven ability to work independently on data-driven solutions;
- Comfortable with fast-paced, high-pressure environments and adaptable to evolving systems and processes.

Teamwork and Communication:

- Effective communicator able to collaborate with cross-functional teams including IT and sales;
- Open to feedback and knowledge sharing in collaborative environments;
- Experience presenting research and delivering practical insights to non-technical stakeholders.

Languages

Italian (Native), English (Fluent), French (Intermediate), Spanish (Beginner), German (Beginner - Currently improving German language skills through intensive courses, aiming for professional fluency.)