Competenze principali

Financial Econometrics

Econometrics

Stochastic Modeling

Publications

Pairs Trading: a latent variable model based on Kalman Filter

The impact of supply and demand imbalance on stock prices: An analysis based on Fractional Cointegration using Borsa Italiana ultra high frequency data

Mattia Manzoni

Model Validation @ Banca Sella Holding

Milano

Riepilogo

Technical Skills (application and often implementation from scratch):

1) Econometrics: Multivariate Regression, Discrete variable models (i.e. Logit), Time series models (i.e. AR/MA, ARCH/GARCH), Vector AutoRegressive model (VAR), Cointegration (Engle-Granger, VECM), Long-memory process (Fractional Integration), Regime switching models (Hamilton Filter), Kalman Filter, Unobserved Components ARIMA model, Beveridge-Nelson decomposition (Hansen's approach), Copula methods, Metropolis-Hastings algorithm, Black-Litterman model (Meucci's approach), Hierarchical Risk Parity

2) Quantitative Trading (Mid-High Frequency Trading): Stat Arb & Pairs Trading models, Order Imbalance & Order Replenishment effects on intraday returns, Optimal Setup of Entry-Exit Trading Triggers for Quant Trading Strategies, Stat Arb Bertram Model, Data sampling rules for non equally-spaced data (time vs. volume clock for high freq data), Bid-Ask Bounce Bias & Sahalia Method for Microstructure Noise Estimation & Test, Hayashi-Yoshida Lead-Lag Index, D'Aspremont Method for Mean Rev Portfolios, Market Fragmentation in Financial Markets, High-Low prices & Pivot Points trading rule, Trend Following Strategy, Avellaneda-Stoikov Model for Optimal Trading Execution

3) Risk Management: P&L production & analysis for energy trading, VaR & Profit at Risk for energy trading, PD credit models, Merton approach for Credit VaR (migrations included), EVT & Copula-based VaR, Stress Test models, Structured Credit Models (Regulatory Risk-Transfer), Additional Value Adjustments for Balance Sheet, Risk Aggregation, Model Risk, Interpolation Methods for multi-year PD Term Structure, Methods for Semidefinite-Positive Corr Matrix Adjustment

4) Financial Mathematics: Longstaff-Schwartz, HJM model (Glasserman's scheme), Greeks with Finite Difference Method, CPPI Products & Cushion Multiplier Setup

5) Machine Learning: Support Vector Machine, Decision Tree, Principal Component Analysis & Regression, XGBoost, Random Forest

Esperienza

Banca Sella
Model validation
dicembre 2021 - Present (4 mesi)
Milano, Lombardia, Italia

UniCredit
Team Manager - Local Credit Risk Validation (Foreign Branches)
febbraio 2014 - dicembre 2021 (7 anni 11 mesi)
Milano, Italia

- Member of the Group Internal Validation Department, with a specific focus on quantitative model validation;
- Steering of validation activities for 6 offices in Central and Eastern Europe (~40 persons)
- Validation of Pillar 1 (PD, EAD, LGD), ICAAP and managerial models (Credit VaR model for default and migration risks for UniCredit Group Portfolio, Securitizations for Risk Transfer, EBA Stress Test models, Additional Value Adjustments for Balance Sheet, Backtesting Models for Liquidity Risk, Spread VaR, Risk Aggregation, Model Risk, Business Risk, Perdar), in terms of code reliability (mainly using R and Matlab, with autonomous re-implementation of internally developed models) and model design, providing an overall assessment for internal and external regulatory purposes;
- Production of Validation Report on internal models, mainly including quantitative analyses (application of statistical tests on model parameters, reliability of theoretical framework and results, sensitivity analysis for risk indicators,...).

Alma Mater Studiorum - Università di Bologna
Lecturer
marzo 2019 - marzo 2019 (1 mese)
Bologna, Italia

Lecturer (14 hours) of "Quantitative Systematic Investments & Algorithmic Trading" at Corso di Alta Formazione in Finanza Matematica (Financial Mathematics post degree course)

Syllabus: http://www.dm.unibo.it/finanza/2018/show_ins.php?item=corso_55

Politecnico di Milano
Research Fellow in Applied Econometrics
gennaio 2010 - dicembre 2018 (9 anni)
Milano, Italia

Research area and topics:
Financial Applied Econometrics, Markets Microstructure, Algorithmic Trading, Statistical Arbitrage, Energy Trading, High Frequency Data

Teaching Assistant:
1) Applied Econometrics Course (14 hours in academic year 2010/2011) - Assistant of Full Professor Rocco Mosconi - Master of Science Course at Politecnico di Milano (Management Engineering);
2) Applied Econometrics Course (14 hours in academic year 2011/2012) - Assistant of Full Professor Rocco Mosconi - Master of Science Course at Politecnico di Milano (Management Engineering);
3) Applied Econometrics Course (14 hours in academic year 2012/2013) - Assistant of Full Professor Rocco Mosconi - Master of Science Course at Politecnico di Milano (Management Engineering);

Graduated Student Supervision:
1) Francesco Delledonne (MSc Management Engineering - Politecnico di Milano - 2012)
2) Michele Malegori (MSc Management Engineering - Politecnico di Milano - 2013)
3) Giulia Moro (MSc Management Engineering - Politecnico di Milano - 2013)
4) Daniel Squindo (MSc Management Engineering - Politecnico di Milano - 2014)
5) Simona Sanna (MSc Management Engineering - Politecnico di Milano - 2014)
6) Luca Maestrini (MSc Management Engineering - Politecnico di Milano - 2015)
7) Luca Meroni (MSc Management Engineering - Politecnico di Milano - 2016)
8) Clarissa Bardelli (MSc Management Engineering - Politecnico di Milano - 2017)

External Courses:
- Qtrade Bootcamp 2015 (2015): Tutorship on Quantitative Trading topics (pairs trading models, high frequency trading via order imbalance)
- Corso di Alta Formazione in Finanza Matematica (2019): Quantitative Systematic Investments & Algorithmic Trading

PhD Referee:
Phd thesis Referee, selected for my academic experience in Financial Econometrics and job expertise in the Energy Commodity sector ("A particle filter approach to parameter estimation in stochastic volatility models with jumps for crude oil market" - Gaetano Fileccia)

Eni
Financial Modelling Analyst (Commodity Market Risk)
maggio 2012 - febbraio 2014 (1 anno 10 mesi)
San Donato Milanese

- Member of the start up risk management team of Eni Trading Department (DIMID), the newborn trading area aimed at managing commodity price risk (Oil, Natural Gas, Power, Emissions);
- Design and development of ad hoc tools for daily PnL calculation of part of DiMiD portfolio, including cash flows generated by physical derivatives - Natural Gas, Power, LNG, Steam, CO2 - transferred from Eni Gas & Power to Eni DiMiD, and financial derivatives concluded by the front office to reduce the initial transferred risk exposure;
- On demand in-depth analysis concerning relevant variations of exposure and risk of DiMiD portfolio, to convey to DiMiD Top Management the explanation of the main causes of the observed phenomena;
- Internal model validation of an "in-house" developed quantitative tool of risk measurements for DiMiD portfolio analysis.

ENOI S.p.A.
Commodity Structurer & Quantitative Analyst
giugno 2011 - aprile 2012 (11 mesi)

- Production of analytical reports for internal customers (CEO, Managing Director, Chief Risk Officer, Head of Trading), concerning company counterparts, trading strategies and market point of view on economic fundamentals driving energy markets (main focus on European Natural Gas derivatives);

- Design of structured products, creating and maintaining pricing and hedging models;
- Proactive quantitative support for potential trading strategies (IT tools: Matlab and SQL), building decision support econometric models and setting of risk parameters;
- Evaluation and VaR estimation of selected portfolio positions (VaR Risk metrics), supporting trading, origination and risk management business decisions;
- Quantitative credit and cash flow analysis on the different rules of margin call payments (OTC vs. clearing house).

Borsa Italiana (London Stock Exchange Group)

Markets Analyst

febbraio 2010 - maggio 2011 (1 anno 4 mesi)

- Data elaboration for Group markets statistics and press release;
- Documents preparation for internal (Top Management, Markets team, Finance, Press Office) and external clients (CESR, Consob, Courts, University, Assosim), with data extraction from internal database using SQL;
- Automation of Group reports with VBA and daily check of data integrity inside internal database with IT tools;
- Constant monitoring and production of reports for LSE Group internal customers about MiFiD impacts on financial markets, in particular about the increasing importance of MTFs and Algorithmic Traders in the international framework;
- International collaborations with UK Markets Analysis team, based in London at London Stock Exchange.

Formazione

Politecnico di Milano

Master of Science, Management Engineering - Finance · (2004 - 2009)

Istituto Gonzaga

High School · (1999 - 2004)