Thomas VAUDESCAL

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Personal profile

Quantitative Researcher at Greenberg Management, a fintech specializing in quantitative trading solutions for qualified investors. Passionate about quantitative finance, derivatives, and systematic trading strategies. Holder of a Master's in Financial Engineering from HEC Montréal, with professional experience as Quantitative Analyst at Deloitte (credit risk modeling) and Quantitative Developer at National Bank Financial Markets (SmartBeta strategies, $800M AUM). My thesis, **Gamma Exposure and Intraday Volatility Dynamics in the SPX Options Market**, analyzes the impact of dealer gamma hedging on SPX realized volatility using high-frequency options data (5-minute intervals, 2 billion data points, August 2020–July 2025). Specialized in options, volatility trading, and market microstructure.

Professional Experience

Greenberg Management

Montreal, Canada

Quantitative Researcher

May 2025 - Present

- Develop and optimize systematic trading strategies (Momentum, Volatility Risk Premium, Mean Reversion) across US equities, indices, options, and fixed income markets.
- Design and implement volatility strategies harvesting the VRP through systematic derivatives trading, achieving **25% annualized returns** over a 7-year period with controlled drawdown (∼25%).
- Build cloud-based algorithmic trading infrastructure in Python; execute and monitor strategies with 7-figure monthly volume.
- Collaborate with derivatives trader to systematize discretionary volatility strategies into fully automated trading systems.
- Conduct quantitative research on options pricing, Greeks dynamics, and market microstructure to enhance signal generation and execution.
- **Stack**: Python, cloud infrastructure, options analytics, algorithmic execution, backtesting frameworks, risk management.

Financial Engineering & Modeling - Financial Risk | Deloitte

Montreal, Canada

Quantitative Analyst

October 2024 - June 2025

- Developed and validated credit risk models (PD, LGD, EAD) for major Canadian financial institutions under IFRS 9 and Basel III/IV regulatory frameworks.
- Led independent model validation engagements: statistical backtesting, sensitivity analysis, stress testing, and regulatory documentation for OSFI compliance.
- Performed quantitative assessment of model assumptions, calibration methodologies, and discriminatory power using Gini coefficients and KS statistics.
- Built automated model monitoring dashboards and validation pipelines in Python, reducing manual review time by **40%**.
- Authored technical validation reports and presented findings to senior stakeholders and client risk committees.
- **Stack**: Python, R, SQL, statistical modeling, regulatory compliance (IFRS 9, Basel III/IV, OSFI guidelines).

Global Equity Derivatives R&D - Structured Products & Exotics | National Bank Financial Markets

Montreal, Canada

Quantitative Developer Intern

May 2023 - December 2023

- Developed and deployed SmartBeta strategies (Low Volatility, Momentum) managing **$800M AUM** within a $7B structured products division.
- Achieved **$1M annual cost savings** through strategy optimization and migration from external vendor to internal production systems.
- Built end-to-end backtesting framework in Python: signal generation, portfolio construction, transaction cost modeling, risk analytics, and performance attribution.
- Implemented portfolio optimization algorithms with constraints (turnover limits, sector exposure, factor tilts) using convex optimization (cvxpy).
- Delivered weekly quantitative reports to senior stakeholders; presented strategy performance and risk metrics to trading desk and portfolio managers.
- Collaborated with structuring and trading teams to integrate quantitative signals into exotic derivatives pricing and hedging workflows.
- **Stack**: Python (OOP), Bloomberg Terminal & API, SQL, AWS (EC2, S3), optimization algorithms, statistical testing.

Videns Analytics

Montreal, Canada

Data Analyst

April 2020 - June 2021

- Designed and delivered data science curriculum (Python, statistics, ML) for *Videns Academy* platform; content adopted by UQAC for university course.
- Built predictive models and automated reporting pipelines for insurance clients, improving claims analysis and risk assessment workflows.
- Led consulting engagements in insurance analytics: data cleaning, exploratory analysis, and dashboard development for client decision-making.
- Promoted from intern to full-time Data Analyst based on project delivery and client satisfaction.

Education

HEC Montreal
Montreal, Canada

MSc in Financial Engineering - Thesis
August 2022 - December 2024

- **Thesis:** Gamma Exposure and Intraday Volatility Dynamics in the SPX Options Market – Analysis of dealer gamma hedging impact on realized volatility using 5-minute options data (2B+ data points, Aug 2020–Jul 2025).
- **GPA:** 3.88/4.3. Recipient of the Deloitte M.Sc scholarship and the Jocelyne & Jean C. Monty scholarship of excellence for academic merit.
- **Hackathons:** ConUHacks VIII winning team for National Bank challenge 2024 (1000+ participants). Top 10 finalist at McGill FIAM Portfolio Management Hackathon (66 teams).
- **Leadership:** Vice President Research at the Trading Club – organized workshops on derivatives and systematic trading. R&D Analyst at BNI-HEC Investment Fund ($5M AUM) – conducted equity research and portfolio analysis.
- **Courses:** Stochastic Calculus, Derivatives Pricing, Fixed Income Securities, Financial Econometrics, Machine Learning for Finance, Numerical Methods, Risk Management.

HEC Montreal
Montreal, Canada

Bachelor's degree in Business Administration | specialization in Mathematics, Finance and Economics
August 2017 - May 2022

- **GPA:** 3.8/4.3 for specialization courses. Selective quantitative track combining advanced mathematics, economics, and finance.
- **Leadership:** Vice President Education at the Data Science Committee – organized Python workshops and machine learning seminars.
- **Competitions:** RITC Trading Competition participant – simulated trading in equities and derivatives markets.
- **Teaching:** Teaching Assistant for Intermediate Microeconomics (200+ students). Private mathematics tutor (Calculus, Linear Algebra).
- **Courses:** Econometrics, Portfolio Management, Options & Futures, Quantitative Finance, Probabilistic Models, Corporate Finance.

University of Montreal
Montreal, Canada

Minor in Mathematics
August 2018 - August 2022

- Complementary mathematics program completed concurrently with BBA to strengthen quantitative foundations.
- **Courses:** Probability Theory, Mathematical Statistics, Stochastic Processes, Linear Algebra, Multivariable Calculus, Real Analysis, Programming (C/C++).

Skills

Programming	**Python** (5+ years): NumPy, Pandas, SciPy, statsmodels, scikit-learn, PyTorch, cvxpy, QuantLib. **SQL**, R, C/C++, Matlab, VBA.
Quant Finance	Options pricing, Greeks, volatility modeling, gamma exposure analysis, backtesting, portfolio optimization, risk management, market microstructure, systematic trading, time series analysis, Monte Carlo simulation.
Data & Tools	Bloomberg Terminal, large-scale data processing (2B+ records), Git, Docker, AWS, REST APIs, WebSocket (live data), Linux/Shell.
Research	Scientific writing, quantitative research methodology, statistical analysis, academic publications, technical presentations.

Languages

French	Native
English	Professional proficiency (spoken and written)

Interests

Sports	Marathon running, mountain hiking, indoor climbing, swimming, weight training, scuba diving.
Intellectual	Chess (1800 Elo), mathematics, philosophy, programming.