Saad Mouti, Ph.D.

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Research interests. Volatility modeling and derivatives pricing; empirical asset pricing and factor model inference; machine learning, generative models, and causal inference for market and insurance risk; computational and energy finance; actuarial science.

Academic Appointments

University of New Haven, West Haven, CT August 2025 – present
Assistant Professor, Department of Mathematics and Physics, College of Arts and Sciences
Coordinator, B.S. in Actuarial and Mathematical Sciences

Worcester Polytechnic Institute, Worcester, MA August 2024 – June 2025
Postdoctoral Fellow, Department of Mathematical Sciences. Host: Professor Fangfang Wang.

University of California, Santa Barbara July 2021 – July 2024
Visiting Assistant Professor, Department of Statistics and Applied Probability. Host: Professor Michael Ludkovski.

University of California, Berkeley May 2018 – June 2021
Postdoctoral Fellow, Consortium for Data Analytics in Risk (CDAR). Supervisors: Professors Lisa Goldberg and Robert Anderson; funded by Swiss Re.

Evry University, France 2012 – 2016
Lecturer in Finance and Insurance, Master of Financial Engineering program.

Industry Experience

Crosure Inc. Present
Co-founder and Board Member (part-time)

- Built the company's actuarial function from the ground up.
- Developed the risk models used for insurance product pricing and premium calculation.
- Established the quantitative approach to underwriting risk assessment.

AXA Group Risk Management, Paris 2012–2015 (part-time), May 2016 – Dec. 2017
Quantitative Engineer

- Built a pricing tool for variable annuity products in C++ from scratch, working from the commercial brochures, with a template model to run pricing and produce the output analyses.
- Studied rational policyholder behavior for variable annuities; the results changed the design of several products.
- Investigated dynamic hedging strategies for option-like products under IFRS and US GAAP.
- Developed capped volatility funds and constant proportion portfolio insurance (CPPI) to reduce risk and improve the risk-return profile of the funds.
- Led the preparation of risk reviews presented to the Chief Risk Officer, which changed assumptions at the entity level. Also worked on mortality modeling and capital requirements.

Internships. AXA Group Risk Management, Paris, 2011, eight months: implied volatility surface modeling. AXA Hedging Services, Paris, 2010, six months: capped volatility funds.

Education

Pierre and Marie Curie University (UPMC), Paris December 2017

Ph.D. in Applied Mathematics in Finance

- Advisors: Professor Nicole El Karoui (UPMC) and Professor Mathieu Rosenbaum (Ecole Polytechnique).
- Thesis: "Risk management for Insurance Companies: a Financial Markets Approach." Funded by the Industrial Research Initiative program; conducted partly at AXA Group Risk Management.

Dauphine University, Paris 2011

M.Sc. in Statistical Processing of Information: Bayesian statistics, Monte Carlo methods, time series analysis.

ENSIMAG, Grenoble 2010

Master of Financial Engineering and M.Sc. in Quantitative Finance (double degree with Grenoble IAE). Merit scholarship for Grandes Ecoles d'Ingenieurs.

Honors and Awards

- **Whitley Professorship in Mathematics and Physics**, University of New Haven, January 2026. Awarded at the College level for teaching, in the first year of appointment.
- Second place, SWUFE FinTech competition, Chengdu, China, two consecutive years, as leader of the UC Berkeley team.
- Merit scholarship, Grandes Ecoles d'Ingenieurs, France.

Working Papers

1. **S. Mouti**. "Rough Volatility Across Assets." Sole authored. arXiv:2608.16749, August 2026. *Target: Quantitative Finance.* Tests rough volatility on 3,926 US equities, 34 CME futures roots and options on 44 underlyings in one pipeline, and maps where the methods identify H and where they fail.
2. A. Horenstein, P. Maio, **S. Mouti**, F. Wang. "Inference on Cross-Sectional Fit in Linear Factor Models." SSRN 6460038, March 2026. Authors listed alphabetically. Derives the asymptotic distribution of the cross-sectional R^2 and of differences across models, providing hypothesis testing and standard errors for factor-model comparisons.
3. **S. Mouti**. "Rough volatility: evidence from range volatility estimators." arXiv:2312.01426, 2024. Estimates roughness from Parkinson and Garman-Klass range proxies; superseded in part by the 2026 cross-asset study, which finds that range estimators introduce spurious roughness.

Publications

Book

1. A. Kalife, L. Goudenège, X. Tan, **S. Mouti**, M. Bellmane. *Sustainable Life Insurance: Managing Risk Appetite for Insurance Savings and Retirement Products.* Chapman & Hall/CRC Financial Mathematics Series, 2023.

Refereed Journal Articles

2. C. R. Tramontt, **S. Mouti**, M. R. L. do Vale, X. Li, C. Delon, S. Armes, R. Golubic, S. Ray. "Do markers of adiposity and glycaemia mediate the association between low carbohydrate diet and cardiovascular risk factors: findings from the UK National Diet and Nutrition Survey (NDNS) 2008–2016." *BMJ Nutrition, Prevention & Health*, 2023.
3. X. Dai, **S. Mouti**, M. Lima do Vale, S. Ray, J. Bohn, L. Goldberg. "A resampling approach for causal inference on novel two-point time-series with application to identify risk factors for type-2 diabetes and cardiovascular disease." *Statistics in Biosciences*, 2023.
4. L. Goldberg, **S. Mouti**. "Sustainable investing and the cross-section of returns and maximum

drawdown." *The Journal of Finance and Data Science*, Vol. 8, 2022.

5. M. Lima do Vale, L. Buckner, C. G. Mitrofan, C. R. Tramontt, S. K. Kargbo, A. Khalid, S. Ashraf, **S. Mouti**, X. Dai, D. Unwin. "A synthesis of pathways linking diet, metabolic risk and cardiovascular disease: a framework to guide further research and approaches to evidence-based practice." Cambridge University Press, 2021.
6. A. Kalife, G. Lopez Ruiz, **S. Mouti**, X. Tan. "Optimal behavior strategy in the Guaranteed Minimum Income Benefit product." *Insurance Markets and Companies*, Vol. 9, 41–69, 2018.
7. G. Livieri, **S. Mouti**, A. Pallavicini, M. Rosenbaum. "Rough volatility: Evidence from option prices." *IISE Transactions*, Vol. 50, No. 9, 767–776, 2018.
8. A. Kalife, **S. Mouti**. "On optimal options book execution strategies with market impact." *Market Microstructure and Liquidity*, Vol. 6, Issue 3, 2016.
9. A. Kalife, **S. Mouti**, X. Tan. "Minimizing the market impact of hedging insurance liabilities within risk appetite constraints." *Insurance Markets and Companies*, Vol. 6, Issue 2, 2015.
10. L. Wang, A. Kalife, X. Tan, B. Bouchard, **S. Mouti**. "Understanding guaranteed minimum withdrawal benefit: a study on financial risks and rational lapse strategy." *Insurance Markets and Companies*, Vol. 6, Issue 1, 6–21, 2015.
11. A. Kalife, L. Goudenège, **S. Mouti**. "Managing gap risks in iCPPI for life insurance companies." *Insurance Markets and Companies*, Vol. 5, Issue 2, 2014.
12. A. Kalife, **S. Mouti**, L. Wang. "Financial risk management and the rational lapse strategy in life insurance policies." *Insurance Markets and Companies*, Vol. 4, Issue 2, 2013.

Refereed Conference Proceedings

13. M. Ludkovski, **S. Mouti**, G. Swindle. "Least-cost structuring of 24/7 carbon-free electricity procurements." *IEEE Power & Energy Society General Meeting*, Seattle, 2024. arXiv:2312.07733.

Invited Talks and Conference Presentations

- 2026 Cambridge Forum on Health & AI, Cambridge, UK. *Talk*: Generative AI for Health and the Years a Treatment Buys.
- 2026 39th New England Statistics Symposium, Storrs, CT.
- 2026 AMS Joint Mathematics Meetings, Washington DC. *Organizer and moderator*, Special Session on Financial Mathematics: Theory and Practice.
- 2025 Cambridge Forum on Tech For Good, Cambridge, UK. *Talk*: Finance for good: A causal inference framework for ESG investing.
- 2025 38th New England Statistics Symposium, New Haven, CT.
- 2025 AMS Spring Eastern Sectional Meeting, Hartford, CT. *Co-organizer*, session on Frontiers of Financial Mathematics (sustainable and energy finance).
- 2023 Southern California Probability Symposium, UC San Diego, CA.
- 2016 Workshop on Rough Volatility Modeling, Imperial College London, UK.
- 2016 Frontiers in Stochastic Modeling for Finance, Padova, Italy.
- 2014 Market Microstructure: Confronting Many Viewpoints, Paris, France.
- 2014 7th Financial Risks International Forum: Big Data in Finance and Insurance, Paris, France.
- 2013 6th Financial Risks International Forum: Liquidity Risk, Paris, France.

Teaching

University of New Haven (2025–present)

Course	Level	Terms
MATH 1117 Calculus I	Undergrad.	Fall 2025, Spring 2026, Fall 2026
MATH 3371 Probability and Statistics I (P Exam)	Undergrad.	Fall 2025
MATH 4472 Probability and Statistics II	Undergrad.	Spring 2026

Worcester Polytechnic Institute (2024–2025)

MA 1024 Multivariate Calculus	Undergrad.	Fall 2024, Spring 2025
MA 2621 Probability and Applications	Undergrad.	Fall 2024, Spring 2025

University of California, Santa Barbara (2021–2024)

Five courses per academic year plus two in summer.

PSTAT 120A Probability and Statistics I (P Exam)	Undergrad.	2021–2024
PSTAT 120B Probability and Statistics II	Undergrad.	2021–2024
PSTAT 126 Regression Analysis	Undergrad.	2021–2024
PSTAT 160A/160B Applied Stochastic Processes	Undergrad.	2021–2024
PSTAT 171 Mathematics of Fixed Income Markets (FM Exam)	Undergrad.	Spring 2022–2024
PSTAT 182T Actuarial Exam Tutorial (P and FM Exam prep)	Undergrad.	2021–2024

Evry University, France (2012–2016)

Finance and Insurance Lecturer, Master of Financial Engineering program: financial instruments and derivatives pricing. Graduate level.

Courses Prepared to Teach

Derivatives and options; fixed income; investments and portfolio analysis; financial modeling; financial analytics in Python; risk management; volatility modeling; probability and statistics.

Mentoring and Supervision

- **University of New Haven, 2025–present.** Supervising an undergraduate honors project on climate risk and insurance premium pricing in Connecticut, connecting actuarial science to property and casualty insurance through statistical analysis of public data.
- **UC Santa Barbara, 2021–2024.** Committee member, Undergraduate Lab of the Center for Financial Mathematics and Actuarial Research (CFMAR); selected and paired a dozen students from a pool of 60 with mentors for two-quarter research projects.
- **AXA Group Risk Management.** Supervised a graduate student from the Master of Financial Mathematics at Pierre and Marie Curie University / Ecole Polytechnique through a six-month internship. We co-authored a paper; she went on to a Ph.D. at the Laboratoire Jacques-Louis Lions.
- **Student project topics supervised:** American option pricing by finite differences compared with physics-informed neural networks; classification methods for asset return prediction; causal inference for survival analysis; deep learning in asset pricing; neural networks for control problems.

Professional Service and Program Development

Program Accreditation and Curriculum (University of New Haven, 2025–present)

- **Led the UCAP-IC recognition application to the Society of Actuaries. Granted.**
- **Led the Bronze recognition application to the Casualty Actuarial Society. Granted**, extending the program's affiliation to the property and casualty sector.
- Developed the SOA Exam P alignment documentation for MATH 3371 and mapped the program's curriculum pathway toward the SOA preliminary exams.
- Corporate Partnership Council member; build an insurance-industry contact list and serve as liaison

to regional employers, working with the Career Development Center on an employer pipeline in Hartford, Stamford and New York.
- Department Outreach Committee; updated recruitment materials and presented at Fall and Spring Accepted Students Day and the November Open House.

Conference and Seminar Organization
- **Organizer**, Special Session on Financial Mathematics: Theory and Practice, AMS Joint Mathematics Meetings 2026, Washington DC. Invited speakers, reviewed abstracts, coordinated presenters, moderated the session.
- **Co-organizer**, session on Frontiers of Financial Mathematics, AMS Spring 2025 Eastern Sectional Meeting, Hartford, CT, focused on sustainable and energy finance.
- **Co-organizer**, Financial Mathematics Seminar, Worcester Polytechnic Institute, 2024–2025.

Other Service
- Board member and Chair, Berkeley Postdoctoral Entrepreneurship Program (BPEP); organized a workshop on gender equality with female entrepreneurs from several sectors.
- Team leader, UC Berkeley team, SWUFE FinTech competition, Chengdu, China; second place two years in a row.
- Board member, two technology startups, one of them an insurtech.

Skills and Languages

Programming: Python, R, Matlab, C++, VBA, SQL.
Machine learning: PyTorch, TensorFlow and Keras.
Languages: English, French, Arabic, all fluent.