SAI PRAKASH

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Education

Madras School of Economics — *Chennai*
Master of Arts in Applied Quantitative Finance — *2023 – 2025*

Central University of Tamil Nadu — *Thiruvarur*
Bachelor of Arts in Economics — *2020 – 2023*

Experience

MicroSave Consulting (MSC), Research Intern — *Dec 2025 – Mar 2026*

- Constructed climate-adjusted credit risk scenarios for an MFI loan portfolio by engineering district-level physical hazard indicators from 200+ OCR-digitised government reports and web-scraped media sources; stress-tested expected loan losses under drought, flood, and cyclone scenarios, quantifying portfolio-at-risk exposure by geography
- Engineered a composite district risk scoring model integrating multi-source hazard, exposure, vulnerability, and adaptive capacity data for 50+ districts; applied weighted aggregation methodology to rank and shortlist districts for UNDP field deployment
- Analysed climate finance expenditure data across two states, identifying scheme-level allocation gaps and quantifying adaptation financing shortfalls against national targets

Projects

Credit Scoring and PD Estimation | *Python, scorecardpy, XGBoost, scikit-learn*

- Developed WoE-based logistic scorecard on 307K retail loan applications with IV-driven feature selection; achieved Gini 45.2% (XGBoost benchmark: 45.9%), within the 40–60% industry range for retail PD models
- Corrected balanced-weight miscalibration (MAE: 0.354 to 0.0018) via Platt scaling; threshold analysis at PD 0.10 yields 55.9% default capture rate at 73.8% portfolio approval rate

Volatility Modelling and Conditional VaR | *Python, ARIMA-GARCH, arch, yfinance*

- Fitted ARIMA(1,0,0)-GARCH(1,1) on 5 years of Coromandel International daily returns; confirmed ARCH effects via Engle's LM test ($p < 0.001$); estimated persistence 0.915, volatility shock half-life ~ 8 trading days
- Derived conditional 1-day VaR from time-varying GARCH volatility; backtested 250 days using Basel traffic light framework; peak 99% VaR 8.08% vs mean 4.16%, with elevated volatility windows aligning with Cyclone Asani (2022) and monsoon deficit (2023)

Options Pricing and Volatility Analysis | *Python, Black-Scholes, Binomial Tree*

- Built Black-Scholes pricer, analytical Greeks, and CRR binomial tree from first principles; tree converges to BS price within 0.004 at $N = 500$, confirming theoretical equivalence
- Extracted IV from live NSE Nifty 50 options chain (141 strikes) using Brent's method; smile shows ATM IV 18.5% vs OTM put IV 43.0%, skew spread 8.55 pp

Coursework

IIT Madras | *BS in Data Science and Applications* — *Online (2024 – Present)*

Madras School of Economics | *Selected Coursework*

Financial Derivatives	Fixed Income Securities	Risk Analysis and Management
Financial Mathematics	Econometric Methods	Stochastic Calculus & Quant. Finance
Corporate Finance	Mathematical Methods	Applied Macro & Fin. Econometrics

Certifications and Skills

Certifications

Climate Data · **Public Policy** · **Python 101** · **R for Data Science** · **Advanced SQL**

Skills

Programming	Python (pandas, NumPy, scikit-learn, statsmodels, arch, scipy) · R (tidyverse, forecast) SQL (window functions, CTEs) · Stata · LaTeX
Tools	Power BI · MS Excel · QGIS · Git