Tanishk Yadav

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Education

New York University — New York, NY
Master of Science in Financial Engineering, Tandon School of Engineering — May 2027
Coursework: Econometrics & Time Series, Volatility Models, Derivative Securities, Fixed Income Quant Trading, Risk Management

SRM University-AP — Amaravati, India
Bachelor of Technology in Computer Science & Engineering (AI & Machine Learning); 100% merit scholarship — Jun 2025
Coursework: Linear Algebra, Multivariable Calculus, Differential Equations, Probability & Statistics, Algorithms, Machine Learning

Master's Thesis

The U.S. Sovereign Debt Doom Loop: A Point-in-Time Framework for Identification, Market Pricing, and Policy Response
MS thesis, NYU; advisor Prof. David Shimko · Overview — *In progress, May 2027*

- **Identification.** Tests in real time when US debt dynamics turn self-reinforcing: rebuilds the marketable Treasury debt bond by bond from 11,000+ auctions since 1979 and reads 39 macro series exactly as first published
- **Market pricing.** Asks whether the bond market sees fiscal stress first: measures the Treasury volatility risk premium (implied versus realized) and a regime-switching stress state, and tests whether either leads the fiscal gap under multiple-testing control
- **Policy response.** Prices five policy responses against four shocks over 30-year debt paths, running two independently estimated macro engines (a VAR and a regime-switching hidden Markov model) on identical random draws so every comparison is like for like
- **Rigor.** Every assumption is tested out of sample or bounded by the literature, then cross-examined by an LLM agent over a purpose-built 147-paper corpus (hybrid vector and keyword search, citation graph); invariance tests rule out lookahead

Research & Projects

RateWalk: Forecasting Fed Decisions with a Shrunk Markov Chain Paper & code — *Working paper, 2026*

- Turns each Fed meeting into a calibrated hike, hold, or cut probability to set against Treasury-curve pricing: a Markov chain on policy moves and inflation regimes, CPI read as first published, tested out of sample in the US, UK, and Germany, 1990-2026
- Caught its own regime model overfitting and fixed it with empirical-Bayes shrinkage, replicated in all three countries; blended with a Treasury-curve proxy, it calls 72.7% of 319 Fed decisions vs 54.6% for the proxy alone: the curve reads moves, the chain reads holds

Too Big to Co-Move: Concentration and Sector Connectedness Around the World Paper & code — *SSRN preprint, 2026*

- Asked what mega-cap concentration does to sector diversification as the top 10 stocks grew from 24% to 41% of the S&P 500: filtered TVP-VAR connectedness across the 11 sectors, 2018-2026, on point-in-time constituents, then ten other markets
- Concentrated sectors co-move less (a 1-point rise in top-3 share cuts monthly R^2 by 0.75 points, permutation $p = 0.04$), yet the leaders trade as one cluster across three sectors, so a sector-diversified book is less diversified than it looks

Calm Months, Crash Months: Why Volatility Management Pays for Momentum Paper & code — *SSRN preprint, 2026*

- Tested the volatility-targeting rule systematic funds use to size factor bets the way an investor could have run it: only past data, exposure capped at 1.5x, 14 bp per unit of exposure change, the Fama-French five factors plus momentum, 1973-2026
- Only momentum improves (Sharpe 0.43 to 0.94 net, Holm-adjusted $p = 0.023$); explained why with a closed-form formula for momentum's market beta, tested on CRSP with no fitted parameter (slope 0.92 against a predicted 1)

VolEdge: Measuring the Variance Risk Premium from Option Chains Paper & code — *Working paper, 2026*

- Built a full-stack platform (Python, FastAPI, React) that measures the variance risk premium option sellers collect, reading implied variance, skew, and kurtosis model-free from live option chains (Bakshi-Kapadia-Madan) against realized moments
- Net of costs over 2019-2024, a GARCH volatility-targeting strategy beat SPY (Sharpe 0.85 vs 0.68, 41% smaller drawdown) while naively selling variance lost money (Sharpe −0.16): the premium is payment for crash risk, not free yield

Multi-Scale Regime Detection for Adaptive Sector Portfolios Paper & code — *SSRN preprint, 2026*

- Capital-preservation overlay that de-risks only when two of four independent stress signals agree: walk-forward 2009-2025, net of costs, max drawdown −6.2% vs −41.7% for SPY (Sharpe 0.97 vs 0.58), unchanged on factor (1.21) and international (1.04) books

Also built: ChronoFund, SEC filings dated so no backtest sees them early (65 tests); PinSight, 0DTE options priced off implied densities

Experience

New York University — New York, NY
Course Assistant, Valuation for Financial Engineering (Prof. David Shimko) — Sep 2026 - Present
Contributor, Valuation Principles, Prof. Shimko's graduate valuation textbook (Wiley, in preparation) — Jun 2026 - Present

- Picked by the professor to lead four course assistants; resolve questions on mortgage prepayment and Treasury curve bootstrapping
- Restructured the book's Monte Carlo and variance-reduction material, built its figures, companion Python notebooks, and five Excel models, reconciled the 164-page solutions manual, and proposed additions the author approved into the text

Skills

Programming: Python (pandas, NumPy, SciPy, statsmodels, scikit-learn), SQL, R, C++ (coursework); FastAPI, React, Git, LaTeX
Data and training: Bloomberg Terminal, WRDS, SEC EDGAR/XBRL, FRED/ALFRED; ARPM Quant Bootcamp (2026)