Zachary Polaski, CFA, FRM

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Summary

Quantitative systems architect and derivatives specialist with 7+ years designing, building, and operating production-grade pricing, hedging, and regulatory capital platforms for Fixed Indexed Annuities (FIA), Registered Index-Linked Annuities (RILA), and defined-outcome (DO) strategies. Owns trading-adjacent quantitative infrastructure supporting $2B+ in client liability fair value and $1M+/year in client billings, bridging actuarial, derivatives, and portfolio-management functions.

Expert in arbitrage-free option and volatility modeling (SVI/SSVI, Heston, Black–Scholes, Hull–White, G2++), large-scale Monte Carlo and scenario systems, and NAIC/SEC regulatory frameworks (VM-21, AG-54, 18f-4). Proven ability to translate market data, dealer surfaces, and risk metrics into actionable pricing, hedge construction, capital, and governance decisions for both internal trading teams and external insurance clients.

Work Experience

Quantitative Developer — *Milliman Financial Risk Management • Chicago, IL (Remote)* — Nov 2018 – Present

- Owned pricing, volatility, and risk infrastructure supporting $2B+ in FIA liability fair value, including automated Greek, shock, and attribution pipelines that directly drove cap rates, hedge rebalancing, and client portfolio decisions.
- Designed and implemented arbitrage-free option and volatility models (Practitioners Black–Scholes, SVI/SSVI, Heston, G2++/Hull–White) used in live pricing, hedge design, and statutory valuation across multiple client programs.
- Spearheaded development of the SEC Rule 18f-4 Program VaR engine for defined-outcome products, enabling compliant risk limits, stress testing, and portfolio construction for exchange-traded options strategies.
- Owned the AG-54 / VM-21 regulatory capital simulation platform, including rules-based hedge rebalancing, credit transition and default models, and the end-to-end GPVAD pipeline linking pricing engines, governance controls, and statutory/economic capital reporting.
- Architected real-time conversion of American option surfaces into implied European volatility surfaces, enabling consistent pricing, hedging, and scenario analysis across dealer quotes and exchange markets.
- Developed and operated systematic fund strategies (volatility targeting, portfolio insurance, multi-asset and risk-parity variants) integrated directly into production pricing and hedging workflows.
- Ran nightly model calibrations, dealer quote ingestion, and strategy execution through C# and C++ engines, APIs, and ETL pipelines supporting next-day trading and client reporting.

Investment Performance Analyst — *The Northern Trust • Chicago, IL* — Aug 2015 – Jul 2016

Investment Operations Analyst — *The Northern Trust • Chicago, IL* — Aug 2013 – Aug 2015

Risk Analyst — *Porsche Financial Services • Chicago, IL* — Apr 2012 – Jun 2013

Technical Skills

Derivatives, Risk & Regulation: FIA and RILA pricing, defined-outcome products, arbitrage-free volatility surfaces (SVI/SSVI), stochastic volatility (Heston), interest-rate models (Hull–White, G2++), dynamic hedging and Greeks, SEC Rule 18f-4 Program VaR, NAIC VM-21, AG-54, GPVAD, statutory and economic capital, RBC.

Quantitative Systems: Large-scale Monte Carlo and scenario engines, American-to-European surface conversion, dealer quote ingestion, real-time calibration, rules-based hedge rebalancing, credit transition and default modeling, portfolio insurance and volatility-targeted strategies.

Programming & Platforms: C# (production services, async pipelines, schedulers, ETL and I/O pipelines), C++ (QuantLib - pricing engines, market environments, numerical methods), SQL (schema design, stored procedures), MATLAB (model prototyping).

Data, Infrastructure & Governance: Dealer APIs, ETL pipelines, CI/CD, Git, Azure DevOps, regression and unit-test frameworks, controlled production deployment under audit and model-risk governance.

Analytics & Tooling: Excel (VBA, XLL add-ins), Visual Studio, VS Code, LaTeX.

Education

University of Lisbon, ISEG — M.S. in Mathematical Finance — 2018

Benedictine University — B.B.A. in Finance, *Summa Cum Laude* — 2012

Professional Certifications

CFA Charterholder (since 2016); Member CFA Societies Miami, Chicago.
FRM Certified (since 2020).