

PolySystems Risk Neutral Economic Scenario Generator

PolySystems Risk Neutral Economic Scenario Generator (RN ESG) is easy-to-use, audit-ready, and appropriate for LDTI Market Risk Benefits. Our solution is vendor-based and generates rigorous interest and equity scenarios without the requirement of in-depth, in-house financial expertise. PolySystems can either provide fully vetted scenarios within your close cycle or you can produce the scenarios in-house. Our arbitrage-free model combines a flexible Lognormal Forward Model (LFM) with a stochastic volatility SABR equity model.

Risk Neutral ESG Consulting Services

Contact us today to help:

- Develop an automated process to translate market data from your source to our format
- Develop correlations
- Customize our risk neutral validation framework to your needs
- Build and validate historical scenario sets for MRB implementation
- Build auditor-ready documentation for your scenario sets
- Create incremental scenario sets to support your MRB Analysis of Change framework
- Provide fully vetted and documented scenario sets within your MRB valuation close cycle

Inputs

PolySystems RN ESG calibrates to the following inputs:

- Reference rates (e.g., OIS, SOFR, or LIBOR yield curve)
- Interest rate caplet volatilities
- Equity option volatilities and dividend yields
- Interest rate and equity correlations

Calibration

Our calibration process is fast and removes the burden of producing mathematically tractable target curves and surfaces from the user by:

- Fitting interest rate volatility curves based on Rebonato's formulas
- Fitting a SABR equity volatility surface to market observable smiles
- Ensuring positive semi-definiteness of the fitted correlation matrices

You may review the targets, adjust inputs, and recalibrate if desired.

Scenario Generation

Our generation process ensures your scenarios are fit-for-purpose:

- Projects the full yield curve, not just the short rate
- Stochastic equity volatilities result in more accurate option pricing
- Selects surface correlations according to remaining time to maturity
- Uses antithetics to achieve convergence with fewer scenarios
- Maintains arbitrage-free characteristics throughout the projection

Validation

PolySystems validation framework of Martingale, payoff, volatility, convergence, and correlation tests demonstrates the overall soundness and risk neutrality of our economic scenario generator.

Our LFM interest and SABR equity RN ESG and the resultant scenarios are fully integrated with the PolySystems suite but may also be used as a standalone module. Please contact us for a copy of our white paper.

Contact Us

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