

- ✓ Axioma Fixed Income Spread Curves™
- ✓ **Axioma Factor Based Fixed Income Risk Model™**
- ✓ Axioma Granular Fixed Income Risk Model™

AXIOMA FACTOR-BASED FIXED INCOME RISK MODEL

Advanced modeling to reliably capture systematic risk

Powered by proprietary methodologies for issuer classification and modeling issuer spread returns, the Axioma Factor-based Fixed Income Risk Model enables portfolio and risk managers to construct investment portfolios with better control for tracking error and rigorously manage exposure to investment style factors.

Our Approach

The Axioma Factor-based Fixed Income Risk Model combines:

1 Parsimonious credit factor model

Coverage for spread risk of corporate, foreign currency sovereign (EM, DM), sub-sovereign and supranational bonds in all major and minor currencies for IG and HY

2 Granular key rate factors and rate volatility factors

Coverage for interest rate risk

3 Covariance with multi-asset class risk factors

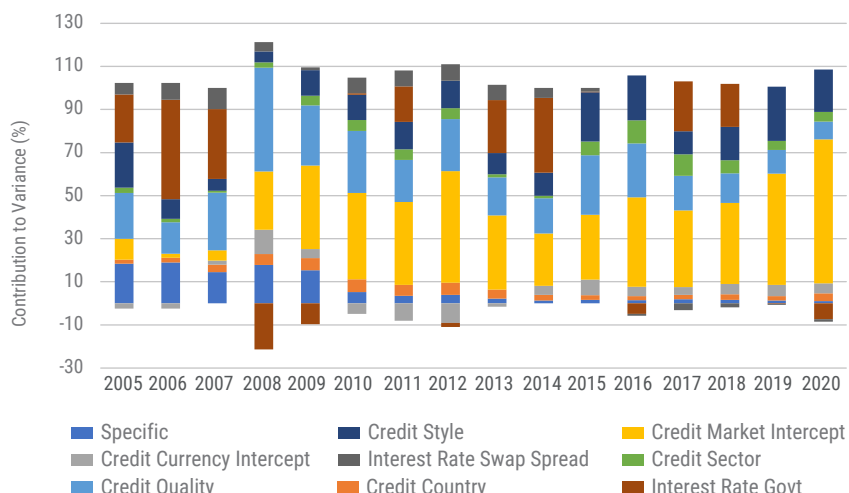
Covering equities, commodities, FX, etc.

The factor model is derived from a cross-sectional regression on thousands of issuer-level spread returns with Duration Times Spread (DTS)-based factor exposures. The factor structure incorporates:

- > Global and regional market factors
- > Currency factors
- > Quality factors by region
- > Sector factors
- > Style factors: momentum, value, beta, size and steepness

The factors have been rigorously tested for statistical significance in explaining returns and are comparable to Axioma's industry-leading equity risk factor models in capturing factor risk.

Risk attribution through time for a US high yield benchmark to the model factors



Key Differentiators

✓ Meaningful risk factors

Portfolio risk attribution can be derived from statistically significant factors (sector, quality, style, etc.)

✓ Style factors as risk model components

Risk premia returns for style-tilted portfolios can now be captured by systematic factors in the risk model

✓ Superior specific risk estimation

Granular bond-level specific risk derived from issuer spread curves is combined with issuer specific risk derived from the parsimonious factor model

✓ Risk differentiation across spread regimes

Beyond DTS, risk is further differentiated across four spread quality categories

✓ Model built on issuer spread curves

Factor return estimation based on 4,500 issuer spread returns; bond exposures generated from 12,000 full term structure issuer spread curves and an additional 6,000 rating-sector-currency-region aggregate curves produced daily

✓ Proprietary issuer classification system

New methodology to classify issuers that maximizes the number of relevant bonds used to construct issuer curves, assigns a country and sector of risk, and separates out bonds with different risk characteristics

Additional Details

- > **Extensive history:** More than a 17-year history of daily fixed income risk factor returns
- > **Delivery method:** This model is available in the Axioma Risk™ platform with output that can be directly imported into the Axioma Portfolio Optimizer™

Axioma Factor-based Fixed Income Risk Model can be used for:

✓ Risk Management

Monitor and manage risk through ex-ante risk decomposition

✓ Factor-based Investing

Construct smart beta strategies and tilt portfolios

✓ Index Replication

Create tracking baskets to replicate broad fixed income indices

✓ Factor-based Risk Attribution

Attribute portfolio risk to the risk factors

Axioma Factor-based Fixed Income Risk Model is intended for:

- > Fixed Income quant or smart beta investors
- > Quantamental hedge funds
- > Sell-side quant strategy teams focused on fixed income factors
- > Fixed income fund managers pivoting to smart beta strategies
- > Investors investigating style biases in fixed income strategies
- > Asset managers constructing benchmark-tracking ETFs

To learn more about Qontigo, please contact us, or visit qontigo.com



sales@qontigo.com
info@qontigo.com



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