

# Two Approaches to Buy-Side Scenario Analysis

## bobs guide

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Buy-side firms increasingly offer a diverse set of funds and products to meet the risk appetites and investment objectives of their institutional clients. Multi-asset, long-only, and leveraged portfolios all have very different characteristics that require front and middle office technology

solutions capable of supporting increasingly sophisticated risk management capabilities. Scenario analysis is an essential and versatile tool that enables firms to anticipate and model portfolio impacts in both normally functioning and stressed markets.

This article discusses two approaches to scenario analysis and the central role of buy-side technology in facilitating those capabilities. While stress tests are a well-known application of scenario analysis, this tool has additional uses that complement other risk management measures such as Value at Risk and volatility. Although scenario analysis is most often associated with gauging the impact of negative events, it can also be useful for constructing and analyzing upside scenarios to help portfolio managers allocate capital to new opportunities.

### Factor-based Scenario Analysis

Using factor models for scenario analysis lets portfolio managers come up with realistic scenarios based on historical risk factor covariances. Users specify shifts to a few key factors, and scenario analysis then adjusts the remaining factors. This captures the correlated effects of factor shifts on the portfolio and ensures that the historical correlation between factors is preserved.

Using investable factors to test strategies and allocations (such as style and momentum for equities or key rate durations and spreads for fixed income exposures) has intuitive appeal. Because the factors are investible, it is easier to identify biases at the portfolio and enterprise levels and remediate them.

#### Applications of factor-based scenario analysis include:

- a) Enabling better informed asset allocation and portfolio construction
- b) “Big-picture” strategic decision making
- c) Exposing unintended biases that could adversely impact performance

While factor models provide a powerful method of decomposing and attributing risk, attribution is most useful under normally functioning (non-stressed) market conditions. To simulate stressed market conditions portfolio managers can use factor covariance matrices from a stressed market period.

### Economic Scenario Analysis

Scenario analysis based on economic models lets firms specify stressed market conditions in broad strokes, and gauge the portfolio impact of any conceivable event, either historical or hypothetical. Users can stress individual market variables and apply both parallel and custom interest rate changes, credit spreads, mortgage prepayments, and FX and equity shifts to their portfolios.

Horizon analysis is a variation of economic scenario analysis that gradually applies shifts and then displays portfolio performance over a horizon term ranging from days to years. The analysis incorporates a reinvestment rate for any cash flows received, including coupon or dividend payments, prepayments, and evaluating whether calls and puts will be exercised by a bond's issuer within that term.

Economic modeling performs a full revaluation of the portfolio and dynamic cash flow projections for each scenario. Cash flows can then be compared to a benchmark in order to assess shortfalls and surpluses. This type of analysis is not constrained by historical correlations and is generally more realistic and accurate than factor-based analysis. However, it is highly dependent on the assumptions used to define the scenarios.

*“Stress-tests improve an asset manager’s resilience in times of market stress regardless of regulation. Consequently, best-in-class firms will accommodate emerging trends in asset management that affect investors well before regulators take action.”*

– Asset Managers Face Rising Regulatory Scrutiny

Boston Consulting Group

Full revaluation introduces significant computational complexity, especially for portfolios holding FAS 157 Level 2 and 3 assets that are hard to value due to liquidity constraints. Technology platforms need to support three related capabilities:

- a) An integrated data model that supports terms and conditions data across all asset classes and the ability to use preferred pricing data from multiple sources
- b) A sophisticated analytical engine with extensive pricing routines and rules to ensure they are applied properly
- c) A flexible and intuitive user interface that facilitates data exploration and hedging, rebalancing and generation of trading ideas.

### Applications of economic scenario analysis include:

- a) Regulator-mandated bank, insurer and pension stress tests
- b) Hedge validation to determine whether proposed trades will ensure sufficient portfolio inoculation
- c) What-if analysis to understand portfolio impacts of stressed scenarios

	Economic Model	Factor Model
<b>Shift type</b>	Uncorrelated	Correlated
<b>Factors to shift</b>	<ul style="list-style-type: none"> <li>• Interest rates</li> <li>• Credit spreads</li> <li>• Inflation</li> <li>• Prepayments</li> <li>• Equity</li> </ul>	Targeted model factors such as: <ul style="list-style-type: none"> <li>• Interest rates</li> <li>• Markets</li> <li>• Style/Size</li> <li>• Statistical</li> </ul>
<b>Shift realization</b>	Immediate or gradual	Immediate
<b>Input pricing</b>	Multi-sourced	Multi-sourced
<b>Results</b>	<ul style="list-style-type: none"> <li>• Fair values</li> <li>• Returns</li> <li>• Analytics</li> </ul>	<ul style="list-style-type: none"> <li>• Fair values</li> <li>• Returns</li> </ul>

### OVERVIEW OF ECONOMIC AND FACTOR BASED SCENARIO ANALYSIS >

## Technology Demands

The growing importance of risk management to buy-side firms requires technology solutions capable of providing on-demand risk metrics, coupled with the scalability and performance needed to handle large multi-asset portfolios and computationally intensive risk calculations and scenarios. The following considerations are key when evaluating risk technology solutions and vendors:

**Usability:** Historically, disparate risk reporting and portfolio management tools resulted in cumbersome manual workflows and backward looking views of risk. Modern front and middle office solutions provide firms with risk and scenario analysis capabilities integrated directly in the portfolio management workspace. The transition from static reporting to interactive analytical tools provides portfolio managers with immediate, actionable results that greatly reduce the time required to move from scenario construction and analysis to implementing hedging and de-risking decisions.

**Instrument coverage and data:** Institutional portfolios can contain thousands of exchange traded and OTC instruments across multiple geographies. Technology solutions must incorporate an extensive security master and the requisite data feeds to accurately value every instrument in the portfolio. While equities are relatively straightforward, fixed income and derivatives require significantly more data, including zero curves and spread curves, and CDS data to evaluate credit factors.

**Scenario evaluation:** For factor-based scenario analysis, either a multi-asset factor model or several asset-class specific factor models must be supported. Technology solutions built on an open architecture allow firms to incorporate both bespoke and third party models with minimal integration overhead.

For economic scenario analysis, a highly performant scenario evaluation engine is needed to ensure near-real time valuations and hedge validations. Industry standard valuation methodologies must be supported, in addition to any constraints or requirements mandated by regulators.

## Summary

With global AUM at an all-time high, the confluence of highly leveraged institutional portfolios and growing macroeconomic risk make it imperative for buy-side firms to maintain a detailed and realistic view of risk across asset classes, portfolios and business lines. Scenario analysis is a versatile and powerful tool that helps portfolio managers identify and respond to the most relevant risk drivers impacting their portfolios, assess their risk tolerance, and ensure adherence to investment policies and risk mandates.

Firms depend on technology vendors to build, maintain and support the risk management solutions they need to perform realistic and timely risk assessments. Providing portfolio managers with better tools, accessible from a single workspace where they can analyze and act on risk drivers impacting their portfolios, should be required functionality in any modern buy-side technology stack.

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