



MULTI-MANAGER PORTFOLIO CONSTRUCTION

CUSTOM PORTFOLIO CONSTRUCTION

Creating Powerful Manager Combinations

Northern Trust
conducts a
disciplined,
four-step
process before
recommending a
portfolio solution.

To design a diversified portfolio tailored to your risk/return needs, Northern Trust Global Advisors (NTGA) uses modern portfolio theory and leverages industry-leading manager research and analysis tools.

Northern Trust's manager of managers practice has been researching and monitoring investment managers for client programs for more than 25 years. In that time, we have developed the skill, resources and processes to research, compare and select money managers worldwide. Today, we continuously track approximately 5,000 global money managers with specific investment specialties, recommending fewer than 300 to clients.

DISCIPLINED PROCESS

Before recommending a portfolio solution to you, Northern Trust completes a disciplined, four-step process.

- Asset Allocation Analysis
- Investment Manager Selection
- Asset Class Fulfillment
- NTGA System of Interactive Testing and Evaluation (NSITE)

Asset Allocation Analysis

Our Investment Policy Committee, made up of senior asset management professionals, reviews and approves investment policy for all clients. The committee forecasts market

returns, analyzing market correlation and volatility. This information drives our efficient frontier and provides a broad framework for designing an optimized portfolio to accommodate your specific needs.

Investment Manager Selection

To understand each manager's unique investment process and discipline, we use a rigorous, uniform process employing both qualitative and quantitative tools. We develop a qualitative sense of how different managers' styles complement each other before testing statistically to determine which manager combinations provide the most compelling risk/return results.

Asset Class Fulfillment

Strategic combinations of managers are used to fulfill your asset allocation objectives. Each investment manager has a style or philosophy that works better in certain financial conditions than others. Using a single manager in any asset class can leave you vulnerable to style risk – fluctuations in performance as financial conditions vary.

Combining complementary managers can help reduce portfolio volatility and provide enhanced returns. Style- and capitalization-neutral portfolios help manage risk by combining managers whose approaches have low levels of correlation with one another.

CONTINUED



You will receive a portfolio recommendation only after a series of rigorous tests have been completed.

Holdings-based analysis measures manager skill in security selection.

NSITE

To position your portfolio for success in changing market environments and to gain further insight into the true structure of the portfolio, each potential solution goes through a rigorous series of tests. These tests help us fine-tune various allocation scenarios so as to understand and manage sources of risk. If a particular allocation scenario triggers a flag in one stage of the analysis, we adjust the allocations before moving on to the next stage.

Returns-Based Analysis. Northern Trust goes beyond common industry practices to analyze return statistics.

RETURNS-BASED ANALYSIS	
COMMON INDUSTRY PRACTICE	NORTHERN TRUST PROCESS
<p>Review absolute and relative performance on a cumulative and calendar year basis.</p> <p>Measure information ratio and Sharpe ratio.</p> <p>Risk is defined by tracking error and standard deviation.</p> <p>Low-correlated products influence selection.</p>	<p>Analyze a broad set of absolute and relative statistics.</p> <p>Perform ratio analyses on both a cumulative and rolling basis.</p> <p>Confirm style bias through regression and fundamental analysis.</p> <p>Examine up-market capture and down-market protection.</p> <p>Look for consistency across time periods and market environments.</p> <p>Measure batting averages (percentage of times the portfolio has beaten its benchmark) for returns as well as a variety of other statistics and ratios.</p>

Fundamental Holdings-Based Analysis. This stage of testing measures manager skill in security selection, based on three core beliefs.

- Fundamentals, the key drivers of a manager’s investment style, are more sensitive than returns to changes in manager allocations.
- A manager following a strict style discipline will display strategic fundamental traits.
- Skill in security selection is a significant source of a manager’s excess returns.

The goal of holdings-based analysis is to leverage each manager’s stock selection expertise, while managing inherent risks

from style or capitalization. We evaluate a broad set of historical and forward-looking fundamentals. These include the same measures the underlying managers would consider when selecting securities for their portfolios, the most common of which include:

- Price-to-earnings ratio;
- Price-to-book ratio;
- Yield;
- Earnings growth; and
- Return on equity.

Holdings-based analysis provides a truer picture of capitalization, sector, regional and country bets. A manager's style bias can be determined by the over- or underweights of these factors and fundamentals. This analysis helps determine whether a manager's performance is driven by one of these factors or by skill in stock selection. If we discover risks or unintended bias in the overall solution, we readjust the manager allocations and retest the portfolio with returns-based analysis.

Stress Testing. Once we are confident with the results from the returns-based and holdings-based analyses, stress testing is conducted using proprietary and third-party analytics. Stress testing forecasts the portfolio's sensitivity to interest rates and inflation, as well as its strengths and weaknesses in different market environments and cycles.

- Bull
- Bear
- Speculative
- Narrow
- Growth-, value- and capitalization-driven

Stress testing involves a series of analyses.

- Time period
- Sensitivity
- Scenario testing
- Risk decomposition
- Alternative manager combinations

Once again, if risks or unintended biases are noted, we adjust the allocations and re-evaluate the portfolio through returns-based and holdings-based analyses.

It is only after successfully completing all phases of the NSITE process that Northern Trust will recommend a portfolio to you. Leveraging Northern Trust's expertise in portfolio construction provides you with a well-structured, diversified solution designed to offer the highest potential return for your risk tolerance targets.

FOR MORE INFORMATION

To learn more about portfolio construction, please contact Waz Saluchok, 1-866-791-7396, wasy1_saluchok@ntrs.com.

Stress testing

forecasts portfolio

sensitivity to interest

rates, inflation and

market cycles.

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