



REFINING A PENSION'S ACTIVE RISK, IMPROVING PERFORMANCE

“How can we maintain our allocation to systematic equity strategies while increasing the likelihood of outperforming our benchmark?”

The Client

\$7 billion Canada-based defined benefit pension plan.

The Challenge

Portfolio underperformance due to inefficient factors that were also inefficiently combined together in a multi-factor approach.

Our Approach

Precision in factor exposures intends to result in expected outcomes.

The client's equity portfolio included a combination of allocations to passive, fundamental active and quantitative active. It is the quantitative active allocation within this client's portfolio that is of interest for this case study.

Identifying why the portfolio had underperformed

After a period when its quant equity portfolio had trailed the MSCI World Index benchmark, the client wanted to discover why this had happened in preparation for improving performance. Ahead of our appointment to manage the portfolio in 2021, NTAM identified two reasons:

- 1 Inefficient individual factor implementation.** In other words, factors had been implemented in a naïve manner that unintentionally led to uncompensated sector biases.
- 2 Inefficient multi-factor portfolio construction.** The underperforming multi-factor solutions within the client's quantitative allocations utilized a portfolio construction approach that resulted in underlying investment managers taking positions that in effect diluted each other's exposures. In some cases, they were taking opposing positions that were resulting in cancellation of each other's exposures resulting in no net active exposure vs. benchmark for the overall portfolio while paying higher fees that are associated with active manager allocations vs. passive.

Constructing the portfolio with a laser focus on compensated risks, while seeking to avoid unintended exposures

Our approach is to implement factor portfolios efficiently, taking only intended risks. By contrast, traditional factor implementations tend to naively have unintended exposures that result in unexpected outcomes. The pension plan's portfolio was following MSCI's factor models, utilizing these to select style exposures. However, upon engagement with NTAM it realized that MSCI's models were leading to exactly the type of unexpected outcomes it wished to avoid.

CASE STUDY: REFINING A PENSION'S ACTIVE RISK, IMPROVING PERFORMANCE

NTAM's approach starts with an evaluation of factor exposures of individual securities on a basis that is both region and sector neutral, as we aim to avoid unintended biases. For example, when evaluating securities' quality characteristics, our portfolio managers compare these to other securities within their respective regions/sectors. Taking a regional sector such as European industrials, we would rank each security by its quality score. We then separate the securities in the region/sector into quintiles and rank them (i.e., Q1, Q2, ..., Q5). Consequently, the client's portfolio was constructed without unintended biases, as the quality quintiles themselves did not have any biases.

Additionally, NTAM makes sector neutrality a constraint when optimizing the portfolio. That is, we set limits relative to the benchmark so that the resulting portfolio does not exhibit significant biases at the sector or region levels. Below are examples of information that we shared with the client to educate them about our principles and one of the metrics we use to optimize allocations.

FACTOR PURITY — CORE PRINCIPLES

Common Themes and Core Beliefs

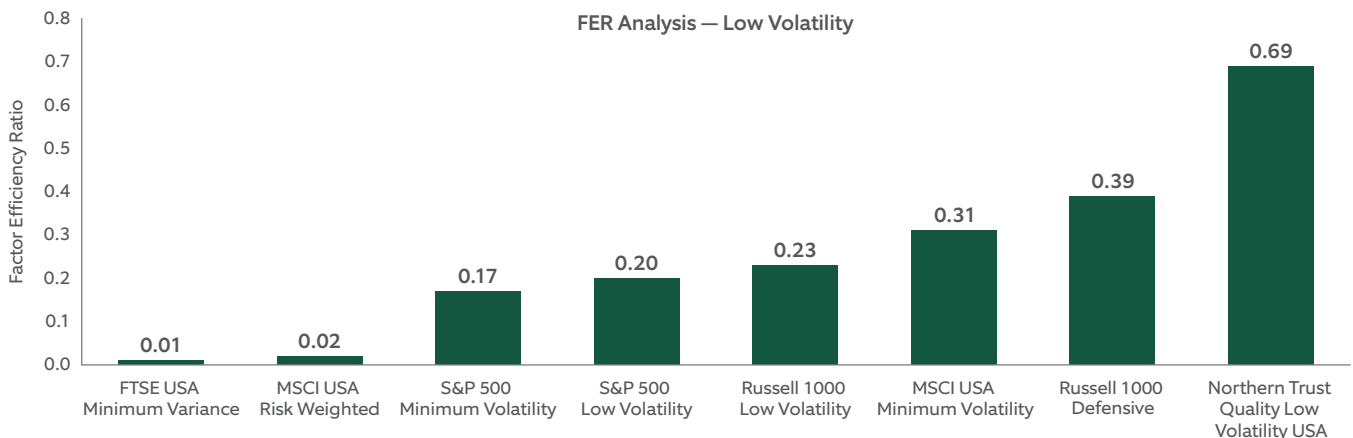
All strategy design principles are aimed at a single goal: *factor efficiency and stability*.

<p>MULTI-DIMENSIONALITY</p> <p>Factors are unobservable and must be triangulated.</p>	<p>REGION AND SECTOR SPECIFIC SCORING (WHERE APPROPRIATE)</p> <p>Factor definitions can vary by region and sector to avoid apples-and-oranges comparisons.</p>	<p>BUCKETING OF FACTOR SCORES (WHERE APPROPRIATE)</p> <p>Most factors have a low signal-to-noise ratio. Some mechanism must be in place to control signal variance.</p>
<p>REGION AND SECTOR NEUTRALITY</p> <p>Region and sector misweights are not a reflection of true factor premia.</p>	<p>QUALITY SCREEN</p> <p>Low-quality stocks add noise to all factors. We never hold low-quality names.</p>	<p>RELATIVE SCORING</p> <p>Absolute factor scoring does not reflect the dynamics of the underlying market.</p>

PEER RELATIVE FACTOR PURITY

Not All Strategies Deliver Pure Factor Exposure

While it is not possible to achieve a perfect FER ratio (1.00), the below example illustrates how disparate and low the true factor exposure is across the industry.



Efficient multi-factor portfolio construction following intersection approach

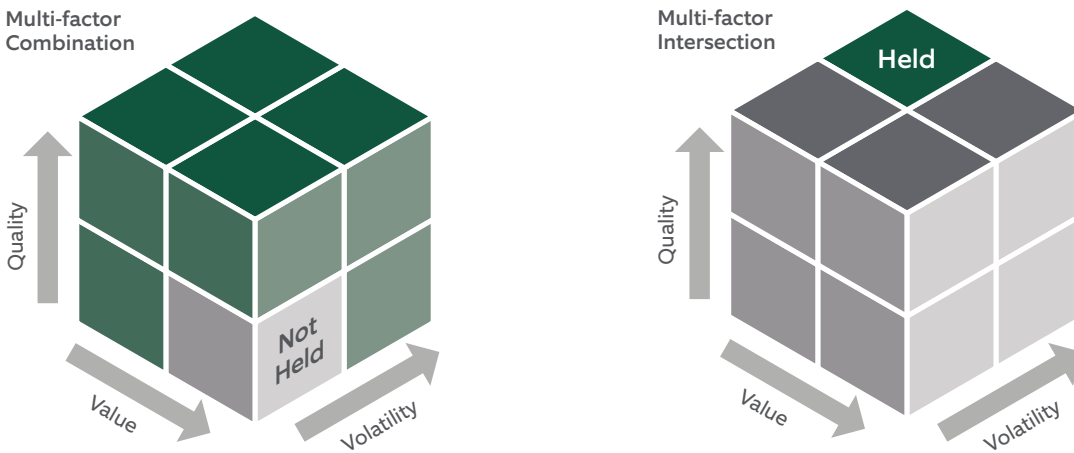
When constructing the multi-factor portfolio, NTAM utilizes an integration or intersection approach because our research shows that it offers the best way to implement diversified factor combinations while minimizing the challenges of factor dilution or cancellation. The client noted that other well-known asset managers had suggested sub-optimal portfolio construction methodologies of combining factors that have resulted in client's portfolio underperforming its benchmarks.

The below exhibits summarize NTAM's approach to multi-factor portfolio construction.

MULTI-FACTOR APPROACH – INTERSECTION DELIVERS SUPERIOR RISK-ADJUSTED RETURNS

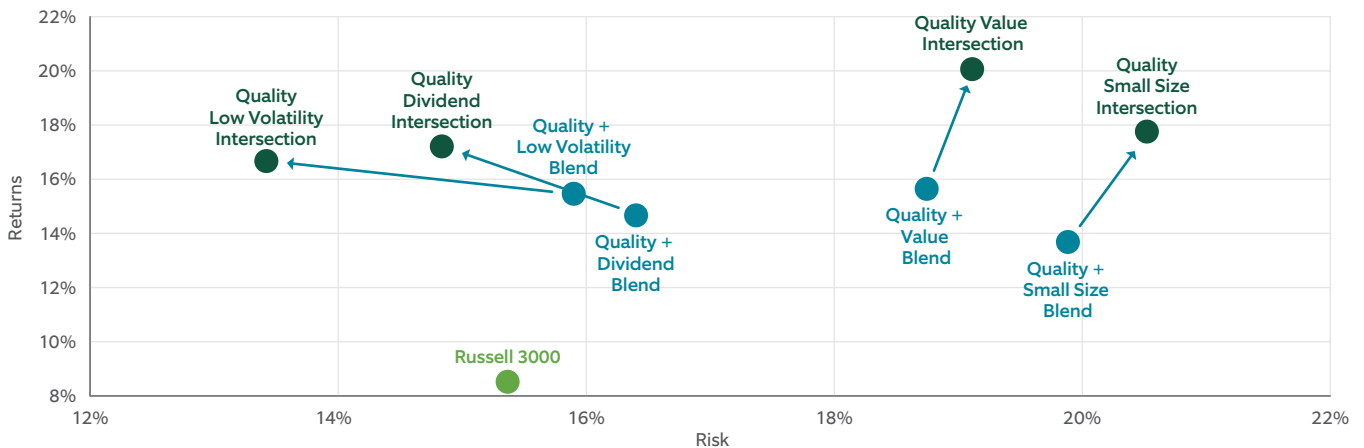
Effectively Combining Factor Exposures

The impact becomes more pronounced as additional factors are added. Moving to three factors causes the percentage of stocks not held to be reduced to just 12.5%.



INTERSECTION APPROACH

Risk/Return Characteristics



Source: Northern Trust Quantitative Research. US stocks 1978 to 2015. For illustrative purposes only. Illustrative portfolio does not show actual performance history. Return shows annual return and risk shows annual standard deviation. For illustrative purposes only. Past performance is not indicative or a guarantee of future results. Index performance returns do not reflect any management fees, transaction costs or expenses. It is not possible to invest directly in any index.

Our Solution

A multi-factor strategy based on the intersection approach.

The Benefits

Efficient, effective factor investing supported by ongoing research.

The Result

Increasing the likelihood of outperformance over time.

Customizing Northern Trust Quality Large Cap Core

We delivered a Quality Large Cap Core multi-factor strategy utilizing the intersection approach discussed above. At the client's request, this was customized to include three factors — quality, value and momentum.

Maximizing the likelihood of outperformance

The client achieved its goals of implementing factor investing efficiently without unintended risks. This allowed it to keep the quantitative factor portfolio yet maximize the likelihood of outperformance and lower the tracking error. What's more, it benefited from NTAM's commitment to ongoing research into factor investing. The client also gained the flexibility to customize the investment strategy in the future to match any changes in its investment views or to reflect any changes to the broader pension plan.

In summary, NTAM's solutions delivered the below client benefits:

- 1 Generating excess returns above strategy benchmark (MSCI World)
- 2 Minimizing volatility i.e., maximizing sharpe ratio
- 3 Control for uncompensated exposures
- 4 Limiting tracking error to an acceptable level

Efficiently investing in companies displaying all client-selected factors

Our approach to constructing efficient investment strategies by focusing only on intended risks, while avoiding risks known to be uncompensated, puts the portfolio in a strong position to outperform over the long term.

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Northern Trust Asset Management is a global investment manager that helps investors navigate changing market environments, so they can confidently realize their long-term objectives.

Entrusted with \$1.0 trillion in assets,* we understand that investing ultimately serves a greater purpose. We believe investors should be compensated for the risks they take — in all market environments and any investment strategy. That's why we combine robust capital markets research, expert portfolio construction and comprehensive risk management to craft innovative and efficient solutions that deliver targeted investment outcomes.

As engaged contributors to our communities, we consider it a great privilege to serve our investors and our communities with integrity, respect and transparency.

*AUM as of June 30, 2022. Article published as of June 30, 2022. For more recent AUM, please visit northerntrust.com.

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