Optimizing Investment Outcomes Through 'Beta-Plus'

Morningstar Indexes' portfolio optimization process targets broad equity market exposure in conjunction with other investment goals.

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Exposure to equity "beta," or the movement of the overall market, has served investors exceedingly well in recent years. The Morningstar Global Markets Index, a gauge of large-, mid-, and small-cap stocks spanning developed and emerging markets, averaged a nearly 11% annual gain for the past 15 years through the end of 2023.[1] The Morningstar US Market Index was up closer to 14% per year. Given these impressive numbers, it's no surprise that plain-vanilla investments that track broad market indexes continue to attract the lion's share of flows.

But capital appreciation through broad equity market exposure can coexist with other goals — a two-pronged approach that can be referred to as "beta-plus." For example, many investors want to simultaneously build wealth through equities while also extracting income from their portfolio through dividend-paying stocks. Sustainability, through the integration of environmental, social, and governance factors, is capturing investor attention across the globe, yet investors want to minimize the degree to which their portfolios deviate from the market.

The process of portfolio optimization can be used to target investment outcomes while also constraining deviation from the broad market. By forecasting the covariance of asset returns, the optimizer aims to control tracking error. This paper will examine two case studies of index methodologies employing a constrained optimization framework:

- Morningstar Dividend Enhanced Select Indexes[2]
- Morningstar ESG Enhanced Indexes[3]

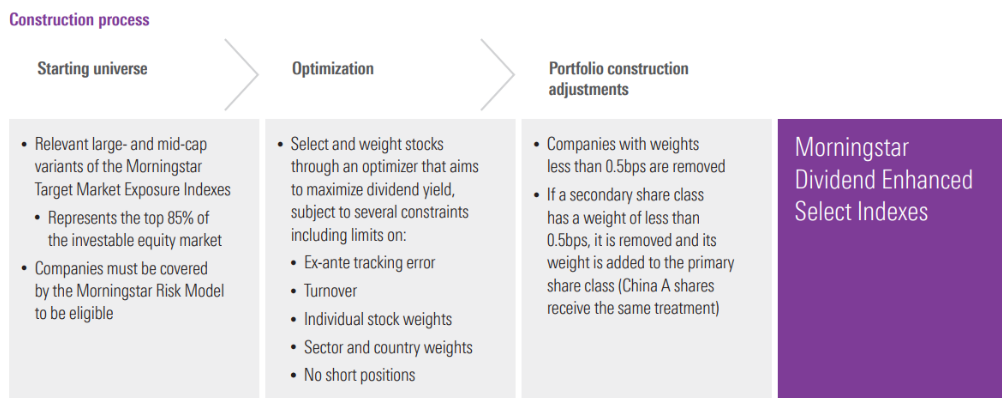
Then it will explore other areas where optimization can be employed in the service of "beta-plus."

1 Index performance is expressed in a total return, USD format and is calculated through Oct. 31, 2023.
2 For a full discussion of index methodology, see "Construction Rules for the Morningstar Dividend Enhanced Select Indexes."
3 For a full discussion of index methodology, see "Construction Rules for the Morningstar ESG Enhanced Indexes."

Investment Optimization in Practice: Equity Income

The Morningstar Dividend Enhanced Select Indexes are designed to deliver a portfolio of stocks with a higher dividend yield than their parent benchmarks while limiting expected tracking error—or performance deviation from the broad equity market segment from which they are derived. As depicted in Exhibit 1, the indexes are constructed using a constrained optimization framework that aims to maximize dividend yield, improve diversification, mitigate active risk, and simplify replication.

Exhibit 1 Morningstar Dividend Enhanced Select Indexes



Source: Morningstar Indexes.

The indexes target ex-ante tracking error by leveraging the Morningstar Global Industry Standard Risk Model.[4] The optimization methodology is expressed in the formula depicted in Exhibit 2.

Exhibit 2 Morningstar Dividend Enhanced Select Indexes Optimization Methodology

Ex-Ante Tracking Error

$$TE = (w_p^T - w_b^T)\,(X^T F X + \lambda D)\,(w_p - w_b)$$

Where:

$\mathrm{w_p}$ = vector of portfolio weights, unknown
$\mathrm{w_b}$ = vector of benchmark weights
X = matrix of asset factor exposures
F= factor covariance matrix
D = specific (idiosyncratic, residual) risk block of covariance matrix
$\mathrm{X^TFX}$ = systematic (factor-driven) risk block of covariance matrix from the risk model
λ = 1.5, specific risk aversion parameter; λ=1 results in a specific risk-neutral volatility forecast; λ>1 implies greater penalty for asset-specific risk not modelled by systematic risk factor exposures

Source: Morningstar Indexes.

Any risk model will miss some systematic sources of risk because of the bias-variance trade-off. The model will therefore underestimate the contribution of specific risk to the risk of the overall portfolio because it assumes the residual risk is perfectly uncorrelated and diversifiable. λ = 1.5 was chosen to compensate for the above effects based on empirical testing of ex-post tracking error. Constraints will be

4 For more information: see Morningstar Global Risk Model.

relaxed if a feasible solution is not obtained, governed by a predetermined order detailed in the index rulebook.

How does one member of the index series, the Morningstar US Dividend Enhanced Select Index, achieve its goals? As depicted in Exhibit 3, the index had a higher dividend yield than its parent, a broad U.S. equity market benchmark, as of year-end 2023. For the trailing five-year period, it had a tracking error below 2.0. This compares with a tracking error exceeding 8.0 for the Morningstar US High Dividend Yield Index, which is unconstrained.

Exhibit 3 Targeting Higher Yield With Minimal Tracking Error

Indexes	Dividend Yield %	Tracking Error
Morningstar US Dividend Enhanced Select Index	2.4	1.9
Morningstar US Target Market Exposure Index	1.4	0.0

Sources: Morningstar Indexes and Morningstar Direct. Dividend yield % as of Dec 31, 2023. Trailing five-year tracking error through Dec. 31, 2023, for Total Return USD index variants. The Morningstar Dividend Enhanced Select Indexes were launched in 2022, so the five-year performance history includes back-test returns.

Investment Optimization in Practice: ESG

The Morningstar ESG Enhanced Indexes aim to minimize the environmental, social, and governance risk of a portfolio and achieve a targeted reduction in carbon emissions intensity while delivering diversified exposure similar to a parent benchmark, with limits on tracking error. As depicted in Exhibit 4, the indexes exclude certain companies on ESG grounds and use a constrained optimization framework to target ESG outcomes while mitigating active risk.

Exhibit 4 Morningstar ESG Enhanced Indexes Construction Process

Starting Universe	Eligibility	Portfolio Construction	
• Parent benchmark members. • One (primary) share class per company is allowed. • Companies must be covered by the risk model, ESG Risk and Controversy scores, Product Involvement data.	• Exclude Severe Controversy. • Exclude Global Compact noncompliance. • Exclude involvement in civilian firearms, certain fossil fuels, tobacco, controversial weapons, adult entertainment, alcohol, and gambling.	• Weight companies based on the objective and constraints through an optimization process.	Morningstar ESG Enhanced Indexes

Source: Morningstar Indexes.

The indexes use data and research from Morningstar Sustainalytics for ESG-related exclusions and portfolio-level objectives.[5]

As in the previous example, the indexes target ex-ante tracking error by leveraging the Morningstar Global Industry Standard Risk Model[6] and use the same optimization methodology.

How does one member of the index series, the Morningstar Developed Europe ex-UK ESG Enhanced Index, achieve its goals? As depicted in Exhibit 5, the index had lower carbon intensity and overall ESG risk than its parent, a broad equity market benchmark, as of 2023's fourth quarter. For the trailing five-year period through the end of 2023, its tracking error was 1.3. This compares with a tracking error exceeding 6.0 for the unconstrained Morningstar Developed Europe Sustainability Leaders Index.

Exhibit 5 Targeting Stronger ESG Outcomes While Minimizing Tracking Error

Indexes	Carbon Intensity	ESG Risk	Tracking Error
Morningstar Developed Europe ex-UK ESG Enhanced Index	709.0	17.9	1.3
Morningstar Developed Europe ex-UK Target Market Exposure Index	1,052.2	19.4	0.0

Sources: Morningstar Indexes and Morningstar Direct. Carbon Intensity and ESG Risk are as of Nov. 30, 2023. Index-level carbon intensity is a weighted average of constituent-level data, using company-level emissions data from Morningstar Sustainalytics. Carbon intensity is computed for each constituent by dividing total emissions (metric tons of CO_2) by enterprise value including cash (USD, millions). ESG risk is represented by index-level Portfolio Sustainability Scores, a weighted average of Sustainalytics' company-level ESG Risk Ratings. The scores are rendered on a 0-100 scale where lower scores are better. Trailing five-year tracking error through Dec. 31, 2023, for gross return GBP index variants. The Morningstar ESG Enhanced Indexes were launched in 2021, so the five-year performance history includes back-test returns.

Exploring Other Investment Goals for Beta-Plus Strategies

Any number of objectives can be targeted, and research methodologies utilized within a constrained optimization framework aim to limit tracking error. These could include:

- Valuation signals: Morningstar Equity Research's proprietary price/fair value estimates could be leveraged to construct a portfolio tilted toward stocks trading at discounts.
- Factor tilts: The Morningstar Risk Model could be leveraged to tilt a portfolio to companies exhibiting attributes like value, size, quality, low volatility, or momentum.
- Ownership lens: Morningstar Medalist Ratings on managed strategies could be leveraged to tilt toward companies widely owned by top stock-pickers.

5 For more information: see Morningstar Sustainalytics.

6 Ibid., 2.

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Through beta-plus optimization strategies, indexes can serve investors targeting broad equity market exposure and other goals.

About Morningstar Indexes

Morningstar Indexes was built to keep up with the evolving needs of investors—and to be a leading-edge advocate for them. Our rich heritage as a transparent, investor-focused leader in data and research uniquely equips us to support individuals, institutions, wealth managers and advisors in navigating investment opportunities across major asset classes, styles and strategies. From traditional benchmarks and unique IP-driven indexes, to index design, calculation and distribution services, our solutions span an investment landscape as diverse as investors themselves.

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