

MSCI Emerging Markets Multi-Factor Select Index Methodology

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1. Introduction

The MSCI Emerging Markets Multi-Factor Select Index (herein, the “Index”) is designed to represent the performance of a strategy that seeks higher exposure to four style factors - Value, Momentum, Low Size and Quality - relative to other factors from the relevant Barra Equity Model¹ with controlled ex-ante risk. In other words, the index methodology aims to represent high exposure to the above-mentioned four factors while maintaining market risk exposure similar to the underlying parent index.

The MSCI Emerging Markets Multi-Factor Select Index is an optimization-based index that aim to maximize exposure to the four style factors while maintaining a total risk profile for the Index similar to that of the underlying parent index at the time of rebalancing.²

¹ Please refer to Appendix II and Appendix IV

² The Indexes are governed by a set of methodology and policy documents (“Methodology Set”), including the present index methodology document. The Methodology Set for the Indexes can be accessed from MSCI’s webpage <https://www.msci.com/index-methodology> in the section ‘Search Methodology by Index Name or Index Code’.

2. Index Construction Methodology

The applicable universe includes all the existing constituents of the MSCI EM (Emerging Markets) Index (herein, the “Parent Index”). This approach aims to provide an opportunity set with sufficient liquidity and capacity.

The MSCI Emerging Markets Multi-Factor Select Index is constructed by optimizing from an underlying Parent Index using a Barra Equity Model to maximize the index-level exposure to the targeted style factors while maintaining market risk similar to the Parent Index.

The steps for constructing the MSCI Emerging Markets Multi-Factor Select Index are described below.

2.1 Applicable universe

All the securities from the Parent Index become part of the applicable universe. The optimization relies on the factor exposures for all the securities in the Parent Index and the factor covariance matrix of the relevant Barra Equity Model. The optimization is performed using a base currency. The optimization currency is the US Dollar.

2.2 Constituent identification

Identification of the constituents from the applicable universe is done by the process of optimization.

2.3 Weighting universe

The optimization objective is to maximize the Alpha score (representative of the exposures to the set of target factors) under the “target risk” constraint where the risk target is equal to the ex-ante risk of the Parent Index at the time of rebalancing.

2.3.1 Calculation of the Alpha Score

$$\alpha_i = 0.25 * F_{1,i} + 0.25 * F_{2,i} + 0.25 * F_{3,i} + 0.25 * F_{4,i}$$

Where,

$F_{j,i}$ = Factor exposure of each security i for each of the target factors.

The factor exposures for the target factors are sourced as follows:

- Momentum – Factor exposure for each security taken from the Momentum factor exposure in the relevant Barra Equity Model. The factor definition is given in Appendix III.
- Low Size - Factor exposure for each security taken from the relevant Barra Equity Model. The factor definition is given in Appendix III.
- Value – Sector-relative score calculated using the security-level exposures to earnings-based, asset-based and whole-firm based valuation metrics from the relevant Barra Equity Model. The factor definition is given in Appendix III.

- Quality – Sector-relative score calculated using the security-level exposures to all quality factors from the relevant Barra Equity Model. The factor definition is given in Appendix III.

2.4 Optimization constraints

At each Semi-Annual Index Review, the following optimization constraints are employed, which aim to ensure investability while achieving total risk in line with that of the Parent Index.

- The maximum weight of an index constituent will be restricted to the lower of (the weight of the security in the Parent Index + 2%) or 10 times the weight of the security in the Parent Index. The minimum weight of an index constituent will be restricted to the higher of the (weight of the security in the Parent Index - 2%) or 0.
- Exposure of the MSCI Emerging Markets Multi-Factor Select Index to non-target Barra style factors, namely, Beta, Residual Volatility, Growth and Liquidity will be restricted to ± 0.25 standard deviations relative to the Parent Index.
- The sector weights of the MSCI Emerging Markets Multi-Factor Select Index will not deviate more than $\pm 5\%$ from the sector weights of the Parent Index.
- For countries with weight greater than 2.5% in the Parent Index, the weight in the MSCI Emerging Markets Multi-Factor Select Index will not deviate more than $\pm 5\%$ from the country weight in the Parent Index.
- For countries with weight less than 2.5% in the Parent Index, the weight in the MSCI Emerging Markets Multi-Factor Select Index will be capped at 3 times their weight in the Parent Index.
- The above country weight constraint will also apply on China A Stock Connect listings as a group separately in addition to the usual country weight constraint on China.
- The one-way turnover of the MSCI Emerging Markets Multi-Factor Select Index is constrained to a maximum of 20% at each index review.

2.5 Determining the optimized index

The MSCI Emerging Markets Multi-Factor Select Index is constructed using the Barra Open Optimizer in combination with the relevant Barra Equity Model. The optimization uses the Parent Index as the universe of eligible securities and the specified optimization objective and constraints to determine the MSCI Emerging Markets Multi-Factor Select Index. The Barra Open Optimizer determines the optimal solution, i.e., the set of securities with the highest possible Alpha score with “target risk” equal to the ex-ante risk of the Parent Index at the time of rebalancing, using an estimated security covariance matrix under the applicable investment constraints.

3. Maintaining the Indexes

3.1 Semi-Annual Index Reviews

The MSCI Emerging Markets Multi-Factor Select Index is rebalanced on a semi-annual basis to coincide with the May and November Index Reviews of the MSCI Global Investable Market Indexes. Barra Equity Model data as of the end of April and October are used respectively. The pro forma MSCI Emerging Markets Multi-Factor Select Index is in general announced nine business days before the effective date.

3.2 Ongoing event related changes

The general treatment of corporate events in the MSCI Emerging Markets Multi-Factor Select Index aims to minimize turnover outside of Index Reviews. The methodology aims to appropriately represent an investor's participation in an event based on relevant deal terms and pre-event weighting of the index constituents that are involved. Further, changes in index market capitalization that occur as a result of corporate event implementation will be offset by a corresponding change in the Variable Weighting Factor (VWF) of the constituent.

Additionally, if the frequency of Index Reviews in the Parent Index is greater than the frequency of Index Reviews in the MSCI Emerging Markets Multi-Factor Select Index, the changes made to the Parent Index during intermediate Index Reviews will be neutralized in the MSCI Emerging Markets Multi-Factor Select Index.

The following section briefly describes the treatment of common corporate events within the MSCI Emerging Markets Multi-Factor Select Index.

No new securities will be added (except where noted below) to the Index between Index Reviews. Parent Index deletions will be reflected simultaneously.

EVENT TYPE	EVENT DETAILS
New additions to the Parent Index	A new security added to the parent index (such as IPO and other early inclusions) will not be added to the index.
Spin-Offs	All securities created as a result of the spin-off of an existing Index constituent will be added to the Index at the time of event implementation. Reevaluation for continued inclusion in the Index will occur at the subsequent Index Review.
Merger/Acquisition	<p>For Mergers and Acquisitions, the acquirer's post event weight will account for the proportionate amount of shares involved in deal consideration, while cash proceeds will be invested across the Index.</p> <p>If an existing Index constituent is acquired by a non-Index constituent, the existing constituent will be deleted from the Index and the acquiring non-constituent will not be added to the Index.</p>

Changes in Security Characteristics

A security will continue to be an Index constituent if there are changes in characteristics (country, sector, size segment, etc.) Reevaluation for continued inclusion in the Index will occur at the subsequent Index Review.

Further detail and illustration regarding specific treatment of corporate events relevant to this Index can be found in the MSCI Corporate Events Methodology book under the sections detailing the treatment of events in Capped Weighted and Non-Market Capitalization Weighted indexes.

The MSCI Corporate Events methodology book is available at:

<https://www.msci.com/index/methodology/latest/CE>

Appendix I: Handling Infeasible Optimizations

During the Semi-Annual Index Review, in the event that there is no optimal solution that satisfies all the optimization constraints defined in Section 2.4, the following constraints will be relaxed, until an optimal solution is found:

- Relax the maximum active weight constraint (2%) in multiples of 1.25 up to a maximum of 4 iterations based upon the following formula

$$w_{i+1} = 1.25 * w_i \text{ for } i = 0 - 3$$

Where w_i = Maximum Active weight constraint

- Relax the maximum weight multiple (10x) in steps of 2 up to a maximum of 5 iterations based upon the following formula

$$wm_{i+1} = 2 + wm_i \text{ for } i = 0 - 4$$

Where wm_i = Maximum Active weight multiple

- The maximum active weight constraint and the maximum weight multiple are alternately relaxed until a feasible solution is achieved.

In the event that no optimal solution is found after the above constraints have been relaxed over all the iterations, the relevant MSCI Emerging Markets Multi-Factor Select Index will not be rebalanced for that Semi-Annual Index Review.

Appendix II: New release of Barra® Equity Model or Barra® Optimizer

A new release of the relevant Barra Equity Model or Barra Optimizer may replace the former version within a suitable timeframe.

Appendix III: Target Factor Definition Summary

The style factors targeted in the MSCI Emerging Markets Multi-Factor Select Index are the four style factor groups and their combinations: Momentum, Low Size, Value and Quality. These factor groups are described using individual factor scores from the current release of the MSCI Barra Global Equity Model for Long-Term Investors (GEMTL). The choice of factors used within each factor group is governed by the current model used for the optimization, which may change with a new release of the Barra Equity Model (as specified in Appendix II). The model data will be used from previous end of month prior to the rebalancing date. Following are the definitions of factor groups currently used in the Index. For more detailed information on individual factors in GEMTL, please refer to <https://www.msci.com/portfolio-management/>.

Momentum:

The Momentum score for each security is same as the Momentum factor score taken from the relevant Barra Equity Model (currently GEMTL).

Low Size:

The Size score for each security is the negative of the Size factor score taken from the relevant Barra Equity Model (currently GEMTL).

Value:

The Value score for each security is currently based on earnings-based, asset-based and whole firm-based valuation metrics - currently captured by the following two factors, Book-to-Price and Earnings Yield, from the relevant Barra Equity Model (currently GEMTL). A sector-relative score is derived from the combined score by standardizing the latter within each sector and winsorizing at +/- 3.

$$\text{Value}_i = (0.33) * \text{BtoP}_i + (0.67) * \text{EarningsYield}_i$$

Quality:

The Quality score for each security is currently based on all quality factors, Profitability, Investment Quality, Earnings Quality, Leverage and Earnings Variability, from the relevant Barra Equity Model (currently GEMTL). A sector-relative score is derived from the combined score by standardizing the latter within each sector and winsorizing at +/- 3.

$$\text{Quality}_i = (0.2) * \text{Profitability}_i + (0.2) * \text{Investment Quality}_i + (0.2) * \text{Earnings Quality}_i + (-1) * (0.2) * \text{Earnings Variability}_i + (-1) * (0.2) * \text{Leverage}_i$$

Appendix IV: MSCI Barra Equity Model Used In The Optimization

The MSCI Emerging Markets Multi-Factor Select Index, since inception, made use of the MSCI Barra Global Equity Model – Long Horizon (GEM2L) within the optimization setup. However, starting from the May 2018 Semi-Annual Index Review, the index construction currently uses an optimization setup using the MSCI Barra Global Equity Model for Long-Term Investors (GEMTLTL).

Appendix V: Changes to this document

The following sections have been modified as of November 2023:

- Methodology book was updated to reflect the transition of the MSCI Global Investable Market Indexes (GIMI) to Quarterly Comprehensive Index Reviews.
- All references to “Semi-Annual Index Reviews” and “Quarterly Index Reviews” of the MSCI GIMI were replaced with “Index Reviews”.

Section 1: Introduction

- Added footnote on Methodology Set.

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