

# MSCI World Thematic Rotation Factor Selection Index

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## Contents

1. Introduction
2. Index Construction4
2.1 Constructing the Eligible Universe
2.1.1 World Thematic Subset Security Selection 4
2.1.2 Subsets Selection4
2.2 Security Weighting 5
2.3 Defining the Optimization Setup5
2.3.1 Calculation of Alpha Score5
2.3.2 Optimization Constraints
3. Input Data Fallback Mechanism7
4. Maintenance of the Index8
4.1 Monthly Index Reviews
4.2 Ongoing Event Related Changes
Appendix 1: MediaStats Megatrend Scores10
Appendix 2: Eligible Indexes11
Appendix 3: Target Factor Definition Summary12
Appendix 4: New release of Barra® Equity Model or Barra® Optimizer
Appendix 5: Methodology Set14



## 1. Introduction

The MSCI World Thematic Rotation Factor Selection Index<sup>1</sup> (the 'Index') is designed to represent the performance of a strategy that seeks higher exposure to three style factors -Momentum, Growth and Quality - while seeking to minimize risk<sup>2</sup> for a given set of constraints. The Index selects securities from the MSCI World Index which belong, each month, to the four highest ranked MSCI Thematic Indexes, as selected from a set of MSCI Thematic Indexes<sup>3</sup>. The selection is based on theme specific media sentiment score (MediaStats Megatrend Scores) calculated for each of the respective themes by MKT MediaStats<sup>4</sup>.

<sup>&</sup>lt;sup>1</sup> The index is governed by a set of methodology and policy documents ("Methodology Set"), including the present index methodology document. Please refer to Appendix 5 for more details.

<sup>&</sup>lt;sup>2</sup> An estimated security co-variance matrix based on the relevant Barra multi-factor equity model is used to forecast lowest risk. Details about the Barra multi-factor risk models are available at https://www.msci.com/portfolio-management

<sup>&</sup>lt;sup>3</sup> Please refer to <u>https://www.msci.com/our-solutions/indexes/thematic-investing</u> for more information about MSCI Thematic Indexes.

<sup>&</sup>lt;sup>4</sup> MKT MediaStats is a big-data information technology company specializing in financial markets which generates theme level Megatrend Scores on a monthly basis https://www.mktmediastats.com/. Please refer to Appendix 1 for details.



## 2. Index Construction

The Index is constructed from the MSCI ACWI IMI Index (the 'Parent Index'). The following steps are applied at initial construction and at each Index Review of the Index:

- Constructing the Eligible Universe
- Security Weighting
- Defining the optimization setup
- Determining the optimized Index

The steps defined above are defined in detail in the subsequent sections.

### 2.1 Constructing the Eligible Universe

The Eligible Universe for the Index is constructed by combining the securities from a set of MSCI Thematic Indexes<sup>5</sup> (the 'Eligible Indexes') and subsequently applying the steps below.

#### 2.1.1 World Thematic Subset Security Selection

For each of the respective Eligible Indexes, a corresponding MSCI World Thematic subset ('Subset') is created by only selecting the securities that belong to the MSCI World Index and that have a 3-month ADTV<sup>6</sup> (Average Daily Traded Value) greater than or equal to USD 10 Million.

ADTV is calculated as:

$$ADTV_{3M} = \frac{ATV_{3M}}{252}$$

Where  $ATV_{3M}$  is annualized 3-month Average Traded Value of the security.

To avoid multiple securities of the same company in the final Index, only the most liquid security for each issuer per its 3-month ADTV, is eligible for inclusion in the Subset. In case of a tie, the security with the highest weight in the Parent Index will be selected.

#### 2.1.2 Subsets Selection

At each Index Review, the Subsets are ranked in descending order of the MediaStats Megatrend Scores of the corresponding Eligible Index from which each Subset is constructed. The four Subsets with the highest MediaStats Megatrend Scores are selected, and a weight of 25% is allocated to each of the selected Subsets<sup>7</sup>.

The weight of each security after combining the four Subsets can be calculated as follows:

$$W_{Sec_i}^{CI} = \sum_j W_{C_j} W_{Sec_i}^{C_j}$$

<sup>&</sup>lt;sup>5</sup> Please refer to Appendix 2 for details.

<sup>&</sup>lt;sup>6</sup> Please refer to MSCI Index Calculation Methodology at <u>https://www.msci.com/index-methodology</u>

<sup>&</sup>lt;sup>7</sup> A security can be part of multiple Eligible Indexes. In such a case, the security weights of each selected Eligible Index will be multiplied by their corresponding target weight and then added up.



#### Where:

 $W_{Sec_i}^{CI}$  is the weight of security  $Sec_i$  in the combined Subsets CI

 $W_{C_i}$  is the target weight of the Subset  $C_j$ 

 $W_{Seci}^{C_j}$  is the weight of security  $Sec_i$  in the corresponding Subset  $C_j$ 

*C<sub>i</sub>* is the selected Subset

#### 2.2 Security Weighting

At each Index Review and at initial construction, the securities selected for inclusion in the Index are assigned the weights  $W_{Sec_i}^{CI}$  from the Section 2.1.2 and are normalized to sum to 100%.

Additionally, the constituent weights are capped to mitigate concentration risk in the Index. The individual security weights in the Index are capped at 5%.

#### 2.3 Defining the Optimization Setup

The Index is constructed using the Barra Open Optimizer in combination with the relevant Barra Equity Model<sup>8</sup>. 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 or lower than a fixed proportion of the (predicted) total risk of the parent Index at the time of rebalancing and a given set of constraints detailed in below sections.

#### 2.3.1 Calculation of Alpha Score

The alpha score is defined as follows:

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

Where,

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

The factor exposures for the target factors<sup>9</sup> are sourced as follows:

- 1. Momentum Factor exposure for each security taken from the momentum factor exposure in the relevant Barra Equity Model (GEMLT).
- 2. Growth Factor exposure for each security taken from the growth factor exposure in the relevant Barra Equity Model (GEMLT).
- 3. Quality Sector-relative score, calculated using the security-level exposures to all quality factors from the relevant Barra Equity Model.

<sup>&</sup>lt;sup>8</sup> Please refer to Appendix 4 for the detailed information on model usage.

<sup>&</sup>lt;sup>9</sup> The factor definitions are given in Appendix 3.



#### 2.3.2 Optimization Constraints

At each monthly Index Review, the following optimization constraints are employed, which aim to ensure investability while achieving relatively higher risk adjusted alpha exposure:

Constraint	Value
Maximum weight of and index constituent	5.0%
Minimum weight of an index constituent	0.0%
Maximum weight per country	50.0%
Minimum weight per country	0.0%
Maximum weight per GICS <sup>®10</sup> Sector	75.0%
Minimum weight per GICS Sector	0.0%
Maximum number of constituents	100
Minimum number of constituents	30
Portfolio Risk Currency	USD
Minimum weight per GICS Sector	0.0%

<sup>&</sup>lt;sup>10</sup> GICS, the global industry classification standard jointly developed by MSCI and S&P Global Market Intelligence.



## 3. Input Data Fallback Mechanism

If, at an Index Review, the MediaStats Megatrend Scores required for the Index rebalance are not available from MKT MediaStats, dated as of the month-end prior to the Index Review, then the latest available MediaStats Megatrend Scores prior to the Index Review date will be used.

If, at an Index Review, MSCI determines that the primary source data from MKT MediaStats is stale for the last 4 months or is not reflective of current market conditions, the Eligible Indexes then will be ranked in descending order of their 3-month price momentum score and the four highest ranked Eligible Index would be selected. In the case that two Eligible Indexes have same 3-month price momentum score, the index with higher 6-month price momentum score will be selected.

The 3-month price momentum score and 6-month price momentum score will be calculated as follows:

At each index review date, the 3-month price momentum score will be calculated by dividing the last 3-month price return of the individual Eligible Index as of Index review date by standard deviation of the daily price returns of the Eligible Index over the same period. The 6-month price momentum score will be calculated by dividing the last 6-month price return of the individual Eligible Index as of Index review date by standard deviation of the daily price returns of the same period.

Subsequently, a review of alternative data for the MediaStats Megatrend Scores would be conducted. The adoption of an alternative data source and any amendments to the methodology to reflect such change will be handled in line with MSCI Index Consultation Policy<sup>11</sup>.

<sup>&</sup>lt;sup>11</sup> Please refer to MSCI Index Policies document at: <u>https://www.msci.com/index-methodology</u>



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## 4. Maintenance of the Index

#### 4.1 Monthly Index Reviews

The Index is reviewed on a monthly basis. The rebalancing is generally effective as of the first business day of every month. The pro forma Index is announced nine business days before the effective date.

#### 4.2 Ongoing Event Related Changes

The following section briefly describes the treatment of common corporate events within the Index. Changes in index market capitalization that occur because of corporate event implementation will be offset by a corresponding change in the Variable Weighting Factor (VWF) of the constituent.

No new securities will be added (except where noted below) to the Index between Index Reviews. For cases where additions are noted below, securities will be added to the Index only if added to the Parent Index. Parent Index deletions will be reflected simultaneously.

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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	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.
	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.
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: <u>https://www.msci.com/index-methodology.</u>



## **Appendix 1: MediaStats Megatrend Scores**

The MediaStats Megatrend Score is calculated by MKT MediaStats for each of the Eligible Indexes at the end of every calendar month.

For each Eligible Index, MKT MediaStats uses the business descriptions from each of the indexes methodology document to capture time series<sup>12</sup> and cross-sectional shifts of investor attention and sentiment towards megatrends by analyzing media articles sourced from approximately 100 thousand individual sources. The MediaStats Megatrend Score<sup>13</sup> is calculated based on an average positive sentiment intensity change over the most recent three months period compared to the preceding three months.

As part of the standardization process, the Mediastats Megatrend Score is winsorized at +/- 3 i.e. the scores above 3 are capped at 3 and scores below -3 are capped at -3. This score is then rounded to the first decimal. For the Subsets ranking in Section 2.1.2, in case two or more scores have the same rounded value, the ranks from the previous rebalancing are applied<sup>14</sup>.

For further details on the calculation methodology, please refer to:

https://www.mktmediastats.com/post/dynamic-megatrend-rotation.

<sup>&</sup>lt;sup>12</sup> The business descriptions of some of the MSCI Thematic Indexes may overlap. For example, the descriptive terms of the MSCI ACWI IMI Robotics Index are also part of the descriptive terms for the MSCI ACWI IMI Autonomous Technology & Industrial Innovation Index. Consequently, a fraction of the articles covering these two themes are also shared. The overlap in articles can potentially lead to correlated MediaStats Megatrend Scores.

<sup>&</sup>lt;sup>13</sup>MediaStat Megatrend Scores may behave differently for broader themes that include narrower themes in comparison to separate narrow themes. The relative change in positive intensity for a broader theme that may cover more articles in general could be lower than for a narrow theme that may cover less articles. For instance, an absolute change of 1 article would be a 100% change for a theme that had 1 article in the previous period and 1% change for the theme that had 100 articles in the previous period.

<sup>&</sup>lt;sup>14</sup> This mechanism will not be applied for the index base date rebalance on May 30th, 2014, for the February 28th, 2017 rebalance, nor for the June 28th, 2024 rebalance. For the first date, no historical information is available for the MediaStats Megatrend Score. The second date involves an increase in the number of indexes to be considered, thus making the historical rank irrelevant. On the third date, the index transitions from a historical calculation to a live index.



## **Appendix 2: Eligible Indexes**

From May 30<sup>th</sup>, 2014, until February 27<sup>th</sup> 2017, the Eligible Indexes list includes the following twelve MSCI Thematic Indexes<sup>15</sup>:

- 1. MSCI ACWI IMI Ageing Society Opportunities Index
- 2. MSCI ACWI IMI Autonomous Technology & Industrial Innovation Index
- 3. MSCI ACWI IMI Digital Health Index
- 4. MSCI ACWI IMI Efficient Energy Index
- 5. MSCI ACWI IMI Fintech Innovation Index
- 6. MSCI ACWI IMI Future Education Index
- 7. MSCI ACWI IMI Future Mobility Index
- 8. MSCI ACWI IMI Genomic Innovation Index
- 9. MSCI ACWI IMI Millennials Index
- 10. MSCI ACWI IMI Next Generation Internet Innovation Index
- 11. MSCI ACWI IMI Robotics Index
- 12. MSCI ACWI IMI Smart Cities Index

From February 28<sup>th</sup>, 2017, and beyond, the Eligible Indexes list includes the previously listed indexes plus the following ten MSCI Thematic Indexes:

- 1. MSCI ACWI IMI Blockchain Economy Index
- 2. MSCI ACWI IMI Clean Energy Infrastructure Index
- 3. MSCI ACWI IMI Cybersecurity Index
- 4. MSCI ACWI IMI Food Revolution Index
- 5. MSCI ACWI IMI Natural Resources Stewardship Index
- 6. MSCI ACWI IMI Plastics Transition Index
- 7. MSCI ACWI IMI Renewables and Energy Efficiency Index
- 8. MSCI ACWI IMI Sharing Economy Index
- 9. MSCI ACWI IMI Space Exploration Index
- 10. MSCI ACWI IMI Sustainable Water Transition Index

MSCI may review the Eligible Indexes list from November 2026 Index Review and bi-annually thereafter. The MSCI Thematic Index could be added or deleted from the list of Eligible Indexes based on the review.

<sup>&</sup>lt;sup>15</sup> Please refer to <u>https://www.msci.com/index-methodology</u> for the methodology of the MSCI Thematic Indexes



## **Appendix 3: Target Factor Definition Summary**

The style factors targeted in the MSCI World Thematic Rotation Factor Selection Index are the three style factor groups and their combinations: Momentum, Growth, 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 (GEMLT). 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. 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 GEMLTL, please refer to <a href="https://www.msci.com/our-solutions/analytics/portfolio-management">https://www.msci.com/our-solutions/analytics/portfolio-management</a>.

#### Momentum:

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

#### Growth:

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

#### **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 GEMLT). A sector-relative score is derived from the combined score by standardizing the latter within each sector and winsorizing at +/- 3.

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



## Appendix 4: New release of Barra® Equity Model or Barra® Optimizer

The methodology presently uses MSCI Barra Global Equity Model for Long-Term Investors ("GEMLT") for the optimization. A new release of the relevant Barra Equity Model or Barra Optimizer may replace the former version within a suitable timeframe.



## **Appendix 5: Methodology Set**

The Index is governed by a set of methodology and policy documents ("Methodology Set"), including the present index methodology document as mentioned below:

- Description of methodology set <u>www.msci.com/index/methodology/latest/ReadMe</u>
- MSCI Corporate Events Methodology <u>www.msci.com/index/methodology/latest/CE</u>
- MSCI Index Calculation Methodology www.msci.com/index/methodology/latest/IndexCalc
- MSCI Index Glossary of Terms <u>www.msci.com/index/methodology/latest/IndexGlossary</u>
- MSCI Index Policies <u>www.msci.com/index/methodology/latest/IndexPolicy</u>
- MSCI Global Investable Market Indexes Methodology www.msci.com/index/methodology/latest/GIMI
- MSCI Excess Return Indexes Methodology <u>www.msci.com/index-methodology</u>
- MSCI Global Industry Classification Standard (GICS) Methodology www.msci.com/index/methodology/latest/GICS

The Methodology Set for the Indexes can also be accessed from MSCI's webpage <u>https://www.msci.com/index-methodology</u> in the section 'Search Methodology by Index Name or Index Code'.



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