

MSCI Global Transformational Changes Index

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1 Introduction

The MSCI Global Transformational Changes Index (the 'Index') aims to represent the performance of a set of companies that are expected to derive significant revenue from one or more of the following themes:

- 'Future of Work'
- 'Digital Consumer'
- 'Genomics & Telehealth'
- 'Food Revolution'

2 Constructing the Index

The Index is constructed by selecting stocks from the MSCI ACWI Investable Market Index (IMI) ('Parent Index'), based on rules explained in the following sections.

2.1 Determining the components of the Index

The Index is constructed by combining stocks from the following thematic components using the rules described below:

- **Future of Work** Component: This theme aims to measure the performance of a set of companies that are expected to derive significant revenue from the development of new products and services focused on working, collaborating, meeting and doing business remotely. It is designed to select companies which are assessed to have high exposure to the following business activities as further described in Appendix 1:
 - a) Cybersecurity
 - b) Industrial Automation
 - c) Machine Learning and Artificial Intelligence
 - d) Digital Transactions and Blockchain Technology
 - e) Cloud computing, IoT and Remote Collaboration

- **Digital Consumer** Component: This theme aims to measure the performance of a set of companies that are expected to derive significant revenue from the development of new products and services focused on the digital consumer. It is designed to select companies which are assessed to have high exposure to the following business activities as further described in Appendix 1:
 - a) E-commerce
 - b) Social Media
 - c) E-gaming

- **Genomics & Telehealth** Component: This theme aims to measure the performance of a set of companies that are expected to derive significant revenue from the development of new products and services in the field of genomic sequencing, gene editing and therapy, bio computing, bioinformatics, molecular diagnostics and remote healthcare. It is designed to select companies which are assessed to have high exposure to the following business activities as further described in Appendix 1:

 - a) Gene editing and therapy
 - b) Molecular Diagnostics
 - c) Targeted therapeutics and Stem Cell therapy
 - d) Bioinformatics
 - e) Bio hardware
 - f) Digital Health and Remote Care

- **Food Revolution** Component: This theme aims to measure the performance of a set of companies that are expected to derive significant revenue from the development of new products and services focused on improving the way food is produced and consumed. It is designed to select companies which are assessed to have high exposure to the following business activities as further described in Appendix 1:

 - a) Sustainable and responsible farming,
 - b) Plant-based meat substitutes and agricultural technology,
 - c) Food delivery technology,
 - d) Biosecurity and zoonotic disease mitigation

2.2 Determining the Eligible Universe of the Index

The eligible universe for each component described in section 2.1 is constructed. Please refer to Appendix 1 for details.

2.3 Determining the Selected Universe for the Index

All securities from the eligible universe for each component described in section 2.2 which satisfy all criteria below are included in the selected universe for each component.

2.3.1 GICS®¹ sector and sub industry filtering

Securities mapped to the following GICS sub-industries are excluded from the selected universe of the components described in the table below.

Component	GICS Sector	GICS sub-industry
Food Revolution	Consumer Staples	Personal Products

2.3.2 Liquidity filtering

Securities with a 3-month Average Daily Traded Value (ADTV) less than US\$ 1 million are excluded from the selected universe. Please refer to Appendix 2 for details of the calculation of 3-month ADTV.

Further, for every issuer in the eligible universe, only the security with the highest 3-month ADTV is included in the selected universe.

2.3.3 Size filtering

Securities with float adjusted market capitalization less than the size cutoff for the selected universe are excluded from the selected universe. Please refer to Appendix 3 for details of the calculation of this size cutoff.

2.3.4 Selected Universe 1

For each component, the set of all securities obtained after applying criteria 2.3.1 to 2.3.3 is further filtered to exclude securities with a relevance score less than 50%. For details of relevance score calculation, please refer to section 4.2.7 of Appendix 1. Next, these are sorted in descending order of their relevance scores and then in descending order of their weight and those in the top quarter are included in Selected Universe 1.

¹ GICS, the global industry classification standard jointly developed by MSCI and S&P Global.

If there remain securities in the bottom three-quarters with a relevance score of 100%, then those are also included in Selected Universe 1.

If the number of securities included in Selected Universe 1 thus far is less than 20, the selection by relevance score continues until 20 securities are included in Selected Universe 1.

2.3.5 Selected Universe 2

In order to include securities in the Index that have a high relevance score when summed across the four components described in section 2.1, a Selected Universe 2 is constructed using the following steps:

- Construct a combined universe from the eligible universe of the four components as described in section 2.2.
- Securities that are in Selected Universe 1 of the four components as determined in section 2.3.4 are excluded from this combined universe.
- For each security in the combined universe, calculate its combined relevance score as:

$$\text{Combined relevance score} = \text{minimum} (100\%, \text{sum of relevance score in each component}).$$
- Select those securities whose product of combined relevance score and float adjusted market capitalization is greater than or equal to the additional size cutoff for the selected universe. Please refer to Appendix 4 for details of the calculation of this size cutoff.

These securities comprise Selected Universe 2 of all the individual component/s where they have non-zero relevance score.

The Selected Universe for each component is obtained by combining securities from Selected Universe 1 and Selected Universe 2.

The Selected Universe of the Index is obtained by combining securities from the Selected Universe of each component and comprise the Index.

2.3.6 Weighting scheme

Securities in the Selected Universe for each component are weighted by the product of their relevance score and float adjusted market capitalization. The weights are then normalized to sum to 100%. Further, stocks in the Selected Universe for each component follow an iterative capping and flooring mechanism as described in Appendix 5.

2.4 Determining the weights of the constituents of the Index

The weight of each constituent in the Index is calculated as follows:

$$w_i^{Index} = \sum_{C(j)} \left(\frac{1}{4}\right) \times w_i^{C(j)}$$

where:

- w_i^{Index} is the weight of constituent i in the Index
- $w_i^{C(j)}$ is the weight of constituent i in the selected universe of component $C(j)$, $j = 1, 2, \dots, 4$

Further, constituents in the Index follow an iterative weighting scheme as described in Appendix 6.

3 Maintaining the Index

3.1 Semi-Annual Index Review

The Index is reviewed on a Semi-Annual basis in May and November to coincide with the May and November Semi-Annual Index Reviews of the Component Indexes, and the changes are implemented at the end of May and November. In general, the pro forma index is announced nine business days before the effective date.

During the Semi-Annual Index Review, the eligible universe and selected universe are updated.

In general, MSCI uses company business segment names, business description and revenue data as of the rebalancing date for the Semi-Annual Index Review.

3.2 Annual Index Review

The set of relevant words (as described in section 4.1 of Appendix 1) are reviewed annually by MSCI during the May Semi-Annual Index Review. In general, MSCI completes this review of relevant words nine business days before the effective date of the May Semi-Annual Index Review.

3.3 Ongoing event-related maintenance

The general treatment of corporate events in the 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.

The following section briefly describes the treatment of common corporate events within the 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 details and illustration regarding specific treatment of corporate events relevant to this Index can be found in the MSCI Corporate Events Methodology.

The MSCI Corporate Events methodology book is available at:
<https://www.msci.com/index-methodology>.

Appendix 1: Thematic Framework for constructing the eligible universe of each component

4.1 The set of relevant words and phrases used for constituent selection

MSCI uses a broad set of relevant words and phrases derived from the Index objective which are important to describing the products and services of companies engaged in the business activities for each component in section 2.1.

4.2 Company level data used for assessing company exposure

The following data is used at the company level:

- Business segment information from company annual reports and vendor data sources: business segment names, assigned SIC codes² and related revenue.
- An English language summary description of the company’s business activities from public sources is used.

4.2.1 Selection on business segments

Company identified business segment names are compared against the set of relevant words. Companies from the Parent Index which include at least one relevant word in their business segment names are included in the eligible universe.

4.2.2 Selection on company’s summary description

The company’s summary business description is compared against the set of relevant words. Companies from the Parent Index which include at least two distinct relevant words in their summary description are included in the eligible universe.

4.2.3 Selected business segments

‘Selected business segments’ are business segments which include at least one relevant word. These are the business segments based on which stocks are selected as described in section 4.2.1.

² Company’s business segments are assigned with a specific SIC (Standard Industry Classification) description for products and services, used by official agencies within the US government. These descriptions provide additional information on the nature of the segment.

4.2.4 SIC code selection

Company business segments are mapped to a SIC code. The SIC code selection is a set of all the SIC codes which satisfy the following criteria:

- The SIC code is mapped to at least one of the ‘selected business segments’ as described in section 4.2.1.
- The SIC code is assigned to the business segments of at least two different stocks from the eligible universe. The SIC code 9999 is not selected.

4.2.5 Calculating the stock relevance score

A relevance score for all stocks in the eligible universe is calculated. The relevance score for a company is calculated by taking into account the portion of company’s revenue which is derived from the selected business segments (as described in section 4.2.3) filtered via the SIC code selection (as described in section 4.2.4).

Companies at a very early stage of development may not declare any revenue from their businesses and would be assigned zero relevance score. But, in order to reflect the economic linkage via a non-zero relevance score for such companies in the Genomics & Telehealth component, the relevance score calculation takes into account the portion of company’s asset in place of revenue which may be tied to the selected business segments (as described in section 4.2.3) filtered via the SIC code selection (as described in section 4.2.4).

4.2.6 Relevance score discount factor

A stock level relevance score discount factor is calculated by normalizing the cumulative frequency of relevant words in the company’s summary description relative to all companies selected on summary business descriptions as described in section 4.2.2.

At a company’s business segment level, the revenue discount factor is applied on revenue from each selected SIC code as described in section 4.2.4. The revenue discount factor is 1 for revenue derived from ‘selected business segment’.

4.2.7 Relevance score

Relevance score for stocks in the eligible universe is calculated as follows:

Relevance score = [revenue from the selected business segments (as described in section 4.2.3) + relevance score discount factor * revenue from the selected SIC code (as described in section 4.2.4)] / Total company revenue.

For those companies in the Genomics and Telehealth component which do not declare any revenue, the relevance score is calculated as follows:

Relevance score = [assets from the selected business segments (as described in section 4.2.3) + relevance score discount factor * assets from the selected SIC code (as described in section 4.2.4)] / Total company assets.

Appendix 2: Calculation of 3-Month Average Daily Traded Value (ADTV)

$$ADTV = ATV / 252$$

Where:

- ADTV = 3-month Average Daily Traded Value
- ATV = 3-month Annualized Traded Value

For details on the calculation of ATV, please refer to the MSCI Fundamental Data Methodology (<https://www.msci.com/index-methodology>)

Appendix 3: Calculation of Size Cutoff for Selected Universe

This size cutoff is calculated in the following steps:

- 1) Sort all securities in the MSCI World Investable Market Index (IMI) in descending order of weight.
- 2) Select the float adjusted market capitalization of the first security that corresponds to a cumulative 96% or more of weight in the MSCI World Investable Market Index.

Appendix 4: Calculation of Additional Size Cutoff for Selected Universe

This size cutoff is calculated in the following steps:

- 1) Sort all securities in the MSCI World Investable Market Index (IMI) in descending order of weight.
- 2) Select the float adjusted market capitalization of the first security that corresponds to a cumulative 50% or more of weight in the MSCI World Investable Market Index.

Appendix 5: Iterative capping and flooring of weights

1. Assign the cap weight C^3 to all stocks whose uncapped weight, w_i , is above C . Assume there are n such stocks.

2. Calculate the weight freed up, F , as a result of step 1 as under:

$$F = \sum_{j=1 \text{ to } n} w_j - n * C$$

3. Identify all 'floor stocks', i.e. stocks whose uncapped weight is below the floor weight, M^4 . Assume there are m such stocks.

4. Calculate the deficit weight, D , as a result of step 3, as under:

$$D = m * M - \sum_{j=1 \text{ to } m} w_j$$

5. Compare F and D and follow the steps appropriate to the condition satisfied in 5a. or 5b.

5a. If $F \geq D$, the following two steps are taken:

- All floor stocks as defined in step 3 above are assigned the floor weight of M .
- The weight $(F-D)$ is then proportionally distributed among those stocks where $M < w_j < C$.
- If at this stage, there is another stock/s with weight $> C$, then this excess weight is redistributed proportionally among those stocks with weight below C and greater than or equal to M .

5b. If $F < D$, the following steps are taken for the floor stocks:

- Sort the stocks in ascending order of uncapped weight, w_j
- For stocks $i=1, \dots, m$, identify the largest value of i such that:

$$F > i * w_i - \sum_{j=1 \text{ to } i} w_j$$

- Assign stocks 1 to i , a weight of

$$\left\{ \sum_{j=1 \text{ to } i} w_j + F \right\} / i$$

- The weight of stocks $i+1$ to m is unchanged.

³ For section 2.3.6, $C = 8\%$. For section 2.4, $C = 2\%$

⁴ For section 2.3.6, $M = 0.8\%$. For section 2.4, $M = 0.2\%$

Appendix 6: Weighting Scheme for the Index

1. Assign the cap weight C^3 to each constituent in the Index whose uncapped weight, w_i , is above C .
2. For each such stock S_i , calculate the freed-up weight, $(w_i - C)$ and identify the component/s in which it has a non-zero weight as calculated in section 2.3.6.
3. The freed-up weight is distributed pro-rata among each of the components identified in step 2. This is done in the following steps:
 - Denote by $P(j)$ the proportion of the freed-up weight, $(w_i - C)$, to be re-distributed to component $C(j)$, $j= 1, 2,..4$.
 - The weight of stock S_i from component $C(j)$ is reduced by $P(j)^* (w_i - C)$.
 - Upweight all other stocks in component $C(j)$ by proportionally distributing the weight $P(j)^* (w_i - C)$.
 - If at this stage, the weight of a stock/s in component $C(j)$ exceeds the component level cap, use steps in Appendix 5 to re-apply the cap.
4. Repeat step 3 for all constituents in the Index whose uncapped weight, w_i , is above C .

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