

TIAA ESG INDEXES METHODOLOGY

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1 INTRODUCTION

MSCI Indexes are constructed and maintained in accordance with the MSCI Global Investable Market Indexes Methodology and calculated as per the MSCI Index Calculation Methodology.

This methodology book provides a description of the rules and guidelines followed by MSCI for the construction and maintenance of the TIAA ESG Indexes. The TIAA ESG Indexes (“Indexes”) are created from specified Parent Indexes (defined below) and designed to increase the Index’s exposure to positive environmental, social and governance (ESG) factors as well as exhibit lower carbon exposure than the Parent Index. They also aim to minimize the tracking error relative to the Parent Index through an optimization process.

2 MSCI ESG RESEARCH

The TIAA ESG Indexes use company ratings and research provided by MSCI ESG Research LLC. In particular, these indexes use data from the following MSCI ESG Research products: MSCI ESG Ratings, MSCI ESG Controversies, MSCI Business Involvement Screening Research and MSCI CarbonMetrics.

For details on MSCI ESG Research's full suite of ESG products, please refer to:
http://www.msci.com/products/esg/about_msci_esg_research.html

2.1 MSCI ESG RATINGS

MSCI ESG Ratings provides research, analysis and ratings of how well companies manage environmental, social and governance risks and opportunities.

MSCI ESG Ratings provides an overall company ESG rating - a seven point scale from 'AAA' to 'CCC'. In addition, the product provides scores and percentiles indicating how well a company manages each key issue relative to industry peers.

For more details on MSCI ESG Ratings, please refer to
https://www.msci.com/documents/1296102/1636401/MSCI_ESG_Ratings.pdf

2.2 MSCI ESG CONTROVERSIES

MSCI ESG Controversies (formerly known as MSCI Impact Monitor) provides assessments of controversies concerning the negative environmental, social, and/or governance impact of company operations, products and services. The evaluation framework used in MSCI ESG Controversies is designed to be consistent with international norms represented by the UN Declaration of Human Rights, the ILO Declaration on Fundamental Principles and Rights at Work, and the UN Global Compact. MSCI ESG Controversies Score falls on a 0-10 scale, with "0" being the most severe controversy.

For more details on MSCI ESG Controversies Score, please refer to
<https://www.msci.com/documents/10199/acbe7c8a-a4e4-49de-9cf8-5e957245b86b>

2.3 MSCI ESG BUSINESS INVOLVEMENT SCREENING RESEARCH

MSCI ESG Business Involvement Screening Research (BISR) aims to enable institutional investors to manage environmental, social and governance (ESG) standards and restrictions reliably and efficiently.

For more details on MSCI ESG Business Involvement Screening Research, please refer to
http://www.msci.com/resources/factsheets/MSCI_ESG_BISR.pdf

2.4 MSCI ESG CARBONMETRICS DATA

MSCI ESG Research collects annual company-specific direct (Scope 1) and indirect (Scope 2) greenhouse gas (GHG) emissions data from company public documents and/or the Carbon Disclosure Project. If a company does not report GHG emissions, then MSCI ESG Research estimates Scope 1 and Scope 2 GHG emissions. Further, to normalize for size, MSCI ESG Research divides the sum of Scope 1 and Scope 2 GHG emissions by the issuer market capitalization to calculate emission intensity.

For companies which do not report emission data and where MSCI ESG Research has not estimated the greenhouse gas emissions yet, the methodology uses the average emissions per dollar of issuer market capitalization for the companies in the same industry group, multiplied by the market capitalization of the company as the estimated emission for the company.

MSCI ESG Research collects fossil fuel reserves data where relevant for companies which have reserves, typically in the Oil & Gas, Coal Mining and Electric Utilities industries (details in MSCI ESG CarbonMetrics methodology). The data is updated on an annual basis and based on information disclosed by companies. Sources include company publications, other public records and third party data providers. For newly added companies where data is not available yet, the methodology uses zero fossil fuel reserves.

3 CONSTRUCTING THE TIAA ESG INDEXES

Constructing the TIAA ESG Indexes involves the following steps:

- Defining the Parent Index;
- Defining the ESG Screened Universe
- Defining the Carbon Screened Universe
- Determining the optimized index subject to the optimization constraints

3.1 DEFINING THE PARENT INDEX

Following is the list of the parent indexes (Parent Index) for respective TIAA ESG Indexes:

TIAA ESG Index	Parent Index
TIAA ESG USA Large-Cap Growth Index	MSCI USA Growth Index
TIAA ESG USA Large-Cap Value Index	MSCI USA Value Index
TIAA ESG USA Mid-Cap Growth Index	MSCI USA Mid Cap Growth Index
TIAA ESG USA Mid-Cap Value Index	MSCI USA Mid Cap Value Index
TIAA ESG USA Small-Cap Index	MSCI USA Small Cap Index
TIAA ESG International Developed Markets Equity Index	MSCI EAFE Index
TIAA ESG Emerging Markets Equity Index	MSCI Emerging Markets (EM) Index

3.2 ESG SCREENED UNIVERSE

The ESG Screened Universe includes constituents from the Parent Index, which are not excluded as per the exclusion criteria (section 3.2.1) and are selected in each GICS® sector (as per section 3.2.2).

3.2.1 ESG EXCLUSION CRITERIA

3.2.1.1 CONTROVERSY SCORE EXCLUSION SCREEN

Securities of companies involved in very severe business controversies are not eligible for inclusion in the TIAA ESG Indexes. This is implemented by excluding constituents of the Parent Index with MSCI ESG Controversy Score of 1 or lower ('Red Flag' and 'Orange Flag' companies).

Securities of companies not assessed by MSCI ESG Research for ESG Controversies are excluded from the ESG Screened Universe.

3.2.1.2 ENHANCED CONTROVERSY SCORE

This exclusion criterion is not applicable for the TIAA ESG Emerging Markets Equity Index.

Orange Flag securities which satisfy any of the following criteria do not undergo Controversy Score exclusion screening (as per 3.2.1.1):

- Change in Industry Adjusted Score over the last three years is greater than or equal to 50%. Change in Industry Adjusted Score is calculated relative to the oldest available Industry Adjusted Score in 3 year long history. The change is calculated as (current Industry Adjusted Score – oldest available Industry Adjusted Score)/current Industry Adjusted Score.
 - The change is calculated relative to 2 year old Industry Adjusted Score, if 3 year old score is not available
 - The change is calculated relative to 1 year old Industry Adjusted Score, if neither 3 year old score nor 2 year old score is not available
 - The change is not calculated if there is no available history within last 3 years
- MSCI ESG Rating is 'A' or better

3.2.1.3 CONTROVERSIAL BUSINESS EXCLUSION SCREEN

Securities that are involved in specific businesses which have high potential for negative social and/or environmental impact are ineligible for inclusion in the index. Specifically:

- Alcohol
- Tobacco
- Gambling
- Nuclear Power

- Weapons and Firearms

Please refer to Appendix I for more details on these criteria.

3.2.1.4 ESG RATING EXCLUSIONS

- MSCI ESG Rating Screen – Exclude ‘CCC’
- Missing Rating – Securities not assessed by MSCI ESG Research for MSCI ESG Ratings are excluded from the ESG Screened Universe

3.2.1.5 GLOBAL SANCTIONS

This exclusion criterion is only applicable for TIAA ESG Emerging Markets Equity Index.

Securities of companies that have certain business involvement in Sudan are ineligible for inclusion in the index. Please refer to Appendix II for more details on this criterion.

3.2.2 SECURITY SELECTION CRITERIA

The remaining securities are sorted within each GICS® sector in descending order of industry adjusted score, controversy score and free float adjusted market capitalization.

Subsequently, within each sector securities are selected until the cumulative weight of selected securities is 50% of the aggregate sector weight in the Parent Index.

The security that increases the cumulative sector coverage above 50% is defined as the ‘marginal security’. The marginal security is included if it satisfies any of the following criteria:

- If its non-inclusion would result in cumulative sector coverage of less than 45%
- If its non-inclusion leads to higher absolute deviation from the target than the deviation due to marginal security’s inclusion

3.3 CARBON SCREENED UNIVERSE

Securities from the ESG Screened Universe (from section 3.2) that are not excluded as per the below carbon emission exclusion criteria are included in the Carbon Screened Universe.

3.3.1 CARBON EMISSION EXCLUSION

1. Exclude securities with any ownership of fossil fuel reserves
2. Absolute Emission
 - a. Compute cumulative absolute emission (Scope 1 + Scope 2 emission) of the securities in the ESG Screened Universe

- b. Sort securities in descending order of absolute emission
- c. Exclude securities with the highest absolute emission until the cumulative absolute emission of the remaining securities is less than 50% of total cumulative absolute emission (calculated in the first step)

3. Emission Intensity

- a. Compute total sales and Absolute Emission for the securities in the ESG Screened Universe
- b. Compute Total Carbon Emission Intensity of the list by dividing Total Scope 1+2 Emissions by Total Sales (as computed in the previous step)
- c. Set half the value computed above as the exclusion threshold for this step
- d. Calculate Carbon Emission Intensity of each security as the ratio of Absolute Emission to total sales of the security and sort the list in its descending order
- e. Exclude the securities with the highest Carbon Emission Intensity until the Total Carbon Emission Intensity of the remaining securities falls below the threshold set
- f. Exception – Add back companies with GICS® sub-industry Renewable Electricity (GICS code: 55105020)

3.4 DETERMINING THE OPTIMIZED INDEX

The final index constituents are selected from the Carbon Screened Universe (from section 3.3) with an aim to achieve risk and return characteristics similar to the Parent Index using an optimization process. Optimization aims to minimize active risk subject to constraints. At each Quarterly Index Review, the following optimization constraints are employed, which aim to ensure replicability and investability while minimizing tracking error with respect to the respective Parent Index:

Optimization Constraints

No.	Parameter	Standard and Mid Cap Value/Growth	Small Cap	EAFE	EM
1	Predicted Tracking Error	3.0%	3.0%	3.0%	3.0%
2	Min Constituent Weight	0.01%	0.01%	0.01%	0.01%
3	Constituent Active Weight	+/-1.25%	+/-0.75%	+/-1.25%	+/-1.25%
4	Constituent Weight as a multiple of its weight in the Parent Index	10	5	10	10
5	Max Issuer Active Weight*	1.25%	0.75%	1.25%	1.25%
6	Active Sector Weights* (all sectors except Energy)	+/-4%	+/-4%	+/-4%	+/-4%
7	Active Sector Weights* (Energy sector)	+/-8%	+/-8%	+/-8%	+/-8%
8	Active Country Weight	NA	NA	3%	5%
9	One Way Turnover during May & Nov Index Review	20%	20%	20%	20%
10	One Way Turnover during Feb & Aug Index Review	5%	5%	5%	5%
11	Specific Risk Aversion	0.0075	0.0075	0.0075	0.0075
12	Common Factor Risk Aversion	0.75	0.75	0.75	0.75

*Set as soft constraint while setting the optimization, thus reducing the possibility of not finding a feasible solution
Active weights are with respect to the weight in the Parent Index

Infeasible Optimizations - During the Quarterly and Semi-Annual Index Reviews, in the event that there is no optimal solution that satisfies all the optimization constraints, first the turnover constraint will be relaxed up to a maximum turnover of 50% in 5% increments until an optimal solution is found. If a feasible solution is not found at turnover of 50%, the predicted tracking error is relaxed up to a maximum of 5% in 1% increments. In the event that a feasible solution is still not found, initial construction (tracking error constraint of 3% and no turnover constraint) will be undertaken for that Index Review.

The optimization is conducted using the Barra Open Optimizer in combination with the relevant Barra Global Equity Model. The optimization uses securities of Carbon Screened Universe for selection, and the aim to achieve the specified optimization objective within the constraints to determine the constituents of the Index.

4 MAINTAINING THE TIAA ESG INDEXES

4.1 QUARTERLY INDEX REVIEWS

The Index is rebalanced on a quarterly basis to coincide with the regular Index Reviews (Semi-Annual Index Reviews in May and November and Quarterly Index Reviews in February and August) of the MSCI Global Investable Market Indexes. The changes are implemented at the end of February, May, August and November. The pro forma indexes are in general announced nine business days before the effective date.

ESG Ratings, Carbon Metrics data and Barra Equity Model data used for the Quarterly Index Reviews will be taken as of the end of the month preceding the Index Review, i.e., January, April, July and October.

At each Index Review, the optimization process outlined in Section 3.4 is implemented.

4.2 ONGOING EVENT-RELATED MAINTENANCE

The general treatment of corporate events in the TIAA ESG Indexes 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 TIAA ESG Indexes, the changes made to the Parent Index during intermediate Index Reviews will be neutralized in the TIAA ESG Indexes.

The following section briefly describes the treatment of common corporate events within the TIAA ESG Indexes.

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

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

APPENDIX I: CONTROVERSIAL BUSINESS SCREENING CRITERIA

Companies that are involved in certain controversial business activities are ineligible to be included in the TIAA ESG Indexes because of the high potential for negative social and/or environmental impacts of these activities. The details for the ineligibility criteria are as follows:

- Alcohol Producer - All companies classified as alcohol “Producer” that earn either 50% or more revenue or more than \$1.0 billion in revenue from alcohol-related products.
- Tobacco - All companies classified as tobacco “Producer” that earn either 50% or more revenue or more than \$1.0 billion in revenue from tobacco-related products.
- Gambling - All companies classified as gambling “Operations” or “Support” that earn either 50% or more revenue or more than \$1.0 billion in revenue from gambling-related products.
- Nuclear Power
 - All companies with 6000 MW or more of installed capacity attributed to nuclear sources or with 50% or more of installed capacity attributed to nuclear sources
 - All companies involved in nuclear fuel enrichment for nuclear power generation
 - All companies involved in uranium mining for nuclear power generation
 - All companies involved in nuclear reactor design or construction for nuclear power generation.
- Weapons and Firearms
 - Conventional Weapons - All companies that manufacture conventional weapons components or conventional weapons and weapons systems and earn 50% or more in revenue, or \$3 billion or more in revenue from these activities.
 - Controversial Weapons
 - Cluster munitions manufacturers
 - Landmines manufacturers
 - Depleted Uranium Weapons manufacturers
 - All companies involved in manufacturing of nuclear weapon components or nuclear weapon systems

- All companies involved in manufacturing of bio-chemical weapon components or bio-chemical weapon systems
- All companies involved in the production of weapons using Blinding Lasers, Non-Detectable Fragments and Incendiary weapons
- Civilian Firearms - All companies classified as a “Producer” that earn either 50% or more revenue or more than \$100 million in revenue from civilian firearms.

APPENDIX II: GLOBAL SANCTIONS SCREEN

Companies satisfying the following criteria are excluded from the Index

- Companies with ties to Sudanese military or government
- Companies that sell or distribute military equipment to any party based in Sudan or operating within Sudan borders (except United Nations and African Union troops)
- Companies that are majority owned subsidiary of mineral/power/military/oil-involved Sudanese company
- Companies with ten percent or more of its total assets or revenues in Sudan that are associated with oil/mineral/or power sectors, or that have demonstrated complicity in genocide in Sudan

This screen does not exclude companies with substantial action toward cessation of operations, inactive operations, or humanitarian efforts in Sudan. The screen is applied from December 2015.

THE FOLLOWING SECTIONS HAVE BEEN MODIFIED SINCE NOVEMBER 2016

Section 3.1 – Defining the Parent Index

Added two more TIAA ESG and Parent Indexes:

TIAA ESG International Developed Markets Equity Index	MSCI EAFE Index
TIAA ESG Emerging Markets Equity Index	MSCI Emerging Markets (EM) Index

Section 3.2.1.2 – Enhanced Controversy Score

Added a note to qualify that this exclusion criterion is not applicable for TIAA ESG Emerging Markets Equity Index

Section 3.2.1.5 – Global Sanctions

Added the section only applicable for TIAA ESG Emerging Markets Equity Index

Section 3.4 – Optimization Constraints

Modified the table to add constraints applicable for the new TIAA ESG Indexes

Appendix II – Global Sanctions Screen

Added to provide details of the screen

THE FOLLOWING SECTIONS HAVE BEEN MODIFIED SINCE MARCH 2017

- The details of the Corporate Events treatment are now included in Section 4.2

THE FOLLOWING SECTIONS HAVE BEEN MODIFIED SINCE JUNE 2017

Section 3.2.1.2 – Enhanced Controversy Score

Added more details about the calculation of change in Industry Adjusted Score

Section 3.3.1 – Carbon Emission Exclusion

Added that securities with nonzero potential carbon emission are to be excluded

THE FOLLOWING SECTIONS HAVE BEEN MODIFIED SINCE NOVEMBER 2017

Appendix I – Controversial Business Screening Criteria

Added more weapons to the Controversial Weapons related screening

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* = toll free

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