MSCI MINIMUM VOLATILITY ESG TARGET INDEXES METHODOLOGY

September 2017

CONTENTS

1 INTRODUCTION

The MSCI Minimum Volatility ESG Target Indexes are designed to represent the performance of a strategy that seeks systematic integration of environmental, social and governance (ESG) norms in minimum volatility investing by seeking to minimize risk along with the improvement in the ESG profile of the index. In other words, the index methodology aims to achieve lowest risk while improving the ESG score relative to the underlying parent index.

MSCI categorizes the MSCI Minimum Volatility ESG Target Indexes as part of the family of MSCI Factor Indexes, which are designed to reflect the systematic elements of particular investment styles or strategies. While capitalization weighted indexes aim to represent the broad market beta, additional sources of systematic return associated with particular investment styles and strategies, such as value, quality, volatility, etc. or their combination could be represented through alternatively weighted indexes.

This index methodology aims to incorporate ESG-based constraint in a bottom-up factor index construction approach with a focus on low volatility factor indexes (Minimum Volatility)[1].

The MSCI Minimum Volatility ESG Target Indexes are calculated by optimizing a parent MSCI Index by using an estimated co-variance matrix to produce an index that has the lowest absolute volatility for a given set of constraints. This includes specific constraints for improving the ESG profile for the index relative to that of the underlying parent index.

The starting universe to determine a Minimum Volatility Index is an MSCI Equity Index and the estimated co-variance matrix is based on the relevant Barra multi-factor equity model. Details about the Barra multi-factor risk models are available at

https://www.msci.com/portfolio-management

This methodology book describes a generic methodology that can be applied to create Minimum Volatility ESG Target Indexes from any of the existing MSCI equity indexes (herein, “Parent Indexes”). Some of the optimization constraints applied to determine the MSCI Minimum Volatility ESG Target Index may vary based on the Parent Index on which the optimization is performed.

[1] For the methodology for other MSCI Factor ESG Target indexes please see MSCI Factor ESG Target Indexes Methodology

2 ESG RESEARCH FRAMEWORK

MSCI ESG Research provides in-depth research, ratings and analysis of the environmental, social and governance-related business practices of thousands of companies worldwide. It consists of an integrated suite of tools and products to efficiently manage research, analysis and compliance tasks across the spectrum of ESG factors.

The MSCI Factor ESG Target Indexes including MSCI Minimum Volatility ESG Target Indexes use company ratings and research provided by MSCI ESG Research. In particular, these indexes use the following three MSCI ESG Research products: MSCI ESG Ratings Score, MSCI ESG Controversies Score, and MSCI ESG Business Involvement Screening Research.

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

3 INDEX CONSTRUCTION METHODOLOGY

Constructing the MSCI Minimum Volatility ESG Target Indexes involves the following steps:

- Defining the Parent Index and the base currency for optimization
- Defining the optimization constraints
- Determining the optimized portfolio

Each step is described below.

3.1 DEFINING THE PARENT INDEX AND THE BASE CURRENCY FOR OPTIMIZATION

Constructing the MSCI Minimum Volatility ESG Target Index (herein, "the Index) begins with selecting the Parent Index and eligible universe to perform total risk minimizing optimization. The optimization is performed from a base currency perspective and does not allow short selling of securities. The default currency is the US Dollar.

The optimization relies on the factor exposures for all the securities in the Parent Index and the factor co-variance matrix of the relevant Barra Equity Model.

3.1.1 ELIGIBLE UNIVERSE

The eligible universe is the universe of all the securities in the Parent Index that are not involved in very severe ESG controversies ("Red flags") or in the business of controversial weapons. More detailed information about the ESG-based exclusions is provided in Appendix III.

3.2 DEFINING THE OPTIMIZATION CONSTRAINTS

At each Semi-Annual Index Review (SAIR), the following optimization constraints are employed, which aim to ensure replicability and investability while achieving lowest volatility and improving the ESG profile.

- The maximum weight of an index constituent will be restricted to the lower of 1.5% and 20 times the weight of the security in the Parent Index.
- The minimum weight of an index constituent will be 0.05%.
- For countries with weight greater than 2.5% in the Parent Index, the weight in the MSCI Minimum Volatility ESG Target Index will not deviate more than +/-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 Minimum Volatility ESG Target Index will be capped at 3 times their weight in the Parent Index.
- The sector weights of the MSCI Minimum Volatility ESG Target Index will not deviate more than +/-5% from the sector weights of the Parent Index.
- No constraint will be applied on the exposure of the MSCI Minimum Volatility ESG Target Index to the Barra Volatility risk factors (BETA and RESVOL). Exposure to all other Barra risk factors will be restricted to +/-0.25 standard deviations relative to the Parent Index.
- The weighted-average industry-adjusted ESG score of the Index portfolio will be at least 20% more than the weighted-average industry-adjusted ESG score of the Parent Index portfolio at the time of rebalancing
- The one-way turnover of the MSCI Minimum Volatility ESG Target Index is constrained to a maximum of 10% at each SAIR.

3.3 DETERMINING THE OPTIMIZED INDEX

The MSCI Minimum Volatility ESG Target Index is constructed using the Barra Open Optimizer in combination with the relevant Barra Equity Model[2]. The optimization uses the eligible universe as the universe of eligible securities and the specified optimization objective and constraints to determine the MSCI Minimum Volatility ESG Target Index. Infeasible optimizations are handled as explained in Appendix I.

[2] Please refer to Appendix II for the detailed information on model usage

4 MAINTAINING THE INDEXES

4.1 SEMI-ANNUAL INDEX REVIEWS

The MSCI Minimum Volatility ESG Target Indexes are rebalanced on a semi-annual basis, usually as of the close of the last business day of May and November, coinciding with the May and November Semi-Annual Index Reviews (SAIRs) of the MSCI Global Investable Market Indexes. Barra Equity Model data as of the end of April and October are used respectively. This approach aims to capture timely updates to the risk characteristics of the companies and coincide with the rebalancing frequency of the relevant Parent Index. Similarly, the ESG data used for the Semi-annual Index Reviews will be taken as of the end of the month preceding the Index Review i.e., April and October. For some securities, ESG data may not be published by MSCI ESG Research by the end of the month preceding the Index Review. For such securities, MSCI will use ESG data published after the end of month, when available, for the rebalancing of MSCI Minimum Volatility ESG Target Indexes. This approach aims to capture timely updates to ESG data of the constituents and coincides with the rebalancing of the relevant MSCI Parent Indexes.

The pro forma MSCI Minimum Volatility ESG Target Indexes are in general announced nine business days before the effective date.

4.2 QUARTERLY INDEX REVIEWS

In addition to the SAIR, the ESG-based exclusions are applied on a quarterly basis at the time of regular Quarterly Index Reviews (QIR) of the MSCI Global Investable Market Indexes, usually as of the close of the last business day of February and August. At the quarterly index reviews, the Indexes are not be re-constituted, but existing constituents are deleted from the Indexes if they do not satisfy the eligibility criteria as described in section 3.1 above. The ESG data used for the QIR will be taken as of the end of the month preceding the Index Review i.e., January and July. For some securities, this data may not be published by MSCI ESG Research by the end of the month preceding the Index Review. For such securities, MSCI will use ESG data published after the end of month, when available, for the rebalancing of MSCI Minimum Volatility ESG Target Indexes.

4.3 ONGOING EVENT RELATED CHANGES

The general treatment of corporate events in the MSCI Minimum Volatility ESG Target 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 MSCI Minimum Volatility ESG Target Index, the changes made to the Parent Index during intermediate Index Reviews will be neutralized in the MSCI Minimum Volatility ESG Target Index.

The following section briefly describes the treatment of common corporate events within the MSCI Minimum Volatility ESG Target 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: 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 3.2, the following constraints are relaxed, until an optimal solution is found:

- Relax the turnover constraint in steps of 5%, up to a maximum of 30%
- Relax the minimum weight constraint in steps of 0.01% up to a minimum of 0.01%.

For MSCI Regional/Country Indexes which have relatively lower number of stocks, the standard optimization parameters may lead to an infeasible solution. MSCI may apply relaxed constraints relative to the standard set of constraints based on the following guidelines:

Order of Relaxation	Maximum Asset Weight	Sector Weight
1	Lower of 3% or 20 times the weight of the security in the Parent Index	+/-5% from the sector weights of the Parent Index
2	Lower of 3% or 20 times the weight of the security in the Parent Index	+/-7.5% from the sector weights of the Parent Index
3	Lower of 5% or 20 times the weight of the security in the Parent Index	+/-5% from the sector weights of the Parent Index
4	Lower of 5% or 20 times the weight of the security in the Parent Index	+/-7.5% from the sector weights of the Parent Index

In the event that no optimal solution is found after the above constraints have been relaxed, the MSCI Minimum Volatility ESG Target Index will not be rebalanced for that semi-annual index review.

APPENDIX II: NEW RELEASE OF BARRA® EQUITY MODEL OR BARRA® OPTIMIZER

The methodology presently uses MSCI Barra Global Equity Model for Long-Term Investors ("GEMLTL") 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 III: CONTROVERSY SCORE AND CONTROVERSIAL WEAPONS EXCLUSION CRITERIA

- ESG Controversy Score ("Red Flags")

Securities of companies having faced very severe controversies pertaining to ESG issues are not eligible for inclusion in the Index. This is implemented by excluding constituents of Parent Index with MSCI ESG Controversy Score = 0 ("Red Flag" companies). For more details on MSCI ESG Controversies Score, please refer to https://www.msci.com/esg-integration

- Controversial Weapons Involvement

For details please refer to MSCI Global ex Controversial Weapons Indexes Methodology at https://www.msci.com/index-methodology .

CONTACT US

clientservice@msci.com

AMERICAS

Americas	1 888 588 4567 *
Atlanta	+ 1 404 551 3212
Boston	+ 1 617 532 0920
Chicago	+ 1 312 675 0545
Monterrey	+ 52 81 1253 4020
New York	+ 1 212 804 3901
San Francisco	+ 1 415 836 8800
Sao Paulo	+ 55 11 3706 1360
Toronto	+ 1 416 628 1007

EUROPE, MIDDLE EAST & AFRICA

Cape Town	+ 27 21 673 0100
Frankfurt	+ 49 69 133 859 00
Geneva	+ 41 22 817 9777
London	+ 44 20 7618 2222
Milan	+ 39 02 5849 0415
Paris	0800 91 59 17 *

ASIA PACIFIC

China North	10800 852 1032 *
China South	10800 152 1032 *
Hong Kong	+ 852 2844 9333
Mumbai	+ 91 22 6784 9160
Seoul	00798 8521 3392 *
Singapore	800 852 3749 *
Sydney	+ 61 2 9033 9333
Taipei	008 0112 7513 *
Tokyo	+ 81 3 5290 1555

* = toll free

ABOUT MSCI

For more than 40 years, MSCI's research-based indexes and analytics have helped the world's leading investors build and manage better portfolios. Clients rely on our offerings for deeper insights into the drivers of performance and risk in their portfolios, broad asset class coverage and innovative research.

Our line of products and services includes indexes, analytical models, data, real estate benchmarks and ESG research.

MSCI serves 98 of the top 100 largest money managers, according to the most recent P&I ranking.

For more information, visit us at www.msci.com.

NOTICE AND DISCLAIMER

• This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the "Information") is the property of MSCI Inc. or its subsidiaries (collectively, "MSCI"), or MSCI's licensors, direct or indirect suppliers or any third party involved in making or compiling any Information (collectively, with MSCI, the "Information Providers") and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or redisseminated in whole or in part without prior written permission from MSCI.

• The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

• The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PROVIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

• Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

• Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

• The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

• None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

• It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, "Index Linked Investments"). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI Inc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

• Index returns do not represent the results of actual trading of investible assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

• The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

• Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

• Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research LLC and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

• MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.'s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.'s company filings on the Investor Relations section of www.msci.com.

• MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Except with respect to any applicable products or services from MSCI ESG Research, neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI's products or services are not intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. Issuers mentioned or included in any MSCI ESG Research materials may include MSCI Inc., clients of MSCI or suppliers to MSCI, and may also purchase research or other products or services from MSCI ESG Research. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body.

• Any use of or access to products, services or information of MSCI requires a license from MSCI. MSCI, Barra, RiskMetrics, IPD, FEA, InvestorForce, and other MSCI brands and product names are the trademarks, service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and Standard & Poor's. "Global Industry Classification Standard (GICS)" is a service mark of MSCI and Standard & Poor's.