

MSCI 25/50 INDEXES METHODOLOGY

February 2019

CONTENTS

1	Introduction to the MSCI 25/50 Indexes	3
	Introduction	3
2	Index Objectives and Guiding Principles.....	4
2.1	Reflecting the 25% and 50% concentration constraints	4
2.2	Minimizing tracking error to the Parent Index	4
3	Index Construction and Maintenance Methodology	5
3.1	Group Entities.....	5
3.1.1	Maintenance	5
3.2	Construction and Rebalancing of the MSCI 25/50 Indexes	5
3.2.1	Constraint targets	5
3.2.2	Minimizing tracking error from Parent Index	5
3.2.3	Minimize Transaction Cost.....	6
3.2.4	Minimum weight of constituents	6
3.2.5	Maximum weight of constituents.....	6
3.3	Buffer Rules	6
3.4	Maintenance Rules.....	6
3.4.1	Quarterly Index Reviews	6
3.4.2	Ongoing Event Related Changes	7
3.5	Group Entity Concentration Issues	7
	Appendix I: Optimization Parameters	9
	Appendix II: Special Capping Rules.....	10

1 INTRODUCTION TO THE MSCI 25/50 INDEXES

INTRODUCTION

Under the current US Internal Revenue Code, among other things, a fund needs to satisfy certain tests, such as those relating to asset diversification and sources of income, for qualification as a "regulated investment company" or "RIC". More specifically, one requirement of a RIC is that at the end of each quarter of a RIC's tax year no more than 25% of the value of the RIC's assets may be invested in a single issuer and the sum of the weights of all issuers representing more than 5% of the fund should not exceed 50% of the fund's total assets.

The MSCI 25/50 Indexes take into account these investment limits, aiming to offer a pertinent benchmarking alternative for RIC compliant funds.

This document describes the methodology that MSCI uses to calculate the MSCI 25/50 Indexes by applying the weight constraints set forth herein to the non-constrained, free-float adjusted market capitalization weighted MSCI Equity Indexes (herein, "Parent Indexes").

2 INDEX OBJECTIVES AND GUIDING PRINCIPLES

In designing an appropriate methodology for constructing the MSCI 25/50 Indexes from underlying non-constrained indexes, the following principles have guided MSCI.

2.1 REFLECTING THE 25% AND 50% CONCENTRATION CONSTRAINTS

Reflecting the 25% and 50% concentration constraints is the primary consideration in terms of both index construction and index maintenance. Ensuring timely and on-going reflection of the constraints requires an MSCI 25/50 Index to be rebalanced periodically. The MSCI 25/50 Indexes are rebalanced in February, May, August and November.

MSCI also offers other indexes reflecting additional or different constraints. See Appendix II for further details.

2.2 MINIMIZING TRACKING ERROR TO THE PARENT INDEX

Minimizing the tracking error between the MSCI 25/50 Index and the Parent Index, while keeping the index turnover to a reasonable level, is another important objective of the current methodology. This is achieved by rebalancing the MSCI 25/50 Index using an optimization process that aims to minimize the constituent weight differences between the MSCI 25/50 Index and the Parent Index.

3 INDEX CONSTRUCTION AND MAINTENANCE METHODOLOGY

3.1 GROUP ENTITIES

The MSCI 25/50 Indexes use the concept of group entities to define the 25% and 50% concentration constraints at the issuer level.

Financial accounts of listed companies holding stakes of 20% or more in other listed companies are analyzed to determine whether these stakes are controlling in nature and, consequently, whether both companies should be considered as belonging to the same group entity. In certain cases, even in the absence of consolidated accounts, MSCI may consider two companies as belonging to the same group entity where there is reasonable evidence of control based on other information.

3.1.1 MAINTENANCE

MSCI will perform an annual review of all group entities, which will coincide with the August Quarterly Index Review. Any change in a group entity resulting from a corporate event will be implemented at the time of the event. Updates triggered by the disclosure of new public information unrelated to corporate events or corrections to existing group entities will be implemented as of the close of the last business day of the month.

3.2 CONSTRUCTION AND REBALANCING OF THE MSCI 25/50 INDEXES

The MSCI 25/50 Index methodology follows a portfolio optimization framework. The Barra Optimizer is utilized to perform the optimization function which is aimed at minimizing index turnover, tracking error and extreme deviation from the Parent Index.¹

3.2.1 CONSTRAINT TARGETS

The MSCI 25/50 Index has the following constraints:

- No group entity exceeds 25% of index weight
- All group entities with weight above 5% cannot exceed 50% of the index weight

3.2.2 MINIMIZING TRACKING ERROR FROM PARENT INDEX

The index aims at minimizing the tracking error from the pro forma Parent Index. The tracking error of the MSCI 25/50 Index versus the Parent Index is measured as the sum of

¹ A brief description of Barra Optimizer can be found at www.msci.com/research-archive

the squared weight differences between the constituent weights of the MSCI 25/50 Index and Parent Index.

3.2.3 MINIMIZE TRANSACTION COST

A transaction cost is applied as a proxy for index turnover on rebalancing from the current MSCI 25/50 Index to the pro forma MSCI 25/50 Index.

3.2.4 MINIMUM WEIGHT OF CONSTITUENTS

The minimum weight of any MSCI 25/50 Index constituent is equal to the weight of the smallest constituent in the pro forma Parent Index.

3.2.5 MAXIMUM WEIGHT OF CONSTITUENTS

In order to avoid excess weight allocation to the smaller securities relative to their market cap weight, the maximum weight of any MSCI 25/50 Index constituent is capped at four times its weight in the pro forma Parent Index. The constraint is relaxed in steps of one in case of infeasibilities.

For certain narrow parent indexes, the standard maximum weight constraint parameters might lead to an infeasible solution. In such cases, MSCI may apply relaxed constraints relative to the standard set of constraints.

3.3 BUFFER RULES

A buffer of 10% of the value of each constraint is used in order to reduce the risk of non-compliance due to short term market movements between two quarterly rebalancing. As a result, at the point of constructing or rebalancing the MSCI 25/50 Indexes, the weight of any single group entity cannot exceed 22.5% of the index weight and all group entities with weight above 4.5% cannot exceed 45% of the index weight.

3.4 MAINTENANCE RULES

3.4.1 QUARTERLY INDEX REVIEWS

The MSCI 25/50 Indexes are rebalanced quarterly and the changes resulting from the rebalancing are made as of the close of the last business day of each February, May, August and November, to coincide with the Quarterly Index Reviews of their Parent Indexes.

The pro forma MSCI 25/50 Indexes are in general rebalanced nine business days before the effective date. The changes resulting from the rebalancing are announced on the same day.

In case the pro forma MSCI 25/50 Index violates the 25/50 constraints between the announcement date and the effective date, the previously announced results will be discarded and a newly rebalanced pro forma index will be announced.

There is no index rebalancing due to non-compliance between Quarterly Index Reviews.

At each rebalancing, a constraint factor is calculated for each constituent of the MSCI 25/50 Index. The constraint factor is defined as the weight in the MSCI 25/50 Index at the time of the rebalancing divided by the weight in the Parent Index. The constraint factor as well as the constituents of the index remains constant between index reviews except in case of corporate events as described below.

3.4.2 ONGOING EVENT RELATED CHANGES

A security added to the Parent Index following a corporate event is added to the MSCI 25/50 Index with an estimated capped weight, without rebalancing of the MSCI 25/50 index.

In the event of a merger or an acquisition where an index constituent acquires another index constituent or merges with another index constituent, the remaining company is maintained in the index with a constraint factor calculated as the weighted average of the constraint factors before the corporate event.

If a spun off security of an index constituent is added to the Parent Index, it will be added to the MSCI 25/50 Index with the same constraint factor as the parent security.

The deletion of a constituent from the Parent Index following a corporate event triggers its deletion from the MSCI 25/50 Index without rebalancing of the MSCI 25/50 Index.

The addition of a newly eligible security in the Parent Index -- for example an early inclusion of a large IPO, or a security migrating to the Parent Index from another size segment -- will result in the inclusion of that security in the MSCI 25/50 Index and consequently trigger the full rebalancing of the MSCI 25/50 Index.

Please refer to the MSCI Corporate Events Methodology book available at: <https://www.msci.com/index-methodology> for more details.

3.5 GROUP ENTITY CONCENTRATION ISSUES

A minimum of 15 group entities in the Parent Index is required at any point in time for an MSCI 25/50 Index to be rebalanced as described in Section 3.1. In the event the number of group entities drops below 15 but remains above 11 following a corporate event or a regular index review, MSCI will apply the following adjustments:

- Number of group entities drops to 14: the buffer mentioned in sub-section 3.2 will be reduced from 10% to 9%. Thus, the weight of any single group entity cannot exceed

22.75% of the index weight and all group entities with weight above 4.55% cannot exceed 45.5% of the index weight.

- Number of group entities drops to 13: the buffer mentioned in sub-section 3.2 will be reduced from 10% to 4%. Thus, the weight of any single group entity cannot exceed 24% of the index weight and all group entities with weight above 4.8% cannot exceed 48% of the index weight.
- Number of group entities drops to 12: the buffer mentioned in sub-section 3.2 will be reduced from 10% to 0%. Thus, the weight of any single group entity cannot exceed 25% of the index weight and all group entities with weight above 5% cannot exceed 50% of the index weight.

In case of extremely concentrated Parent Indexes where it may not be feasible to construct the pro forma MSCI 25/50 Index using the Barra Open Optimizer, MSCI may temporarily use the capping algorithm described in the MSCI 10/40 Index methodology with the relevant 25/50 parameters to construct the pro forma MSCI 25/50 Index. For more details, please refer to the MSCI 10/40 Index methodology book available at:

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

The MSCI 25/50 Index will need to be discontinued if the number of group entities drops below 12 as mathematically no solution can satisfy the 25% and 50% constraints. MSCI will however temporarily maintain the MSCI 25/50 Index for a minimum of two months before discontinuation by adding the necessary number of securities to the index. The index discontinuation will coincide with one of the subsequent regular index reviews. The securities to be added will be chosen in the following order of priority:

- Securities deleted from the MSCI 25/50 Index, provided they exhibit required liquidity and were not deleted due to financial difficulties, etc.
- Eligible securities of relevant size not included in the Parent Index, e.g., largest small cap size-segment securities if the Parent Index is a MSCI Standard Index.

In the event that no securities are eligible for temporary addition to the MSCI 25/50 Index, MSCI will be providing an index, as close as possible to the 25/50 constraints, for a minimum of two months before discontinuation. The index discontinuation will coincide with one of the subsequent regular index reviews.

MSCI will announce any of these adjustments to all impacted clients ahead of implementation.

APPENDIX I: OPTIMIZATION PARAMETERS

The following parameters are used in the optimization process:

- The Parent Index is used as the benchmark.
- The objective is to minimize tracking error to the Parent Index.
- A diagonal covariance matrix is used with the same risk for each constituent (1) and zero for all off-diagonals.
- The minimum weight of capped index constituents is set to the weight of the smallest constituent in the Parent Index. This avoids the situation where the optimized index holds a security with a very small weight.
- The maximum weight of index constituents are capped at 4 times their weight in the pro forma Parent Index. The constraint would be relaxed in steps of 1 in cases of infeasibilities.
- The risk aversion parameter is set to default value of 0.0075, which is widely used in mean-variance optimizations.
- One way transaction cost is set to 0.5%, which aims to achieve a balance between minimizing active risk and turnover.
- The weight of each China A Stock Connect listing will be capped at a maximum of three times its weight in the Parent Index.

APPENDIX II: SPECIAL CAPPING RULES

Additional capping rules may be applied to address other investment constraints, such as:

- No group entity can exceed 10% of the weight and all group entities with weight above 5% cannot exceed 25% of the index weight.
- No group entity can exceed 5% of the index weight.

The following sections have been modified since Feb 2014:

Section 1: Introduction to the MSCI 25/50 Indexes

- Updates to the description

Section 2: Construction and Rebalancing of the MSCI 25/50 Indexes

- Updated link for the description of Barra Optimizer

The following sections have been modified since September 2017:

Appendix III: Methodology for the MSCI US IMI/Telecom SVC 25-50 Index

- Included details of the construction methodology for the MSCI US IMI/Telecom SVC 25-50 Index.

The following sections have been modified since October 2017:

Appendix I: Optimization Parameters

- Included details on additional constraint to be applied on China A Stock Connect listing

The following sections have been modified since May 2018:

Deleted Appendix III: Methodology for the MSCI US IMI/Telecom SVC 25-50 Index

Included details on maximum weight capping constraint in the below sections

- Section 3.2.5 : Maximum Weight of Constituents
- Appendix I: Optimization Parameters

Section 3.4.1: Quarterly Index Reviews

- Updated rebalancing notification change from five days to nine days

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 disseminated 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 investable 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, 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.

MIFID2/MIFIR notice: MSCI ESG Research LLC does not distribute or act as an intermediary for financial instruments or structured deposits, nor does it deal on its own account, provide execution services for others or manage client accounts. No MSCI ESG Research product or service supports, promotes or is intended to support or promote any such activity. MSCI ESG Research is an independent provider of ESG data, reports and ratings based on published methodologies and available to clients on a subscription basis. We do not provide custom or one-off ratings or recommendations of securities or other financial instruments upon request.

Privacy notice: For information about how MSCI ESG Research LLC collects and uses personal data concerning officers and directors, please refer to our Privacy Notice at <https://www.msci.com/privacy-pledge>