MSCI US LISTING REQUIREMENTS INDEXES METHODOLOGY

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1 Introduction To The MSCI US Listing Requirements Indexes

1.1 Introduction

US-listed exchange traded products (ETPs) have historically only been required to comply with listing standards at the time of initial listing. A rule change, driven by the Securities and Exchange Commission, has now stated that effective January, 2018, US exchanges (which include NYSE/ARCA, CBOE/BATS and NASDAQ) will introduce rules that require ETP portfolios to meet the same initial listing standards on a continual and ongoing basis as well.

This document describes the methodology that MSCI uses to calculate the MSCI US Listing Requirements ("USLR") Indexes. The methodology employs optimization to provide an index which is compliant with the US Continuous Listing Standards, as detailed in Appendix. The underlying index to an MSCI USLR Index can be a market capitalization weighted or non-market capitalization weighted MSCI Equity Index or a MSCI Capped Index (e.g. MSCI 25/50 Index) (herein, "Parent Indexes"). The MSCI USLR Indexes methodology provides an 'overlay' solution to a pre-existing Parent Index underlying an ETP, and aims to remediate, on a quarterly basis, any characteristics of the underlying index that would cause the linked ETP to become non-compliant with the US Continuous Listing Standards.

2 Index Objectives And Guiding Principles

In designing an appropriate methodology for constructing the MSCI USLR methodology, the following principles have guided MSCI.

2.1 Reflecting The US Continuous Listing Standards

Reflecting and ensuring compliance with the US Continuous Listing Standards is the primary consideration in terms of both index construction and index maintenance.

Timely and on-going reflection of the Listing Standards requires an MSCI USLR Index to be rebalanced periodically to comply with, at a minimum, the quarterly enforcement of the Listing Standards by the US exchanges.

Accordingly, the MSCI USLR Indexes are rebalanced quarterly[1] and the changes resulting from the rebalancing are made as of the close of the last business day of February, May, August and November, to coincide with the Quarterly and Semi Annual Index Reviews of their Parent Indexes.

[1] The MSCI USLR indexes are rebalanced on a quarterly basis in alignment with the minimum frequency of enforcement of the US Continuous Listing Standards. These indexes are also available with a daily rebalancing option.

2.2 Minimizing Tracking Error To The Parent Index

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

3 Index Construction And Maintenance Methodology

3.1 Construction And Rebalancing Of The MSCI USLR Indexes

The MSCI USLR Index methodology follows an optimization framework. The Barra Optimizer[2] is utilized to perform the optimization function which is aimed at minimizing index turnover, tracking error and extreme deviation from the Parent Index. Index alignment with the US Continuous Listing Standards, or any other regulatory driven requirements that may be relevant to a Parent Index (i.e. MSCI 25/50 Index), takes priority over any other underlying Parent Index methodological requirement (e.g. sector neutral weighting, issuer level capping, etc.).

3.1.1 Constraint Targets

The MSCI USLR Index uses the following constraints for an underlying International (as defined in Appendix) Parent Index:

- No component stock can exceed 25% of index weight
- The top 5 component stocks by weight cannot in aggregate exceed 60% of the index weight
- The minimum market cap of component stocks that account for at least 90% of index weight should be $100 million
- Minimum liquidity of component stocks that account for at least 70% of index weight should be a minimum monthly trading volume of 250,000 shares or a minimum notional volume traded per month of $25,000,000 averaged over the last six months
- Minimum number of component stocks is 20

[2] A brief description of Barra Optimizer can be found at https://www.msci.com/portfolio-management

The MSCI USLR Index has the following constraints for an underlying Domestic (as defined in Appendix) Parent Index:

- No component stock can exceed 30% of index weight
- The top 5 component stocks by weight cannot in aggregate exceed 65% of the index weight
- The minimum market cap of component stocks that account for at least 90% of index weight should be $75 million
- Minimum liquidity of component stocks that account for at least 70% of index weight should be a minimum monthly trading volume of 250,000 shares or minimum notional volume traded per month of $25,000,000 averaged over the last six months
- Minimum number of component stocks is 13

3.1.2 Minimizing Tracking Error From Parent Index

The index aims to minimize the tracking error from the pro forma Parent Index. The tracking error of the MSCI USLR Index versus the Parent Index is measured as the sum of the squared weight differences between the constituent weights of the MSCI USLR Index and Parent Index.

3.1.3 Minimize Transaction Cost

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

3.1.4 Minimum Weight Of Constituents

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

3.1.5 Minimum Number Of Component Stocks[3]

At each Quarterly and Semi Annual Index Review, the underlying Parent Index will be reviewed for the minimum number of constituents required for MSCI USLR Index to remain in line with the US Continuous Listing Requirements.

[3] If an MSCI USLR Index is based on a daily rebalancing schedule, then the minimum number of constituents required for MSCI USLR Index compliance is satisfied when the index is rebalanced on an "as needed" basis at the end of any day on which the constraints are breached.

3.2 Buffer Rules

A buffer of 10% of the value of each constraint is used in order to reduce the risk of non-alignment due to short term market movements between Quarterly Index Reviews. As a result, at the point of constructing or rebalancing the MSCI USLR Index, an additional buffer of 10% is applied to the weighting threshold on most of the listing standards constraints noted in Appendix. These are implemented during a rebalance as follows (for international indexes):

Market capitalization: With a 10% buffer, all securities which comply will account for at least 91% of index weight (i.e. 10% buffer on index weight of non-compliant securities)

Liquidity: With a 10% buffer, all securities which comply will account for at least 73% of index weight (i.e. 10% buffer on index weight of non-compliant securities)

Top component: With a 10% buffer, the maximum index weight of the top component stock component will be <=22.5%

Aggregate weight of top 5: With a 10% buffer, the maximum aggregate index weight of the top 5 component stocks will be <=54%

3.3 Maintenance Rules

3.3.1 Quarterly Index Reviews

The MSCI USLR Indexes are rebalanced quarterly[4] 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 and Semi-Annual Index Reviews of their Parent Indexes.

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

[4] If the MSCI USLR Index is based on a daily rebalancing schedule so as to rebalance on an "as needed" basis, then the index is checked for compliance with the constraints each day, and rebalanced at the end of any day on which the constraints as specified are breached. The breach of the constraints can be, for example, triggered by the market performance of one constituent.

The rebalancing of the index in this case is done relative to the existing constituents' weights as opposed to rebalancing relative to the constituents' weights in the Parent Index. This feature of the methodology is designed to significantly reduce the index turnover, as rebalancing to the Parent Index may increase or decrease the weight of constituents which are not in breach of the constraints.

The rebalancing will take place as of the close of the day when the index breaches the constraints, based on closing prices, such that the MSCI USLR Index will always be within the constraints before the opening of the following trading day.

In case the pro forma MSCI USLR Index violates the 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.

3.3.2 Ongoing Event Related Changes

The MSCI USLR Indexes are designed to be used as an 'overlay' to a pre-existing Parent Index to comply with the US Continuous Listing Standards.

The corporate events for MSCI USLR Indexes are maintained and implemented in accordance with the respective Parent Index Methodology.

Further detail regarding specific treatment of corporate events relevant to the MSCI USLR Indexes can be found in the respective Parent Index methodology books available at

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

Appendix I: Optimization Parameters

The following parameters are used in the optimization process:

- The Parent Index is used as the benchmark.
- A guiding principle 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 USLR 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 risk aversion parameter is set to default value of 0.0075, which is widely used in mean-variance optimizations.
- The turnover constraint is set as 10%. This constraint may be breached, as non-compliance is deemed an unacceptable outcome of optimization and therefore additional turnover may be needed to achieve the index objective.
- One way transaction cost is set to 0.5% which aims to achieve a balance between minimizing active risk and turnover.

Appendix II: US Continuous Listing Standards[5]

Listing Standard	International/ Global **	Domestic *
Minimum market cap of component stocks that account for at least 90% of index weight	$100M	$75M
Minimum liquidity of component stocks that account for at least 70% of index weight	Minimum monthly trading volume of 250,000 shares or minimum notional volume traded per month of $25,000,000 averaged over the last six months	
Maximum weight of top component stock	25%	30%
Maximum aggregate weight of top 5 component stocks	60%	65%
Minimum number of component stocks	20	13

**A domestic ETF/ETP is an ETF/ETP that includes only "U.S. Component Stocks" which are equity securities that are registered*

a. *under Sections 12(b) or 12(g) of the 1934 Act or*

b. *American Depositary Receipts, the underlying equity security of which is registered under Sections 12(b) or 12(g) of the 1934 Act.*

***A global or international ETF/ETP is an ETF/ETP that consists of either*

a. *only Non-U.S. Component Stocks or*

b. *Both U.S. Component Stocks and Non-U.S. Component Stocks.*

A "Non-U.S. Component Stock" is an equity security that is not registered under Sections 12(b) or 12(g) of the 1934 Act and that is issued by an entity that

i. *is not organized, domiciled or incorporated in the United States, and*

ii. *is an operating company (including REITS and income trusts, but excluding investment trusts, unit trusts, mutual funds, and derivatives).*

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[5] These standards are taken from public information provided by the U.S. exchanges and can be found at: https://listingcenter.nasdaq.com .

There is an additional standard which states that each U.S. Component Stock shall be listed on a national securities exchange and shall be an NMS Stock as defined in Rule 600 of Regulation NMS under the Securities Exchange Act of 1934, and each Non-U.S. Component Stock shall be listed and traded on an exchange that has last-sale reporting.

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