

# LIBERTYQ EMERGING MARKETS INDEX

**May 2019**

**CONTENTS**

- 1 Introduction ..... 3
- 2 Index Construction Methodology ..... 4
  - 2.1 Defining The Eligible Universe..... 4
  - 2.2 Determination Of Factor Score ..... 4
    - 2.2.1 Calculating the Z-Score for Each Individual Factor .....4
    - 2.2.2 Calculating the Composite Factor Z-Score .....6
    - 2.2.3 Calculating the Final Factor Score.....7
  - 2.3 Security Selection & Weighting Scheme ..... 7
- 3 Maintaining the index ..... 8
  - 3.1 Semi-Annual Index Reviews ..... 8
    - 3.1.1 Buffer Rules:.....8
  - 3.2 Ongoing Event Related changes..... 9
- Appendix I: Calculation of Variables..... 11

**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 LibertyQ Emerging Markets Index. The LibertyQ Emerging Markets Index (“Index”) is designed to represent the performance of a strategy that seeks exposure to four style factors – Quality, Value, Momentum and Low Volatility.

## 2 INDEX CONSTRUCTION METHODOLOGY

### 2.1 DEFINING THE ELIGIBLE UNIVERSE

The eligible universe includes all the constituents of the MSCI Emerging Markets Index (herein, the “Parent Index”).

### 2.2 DETERMINATION OF FACTOR SCORE

#### 2.2.1 CALCULATING THE Z-SCORE FOR EACH INDIVIDUAL FACTOR

The z-score for a descriptor for each security is calculated as described below.

$$Z = \frac{(x - \mu)}{\sigma}$$

Where:

- $z$  is the individual descriptor z-score
- $x$  is the descriptor value for a given security included in the Parent Index
- $\mu$  is the equal weighted mean of the descriptor values of all the securities included in the Parent Index
- $\sigma$  is the equal weighted standard deviation of the descriptor values of all the securities included in the Parent Index

Z-scores are then winsorized at +/-3 (i.e., the z-scores above 3 are capped at 3 and z-scores below -3 are floored at -3). If a z-score of an individual descriptor is not computed due to the unavailability of the underlying descriptor data, the universe average z-score is used.

A sector relative z-score is then computed for a descriptor by standardizing the individual descriptor z-scores within the sector groups.

The three sector groups defined to apply sector relative z-scores are:

- a.) Securities belonging to the GICS “Financials” Sector (Sector “40” of the Global Industry Classification Standard (GICS®))
- b.) Securities belonging to the GICS “Real Estate” Sector (Sector “60” of the Global Industry Classification Standard (GICS®) respectively)
- c.) Securities belonging to all the other GICS sectors except “Financials” and “Real Estate” Sectors

$$Z_{\text{sec\_rel}} = \frac{(Z - \mu_{\text{sec\_rel}})}{\sigma_{\text{sec\_rel}}}$$

Where:

- $Z_{\text{sec\_rel}}$  is the sector relative z-score for a descriptor
- $Z$  is the individual descriptor z-score for a given security within a sector group
- $\mu_{\text{sec\_rel}}$  is the equal weighted mean of the descriptor z-scores of all the securities included in a sector group
- $\sigma_{\text{sec\_rel}}$  is the equal weighted standard deviation of the descriptor z-scores of all the securities included a sector group

A sector relative z-score for each sector group universe is then winsorized at +/- 3.

The Factors and the individual descriptors defining each of the four factors are as follows:-

**(i) Quality Factor**

Computed by equal weighting the sector relative z-scores of the relevant descriptor as follows:

**For all the securities in the GICS “Financials” and “Real Estate” Sectors**

- a.) Return on Equity (ROE)
- b.) Negative of Earnings Variability
- c.) Cash ROA

**For all the securities except for “Financials” and “Real Estate” Sectors**

- a.) Return on Equity (ROE)
- b.) Negative of Earnings Variability
- c.) Cash ROA
- d.) Negative of Leverage

**(ii) Value Factor**

Computed by weighting the sector relative z-scores of the relevant descriptor as follows:

**For all the securities in the GICS “Financials” and “Real Estate” Sectors**

- a.) Inverse of Price to Book Value (P/B) with a weight of 66.66%
- b.) Dividend Yield (DY) with a weight of 33.33%

**For all the securities except for “Financials” and “Real Estate” Sectors**

- a) Inverse of Price to Earnings (P/E) with a weight of 33.33%
- b) Inverse of Price to Forward Earnings (P/E fwd) with a weight of 33.33%
- c) Dividend Yield (DY) with a weight of 33.33%

**(iii) Momentum Factor**

Computed by equal weighting the sector relative z-scores of the following descriptors

- a.) 6-month Risk-adjusted Price Momentum
- b.) 12-month Risk-adjusted Price Momentum

**(iv) Volatility Factor**

- a.) Sector Relative z-score of Negative of Historical Beta estimated over the trailing 104 weekly returns

Please refer to Appendix I for further details on the calculation of each factor.

**2.2.2 CALCULATING THE COMPOSITE FACTOR Z-SCORE**

The Composite Factor Z-Score is computed from the factor z-scores as described below.

$$Z_{Comp} = 0.50 * Z_{Quality} + 0.30 * Z_{Value} + 0.10 * Z_{Momentum} + 0.10 * Z_{Volatility}$$

Where:

- $Z_{Comp}$  is composite factor z-score
- $Z_{Quality}$  is the quality factor z-score as calculated in the previous section
- $Z_{Value}$  is the value factor z-score as calculated in the previous section
- $Z_{Momentum}$  is the momentum factor z-score as calculated in the previous section
- $Z_{Volatility}$  is the volatility factor z-score as calculated in the previous section

**2.2.3 CALCULATING THE FINAL FACTOR SCORE**

The Final Factor Score is computed from the composite factor z-score as follows:

$$Final\ Factor\ Score = \begin{cases} 1 + Z, & Z \geq 0 \\ (1 - Z)^{-1}, & Z < 0 \end{cases}$$

Where Z is the composite factor z-score determined in the previous step.

**2.3 SECURITY SELECTION & WEIGHTING SCHEME**

The LibertyQ Emerging Markets Index targets 25% of the number of securities from its Parent Index. All the constituents of the Parent Index are ranked based on their Composite Factor Z-Score and target number of securities with the highest rank, are selected.

The securities included are assigned weights in the proportion of Market Cap Weight\*Final Factor Score.

### 3 MAINTAINING THE INDEX

#### 3.1 SEMI-ANNUAL INDEX REVIEWS

The LibertyQ Emerging Markets Index is 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. Descriptor data as of the end of April and October are used respectively. The pro forma Index is typically announced nine business days before the effective date.

At each rebalancing, a constraint factor (CF) is calculated for each constituent in the Index. The constraint factor is defined as the weight in the Index at the time of the rebalancing divided by the weight in the Parent Index. The constraint factor as well as the constituents in the Index remains constant between index reviews except in case of corporate events as described in the section 3.2.

##### 3.1.1 BUFFER RULES:

To reduce Index turnover and enhance stability, buffer rules are applied as follows:

###### Security Selection Buffer

A security selection buffer of 50% is applied at each Index Review.

For example, the Index targets 25% of the number of securities in the Parent Index and if 25% of the number of securities in the Parent Index equals 'x' number of securities, then buffers are applied between rank  $((x/2)+1)$  and  $x+(x/2)$ . The securities in the Parent Index with a final factor score rank at or below  $x/2$  will be added to the Index on a priority basis. Existing constituents that have a final factor score between  $((x/2)+1)$  and  $x+(x/2)$  are then successively added until the number of securities reaches x. If the number of the securities is below x after this step, the remaining securities in the Parent Index with the highest final factor score rank are added until the number of securities in the Index reaches x.

###### Turnover Buffer

A turnover buffer of 50% is applied at each Index Review. For example, if the ongoing rebalancing results in changing the weight of a security from x% to y% in the Index, then the effective change in weight will be:

$$\text{Effective pro forma constituent weight} = x + (y-x)/2$$

The turnover buffer is applied on the uncapped weights of existing and pro forma constituents and is not applied on deletions. After the turnover buffers are applied, weight capping of 1% is applied at the issuer level.



### 3.2 ONGOING EVENT RELATED CHANGES

The general treatment of corporate events in the LibertyQ Emerging Markets 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.

Additionally, if the frequency of Index Reviews in the Parent Index is greater than the frequency of Index Reviews in the LibertyQ Emerging Markets Index, the changes made to the Parent Index during intermediate Index Reviews will be neutralized in the LibertyQ Emerging Markets Index.

The following section briefly describes the treatment of common corporate events within the LibertyQ Emerging Markets 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
<b>New additions to the Parent Index</b>	A new security added to the parent index (such as IPO and other early inclusions) will not be added to the index.
<b>Spin-Offs</b>	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.
<b>Merger/Acquisition</b>	<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 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: CALCULATION OF VARIABLES**

Factor	Descriptor	Computation Details
Quality	Return on Equity (ROE)	$\frac{\text{Trailing 12 months earnings per share}}{\text{Latest book value per share}}$
	Earnings Variability	Earnings variability is defined as the standard deviation of y-o-y earnings per share growth over the last five fiscal years
	Cash ROA	$\frac{\text{Latest Fiscal Year Net Operating Cash Flow}}{\text{Latest Fiscal Year Total Assets}}$
	Leverage	<p>Leverage is defined as the average of Market Leverage, Book Leverage and Debt to Assets.</p> <p>Market Leverage = <math>(ME + PE + LD)/ME</math>,</p> <p>Book Leverage = <math>(BE + PE + LD)/BE</math>,</p> <p>Debt to Assets = <math>TD/TA</math></p> <p>Where ME = Market Value of Equity on the Last Trading day, PE = Book Value of the Preferred Equity, LD = Most recent Book Value of the Long-Term Debt, BE = Book Value of the Equity, TD = Total Debt, TA is most recent Book Value of Total Assets</p>
Value	Price to Earnings (P/E)	$\frac{\text{Current security price}}{\text{Trailing 12-month earnings per share}}$
	Price to Earnings (P/E fwd)	$\frac{\text{Current security price}}{\text{12-month forward earnings per share}}$
	Price to Book Value (P/B)	$\frac{\text{Current security price}}{\text{Latest book value per share}}$
	Dividend Yield (DY)	Trailing 12-months dividend per share/current security price

<p><b>Momentum</b></p>	<p>6-month Risk-adjusted Price Momentum 12-month Risk-adjusted Price Momentum</p>	<p>6-month Price Momentum = <math>((PT-1/PT-7)-1) - (\text{Local Risk-free rate})</math> 12-month Price Momentum = <math>((PT-1/PT-13)-1) - (\text{Local Risk-free rate})</math> Where, PT-1 = Security Local Price one month prior to the rebalancing date (T) PT-7 = Security Local Price seven months prior to the rebalancing date (T) PT-13 = Security Local Price thirteen months prior to the rebalancing date (T) Risk-adjusted Price Momentum = Price Momentum/<math>\sigma</math> Where <math>\sigma</math> = Annualized Standard Deviation of weekly local price returns over the period of 3 years. Local risk free rates are the short-term rates in local currency of the country, typically the 3M LIBOR rate or short-term deposit rate. The price performance is computed excluding recent 1-month. If 12-month Price Momentum is missing, only 6-month Price Momentum is used for computation of Momentum value. Momentum value is not computed if 6-month Price Momentum is not available and the respective universe average z-score is used.</p>
<p><b>Volatility</b></p>	<p>Historical Beta (<math>\beta</math>)</p>	<p>Computed as the slope coefficient in a time-series regression of local excess stock returns <math>r</math> against the cap-weighted local excess returns of the estimation universe <math>R</math>,</p> $r = \alpha + \beta R + e$ <p>The regression coefficients are estimated on the trailing 104 weeks of returns.</p>

**The following sections have been modified since May 2016:**

- Section 2.2.1: Included GICS Real Estate Sector in methodology to reflect changes to the GICS structure effective September 01, 2016

**The following sections have been modified since August 2016:**

- Appendix I in the previous version of the methodology book describing the Corporate Events treatment has been deleted. The details on the Corporate Events treatment are now included in Section 3.2.

**The following sections have been modified since June 2017:**

- Section 2.3: Updated the target number of securities for the LibertyQ Emerging Markets Index.
- Section 3.1.1: Updated the security selection buffer rules for the LibertyQ Emerging Markets Index.

## 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.

For more information, visit us at [www.msci.com](http://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 be 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](http://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](http://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 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>.