

# MSCI US EQUITY INDEXES METHODOLOGY

Index Construction Objectives and Methodology for the MSCI US Equity Indexes

**July 2018**

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# 1 US EQUITY INDEXES METHODOLOGY OVERVIEW

## 1.1 INTRODUCTION

The MSCI US Equity Indexes aims to reflect the full breadth of investment opportunities across market capitalization size, value and growth investment styles and industry and sector groups within the US equity market from the perspective of US domestic investors. This document contains the guidelines MSCI uses to construct and maintain the MSCI US Equity Indexes<sup>1</sup>.

The MSCI US Equity Indexes include the following indexes:

- **MSCI U.S. Broad Market Index:** Captures broad U.S. equity coverage representing about 99% of the U.S. equity universe.
- **MSCI U.S. Investable Market 2500 Index:** Designed to measure the performance of the large-, mid-, small- cap segment of the U.S. equity market. It is the aggregation of the MSCI U.S. Prime Market 750 (that is, the Large Cap 300 and Mid Cap 450 indexes combined) and Small Cap 1750 indexes.
- **MSCI U.S. Large Cap 300 Index:** Designed to measure the performance of the large cap segment of the U.S. equity market.
- **MSCI U.S. Mid Cap 450 Index:** Includes the next largest 450 companies in terms of Market capitalization of the U.S. equity market and designed to measure the performance of the mid cap segment.
- **MSCI U.S. Prime Market 750 Index:** Represents the aggregation of the Large Cap 300 and Mid Cap 450 Indexes
- **MSCI U.S. Small Cap 1750 Index:** Includes the remaining smallest 1,750 companies in the U.S.
- **The MSCI U.S. Micro Cap Index:** Designed to measure the performance of the micro cap segment of the U.S. equity market.

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<sup>1</sup> Note that the MSCI US Equity Market Capitalization Indexes are based on a different investable universe from the MSCI Global Investable Market Indexes. The MSCI US Equity Market Capitalization Indexes follow its own definition of investability screens, such as liquidity, length of trading, company and security free float.

## 1.2 DEFINING THE US EQUITY MARKET CAPITALIZATION SEGMENTS AND INDEXES

In constructing the MSCI US Equity Market Capitalization Indexes, MSCI has adopted a broad index structure that reflects the full breadth of investment opportunities across market capitalization size in the US equity markets in which companies and their securities are categorized into different market capitalization segments and indexes that are defined by a fixed number of companies.

### 1.2.1 DEFINING THE US EQUITY UNIVERSE

MSCI includes in the eligible US equity universe all listed equity securities of US incorporated companies listed on the NYSE, NYSE Arca, NYSE American LLC, and the NASDAQ, except investment trusts (other than REITs), preferred REITs, mutual funds, equity derivatives, limited partnerships, limited liability companies and business trusts that are structured to be taxed as limited partnerships, and royalty trusts. When appropriate, some non-US incorporated companies may also be considered for inclusion in the MSCI US equity universe based on an analysis and interpretation of a number of factors. Some of these factors include the company's main equity trading markets, shareholder base and geographical distribution of operations (in terms of assets and production).

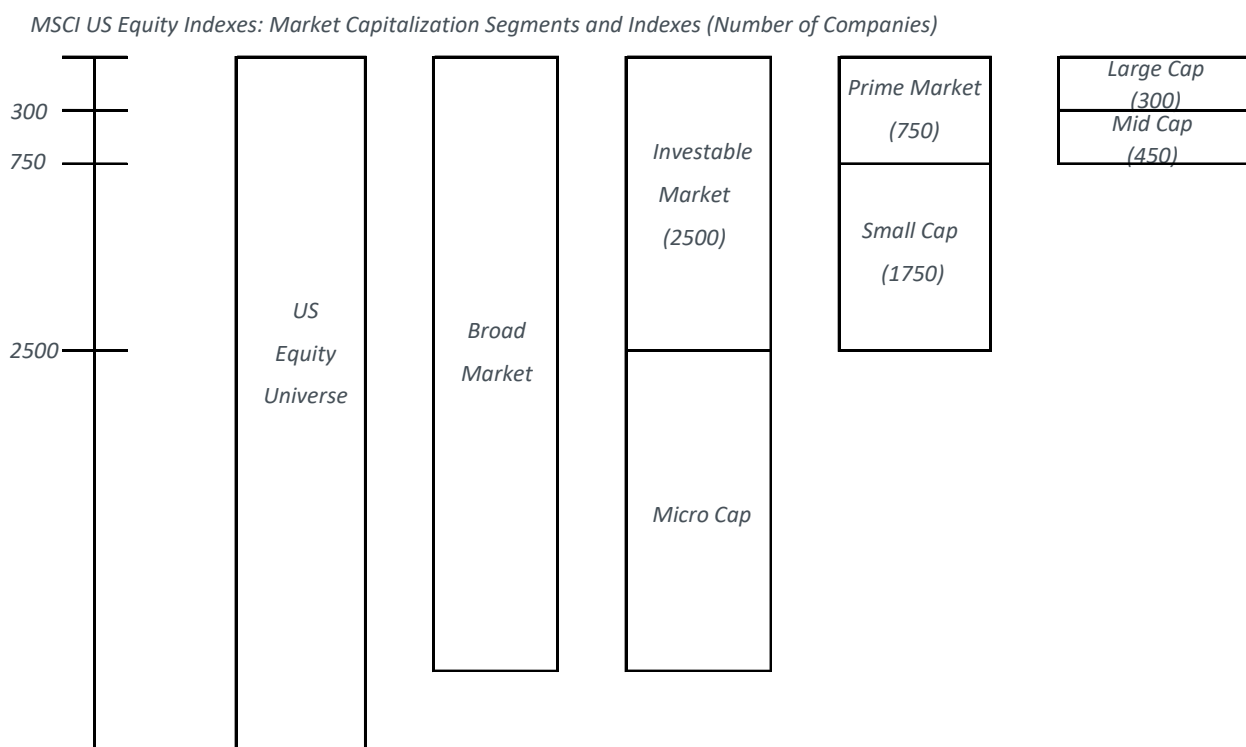
### 1.2.2 DEFINING THE MARKET CAPITALIZATION SEGMENTS AND INDEXES

MSCI segregates the eligible US equity universe in three market capitalization segments, namely:

- The investable market segment
- The micro cap segment, and
- The lower micro cap segment

The design and structure of the market capitalization segments and indexes are represented below.





The investable market segment includes all eligible securities with reasonable size, liquidity, and investability that can cost effectively be represented in institutional and pooled retail portfolios of reasonable size. This segment also allows investors to gain exposure to a significant portion of the performance of the US equity universe. Analysis shows that the 2,500 largest companies by full market capitalization, which cover more than 98% of the US equity universe, form an appropriate representation of the investable market segment. The investment performance characteristics of this investable market segment is represented and measured by an Investable Market Index.

The micro cap segment will comprise micro cap companies with a market capitalization rank lower than the 2,500 companies in the investable market segment and included in the top 99.5% of the US equity universe ranked by full market capitalization. The micro cap segment is estimated to cover around 1.5% of the market capitalization of the US equity universe. The investment performance characteristics of this segment of the US equity universe is represented and measured by a Micro Cap Index.

The lower micro cap segment covers approximately the bottom 0.5% of the full market capitalization of the US equity universe, and will not be represented by an index.

The combination of the Investable Market Index and the Micro Cap Index will form the US Broad Market Index, which thus includes the companies comprised in the top 99.5% of the US equity universe ranked by full market capitalization.

### 1.2.2.1 DEFINING THE LARGE, MID AND SMALL MARKET CAPITALIZATION SEGMENTS AND INDEXES

The investable market segment and index is comprised of three market capitalization segments and their corresponding indexes- large cap, mid cap, and small cap.

MSCI defines the large cap index as consisting of the 300 largest companies by full market capitalization in the investable market segment, the Mid Cap Index as comprising the next 450 companies, and the Small Cap Index as consisting of the remaining 1,750 companies.

The large cap and the mid cap indexes, as defined above, are also combined to create a separate index of the 750 largest companies in the investable market segment ranked by full market capitalization.

MSCI uses a fixed number of companies for defining the cut-off levels for the market capitalization segments. Analysis shows that using a fixed number of companies to specify market capitalization cut-off levels leads to better stability and lower turnover in the resulting market capitalization indexes over time, when compared to using other factors to define market capitalization segments, such as percentiles of market capitalization or absolute market capitalization levels. In making a determination as to what levels of a fixed number of companies appropriately define the various market capitalization segments within the investable market segment, MSCI considered the behavior of several factors over time using different levels of fixed number of companies. The factors include the following:

- The absolute market capitalization level of the smallest company.
- The marginal contribution to the relevant index of the smallest company.
- The cumulative proportion of market capitalization covered.
- The liquidity and trading characteristics of companies.
- An analysis of the average size of portfolio holdings of a variety of large, mid cap, and small cap investment managers.

MSCI periodically reviews the factors mentioned above and the resulting market capitalization cut-off levels in order to ensure that they continue to appropriately define the various market capitalization segments. In the event of a structural change that permanently alters the capitalization characteristics and make-up of the equity market, MSCI may need to change the number of companies in each of the various market capitalization segments.

Since companies and their securities are assigned to the appropriate market capitalization segments and indexes based on their company full market capitalization, consequently, all securities of the same company are always classified in the same market capitalization segment and index and there may be more securities than companies within each market capitalization segment and index.

### 1.2.3 MARKET CAPITALIZATION INDEX REVIEWS AND BUFFER ZONES

The MSCI US Equity Indexes are managed with the objective of reflecting the evolution of equity markets and equity market segments in a timely fashion. In reviewing its various sub-indexes, MSCI's goal is to strike a balance between ensuring that the various indexes continue to accurately reflect the different investment processes and their opportunity sets and at the same time minimize index turnover.

In this regard, and consistent with the index methodology employed in maintaining existing MSCI international equity indexes, MSCI reflects corporate events in the indexes as they occur.

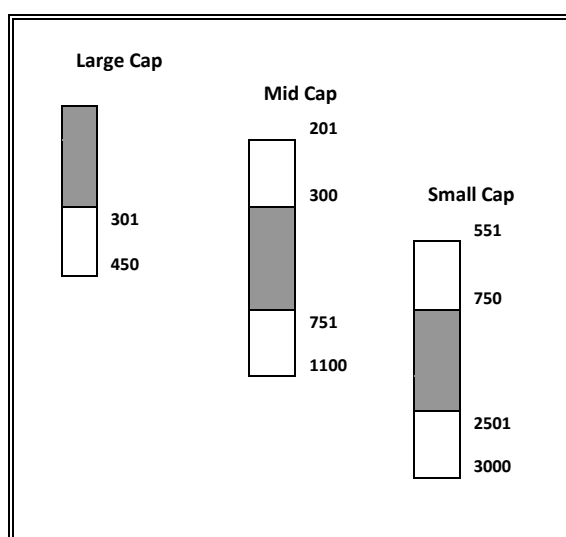
In addition, the market capitalization indexes are also fully reviewed on a semi-annual basis, at the end of May and November, and partially reviewed at the end of February and August. During these index reviews, MSCI uses "buffer zones" to manage the migration of companies from one market capitalization index to another.

For instance, an asymmetrical stock buffer zone, consisting of 100 companies on the upside and 150 companies on the downside, is used around the market capitalization cutoff levels between the large cap and the mid cap indexes. This buffer zone implies that, once the market capitalization sub-indexes have been constructed according to the design mentioned above, an existing constituent will leave the large cap index when it drops to a market capitalization rank of 451. Similarly, a mid cap company will enter the large cap index when it reaches a market capitalization rank of 200. Buffers zones are also used between the mid cap and the small cap indexes and between the small cap and the micro cap indexes, as shown in the table below.

### Upside and Downside Buffer Zones for Market Capitalization Indexes (Company Rank)

	Large Cap	Mid Cap	Small Cap	Micro Cap
<b>Market Capitalization Segment Definition</b>	<b>1-300</b>	<b>301-750</b>	<b>751-2500</b>	
<b>Upside Buffer Zone</b>		<b>201-300</b>	<b>551-750</b>	<b>1851-2500</b>
<b>Downside Buffer Zone</b>	<b>301-450</b>	<b>751-1100</b>	<b>2501-3000</b>	

### Buffer Zones by Market Capitalization Index



During the May and November semi-annual index reviews, the process of the index review ensures that the market capitalization indexes contain the number of companies originally used to define each market capitalization segment. For example, the large cap and the mid cap indexes will contain 300 and 450 companies, respectively. The process of bringing the market capitalization indexes back to the original cut-off levels are applied after allowing for the migration of companies outside of the buffer zones to their appropriate index.

For instance, after applying the buffer zones, if the number of companies in the large cap index were smaller than 300, the largest mid cap companies are migrated to the large cap index until the number of companies reach 300. If the large cap index were to contain more than 300 companies, the smallest large cap companies are migrated to the Mid Cap Index until the number of companies equal 300. A similar process is applied for the migration of constituents between the mid cap and the small cap indexes and, between the small cap and the micro cap indexes.

### 1.3 DEFINING THE US EQUITY VALUE AND GROWTH INVESTMENT STYLES AND INDEXES

In constructing the MSCI US Equity Style Indexes, MSCI has adopted a two-dimensional framework for style segmentation in which value and growth securities are categorized using different attributes. In addition, multiple factors are used to identify value and growth characteristics.

#### 1.3.1 MULTI-FACTOR APPROACH

The value investment style characteristics for index construction are defined using the following three variables:

- Book value to price ratio (BV / P)
- 12-month forward earnings to price ratio (E fwd / P)
- Dividend yield (D / P)

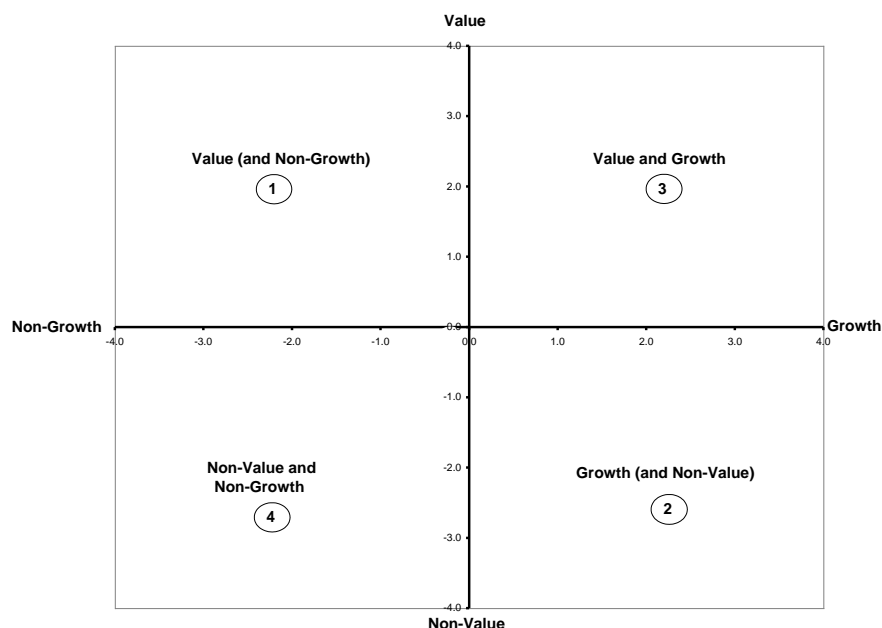
The growth investment style characteristics for index construction are defined using the following five variables:

- Long-term forward earnings per share (EPS) growth rate (LT fwd EPS G)
- Short-term forward EPS growth rate (ST fwd EPS G)
- Current Internal Growth Rate (g)
- Long-term historical EPS growth trend (LT his EPS G)
- Long-term historical sales per share (SPS) growth trend (LT his SPS G)

#### 1.3.2 TWO-DIMENSIONAL FRAMEWORK

Using the variables mentioned above, value z-scores and growth z-scores are calculated and used to determine the overall style characteristics of each security in the MSCI value and growth style space, as depicted in Exhibit 1. In the two-dimensional framework, non-value does not necessarily mean growth, and vice versa. Additionally, some securities can exhibit both value and growth characteristics, while others may exhibit neither.

## EXHIBIT 1 – MSCI VALUE AND GROWTH STYLE SPACE



Note: The values on the axes are z-scores. The point where the value and non-value axis intersects growth and non-growth axis, i.e., the origin, is located at a z-score of zero for each axis.

Hence, under the two-dimensional framework for style segmentation, a security can have the following four style characteristics:

1. A security with a positive value z-score and a negative or zero growth z-score is situated in the Value (and Non-Growth) quadrant as it exhibits clear value characteristics.
2. A security with a negative or zero value z-score and a positive growth z-score is situated in the Growth (and Non-Value) quadrant as it exhibits clear growth characteristics.
3. A security with a positive value z-score and a positive growth z-score is situated in the Value and Growth quadrant as it exhibits both value and growth characteristics.
4. A security with a negative or zero value z-score and a negative or zero growth z-score is situated in the Non-Value and Non-Growth quadrant as it exhibits both non-value and non-growth characteristics.

### 1.3.3 INDEX DESIGN

The objective of the value and growth indexes is to divide constituents of an underlying market capitalization index, into a value index and a growth index, each targeting 50% of the free float-adjusted market capitalization of the underlying market capitalization index. The market capitalization of each constituent should be fully represented in the combination of the value index and the growth index, and, at the same time, should not be “double-counted”. A security may, however, be represented in both the value index and the growth index at a partial weight.

### 1.3.4 UNIVERSE FOR STYLE SEGMENTATION

MSCI adopts a market capitalization index specific approach in conducting the style segmentation of the value and growth indexes. Securities in each market capitalization index are allocated to the appropriate value and growth indexes. The same style segmentation process is applied independently and consistently across all market capitalization indexes.

The consistent application of index methodology to all market capitalization indexes also makes it possible to apply a “building block” approach in the construction of broad market style indexes. Under this approach, individual value and growth indexes can be aggregated to create various meaningful and comparable broad market style indexes.

The value and growth style classification and allocation is applied at the security level rather than at the company level and the value and growth indexes exist only for the investable market segment and index.

### 1.3.5 CONSTRUCTION OF THE VALUE AND GROWTH INDEXES

In order to achieve the above-mentioned index design, MSCI constructs and maintains the value and growth indexes by allocating securities and their free float-adjusted market capitalizations to the appropriate value and growth indexes, during the semi-annual style index reviews of May and November.

MSCI’s construction of the value and growth indexes for each market capitalization index involves the following five steps:

Determining the values of the variables used to specify value and growth characteristics for each security.



- Calculating the z-scores of each variable for each security.
- Aggregating the style z-scores for each security to determine the security's overall style characteristics.
- Assigning initial style inclusion factors for each security.
- Achieving the 50% free float-adjusted market capitalization target by allocating securities to the value and growth indexes after applying buffer rules.

#### 1.4 FREE FLOAT-ADJUSTING CONSTITUENT WEIGHTS IN US EQUITY INDEXES

Although the full market capitalization of companies is used as the basis for determining the various market capitalization segments and indexes, MSCI free float-adjusts the market capitalization of constituents in the US Equity Indexes in order to reflect the availability of shares from the perspective of US domestic investors.

MSCI defines the domestic free float of a security as the proportion of shares outstanding that are deemed available for purchase in the public equity markets by US domestic investors. Therefore, domestic free float excludes strategic investments in a company, such as stakes held by federal, state and local governments and their agencies, controlling shareholders and their families, the company's management or another company. No foreign ownership limit is applied in the domestic free float calculation.

#### 1.5 GLOBAL INDUSTRY CLASSIFICATION STANDARD (GICS)

MSCI has designed, in conjunction with Standard & Poor's, the Global Industry Classification Standard (GICS), which provides a universal approach to industry classification of securities and forms the basis for achieving MSCI's objective of reflecting broad and fair industry representation in its international equity indexes. MSCI applies the GICS to the construction and maintenance of its US Equity Indexes. Common features between MSCI US domestic and international equity indexes, such as the use of the GICS, improves investors' ability to better measure and monitor the risk and attribute the performance of global equity portfolios.

In the next sections, we review each of these factors and steps in detail.

## 1.6 INITIAL CONSTRUCTION OF US EQUITY INDEXES AND ITS HISTORY

MSCI started calculating and maintaining the ongoing Investable Market Index on December 2, 2002 with a base level of 1000 as of November 29, 2002. The initial construction of this index used market capitalizations as of November 25, 2002 and no buffer rules were applied on the Market Capitalization or Style Indexes. MSCI started calculating and maintaining the ongoing Broad Market Index and the Micro Cap Index on June 2, 2003 with a base level of 1000 as of May 30, 2003.

In addition, MSCI has calculated daily price and total return index levels for the Investable Market Index, from May 31, 1992 to November 29, 2002. The methodology used for the historical calculation is basically the same as that of the ongoing index. The main difference is the use of full market capitalization weights for the historical indexes instead of free float-adjusted market capitalization weights for the ongoing indexes.

## 2 CONSTRUCTING THE US MARKET CAPITALIZATION INDEXES

MSCI undertakes an index construction process for the market capitalization indexes, which involves:

- Creating the US equity universe.
- Screening securities for investability.
- Assigning securities to appropriate market capitalization indexes, after applying buffer rules.

Once securities have been selected as index constituents, the full market capitalization of all selected constituents is adjusted for free float available to US domestic investors. In addition, they are classified in their appropriate industry classification based on the Global Industry Classification Standard (GICS).

### 2.1 CREATING THE US EQUITY UNIVERSE

The index construction process begins with the creation of the US equity universe.

MSCI includes in the US equity universe all listed equity securities, or listed securities that exhibit characteristics of equity securities, of US incorporated companies listed on the NYSE, NYSE Arca, NYSE American LLC or the NASDAQ (both NASDAQ National Market and NASDAQ Small Cap Market). Shares of non-US incorporated companies, investment trusts (other than REITs), preferred REITs, mutual funds, equity derivatives, limited partnerships, limited liability companies and business trusts that are structured to be taxed as limited partnerships, and royalty trusts are generally not eligible for inclusion in the universe.

When appropriate, some non-US incorporated companies trading in the US may also be considered for inclusion in the US equity universe based on a number of factors described in Appendix I, entitled “Country Classification of Securities”. Additionally, some US incorporated companies trading in the US may be excluded from the US equity universe.

Some of the factors used to determine the appropriate country classification include the company’s main equity trading markets, shareholder base and geographical distribution of operations (in terms of assets and production). In addition, the company’s regulatory filings

provide useful insights regarding the company and the regulator's perception of its relevant country affiliation.

A comprehensive review of the total US equity universe is conducted to create the US equity universe in order to ensure a broad and fair representation of the full breadth of investment opportunities across the total US equity universe in the US Equity Indexes.

## 2.2 SCREENING SECURITIES FOR INVESTABILITY

After determining the US equity universe, MSCI screens securities for investability using various factors.

Each security of a company is screened and selected for index inclusion based on its own merits, as different share classes of a company are not assimilated. As such, the inclusion or deletion of one security does not imply the automatic inclusion or deletion of the other securities of the same company.

The assessment of a security's investability is determined with the following screens and a security must pass all the screens in order to be considered for index inclusion in the Investable Market Index:

- Liquidity.
- Length of trading.
- Company and security free float.
- Relative security free float-adjusted market capitalization.

For securities that are considered for inclusion or are currently included in the Micro Cap Index, the liquidity and the relative security free float-adjusted market capitalization screens are not applied. In addition, all new companies and securities that are considered for inclusion in the Micro Cap Index must have a company full market capitalization of at least USD 20 million. Current eligible constituents of the Micro Cap Index can remain in the Micro Cap Index, unless their company full market capitalization falls below USD 10 million

Companies that migrate from the Micro Cap Index to the Investable Market Index must have adequate liquidity and must pass other investability criteria applicable for the Investable Market Index.

### 2.2.1 LIQUIDITY

All securities that are considered for inclusion or are currently included in the Investable Market Index must be characterized by adequate liquidity, which is measured along two dimensions. One is based on the level of a stock price and the other is a relative liquidity screening using a direct relative liquidity measure known as the Annualized Traded Value Ratio (ATVR).

Concerning the level of a stock price, there may be liquidity issues for securities trading at a very low or a very high stock price. By and large, the issue of securities trading at a very low stock price is addressed by the stock exchanges directly, with rules to delist securities trading below a stock price of USD 1. However, no comparable rules exist for securities trading at a very high stock price. Hence, a limit of USD 5,000 has been set and securities with stock prices above USD 5,000 fail the liquidity screening.

The relative liquidity screening is conducted by ranking all securities in the US equity universe in descending order of ATVR after excluding those securities trading above USD 5,000.

The ATVR of each security is calculated in a 3-step process described below:

- First, monthly median traded values are computed using the daily median traded value, multiplied by the number of days in the month that the security traded. The daily traded value of a security is equal to the number of shares traded during the day, multiplied by the closing price of that security. The daily median traded value is the median of the daily traded values in a given month.
- Second, the monthly median traded value ratio is obtained by dividing the monthly median traded value of a security by its full market capitalization at the end of the month.
- Third, the ATVR is obtained by taking the average of the monthly median traded value ratios of the previous 12 months – or the number of months for which this data is available (previous 6 months, 3 months or 1 month) – and multiplying it by 12.

Securities that belong to the top 99.5% of the cumulative security full market capitalization of the US equity universe in descending order of ATVR, after excluding those securities trading above USD 5,000, are eligible for inclusion in the Investable Market Index.

Existing Investable Market Index constituents can remain in the index until they fall below 99.75% of the cumulative security full market capitalization as described above. Current Micro Cap Index securities that migrate to the Investable Market Index can be added to the Investable Market Index if they rank within 99.75% of the cumulative security full market capitalization as described above.

Securities that have failed the liquidity screening previously or have been excluded from the indexes as their ATVR fell below the 99.75% level are eligible for inclusion only when they rank within the top 99.25% of the cumulative security full market capitalization as described above.

### 2.2.2 LENGTH OF TRADING

A seasoning period of at least three calendar months is required for all new issues of small companies at the time of the eligible US equity universe creation. This seasoning period helps MSCI assess the investability of securities of small companies, which are defined as those having company full market capitalization rank below 750 in the Investable Market Index.

IPOs and newly listed securities with a company full market capitalization rank equal to or above 750 in the Investable Market Index do not need to satisfy this condition.

### 2.2.3 COMPANY AND SECURITY FREE FLOAT

In general, the following securities are not eligible for inclusion in the Broad Market Index:

- Securities with a corresponding company DIF less than 0.10.
- Securities with a security DIF less than 0.15.

For a security of a company not meeting the above requirement to be eligible for inclusion to the Investable Market Index, the free float-adjusted market capitalization of the security must represent at least:

- 5 basis points of the current Investable Market Index.

In the case of an existing Investable Market Index constituent, if either its company DIF or security DIF decreases to less than the respective thresholds stipulated above, or if an

existing constituent that was exceptionally included in the index given its free float-adjusted market capitalization representation experiences a further decrease in DIF, in order to remain in the index, the free float-adjusted market capitalization of the security must represent at least:

- 5 basis points of the current Investable Market Index, if the existing constituent experienced decreases in free float after its inclusion in the indexes.

#### 2.2.4 RELATIVE SECURITY FREE FLOAT-ADJUSTED MARKET CAPITALIZATION

In general, all securities that are considered for inclusion in the Investable Market Index should have a free float-adjusted security market capitalization representing at least 10% of the company full market capitalization.

For a security with a free float-adjusted security market capitalization representing less than 10% of the company full market capitalization to be eligible for inclusion in the Investable Market Index, the free float-adjusted market capitalization of the security must represent at least:

- 5 basis points of the current Investable Market Index.

For an existing Investable Market Index constituent with a free float-adjusted security market capitalization representing less than 10% of the company full market capitalization to be eligible to remain in the indexes, the free float-adjusted market capitalization of the security must represent at least:

- 2.5 basis points of the current Investable Market Index, if the existing constituent was previously included in the indexes with a free float-adjusted security market capitalization representing less than 10% of the company full market capitalization and this proportion relative to the company has not decreased since then.
- 5 basis points of the current Investable Market Index, if the existing constituent experienced decreases in the free float-adjusted security market capitalization relative to the company full market capitalization after its inclusion in the indexes.

## 2.3 ASSIGNING SECURITIES TO MARKET CAPITALIZATION INDEXES

Assigning securities to the appropriate market capitalization indexes involves a fine balance between the following objectives:

- Reflecting changes in the market capitalization size of companies and their securities.
- Reconstituting the indexes to contain the number of companies originally used to define each market capitalization index.
- Avoiding unnecessary index turnover.

Hence, a careful comparison of a security's old and new market capitalization rank and index is necessary.

The process of assigning securities to their market capitalization indexes involves:

- Preliminarily assigning securities to a market capitalization index based on their new company full market capitalization rank.
- Using buffer rules to manage the migration of securities between market capitalization indexes.
- Assigning the securities to their final market capitalization index.

### 2.3.1 PRELIMINARY ATTRIBUTION OF SECURITIES TO MARKET CAPITALIZATION INDEXES

After selecting the eligible and investable securities of companies, these are preliminarily assigned to their new market capitalization indexes. This is achieved by ranking all selected securities of companies in descending order of company full market capitalization and selecting securities of companies for each market capitalization index until the aggregate number of companies is reached. Company full market capitalization incorporates the full market capitalization of all listed and unlisted securities of the same company.

The table in the next page illustrates the company full market capitalization rank range and number of companies in each market capitalization index.



Market Capitalization Indexes	Company Full Market Capitalization Rank Range	Number of Companies
MSCI US Large Cap 300	1 - 300	300
MSCI US Mid Cap 450	301 - 750	450
MSCI US Small Cap 1750	751 - 2500	1750
MSCI US Micro Cap	Eligible companies included in top 99.5% of the US Equity Universe, but not part of IMI.	No set number of companies is targeted.
MSCI US Prime Market 750	1 - 750	750
MSCI US Investable Market 2500	1 - 2500	2500
MSCI US Broad Market	Represents at least 99.5% of the US Equity Universe	No set number of companies is targeted.

The Broad Market Index is the combination of the Investable Market Index and Micro Cap Index, and represents at least 99.5% of the US equity universe.

For the Micro Cap Index, no fixed number of companies is targeted. All securities that are included in the top 99.5% of the US equity universe and are not part of the Investable Market Index are preliminarily attributed to the Micro Cap Index provided their company full market capitalization is at least USD 20 million.

### 2.3.2 MIGRATION OF SECURITIES BETWEEN MARKET CAPITALIZATION INDEXES

The migration of securities between market capitalization indexes is controlled by using buffer zones. However, in order to avoid that constituents, which repeatedly fall within the buffer zones end up distorting the representation of the various market capitalization indexes, a maximum is set to the length of time constituents can remain in the buffer zones during the semi-annual index reviews.

### 2.3.2.1 BUFFER ZONES

For an existing constituent with a company full market capitalization rank falling outside of the original market capitalization segment range definition to be eligible to remain in its current market capitalization index, its company full market capitalization rank must lie within the following buffer zones:

*Upside and Downside Buffer Zones for Market Capitalization Indexes (Company Rank)*

	Large Cap	Mid Cap	Small Cap	Micro Cap
Market Capitalization Segment Definition	1-300	301-750	751-2500	
Upside Buffer Zone		201-300	551-750	1851-2500
Downside Buffer Zone	301-450	751-1100	2501-3000	

An asymmetrical buffer zone consisting of 100 companies on the upside and 150 companies on the downside is used around the market capitalization cut-off levels between the large cap and the mid cap indexes. For example, a constituent company and its securities leave the large cap index when its company full market capitalization rank falls below 450. Similarly, a constituent company and its securities in the Mid Cap Index enter the large cap index when it reaches company full market capitalization rank of 200.

Likewise, an asymmetrical buffer zone consisting of 200 companies on the upside and 350 companies on the downside is applied around the market capitalization cut-off levels between the mid cap and the small cap indexes. Finally, at the lower end of the market capitalization spectrum, asymmetrical buffer zone, consisting of 650 companies on the upside and 500 companies on the downside is applied around the market capitalization cut-off point of the small cap and the micro cap indexes.

The buffer zones are used to manage constituent migration during quarterly index reviews and semi-annual index reviews. During the quarterly index reviews, buffer zones are used within the Investable Market Index and the Micro Cap Index separately, and hence there is no migration of constituents between the two indexes. During the semi-annual index reviews, the buffer zones are used across all constituents within the eligible US equity universe and therefore, there is migration of companies and their securities across the Broad Market Index.

### 2.3.2.2 MAXIMUM LENGTH OF TIME IN THE BUFFER ZONES

If a constituent falls in the same buffer zone for four consecutive semi-annual index reviews, it will be re-classified to the appropriate market capitalization index at the fourth semi-annual index review.

Under this rule, for instance, if a large cap constituent is ranked between 301 and 450 for four consecutive semi-annual index reviews, it is re-classified in the Mid Cap Index at the fourth semi-annual index review. Likewise, if a Mid Cap Index constituent is ranked between 201 and 300 for four consecutive semi-annual index reviews, it is re-classified in the large cap index. In addition, if a mid cap constituent is ranked between 751 and 1100 for four consecutive semi-annual index reviews, it is re-classified in the Small Cap Index. In the case of a small cap constituent, if it is ranked between 551 and 750 for four consecutive semi-annual index reviews, it is re-classified in the Mid Cap Index. If the small cap constituent is ranked between 2501 and 3000 for four consecutive semi-annual index reviews, it is re-classified in the Micro Cap Index. Likewise, if a Micro Cap Index constituent is ranked between 1851 and 2500 for four consecutive semi-annual index reviews, it is re-classified in the Small Cap Index, provided it passes the investability screens for the Investable Market Index.

This re-classification rule is only applicable during the semi-annual index reviews.

For further details on the quarterly index review and the semi-annual index review, see Section 4, entitled “Maintaining the US Equity Indexes”.

### 2.3.3 FINAL ATTRIBUTION OF SECURITIES TO MARKET CAPITALIZATION INDEXES

After using the buffer rules to manage the migration of constituents, securities of companies within each market capitalization index are ranked again by descending company full market capitalization and the number of companies is counted. If the number of companies in an index is less than the original number of companies that correspond to the index, the securities of the largest companies from the next largest index are migrated into the index until the original number of companies is reached. On the other hand, if the number of companies in an index is more than the original number of companies used to define the market capitalization index, the securities of the smallest companies within that index are migrated out of the index and into the next largest index until the original number of companies is reached.

For instance, after applying the buffer rules, if the number of companies in the large cap index is more than 300, the smallest securities by company full market capitalization in the large cap index are migrated to the Mid Cap Index from the large cap index until the number of companies in the large cap index equals 300. If the number of companies is less than 300, the largest securities by company full market capitalization in the Mid Cap Index are migrated to the large cap index until the number of companies equal 300. This step is repeated for all the other market capitalization indexes of the US Equity Indexes. It is only at the semi-annual index reviews that the final attribution of securities to market capitalization index occurs, ensuring that the market capitalization indexes in the investable market segment contain the number of companies originally used to define each market capitalization segment.

All securities that are included in the top 99.5% of the US equity universe and are not part of the Investable Market Index will be included in the Micro Cap Index, provided they pass the investability screens for Micro Cap Index securities as outlined in section 2.2 and their company full market capitalization is at least USD 20 million. Current eligible constituents of the Micro Cap Index are not deleted from the Micro Cap Index, until their company full market capitalization falls below USD 10 million, they cross the micro cap upper buffer of rank of 1850 or they are added to the Investable Market Index to fill any vacancies created.

## 2.4 ADJUSTING THE FULL MARKET CAPITALIZATION OF SELECTED SECURITIES FOR FREE FLOAT

After selecting and assigning the securities to their appropriate market capitalization indexes, MSCI calculates the free float-adjusted market capitalization of each security in order to represent the securities in the US Equity Indexes at their investable weight. The process of free float-adjusting market capitalization involves:

- Defining and estimating the free float available to US domestic investors for each security.
- Assigning a free float-adjustment factor to each security.
- Calculating the free float-adjusted market capitalization of each security.

### 2.4.1 DEFINING AND ESTIMATING FREE FLOAT

In the context of the US Equity Indexes, MSCI defines the free float of a security as the proportion of shares outstanding that are deemed available for purchase in the public equity markets by US domestic investors. In practice, limitations on free float available to US

domestic investors include strategic and other shareholdings not considered part of available free float.

For further details on the MSCI free float definition, see Appendix II, entitled “Free Float Definition and Estimation Guidelines”.

#### 2.4.1.1 ESTIMATION OF FREE FLOAT AVAILABLE TO US DOMESTIC INVESTORS

The free float of a security is estimated as its total number of shares outstanding less shareholdings classified as strategic and/or non-free float. Examples of shares excluded from free float are stakes held by strategic investors such as governments, corporations, controlling shareholders and management. No foreign ownership limit is taken into consideration in the free float calculation.

$$\text{Non-Free Float Shareholdings (\%)} = \frac{\text{Number of Shares Classified as Non-Free Float}}{\text{Total Number of Shares}}$$

$$\text{Free Float (\%)} = 100\% \text{ minus Non-Free Float Shareholdings (\%)}$$

#### 2.4.2 ASSIGNING A FREE FLOAT-ADJUSTMENT FACTOR

MSCI free float-adjusts the market capitalization of each security in the MSCI US Equity Indexes using an adjustment factor, referred to as the Domestic Inclusion Factor (DIF).

- For securities with free float greater than 15%, the DIF is equal to the estimated free float, rounded up to the closest 5%.
- For securities with free float less than 15%, the DIF is equal to the estimated free float, rounded to the closest 1%.

#### 2.4.3 CALCULATING THE FREE FLOAT-ADJUSTMENT SECURITY MARKET CAPITALIZATION

The free float-adjusted market capitalization of a security is calculated as the product of the DIF and the security’s full market capitalization.

$$\text{Free Float-Adjusted Market Capitalization} = \text{DIF times the Security's Full Market Capitalization}$$

The example below illustrates the calculation of the free float-adjusted market capitalization of securities.

**Example:**

**Calculating Free Float-Adjusted Market Capitalization of Securities:**

Suppose ABC Corp has two listed securities, Class A and B, and one unlisted security, Class C.

	Class A	Class B	Class C
Total number of shares outstanding	10,000,000	10,000,000	10,000,000
Number of shares classified as non-free float	4,300,000	8,760,000	10,000,000
Non-free float shareholding (%)	43.0%	87.6%	100%
Free float (%)	57.0%	12.4%	0%
<b>Domestic Inclusion Factor (DIF)</b>	<b>0.60</b>	<b>0.12</b>	<b>0</b>
Market price (\$)	500	100	500*
Full market capitalization (\$ mm)	5,000	1,000	5,000
Free float-adjusted market capitalization (\$ mm)	3,000	120	0

\* Where each Class C share can be converted into 1 Class A share. To price unlisted securities for the calculation of company market capitalization, MSCI uses the price of the listed security to which the unlisted security can be converted into, adjusted for the conversion ratio. The conversion ratio is defined as the number of listed securities for which each unlisted security will be converted into. For example, if each unlisted security is converted into two listed securities, then the conversion ratio is 2. If the unlisted security is not convertible to another listed security, or if the conversion ratio is not available, it is assumed to be convertible to the listed security that displays the most similar characteristics as the unlisted security.

## 2.5 CLASSIFYING SECURITIES UNDER THE GLOBAL INDUSTRY CLASSIFICATION STANDARD (GICS)

All selected securities are assigned to the industry that best describes their business activities. To this end, MSCI has designed, in conjunction with Standard & Poor's, the Global Industry Classification Standard (GICS). This comprehensive classification scheme provides a universal approach to industries worldwide and forms the basis for achieving MSCI's objective of reflecting broad and fair industry representation in its indexes.

Under the Global Industry Classification Standard (GICS), each company is assigned uniquely to one sub-industry according to its principal business activity. Therefore, a company can only belong to one industry grouping at each of the four levels of the GICS, which consists of 11 sectors, 24 industry groups, 68 industries, and 157 sub-industries.

For further details on the GICS, see Appendix III, entitled "Global Industry Classification Standard (GICS)".

### 3 CONSTRUCTING THE US VALUE AND GROWTH INDEXES

After constructing the US market capitalization indexes based on rules described in Section 2, MSCI constructs the value and growth indexes for each of the large cap, mid cap and small cap indexes, which involves:

- Determining the values of the variables used to specify value and growth characteristics for each security.
- Calculating the z-scores of each variable for each security.
- Aggregating the style z-scores for each security to determine the security's overall style characteristics.
- Assigning initial style inclusion factors for each security.
- Achieving the 50% free float-adjusted market capitalization target by allocating securities to the value and growth indexes after applying buffer rules.

#### 3.1 VARIABLES USED TO SPECIFY VALUE AND GROWTH CHARACTERISTICS

The value and growth indexes construction process begins by determining the values of the variables used to specify value and growth characteristics.

The value investment style characteristics for index construction are defined using the following three variables:

- Book value to price ratio (BV / P)
- 12-month forward earnings to price ratio (E fwd / P)
- Dividend yield (D / P)

For these variables, securities of the same company may have different values due to different security prices. In addition, the dividend rate may differ from one security to another of the same company. As a result, in certain circumstances, one security of a company may be classified as value and another as growth. In the above three variables, the price is used in the denominator in order to compute meaningful market means and standard deviations for these variables.

The growth investment style characteristics for index construction are defined using the following five variables:

- Long-term forward earnings per share (EPS) growth rate (LT fwd EPS G)
- Short-term forward EPS growth rate (ST fwd EPS G)
- Current Internal Growth Rate (g)
- Long-term historical EPS growth trend (LT his EPS G)
- Long-term historical sales per share (SPS) growth trend (LT his SPS G)

For these variables, all securities of the same company have the same variable values for each of the five variables used to define growth investment style characteristics for index construction.

In addition, sales are typically not relevant for financial companies. Therefore, no long-term historical SPS growth trend is calculated for securities classified in the Banks (4010) and Diversified Financials (4020) industry groups, other than securities classified in the Multi-Sector Holdings (40201030) sub-industry, under the Global Industry Classification Standard (GICS).

For further details on the GICS, see Appendix III, entitled “Global Industry Classification Standard (GICS),” and for further details on definitions and computations of the variables, see Appendix IV, entitled “Variable Definitions and Computations”.

## 3.2 STANDARDIZING THE VARIABLE VALUES FOR EACH SECURITY

After computing the eight variable values for each security, each of the eight variable values are standardized within each individual market capitalization index and assigned a z-score. Standardization ensures that the variables are comparable to each other and that the combination of the variables is meaningful.

### 3.2.1 WINSORIZING THE VARIABLES

As part of the standardization process, outlier variable values are winsorized to ensure that the market average values used to standardize the variables are less affected by extreme values.



To do this, for a given variable, the values for all securities are first ranked by ascending order within each market capitalization index. Missing values are excluded from the ranking. Then, for values that lie in the bottom 5th percentile rank or in the top 95th percentile rank, the value of the 5th and the 95th percentile rank security is allocated respectively. This process is repeated for each of the eight variables.

**Example:**

**Winsorization:**

Suppose there are 200 securities ranked by ascending order. For all securities ranked from 1 through 9, their values become equal to the value of the 10<sup>th</sup> ranked security. Meanwhile, for all securities ranked from 192 through 200, their values become equal to the value of the 191<sup>st</sup> ranked security.

### 3.2.2 CALCULATING THE Z-SCORES

After winsorizing all the eight variables within each market capitalization index, the z-score for each of the eight variables for each security can be calculated using the free float-adjusted market capitalization weighted market mean and standard deviation of the relevant variable within each market capitalization index.

Computing a z-score is a widely used method of standardizing a variable in order to combine it with other variables that may have a different unit of measurement or a different scale. Because it has a mean value of zero and a standard deviation of 1, the value of a z-score shows how many standard deviations a given value lies from the mean. The z-score is defined as follows:

$$Z = \frac{(x - \mu_{mcap-weighted})}{\sigma_{mcap-weighted}}$$

Where:

- $x$  is the winsorized variable value for a given security
- $\mu$  is the free float-adjusted market capitalization weighted market mean using winsorized variables in the market capitalization index
- $\sigma$  is the free float-adjusted market capitalization weighted market standard deviation using winsorized variables in the market capitalization index

For further details on the calculation of the market mean and the standard deviation, see Appendix V, entitled “Calculation of Market Mean and Standard Deviation”.

**Example:**
**Calculating Dividend Yield Z-Scores:**

	Index	Security A	Security B	Security C
Mean dividend yield for the market capitalization index	2.50			
Standard deviation of dividend yield for the market capitalization index	1.38			
Dividend yield		3.50	0.90	2.50
<b>Dividend yield z-score</b>		<b>0.72</b>	<b>-1.16</b>	<b>0.00</b>

Security A has a positive dividend yield z-score. This implies that based on dividend yield, Security A exhibits clear value characteristics, as its dividend yield value of 3.5 is 0.72 standard deviation above the market dividend yield of 2.5. On the other hand, a dividend yield z-score of -1.16 for Security B implies that its dividend yield value of 0.9 is 1.16 standard deviation below the market dividend yield. In other words, Security B exhibits clear non-value characteristics, based on dividend yield. As for Security C, a z-score of 0 implies that the security has the same dividend yield value as the market mean.

### 3.3 AGGREGATING THE STYLE Z-SCORES

After standardizing each of the eight variable values for each security, MSCI calculates a value z-score and a growth z-score for each security. Value z-scores are computed by averaging the three value variable z-scores while growth z-scores are calculated by averaging the five growth variable z-scores. The value z-score and the growth z-score of a security define its overall style characteristics and its positioning within the value and growth style space.

#### 3.3.1 CALCULATING THE VALUE Z-SCORE

To compute a value z-score, an equally weighted average of the three value variables' z-scores is calculated. Only available variable z-scores are used and missing variable z-scores are excluded from the calculation.

The value z-score is calculated as follows:

$$\text{Value Z-Score} = \frac{1}{3} (Z_{BV/P} + Z_{E_{fwd}/P} + Z_{D/P})$$

For instance, if the E fwd /P variable is missing:

$$\text{Value Z-Score} = \frac{1}{2}(Z_{BV/P} + Z_{D/P})$$

**Example:**

**Calculating the Value Z-Score:**

	Security A	Security B	Security C
Book value to price z-score	0.90	0.80	-1.60
12-month forward earnings to price z-score	0.78	1.86	-2.0
Dividend yield z-score	0.72	-1.16	0.00
<b>Value Z-Score</b>	<b>0.80</b>	<b>0.50</b>	<b>-1.20</b>

### 3.3.2 CALCULATING THE GROWTH Z-SCORE

The EPS growth rate is given a double weight, as it is the most systematically associated with the concept of growth and it captures growth style attributes relatively more effectively than other variables. Consequently, forward-looking and historical measures of growth are equally weighted in computing the growth z-score.

Computing the growth z-score differs from computing the value z-score because missing variable z-scores are not excluded from the calculation and their z-scores are set to zero (i.e., to the average of the market capitalization index). This is because variables used to define growth investment style characteristics are less correlated to one another compared to those that are used to define value investment style characteristics. Hence, excluding missing variables from the growth z-score calculation could result in a biased growth z-score that is influenced too significantly by variable z-scores that are not missing. In addition, this treatment ensures that in cases where many variables are missing, the resulting growth z-score is close to the market average.

The long-term historical SPS growth trend is not used to specify growth characteristics for securities classified in the Banks (4010) and Diversified Financials (4020) industry groups, other than securities classified in the Multi-Sector Holdings (40201030) sub-industry, under the Global Industry Classification Standard (GICS). In this case, only five variables are averaged, rather than replacing the sales growth trend with a zero value.

The growth z-score is calculated as follows:

$$\text{Growth Z-Score} = \frac{1}{6} (2 * Z_{LT \text{ fwd EPS } G} + Z_{ST \text{ fwd EPS } G} + Z_g + Z_{LT \text{ his EPS } G} + Z_{LT \text{ his SPS } G})$$

For instance, if the long-term forward EPS growth rate variable is missing:

$$\text{Growth Z-Score} = \frac{1}{5} (Z_{ST \text{ fwd EPS } G} + Z_g + Z_{LT \text{ his EPS } G} + Z_{LT \text{ his SPS } G})$$

For a financial company:

$$\text{Growth Z-Score} = \frac{1}{5} (2 * Z_{LT \text{ fwd EPS } G} + Z_{ST \text{ fwd EPS } G} + Z_g + Z_{LT \text{ his EPS } G})$$

**Example:**

**Calculating the Growth Z-Score:**

	Security A	Security B	Security C
Long-term forward EPS growth rate z-score	-0.19	0.68	-1.20
Short-term forward EPS growth rate z-score	0.25	0.50	-0.20
Current Internal Growth Rate z-score	0.72	-1.16	-0.40
Long-term historical EPS growth trend z-score	0.30	1.00	Not Available
Long-term historical SPS growth trend z-score	0.10	Not Relevant (Financial Company)	0.50
<b>Growth Z-Score</b>	<b>0.17</b>	<b>0.34</b>	<b>-0.42</b>

Security A has all 5 variables available. Its growth z-score is the sum of the 5 variables with a double weight on the long-term forward EPS growth divided by 6. Security B is a financial company. Therefore, no long-term historical SPS growth trend is used and its growth z-score is computed using a 5 as the denominator. Finally, the long-term historical EPS growth rate variable is missing for Security C, and it will be treated as 0 and the denominator will still be 6.

### 3.3.3 IDENTIFYING THE OVERALL STYLE CHARACTERISTICS

After calculating the value and growth z-scores for each security, each security's overall style characteristics and position within the value and growth style space can be determined based on the table below.

Value Z-Score	Growth Z-Score	Style Characteristics
Positive	Negative or Zero	Value
Negative or Zero	Positive	Growth
Positive	Positive	Both Value and Growth
Negative or Zero	Negative or Zero	Neither Value nor Growth

### 3.4 ASSIGNING INITIAL STYLE INCLUSION FACTORS

Based on the overall style characteristics, securities are assigned with initial style inclusion factors. At this time, securities that exhibit both value and growth or neither value nor growth characteristics are also adjusted for dominant style.

Each security has two style inclusion factors, one for value, defined as the Value Inclusion Factor (VIF) and the other for growth, defined as the Growth Inclusion Factor (GIF), and they represent the proportion of a security's free float-adjusted market capitalization that should be allocated to the value and/or growth indexes. The sum of the VIF and the GIF is always equal to one. There are five possible values for the style inclusion factors: 1, 0.65, 0.5, 0.35 and 0.

For instance, a VIF of 1 implies that the security's free float-adjusted market capitalization is fully allocated to the value index, while a VIF of 0.35 implies that only 35% of the security's free float-adjusted market capitalization is allocated to the value index. As the sum of VIF and GIF is always equal to one, for example, a VIF of 0.35 will result in a GIF of 0.65 and the remaining 65% of the security's free float-adjusted market capitalization is allocated to the growth index. Exhibit 2 on the next page shows the various style inclusion factors within the value and growth style space, which will be described in detail in the following paragraphs.

#### 3.4.1 INITIAL STYLE INCLUSION FACTORS FOR SECURITIES WITH BOTH VALUE AND GROWTH OR NON-VALUE AND NON-GROWTH CHARACTERISTICS

For securities with style characteristics of both value and growth or neither value nor growth, their initial VIF and GIF can range between 0 and 1, depending on the contribution of the value (or non-growth, if the growth z-score is negative) and growth (or non-value, if the value z-score is negative) z-scores to the distance of a security from the origin.

The contribution of each style z-score to the distance from the origin is calculated as follows:

$$\text{Value contribution} = \frac{\text{value } Z - \text{score}^2}{\text{distance}^2} = \frac{\text{value } Z - \text{score}^2}{\text{value } Z - \text{score}^2 + \text{growth } Z - \text{score}^2}$$

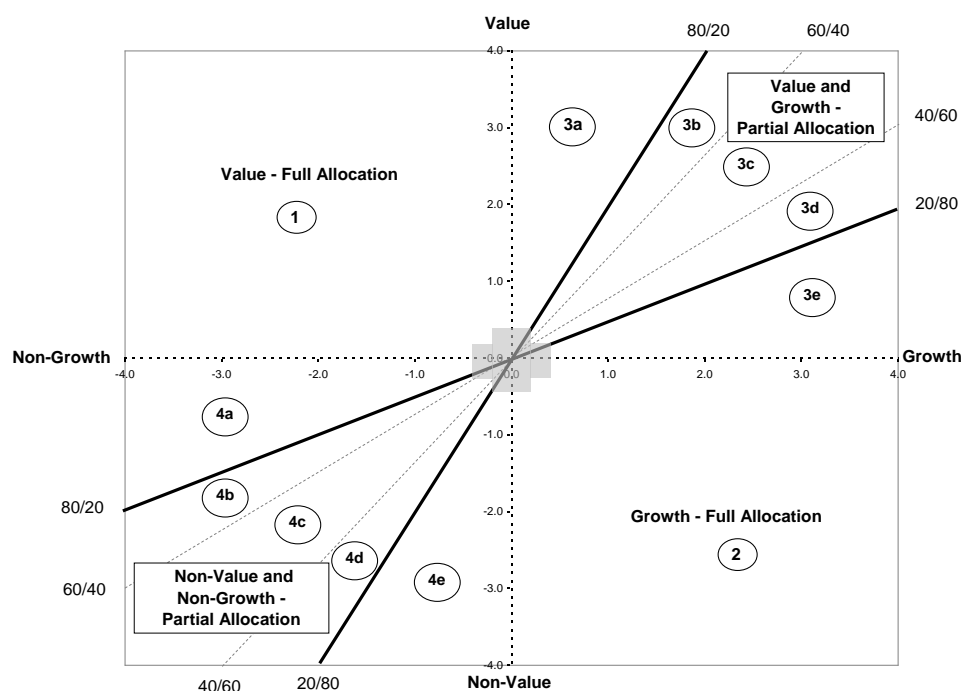
$$\text{Growth contribution} = \frac{\text{growth } Z - \text{score}^2}{\text{distance}^2} = \frac{\text{growth } Z - \text{score}^2}{\text{value } Z - \text{score}^2 + \text{growth } Z - \text{score}^2}$$

$$\text{value contribution} + \text{growth contribution} = 1$$

For securities where a style contribution of a positive style z-score (a negative style z-score) is at least 80% (less than 20%), that style is deemed to clearly dominate the other style. Such securities are allocated with an initial VIF or GIF of 1, depending on whether value (non-growth) or growth (non-value) contributed at least 80% (less than 20%) to the distance respectively. This is represented by the 80/20 line (20/80) in Exhibit 2, which corresponds to the value z-score (growth z-score) representing twice the growth z-score (value z-score), i.e., representing a contribution of 80% of the total distance from the origin.

Otherwise, if a style contribution ranges between more than 20% and less than 80%, the VIF and GIF are determined using the table below.

Exhibit 2 – MSCI Value and Growth Style Space, Allocating Initial VIF & GIF



Note: The values on the axes are z-scores. The point where the value and non-value axis intersects growth and non-growth axis, i.e., the origin, is located at a z-score of zero for each axis.

Zone	1	2	3a	3b	3c	3d	3e	4a	4b	4c	4d	4e
Style Characteristics	Value	Growth	Value/ Growth	Value/ Growth	Value/ Growth	Value/ Growth	Value/ Growth	Non- Value/ Non- Growth	Non- Value/ Non- Growth	Non- Value/ Non- Growth	Non- Value/ Non- Growth	Non- Value/ Non- Growth
Style Bias	Value	Growth	Value	Value- Bias	No Bias	Growth- Bias	Growth	Value	Value- Bias	No Bias	Growth- Bias	Growth
Initial VIF	1	0	1	0.65	0.5	0.35	0	1	0.65	0.5	0.35	0
Initial GIF	0	1	0	0.35	0.5	0.65	1	0	0.35	0.5	0.65	1

**Example:**
**Calculating the Distance and the Style Contribution:**

	Security A	Security B	Security C
Value z-score	0.80	0.50	-1.20
Growth z-score	0.20	0.50	-0.50
Value z-score squared	0.64	0.25	1.44
Growth z-score squared	0.04	0.25	0.25
Distance from the origin squared	0.68	0.50	1.69
<b>Value contribution to the distance</b>	<b>94%</b>	<b>50%</b>	<b>85%</b>
<b>Growth contribution to the distance</b>	<b>6%</b>	<b>50%</b>	<b>15%</b>
<b>Initial VIF</b>	<b>1</b>	<b>0.5</b>	<b>0</b>
<b>Initial GIF</b>	<b>0</b>	<b>0.5</b>	<b>1</b>

Security A's value contributes 94% of its overall style characteristics. Hence, the value z-score clearly dominates the growth z-score and a VIF of 1 is allocated to Security A. As for Security B, no style clearly dominates, as the contribution of the two style z-scores is equal at 50%. Therefore, a VIF and GIF of 0.5 is allocated to security B. For Security C, its value z-score and growth z-score are both negative. Hence, the non-value z-score contributes 85% and the non-growth z-score contributes 15%. This means that the growth z-score clearly dominates the value z-score, and as a result, a GIF of 1 is assigned to Security C.

### 3.5 ALLOCATING SECURITIES TO THE VALUE AND GROWTH INDEXES

The value and growth indexes target a 50% free float-adjusted market capitalization representation for each of the value and growth indexes in each market capitalization index. In order to achieve the 50% target, the style allocation process involves the following three steps:

- Sorting securities by distance from the origin in the style space.
- Applying buffer rules and reassigning initial VIF and GIF, as appropriate.
- Achieving the 50% free float-adjusted market capitalization target by allocating securities to the value and growth indexes.

### 3.5.1 SORTING SECURITIES BY DISTANCE FROM THE ORIGIN

In the allocation process, first all securities are sorted by distance from the origin. The strength of the security style characteristics is measured by the distance from the origin. Therefore, the security with the strongest style characteristics is the one with the greatest distance from the origin.

The distance from the origin (d) is computed as follows:

$$d = \sqrt{\text{value } z\text{-score}^2 + \text{growth } z\text{-score}^2}$$

#### Example:

#### Calculating the Distance:

	Security A	Security B	Security C
Value z-score	0.80	0.50	-1.20
Growth z-score	0.20	0.50	-0.50
Value z-score squared	0.64	0.25	1.44
Growth z-score squared	0.04	0.25	0.25
<b>Distance from the origin</b>	<b>0.82</b>	<b>0.71</b>	<b>1.30</b>

Security C is the furthest away from the origin among the three securities. Therefore, it has the strongest style characteristics and is allocated to its appropriate style index first.

### 3.5.2 APPLYING BUFFER RULES

Next, the initial style inclusion factors for all existing constituents are reviewed based on buffer rules. According to the buffer rules, all securities that fall in the buffers will not change their current style inclusion factors and remain in their current index or indexes, unless they need to be reassigned, if required, to meet the 50% target. Buffer rules help limit the index turnover caused by temporary migration of securities from one style index to the other and come into effect only at the semi-annual style index reviews.

The buffers are represented by a cross resulting from the overlap of a horizontal rectangle around the growth axis and a vertical rectangle around the value axis. The horizontal rectangle is defined by a value z-score between +/- 0.2 and a growth z-score between +/- 0.4 and the vertical rectangle is defined by a value z-score between +/- 0.4 and a growth z-score between +/- 0.2, as shown in the shaded area in Exhibit 2.



**Example:**
**Reassigning Style Inclusion Factors Based on Buffer Rule:**

	<i>Security A</i>	<i>Security B</i>	<i>Security C</i>
Value z-score	0.10	-0.07	0.15
Growth z-score	0.80	-0.05	-0.05
Falls in the buffers	no	yes	yes
Current VIF	1	0.5	0
Initial VIF	0	0.35	1
Post buffer VIF	0	0.5	0

Security A is not impacted by the buffer rules as its value and growth z-scores are not falling within the buffers. Hence, its initial style inclusion factors remain unchanged. Securities B and C are impacted by the buffer rules and therefore, their style inclusion factors are reassigned to the current style inclusion factors.

### 3.5.3 ALLOCATING SECURITIES TO REACH 50% TARGET

The allocation process starts by assigning to the appropriate style index the security that is the greatest distance away from the origin and hence possesses the strongest style characteristics, based on its initial VIF and GIF modified for buffers.

Allocating securities starting with those that are furthest away from the origin ensures that securities with the strongest style characteristics are allocated to their appropriate styles first. During the style allocation process, if two securities have the same distance, the security with a larger free float-adjusted market capitalization is allocated to its appropriate style index first.

The allocation process is stopped when adding a security to a particular style index results in the cumulative weight of that index exceeding the 50% free float-adjusted market capitalization representation target.

The security, which stopped the allocation process, is defined as the “middle security”. In this step, the allocation of the middle security is reviewed to determine how to best approximate the 50% target. If the middle security has a free float-adjusted market capitalization weight of less than 5% in the market capitalization index, its free float-adjusted market capitalization is allocated to the value or growth index that comes closest to the 50% target. If the middle security has a free float-adjusted market capitalization weight of more than 5% in the market capitalization index, its free float-adjusted market capitalization can be partially allocated to the value and growth indexes in order to be closer to the 50% target. The VIF and GIF for a middle security can be either 1, 0.65, 0.5, 0.35 or 0. Depending on the outcome of the attribution of this middle security, neither index may reach the 50% target and therefore the attribution process may continue.

Once the 50% target is reached, all remaining securities are allocated or reallocated to the index that has not yet reached the 50% target.

Therefore, some securities may be allocated to a style index that is different from their initial style classification. However, as the allocation process starts with securities having the strongest style characteristics and the remaining securities that are reassigned have relatively less pronounced style characteristics, the impact on the style indexes is expected to be modest.

**Example:**
**Reallocating Securities with a Weight of Less than 5% to Reach 50% Target:**

Securities	Distance	Security Weights	Cumulative Index Value	Index Weight	Post Buffer VIF	Final VIF
A	3.74	0.1%	0.1%	0.0%	1.00	1.00
B	2.63	0.2%	0.3%	0.0%	1.00	1.00
C	2.49	0.1%	0.4%	0.0%	1.00	1.00
...	...	...	...	...	...	...
...	...	...	...	...	...	...
X	0.33	1.3%	46.5%	50.2%	0.00	0.00
Y	0.32	0.9%	47.4%	50.2%	0.00	Reallocated 1.00
...	...	...	...	...	...	...

Security A is the first security to be allocated as it is the furthest away from the origin and therefore has the strongest style characteristics. This security is assigned to the value index as its post buffer VIF is 1. As a result, the cumulative value index weight increases from 0% to 0.1%. The process continues until Security X is allocated. This security is allocated to the growth index according to its post buffer VIF and as a result, the cumulative growth index weight reaches 50.2%, above the 50% target. Security X is the “middle security”. As a result, securities starting from Security Y are fully reallocated to the value index, even if their post buffer VIF is 0.

**Example:**
**Reallocating Securities with a Weight of More than 5% to Reach 50% Target:**

Securities	Distance	Security Weights	Cumulative Index Weight Value	Cumulative Index Weight Growth	Post Buffer VIF		Final VIF
A	3.74	0.1%	0.1%	0.0%	1.00		1.00
B	2.63	0.2%	0.3%	0.0%	1.00		1.00
C	2.49	0.1%	0.4%	0.0%	1.00		1.00
...	...	...	...	...	...		...
...	...	...	...	...	...		...
<b>X</b>	<b>0.33</b>	<b>5.3%</b>	<b>48.5%</b>	<b>50.6%</b>	<b>0.00</b>	Reallocated	<b>0.35</b>
Y	0.32	0.9%	49.4%	50.2%	0.00	Reallocated	1.00
...	...	...	...	...	...		...

In this example, Security X is the “middle security”. It has a free float-adjusted market capitalization weight of more than 5% in the market capitalization index. According to its post buffer VIF, it should have been allocated to the growth index, resulting in a weight of 52.5% representation, above the 50% target. In this case, the security is partially allocated in order to most closely approximate the 50% target. As a result, 35% of the security’s weight is reallocated from the growth index to the value index and its final VIF is 0.35.

## 4 MAINTAINING THE US EQUITY INDEXES

The MSCI US Equity Indexes are maintained with the objective of reflecting the evolution of the US equity markets, including the evolution of the market's market capitalization and style segments on a timely basis. In maintaining the indexes, emphasis is also placed on their continuity and on minimizing unnecessary index turnover.

In this regard, the market capitalization and value and growth indexes are fully reviewed on a semi-annual basis, at the end of May and November, and the market capitalization indexes are partially reviewed at the end of February and August. In addition, consistent with the index methodology employed in maintaining existing MSCI international equity indexes, MSCI reflects corporate events in the indexes as they occur.

Maintaining the US Equity Indexes involves two main dimensions. The first is related to the maintenance of the constituents of the US Equity Indexes, including additions to and deletions from the indexes, changes in Domestic Inclusion Factors (DIFs), changes in number of shares and changes in industry classification. The second is the style maintenance of the securities, including the maintenance of the 8 value and growth variables.

Overall, index maintenance can be described by the following three broad categories of implementation of changes.

- Semi-annual index reviews, intended to reconstitute the indexes on the basis of a new US equity universe while taking buffer rules into consideration. Semi-annual index reviews intend to ensure that the Broad Market Index represents at least 99.5% of the US equity universe. During the May semi-annual index reviews, the free float of all constituents and non-constituents is also systematically reassessed.
- Quarterly index reviews, aimed at promptly reflecting significant moves of securities within the Investable Market Index and other significant market events and their corresponding impact on DIFs.
- Ongoing event-related changes, which are generally implemented in the indexes as they occur.

## 4.1 SEMI-ANNUAL INDEX REVIEW

The semi-annual index review involves a comprehensive review of the market capitalization indexes as well as the value and growth indexes. During the review, changes in the investability of constituents and non-constituents are also assessed. In addition, during the May semi-annual index review, the free float of all constituents and non-constituents is also systematically reassessed.

### 4.1.1 SEMI-ANNUAL INDEX REVIEW PROCESS FOR MARKET CAPITALIZATION INDEXES

During each semi-annual index review, a new US equity universe is identified and companies and their securities are assigned to the appropriate market capitalization indexes after accounting for the buffer rules, and the number of companies in the market capitalization indexes, within the Investable Market Index is brought back to the original number as outlined in Section 2. In addition, the Broad Market Index is adjusted to represent at least 99.5% of the US equity universe.

### 4.1.2 SEMI-ANNUAL INDEX REVIEW CHANGES IN DIFS AND NUMBER OF SHARES

During the May and November semi-annual index reviews, significant changes in free float estimates and corresponding changes in the DIFs for constituents, related to relatively large events, are reflected in the indexes. Changes may result from the following:

- Large market transactions, involving strategic shareholders that are publicly announced. (For example, transactions made by way of immediate bookbuilding and other processes).
- Secondary offerings of existing shares that, given the lack of sufficient notice, were not reflected immediately.
- Corrections resulting from the reclassification of shareholders from strategic to non-strategic and vice versa.
- Update of DIFs following the public disclosure of the new shareholder structure for companies involved in mergers, acquisitions or spin-offs, where different from MSCI's pro forma free float estimate at the time of the event.
- Large conversions of exchangeable bonds and other similar securities into already existing shares.

- End of lock-up periods or expiration of loyalty incentives for non-strategic shareholders, which determine the reclassification of these shareholdings and result in an increase in free float.
- Changes in DIFs as a result of other events of similar nature.

In addition, during the May semi-annual index review, a detailed review of the shareholder information used to estimate free float for constituent and non-constituent securities is conducted. The review is comprehensive, covering all aspects of shareholder information.

For further details on DIF changes that are implemented during a semi-annual index review, see Appendix VII entitled “Quarterly and Semi-Annual Index Review Changes in DIFs”.

During the May and November semi-annual index reviews, updates in number of shares are also implemented. They are generally small changes in a security’s shares outstanding and result from amongst other things:

- Exercise of options or warrants and employee stock option plans.
- Conversion of convertible bonds or other instruments, including periodic conversion of preferred stocks, and small debt-to-equity swaps.
- Periodic share buybacks.
- Increases of less than 5% in a security’s number of shares resulting from acquisition of non-listed companies.
- Other changes in number of shares resulting from events that could not be implemented on or near the effective dates, and where no price adjustment factor (PAF) is necessary.
- Share cancellations.

Updates in number of shares implemented as part of the semi-annual index review could also trigger a review of the free float of the security. Any resultant changes in Domestic Inclusion Factor (DIF) are implemented simultaneously. Updates in number of shares policy applies to both May and November semi-annual index reviews.

#### 4.1.3 SEMI-ANNUAL INDEX REVIEW PROCESS FOR VALUE AND GROWTH INDEXES

During the semi-annual index review, new value z-scores and growth z-scores are calculated for the pro forma market capitalization index constituents and after applying the buffer rules, securities are allocated to the value and growth indexes, targeting 50% of the free float-adjusted market capitalization within each market capitalization index as outlined in Section 3.

#### 4.1.4 SEMI-ANNUAL INDEX REVIEW FREQUENCY AND TIMING OF IMPLEMENTATION

The semi-annual index review is conducted every 6 months and implemented as of the close of the last business day of May and November.

#### 4.1.5 DATE OF DATA USED FOR SEMI-ANNUAL INDEX REVIEW

In general, data as of the end of March and the end of September is used to create the eligible US equity universe and to determine the values of the fundamental and forward looking data used to determine style characteristics for the May and the November semi-annual style index reviews respectively.

The cut-off date for market capitalization and prices is generally any one of the last 10 business days of April and October for the May and the November semi-annual style index reviews respectively. This same price is used for the calculation of the 3 price based ratios used to determine value style characteristics.

### 4.2 QUARTERLY INDEX REVIEW

The quarterly index review process is designed to ensure that the indexes continue to be an accurate reflection of evolving equity markets. This is achieved by promptly reflecting significant moves of constituents within the Investable Market Index at the time of the quarterly index review. In addition, other significant market events affecting constituents and their corresponding impact on DIFs, which were not captured in the Investable Market Index and the Micro Cap Index at the time of their actual occurrence, are also reflected at the quarterly index review.

During a quarterly index review, only the market capitalization indexes are reviewed using buffer zones described in Section 2.3.2.1 and only securities affected by changes in the market capitalization indexes are also reviewed for style.

Quarterly index reviews may result in changes in DIFs, updates in number of shares or changes in the market capitalization and/or style indexes for existing constituents. There are no new additions to or deletions from the Investable Market Index and the Micro Cap Index at the quarterly index review, unless due to a corporate event or early additions coinciding with the quarterly index review or deletions that result from corrections to the US equity universe.

#### **4.2.1 QUARTERLY INDEX REVIEW CHANGES IN CONSTITUENTS OF THE MARKET CAPITALIZATION INDEXES**

During the quarterly index reviews, the market capitalization rankings are determined within the Investable Market Index only. During a quarterly index review, the existing constituents of the Investable Market Index are reviewed for market capitalization using the buffer zones as described in Section 2.3.2.1. Constituents lying outside of the buffer zones are moved to the appropriate market capitalization index and are not replaced by other companies and securities. Therefore, during a quarterly index review, the market capitalization indexes are not brought back to the original number of companies used to specify each market capitalization index within the Investable Market Index.

#### **4.2.2 QUARTERLY INDEX REVIEW CHANGES IN DIFS AND NUMBER OF SHARES**

The scope of the changes in DIFs at the quarterly index reviews is equivalent to the scope of the November semi-annual index review changes in DIFs, as described in Section 4.1.2 entitled “Semi-Annual Index Review Changes in DIFs and Number of Shares.”

Changes in number of shares during the quarterly index reviews are those typically implemented during semi-annual index reviews, as outlined in Section 4.1.2.

For further details on DIF changes that are implemented during a quarterly index review, see Appendix VII entitled “Quarterly and Semi-Annual Index Review Changes in DIFs”.

#### **4.2.3 QUARTERLY INDEX REVIEW CHANGES IN CONSTITUENTS OF THE VALUE AND GROWTH INDEXES**

During the quarterly index review, style review is conducted only for securities affected by changes in the market capitalization indexes. Hence, once the new market capitalization index has been determined for the affected securities, these are reviewed for style, based on their value z-scores and growth z-scores computed using the latest available values of the



eight variables and the daily market capitalization weighted means and standard deviations available for each of the variables within their corresponding market capitalization index. As there is no new allocation process involved, no buffer rules are applied during the style analysis at the quarterly index review. For further details on the daily calculations, see Section 4.3, entitled “Ongoing Event-Related Changes”.

#### 4.2.4 QUARTERLY INDEX REVIEW FREQUENCY AND TIMING OF IMPLEMENTATION

The implementation of changes resulting from quarterly index reviews occurs on only two dates throughout the year: as of the close of the last business day of February and August.

#### 4.2.5 DATE OF DATA USED FOR QUARTERLY INDEX REVIEW

In general, the cut-off date for market capitalization and prices used for the February and August quarterly index review is any one of the last 10 business days of January and July respectively. This same price is used for the calculation of the 3 price based ratios used to determined value style characteristics.

### 4.3 ONGOING EVENT-RELATED CHANGES

With the exception of the treatment as described below, details regarding the treatment of corporate events not covered below can be found in the MSCI Corporate Events Methodology Book, available at: <http://www.msci.com/index-methodology>

Ongoing event-related changes to the indexes are the result of mergers, acquisitions, spin-offs, delistings, reorganizations and other similar corporate events. They can also result from capital reorganizations in the form of equity offerings, bonus issues, stock splits and other similar corporate actions that take place on a continuing basis. These changes are generally reflected in the indexes at the time of the event.

In order to assess the impact of significant events, MSCI maintains a daily ranking of constituents in the current Broad Market Index in descending order of company full market capitalization, as well as a daily calculation of market capitalization weighted means and standard deviations for each of the 8 value and growth variables within each market capitalization index in the Investable Market Index. These rankings and calculations are based on the previous day’s closing market capitalization.

The appropriate post-event market capitalization index of a company and its securities can be determined by comparing the company's post-event full market capitalization with the daily rankings. Once the appropriate market capitalization index has been determined, the securities are reviewed for style, based on their value z-scores and growth z-scores computed using the latest available values of the eight variables and the daily calculation of market capitalization weighted means and standard deviations of their corresponding market capitalization indexes. During the market capitalization and style analysis related to corporate events, the number of companies in the market capitalization indexes is not brought back to their original number and the 50% free float-adjusted market capitalization is not targeted in the value and growth indexes. In additions, buffer rules do not apply.

General principles that are applied in the treatment of these ongoing event-related changes are described in the following pages. The handling of ongoing event-related changes can be classified in two broad categories:

- Corporate events affecting existing index constituents.
- Corporate events affecting non-index constituents.

#### 4.3.1 CORPORATE EVENTS AFFECTING EXISTING INDEX CONSTITUENTS

Corporate events can affect existing index constituents in various ways:

- Changes in characteristics of existing constituents.
- Early inclusions of non-index constituents.
- Early deletions of existing index constituents.

##### 4.3.1.1 CHANGES IN CHARACTERISTICS OF EXISTING CONSTITUENTS

Changes in characteristics of existing constituents include changes in their market capitalization, style characteristics and industry classification.

In order to ensure that the index accurately reflects the investability of the underlying securities, it is a general policy to coordinate ongoing changes in number of shares with changes in DIFs.

Therefore, when two companies merge, or a company acquires or spins-off another company, the free float of the resulting entity is estimated on a pro forma basis, using pro forma number of shares if applicable, and the corresponding DIFs is applied simultaneously with the event. Other corporate events, which result in a change in shareholder structure and therefore the DIFs are typically reflected in the indexes simultaneously with the implementation of the event in the index. Any other pending shareholder information updates or reclassifications are generally also reflected in the pro forma free float estimation related to the event. In addition, when appropriate, the number of shares changes resulting from the corporate event also incorporates any pending updates in number of shares.

Increases in number of shares and changes in DIFs resulting from all equity offerings as well as increases in DIFs resulting from secondary offerings representing at least 5%, 10% or 25% for Standard, Small Caps and Micro caps respectively of the security's pre-event number of shares will be implemented with two full business days advance notification after the offering is priced. An equity offering involves the issuance of new shares by a company while a secondary offering involves the distribution of current shareholders' existing shares in a listed company and is usually pre-announced by a company or by a company's shareholders and open for public subscription during a pre-determined period.

MSCI implements pending number of shares and/or free float updates simultaneously with the event. Note that if the number of shares update is smaller than  $\pm 1\%$  on a post-event number of shares basis, it will be implemented at a subsequent Index Review.

In order to reflect significant changes in market capitalization of existing constituents in the Investable Market Index in a timely fashion while minimizing index turnover, the market capitalization and style characteristics of a security are reviewed simultaneously with the event, if the market capitalization change implied by the event, including potential update in number of shares for the security, is deemed significant. Significant market capitalization change is defined as an increase of 50% or greater, or a decrease of 33% or more in the company's pre-event full market capitalization.

However, following the market capitalization review, if the post event entity remains in the same market capitalization index, the style characteristics of the affected securities are not reviewed if any of the following criteria is met:

1. When two constituents within the same market capitalization index are involved in mergers and acquisitions and their Value Inclusion Factors (VIFs) are equal.
2. Decreases in market capitalizations due to buybacks of shares.

3. Increases in market capitalizations due to issuances of new shares in order to raise cash, unless it is intended for the payment of an acquisition in the very near term.

The guidelines regarding significant market capitalization changes described above apply in most corporate events cases. For corporate events not described above or combinations of different types of corporate events and other exceptional cases, MSCI will determine the most appropriate implementation method and announce it prior to the changes becoming effective in the indexes.

The above rule regarding significant events does not apply to constituents of the Micro Cap Index unless they are involved in a corporate event with an Investable Market Index constituent and the event is considered significant as described above, in which case a size and style analysis will be performed.

Changes in industry classification resulting from corporate events are generally implemented simultaneously with the event. Other changes in industry classification are implemented at the end of the month.

#### 4.3.1.2 EARLY INCLUSIONS OF NON-INDEX CONSTITUENTS

When there is a corporate event affecting index constituents, non-index constituents that are involved in the corporate event are generally considered for immediate inclusion to replace the constituents affected in the US Equity Indexes. All early inclusions are conditional upon the non-index constituents passing all the investability screens described in Section 2.2 with the exception of the length of trading and liquidity screens.

For example, if a non-constituent company acquires a constituent company, the constituent company's securities are replaced by the securities of the acquiring company. Similarly, if a constituent company merges with a non-constituent company, the merged company replaces the constituent company. In addition, if a constituent's share class is converted into another share class that is new or currently not in the index, this results in the inclusion of one or more share classes in the indexes to replace the constituent. However, when an index constituent is distributing rights to acquire a non-index constituent at a subscription price, MSCI generally will not include the non-index constituent at the time of the event, especially if the post-event information of the new entity is not complete and publicly available.

Such non-index constituents are generally included in the same market capitalization and value and growth indexes as the affected index constituents, since they are considered to be a continuation of the index constituents. However, if the difference between the post-event market capitalization of the non-index constituents and the respective index constituents is deemed significant, as discussed in section 4.3.1.1, a market capitalization and style review is conducted for the non-index constituents. Thereafter, they are included in the appropriate market capitalization indexes based on their market capitalization rankings within the current Broad Market Index, and the appropriate value and growth indexes based on their style attribution within the relevant market capitalization indexes.

Securities spun-off from existing constituents are also considered for inclusion at the time of the event. A systematic market capitalization and style review is conducted for all spun-off securities from existing Investable Market Index constituents provided that they pass all the investability screens described in Section 2.2 with the exception of the length of trading and liquidity screens. Thereafter, they are included in the appropriate market capitalization indexes based on their market capitalization rankings within the current Broad Market Index, and the appropriate style indexes based on their style attribution within the relevant market capitalization indexes.

Securities spun-off from existing Micro Cap Index constituents are eligible for inclusion in the Micro Cap Index only, provided their company full market capitalization is at least USD 10 million and they pass all the investability screens described in Section 2.2 with the exception of the length of trading and liquidity screens.

#### 4.3.1.3 EARLY DELETIONS OF EXISTING INDEX CONSTITUENTS

MSCI will remove from the US Equity Indexes as soon as practicable securities of companies that will be delisted, companies that file for bankruptcy and companies that file for protection from their creditors and/or are suspended for which a return to normal business activity and trading is unlikely in the near future.

When the primary exchange price is not available, MSCI will delete securities at an over the counter or equivalent market price when such a price is available and deemed relevant. If no over the counter or equivalent price is available, the company will be deleted at the smallest price of USD 0.01 at which a security can trade on a given exchange.

For securities that are suspended, MSCI will carry forward the market price prior to the suspension during the suspension period.

In addition, when a constituent company is involved in a corporate event, the securities of the constituent company are removed from the indexes if due to the event they no longer pass the investability screens described in Section 2.2. Conversions of a constituent's share class into another share class resulting in the deletion of one or more share classes in the indexes are also handled in the same manner.

#### 4.3.2 CORPORATE EVENTS AFFECTING NON-INDEX CONSTITUENTS

##### 4.3.2.1 IPOs AND OTHER EARLY INCLUSIONS

In general, newly listed equity securities available to US investors, including securities of companies that change their country of incorporation to the US, are considered for inclusion in the US Equity Indexes at the time of the semi-annual index review. However, for IPOs which are significant in market capitalization and are ranked as one of the top 750 largest companies in the current Broad Market Index as of the close of its first or second trading day, an early inclusion outside of the semi-annual index review is considered, if they pass all the investability screens described in Section 2.2, with the exception of the length of trading and liquidity screens.

Any over-allotment (also called green shoe) publicly announced as exercised prior to MSCI's announcement on the first or second trading day is included in the IPO's market capitalizations calculations.

If the decision is made to include an IPO early, it generally becomes effective after the close of the company's tenth day of trading. However, in certain cases, another date may be chosen for the inclusion to reduce turnover, for example, where the normal inclusion date is close to the effective date of the following quarterly index review or the next semi-annual index review.

Securities may also be considered for early inclusion in other significant cases, including but not limited to those resulting from removal or relaxation of FOLs, a large additional offering of an already listed security, consolidation or restructuring in the industry giving rise to a large new company. Such cases will be treated in the same way as IPOs of significant size.

For significant IPOs and all other early inclusions, a market capitalization and style review is conducted. Thereafter, they are included in the appropriate market capitalization indexes based on their market capitalization rankings within the current Investable Market Index, and the appropriate style indexes based on their style attribution within the relevant market capitalization indexes.

### 4.3.3 CORPORATE EVENTS AFFECTING THE INDEX REVIEW

Some corporate events, such as, but not limited to, additions to or deletions from the Indexes or corporate events that trigger a significant market capitalization change relative to the company's full market capitalization before the event (increase of 50% or greater, or decrease of 33% or more), or corporate events that trigger a significant change in the float of the security, may have an impact on the index changes announced at the time of the Index Reviews. In such situation and if the completion date of the corporate event is effective between the Index Review price-cutoff date and one month after the Index Review effective date, MSCI may amend the Index Review result and announcement to consider the impact of the corporate event, in order to avoid potential reverse turnover. MSCI may amend the Index Review changes until five business days before the Index Review effective date.

To communicate these amendments, a separate announcement will be sent to the clients either with the Index Review announcement or with the corporate event announcement depending on the announcement date of the event.

## 4.4 ANNOUNCEMENT POLICY

### 4.4.1 SEMI-ANNUAL INDEX REVIEW

The results of the semi-annual index reviews are announced at least two weeks in advance of their effective implementation dates as of the close of the last business day of May and November.

### 4.4.2 QUARTERLY INDEX REVIEW

The results of the quarterly index reviews are announced at least two weeks in advance of their effective implementation dates as of the close of the last business day of February and August.

### 4.4.3 ONGOING EVENT-RELATED CHANGES

All changes resulting from corporate events are announced prior to their implementation in the MSCI Indexes.

The changes to the Investable Market Index are typically announced at least ten business days prior to these changes becoming effective in the indexes as an “expected” announcement, or as an “undetermined” announcement, when the effective dates are not known yet or when aspects of the event are uncertain. MSCI sends “confirmed” announcements at least two business days prior to events becoming effective in the indexes, provided that all necessary public information concerning the event is available. The full list of all new and pending changes is delivered to clients on a daily basis, at 5:30 PM US Eastern Standard Time (EST) through the Advance Corporate Events (ACE) File.

In exceptional cases, events are announced during market hours for same or next day implementation. Announcements made by MSCI during market hours are usually linked to late company disclosure of corporate events, or unexpected changes to previously announced corporate events.

Both equity offerings and secondary offerings for US securities in the Investable Market Index will be confirmed through an announcement during market hours for same or next day implementation, as the completion of the events cannot be confirmed prior to the notification of the pricing.

Early deletions of constituents due to bankruptcy or other significant cases are announced as soon as practicable prior to their implementation in the MSCI Indexes.

A more descriptive text announcement is sent to clients of the Investable Market Index for significant events that meet any of the following criteria:

1. Early additions and deletions of constituents described in Sections 4.3.1.3 and 4.3.2.1.
2. Migration of constituents from one market capitalization and/or value and growth index to another.
3. Changes in free float-adjusted market capitalization equal to or larger than US\$ 5 billion.
4. Significant market capitalization changes as described in Section 4.3.1.1.

If warranted, MSCI may make additional announcements for events, which are complex in nature and would benefit from additional clarification.

For the Micro Cap Index, MSCI only sends “confirmed” announcements at least two business days prior to events becoming effective in the index, provided that all necessary public



information concerning the event is available. The full list of “confirmed” changes is delivered to clients on a daily basis at 5:30 PM US Eastern Standard Time (EST) through the Advance Corporate Events (ACE) File.

#### 4.4.3.1 IPOS AND OTHER EARLY INCLUSIONS

Early inclusions of large IPOs or newly listed securities are announced no earlier than shortly after the close of the first day of trading and no later than before the opening of the third day of trading in the market where the company has its primary listing.

Early inclusions of already listed securities, which previously failed the investability screens due to low free float and/or security free float-adjusted market capitalization, following large secondary offerings of new and/or existing shares are announced no earlier than shortly after the end of the offer period.

It is MSCI policy not to comment on future listed equity securities, including their industry classification under the Global Industry Classification Standard (GICS), their country classification and their potential inclusions in an MSCI Index. The same applies to non-index constituents that are already listed with pending large events.

#### 4.4.3.2 GLOBAL INDUSTRY CLASSIFICATION STANDARD (GICS)

Non-event related changes in industry classification at the sub-industry level are announced at least two weeks prior to their implementation as of the close of the last business day of each month.

## APPENDIX I: COUNTRY CLASSIFICATION OF SECURITIES

This appendix outlines the guidelines MSCI uses to determine the country classification of equity securities.

Each of the securities followed in the MSCI universe is classified in one and only one country.

In general, all companies' equity securities are classified in the country in which they are incorporated and where they have their primary listing. In addition, a security can only be eligible for inclusion in a country index if it is listed in that country. This approach determines the country classification of the vast majority of the cases.

One exception is when a company is incorporated in one country, but has its primary listing in a different country. If the country of incorporation is a tax haven or a country that is not part of MSCI ACWI, then the security's primary listing might be used to determine the country of classification, unless other factors lead to another decision.

In the USA, consideration is also given to the type of financial statements filed by the company. Companies that are listed in the US but incorporated in a country that is not covered by MSCI ACWI or in a tax haven may be included in the USA index universe provided that they file a Form 10-K / 10-Q. There may be exceptions to the above rule, due to historical reasons or market perception for example.

Companies incorporated outside of the US which have their securities' primary listing in the US may be included in the USA index universe, provided that they file a Form 10-K/10-Q and that in four of the following five variables they do not point to another single country: operations, revenues, headquarters, management and shareholder base.

### SPECIAL CASES

Exceptions to the general framework can be made in cases for securities that have more than one primary listing, or when a company has its operations in one country but is listed in another. In such circumstances, MSCI determines the appropriate country of classification using a set of considerations, the most important of which are:

- The company's main equity trading markets and its shareholder base.
- The geographical distribution of its operations (in terms of assets and production).

- The location of its headquarters; and
- The country in which investors consider the company to be most appropriately classified.

### CHANGE OF INCORPORATION

In the event that a company already classified in a country by MSCI subsequently re-incorporates in another country it generally will remain within the country in which it was initially classified. However, it may be re-classified into its new country of incorporation if, in addition to the incorporation change, the company's geographical profile has been or will be fundamentally modified. Changes in the country classification of a company's securities generally takes place in the context of the May Annual Index Review, except if the change in country classification is the result of a corporate event, in which case the company's securities may be reclassified simultaneously with the change in incorporation or at a Quarterly Index Review following the corporate event.

When MSCI changes a company's country classification, the company's equity securities are not automatically included in the index of its new country even if it was a constituent of its original country's index. These securities would have to meet all constituent selection criteria for the index of the new country.

### REVIEW AND MAINTENANCE

MSCI periodically reviews the country classification of companies not classified into their country of incorporation. MSCI also periodically reviews the status of stock exchanges and/or market sections to determine whether securities listed on such exchanges or sections will become part of the universe.

## APPENDIX II: FREE FLOAT DEFINITION AND ESTIMATION GUIDELINES

MSCI defines the free float of a security as the proportion of shares outstanding that is deemed available for purchase in the public equity markets by US investors. In practice, limitations on the investment opportunities available to US institutional investors include:

- **Strategic and other non-free float shareholdings:** Stakes held by private or public shareholders whose investment objectives or other characteristics suggest that those holdings are not likely to be available in the market. In practice, disclosure requirements generally do not permit a clear determination of these investment objectives. Therefore, MSCI classifies shareholdings as free float or non-free float based on a categorization of investor types into non-strategic and strategic respectively.

### CLASSIFICATION OF SHAREHOLDER TYPES

STRATEGIC SHAREHOLDER TYPES (NON-FREE FLOAT)	
Governments	Shareholdings owned by governments and affiliated entities are generally classified as non-free float.
Companies	Shares owned by companies. This includes treasury shares owned by the company itself. <sup>2</sup>
Banks	Shareholdings by banks are considered as strategic, excluding shareholdings held in trust on behalf of third parties that are deemed to be non-strategic.
Principal officers and board members	Shares owned by the company's principal officers or members of the Board of Directors, including shares owned by individuals or families that are related to or closely affiliated with the company's principal officers, members of the Board of Directors, or founding members deemed to be insiders.

<sup>1</sup> If the treasury shares are included in the total shares outstanding used for the calculation of indexes, they are taken into account in the calculation of free float. Alternatively, treasury shares can be taken out of the total security shares outstanding used for the calculation of the indexes and therefore not taken into consideration for the free float calculation.

Employees	Shares of the employing companies, which are held in a variety of ways including plans sponsored by the employer for the purpose of retirement and savings plans, incentive compensation programs and other deferred and employee pension funds. Includes shares held by both officers and non-officers.
<b>NON-STRATEGIC SHAREHOLDER TYPES (FREE FLOAT)</b>	
Individuals	Shares owned by individuals, excluding shares owned by individuals or families that are related to or closely affiliated with the company's principal officers or members of the Board of Directors or founding members deemed to be insiders, and, also excluding those shareholdings held by individuals, the significant size of which suggests that they are strategic in nature.
Investment funds, mutual funds and unit trusts	Shares owned in investment funds, mutual funds and unit trusts, including shares owned in passively managed funds.
Security brokers	Non-strategic interests held by broker dealers (e.g.: trades in the process of settlement, holdings in the process of being transferred, as part of underwriting activity etc), unless held within the same group or the nature of holding is deemed strategic.
Pension funds	Shares owned in employee pension funds, excluding shares of the employing company, its subsidiaries or affiliates.
Insurance companies	In principle, all stakes held by insurance companies are part of free float. For exceptions to this general principle, please refer to the additional discussion on insurance companies presented in the next page.
Social security funds	Shares owned in social security funds, unless the fund's management is deemed to exert influence over the management of the company.

In the event that the above categories should not appropriately capture the nature of a specific shareholding, its classification as free float or non-free float will be determined based on a more extensive analysis.

### Special Cases

The following guidelines will be applied in analyzing the special cases set forth below:

- **Nominees or trustees:** Shareholdings registered in the name of a nominee or trustee are classified as strategic or non-strategic based on an analysis of who the ultimate beneficial owner of the shares is, according to the shareholder types described above.
- **Government agencies and government-related investment funds:** Shareholdings of government agencies and government-related investment funds are classified based on an analysis of the objective of the investment and the extent of government involvement in managing the companies.
- **Insurance companies:** Shareholdings by insurance companies are considered as non-free float, when analysis shows that these holdings are unlikely to be made available as free float in the market. This analysis typically looks at the nature of the insurance business, a company's business practices with its group-related or other companies, and the regulatory environment, including fiscal incentives. These factors, individually or combined, could restrict the insurance company's shareholdings from being made freely available in the stock market. Therefore, the treatment of stakes held by insurance companies may differ from company to company.
- **Depository Receipts:** Shares that are deposited to back the issuance of depository receipts such as ADRs and GDRs are classified as non-strategic, unless it is established that a specific stake held in depository receipts is strategic in nature.
- **Shares with "loyalty" incentives:** In a public offering, special incentives are sometimes provided to retail investors and are subject to a minimum holding period. These shares will not be considered as part of the free float during the minimum holding period if the incentives are deemed to be material. In general, a conditional share bonus in a ratio of 1 to 5 (or an equivalent price discount of 1/6th), or more, will be considered as material.
- **Lock up periods:** Any shares that are subject to lock up periods will be considered as non-free float during the lock up period. At the end of the lock up period, these shares will be classified as strategic or non-strategic based on the nature of the shareholder.

MSCI's estimation of free float is based solely on publicly available shareholder information obtained from multiple information sources. For each security, all available shareholdings are considered where public data is available, regardless of the size of the shareholding. MSCI continuously strives to improve the quality of its free float estimates and their related Domestic Inclusion Factors (DIFs). Consultation may be conducted with analysts, other industry experts and official company contacts, particularly where disclosure standards or data quality make the estimation of free float difficult. Additional shareholder information may come from better disclosure by companies or more stringent disclosure requirements by a country's authorities. It may also come from MSCI's ongoing examination of new information sources for the purpose of further enhancing free float estimates and better understanding of shareholder structure.

## APPENDIX III: GLOBAL INDUSTRY CLASSIFICATION STANDARD (GICS)

### INTRODUCTION

The Global Industry Classification Standard (GICS) was developed by MSCI in collaboration with S&P Global to provide an efficient, detailed and flexible investment tool. It is designed to respond to the global financial community's need for a global, accurate, complete and widely accepted approach to defining industries and classifying securities by industry. Its universal approach to industry classification aims to improve transparency and efficiency in the investment process.

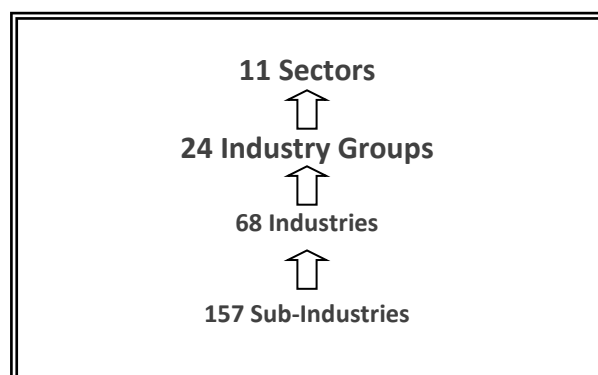
### KEY FEATURES OF GICS

The key features of GICS Structure are that it is:

- Universal: the classification applies to companies globally.
- Accurate: the structure precisely reflects the state of the industries in the equity investment universe.
- Flexible: the classification consists of four levels of analysis, ranging from the most general to the most specialized sub-industry.
- Evolutionary: annual reviews are conducted by MSCI and S&P Global to ensure that the structure remains fully representative of today's global markets.

To provide the level of precision critical in the investment process, GICS is designed with four levels of classifications:

#### The Global Industry Classification Standard (GICS)





GICS has 11 sector classifications:

- Energy
- Materials
- Industrials
- Consumer Discretionary
- Consumer Staples
- Health Care
- Financials
- Information Technology
- Telecommunication Services
- Utilities
- Real Estate.

## PHILOSOPHY AND OBJECTIVES OF GICS

The way in which securities are classified into asset classes forms the basis of many important investment decisions. The relative merits of each security are judged primarily within these asset classes, and investment decisions are taken within this framework.

## APPROACHES TO INDUSTRY CLASSIFICATION SCHEMES

While grouping securities by country and regions is relatively straightforward, classifications by industries are more difficult. There are many approaches to developing industry classification schemes. Some of them are discussed below.

At one extreme, is a purely statistical approach, which is solely financial market-based and backward looking, using past returns. Aggregations are formed around correlation, and this often yields non-intuitive groupings that are dissimilar across countries and regions. Another approach attempts to define a priori financial market-oriented groups or themes, such as cyclical, interest rate sensitive, etc. The difficulty, however, lies in finding widely accepted and relatively stable definitions for these themes.

Two other approaches begin with an economic perspective on companies. The first focuses on a production orientation while the other adopts a market or demand orientation in the analysis of companies. The production-oriented approach was effective in the past in its analysis of the microstructure of industries from the standpoint of producers. For instance, it segregated goods and services on the premise that it was a different set of companies that provided each to consumers. As the structure of the global economy evolved, the limitation of this approach became increasingly obvious. The ever-increasing share of discretionary income brought about by economic development, the emergence of the service era, and the availability and accessibility of information with the advent of new communication technology has moved the emphasis from producers to consumers.

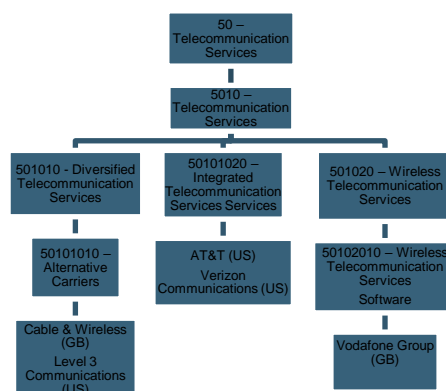
### **GICS: MARKET DEMAND-ORIENTED**

The Global Industry Classification Standard (GICS) is designed to be market demand-oriented in its analysis and classification of companies. For example, drawing the line between goods and services is becoming increasingly arbitrary as they are now commonly sold together. Thus, this distinction between goods and services is replaced by adopting the more market-oriented sectors of “Consumer Discretionary” and “Consumer Staples”, which group goods and services sub-industries. In addition, the creation of large stand-alone sectors such as Health Care, Information Technology and Telecommunication Services accurately represents industries that provide significant value to the consumer in today’s global, integrated economy. This further contributes to a more uniform distribution of weights among the 11 sectors.

### **GICS COMPANY CLASSIFICATION**

The Global Industry Classification Standard (GICS) is used to assign each company to a sub-industry according to its principal business activity. Since the GICS is strictly hierarchical, a company can only belong to one grouping at each of the four levels.

### An Illustration of the GICS – Telecommunication Services Sector:



### CLASSIFICATION BY REVENUE

In order to provide an accurate, complete and long-term view of the global investment universe, a company's revenues often provide a more stable and precise reflection of its activities than earnings. Furthermore, industrial and geographical breakdowns of revenues are more commonly available than earnings broken down the same way for most companies. Nevertheless, company valuations are more closely related to earnings than revenues. Therefore, earnings remain an important secondary consideration in a company's industry classification.

### GENERAL GUIDELINES FOR CLASSIFICATION

The primary source of information used to classify securities is a company's annual reports and accounts. Other sources include brokers' reports and other published research literature. As a general rule, a company is classified in the sub-industry whose definition most closely describes the business activities that generate at least 60% of the company's revenues.

#### Example: Nokia (FI)

2013 Results	Nokia Networks	Nokia Technologies	HERE
Revenues	89%	4%	7%
Earnings	88%	24%	-12%

Classified as:

GICS Level	GICS Code	Code Description
Sector	45	Information Technology
Industry Group	4520	Technology Hardware & Equipment
Industry	452010	Communications Equipment
Sub-Industry	45201020	Communications Equipment

However, a company engaged in two or more substantially different business activities, none of which contribute 60% or more of revenues, is classified in the sub-industry that provides the majority of both the company's revenues and earnings. When no sub-industry provides the majority of both the company's revenues and earnings, the classification will be determined based on further MSCI research and analysis. In addition, a company significantly diversified across three or more sectors, none of which contributes the majority of revenues or earnings, is classified either in the Industrial Conglomerates sub-industry (Industrial Sector) or in the Multi-Sector Holdings sub-industry (Financials Sector).

#### Example: General Electric (US)

2005 Results	Infrastructure	Industrial	Healthcare	NBC Universal	Commercial Finance	Consumer Finance
Revenues	29%	23%	10%	10%	14%	13%
Earnings	33%	11%	11%	13%	18%	13%

Classified as:

GICS Level	GICS Code	Code Description
Sector	20	Industrials
Industry Group	2010	Capital Goods
Industry	201050	Industrial Conglomerates
Sub-Industry	20105010	Industrial Conglomerates

In the case of a new issue, the classification will be determined based primarily on the description of the company's activities and pro forma results as given in the prospectus.

## REVIEW OF SUB-INDUSTRY CLASSIFICATION

A company's sub-industry classification will be reviewed either when a significant corporate restructuring occurs or when the new annual report is made available. In any case, in order to provide a stable sub-industry classification, when reviewing a company's classification, changes will be minimized in the sub-industry classification to the extent possible by disregarding temporary fluctuations in the results of a company's different activities.

In the event that the above guidelines should not appropriately capture a particular company's business activity, its classification will be determined based on a more extensive analysis.

GICS (Global Industry Classification Standard) Structure  
effective after close of business (US, EST) Wednesday - August 31, 2016

Sector	Industry Group	Industry	Sub-Industry
10 Energy	1010 Energy	101010 Energy Equipment & Services	10101010 Oil & Gas Drilling
			10101020 Oil & Gas Equipment & Services
		101020 Oil, Gas & Consumable Fuels	10102010 Integrated Oil & Gas
			10102020 Oil & Gas Exploration & Production
15 Materials	1510 Materials		10102030 Oil & Gas Refining & Marketing
			10102040 Oil & Gas Storage & Transportation
			10102050 Coal & Consumable Fuels
		151010 Chemicals	15101010 Commodity Chemicals
			15101020 Diversified Chemicals
			15101030 Fertilizers & Agricultural Chemicals
			15101040 Industrial Gases
			15101050 Specialty Chemicals
		151020 Construction Materials	15102010 Construction Materials
		151030 Containers & Packaging	15103010 Metal & Glass Containers
			15103020 Paper Packaging
		151040 Metals & Mining	15104010 Aluminum
			15104020 Diversified Metals & Mining
			15104025 Copper
			15104030 Gold
			15104040 Precious Metals & Minerals
20 Industrials	2010 Capital Goods		15104045 Silver
			15104050 Steel
		151050 Paper & Forest Products	15105010 Forest Products
			15105020 Paper Products
		201010 Aerospace & Defense	20101010 Aerospace & Defense
		201020 Building Products	20102010 Building Products
		201030 Construction & Engineering	20103010 Construction & Engineering
		201040 Electrical Equipment	20104010 Electrical Components & Equipment
			20104020 Heavy Electrical Equipment
		201050 Industrial Conglomerates	20105010 Industrial Conglomerates
		201060 Machinery	20106010 Construction Machinery & Heavy Trucks
			20106015 Agricultural & Farm Machinery
			20106020 Industrial Machinery
		201070 Trading Companies & Distributors	20107010 Trading Companies & Distributors
		202010 Commercial Services & Supplies	20201010 Commercial Printing
			20201050 Environmental & Facilities Services
20 Industrials	2020 Commercial & Professional Services		20201060 Office Services & Supplies
			20201070 Diversified Support Services
			20201080 Security & Alarm Services
		202020 Professional Services	20202010 Human Resource & Employment Services
			20202020 Research & Consulting Services
		2030 Transportation	20301010 Air Freight & Logistics
		203010 Air Freight & Logistics	20302010 Airlines
		203020 Airlines	20303010 Marine
		203030 Marine	20304010 Railroads
		203040 Road & Rail	20304020 Trucking
			20305010 Airport Services
		203050 Transportation Infrastructure	20305020 Highways & Railroads
			20305030 Marine Ports & Services
			25101010 Auto Parts & Equipment
			25101020 Tires & Rubber
			25102010 Automobile Manufacturers
25 Consumer Discretionary	2510 Automobiles & Components	251010 Auto Components	25102020 Motorcycle Manufacturers
		251020 Automobiles	25201010 Consumer Electronics
			25201020 Home Furnishings
			25201030 Homebuilding
			25201040 Household Appliances
			25201050 Housewares & Specialties
		252020 Leisure Products	25202010 Leisure Products
		252030 Textiles, Apparel & Luxury Goods	25203010 Apparel, Accessories & Luxury Goods
			25203020 Footwear
			25203030 Textiles
			25301010 Casinos & Gaming
			25301020 Hotels, Resorts & Cruise Lines
			25301030 Leisure Facilities
			25301040 Restaurants
		253020 Diversified Consumer Services	25302010 Education Services
			25302020 Specialized Consumer Services
25 Consumer Discretionary	2530 Consumer Services		25401010 Advertising
			25401020 Broadcasting
			25401025 Cable & Satellite
			25401030 Movies & Entertainment
			25401040 Publishing
			25501010 Distributors
			25502020 Internet & Direct Marketing Retail
			25503010 Department Stores
			25503020 General Merchandise Stores
			25504010 Apparel Retail
			25504020 Computer & Electronics Retail
			25504030 Home Improvement Retail
			25504040 Specialty Stores
			25504050 Automotive Retail
			25504060 Homefurnishing Retail

Sector	Industry Group	Industry	Sub-Industry
30 Consumer Staples	3010 Food & Staples Retailing	301010 Food & Staples Retailing	30101010 Drug Retail
			30101020 Food Distributors
			30101030 Food Retail
			30101040 Hypermarkets & Super Centers
	3020 Food, Beverage & Tobacco	302010 Beverages	30201010 Brewers
			30201020 Distillers & Vintners
			30201030 Soft Drinks
		302020 Food Products	30202010 Agricultural Products
			30202030 Packaged Foods & Meats
	3030 Household & Personal Products	303010 Household Products	30301010 Tobacco
			30301010 Household Products
			30302010 Personal Products
			30302010 Personal Products
35 Health Care	3510 Health Care Equipment & Services	351010 Health Care Equipment & Supplies	35101010 Health Care Equipment
			35101020 Health Care Supplies
			35102010 Health Care Distributors
			35102015 Health Care Services
	3520 Pharmaceuticals, Biotechnology & Life Sciences	352010 Biotechnology	35102020 Health Care Facilities
			35102030 Managed Health Care
			35103010 Health Care Technology
			35201010 Biotechnology
	4010 Banks	401010 Banks	35202010 Pharmaceuticals
			35203010 Life Sciences Tools & Services
			40101010 Diversified Banks
			40101015 Regional Banks
40 Financials	4020 Diversified Financials	402010 Diversified Financial Services	40102010 Thrifts & Mortgage Finance
			40201020 Other Diversified Financial Services
			40201030 Multi-Sector Holdings
			40201040 Specialized Finance
	4030 Insurance	403010 Insurance	40202010 Consumer Finance
			40203010 Asset Management & Custody Banks
			40203020 Investment Banking & Brokerage
			40203030 Diversified Capital Markets
	4040 Mortgage Real Estate Investment Trusts (REITs)	404010 Mortgage REITs	40203040 Financial Exchanges & Data
			40204010 Mortgage REITs
			40301010 Insurance Brokers
			40301020 Life & Health Insurance
45 Information Technology	4510 Software & Services	451010 Internet Software & Services	40301030 Multi-line Insurance
			40301040 Property & Casualty Insurance
			40301050 Reinsurance
			40301050 Reinsurance
	4520 Technology Hardware & Equipment	452010 Communications Equipment	45102010 IT Consulting & Other Services
			45102020 Data Processing & Outsourced Services
			45103010 Application Software
			45103020 Systems Software
	4530 Semiconductors & Semiconductor Equipment	453010 Semiconductors & Semiconductor Equipment	45103030 Home Entertainment Software
			45201020 Communications Equipment
			45202030 Technology Hardware, Storage & Peripherals
			45203010 Electronic Equipment & Instruments
50 Telecommunication Services	5010 Telecommunication Services	501010 Diversified Telecommunication Services	45203015 Electronic Components
			45203020 Electronic Manufacturing Services
			45203030 Technology Distributors
			45301010 Semiconductor Equipment
	5020 Wireless Telecommunication Services	502010 Wireless Telecommunication Services	45301020 Semiconductors
			50101010 Alternative Carriers
			50101020 Integrated Telecommunication Services
			50102010 Wireless Telecommunication Services
55 Utilities	5510 Utilities	551010 Electric Utilities	50102010 Gas Utilities
			55101010 Electric Utilities
			55102010 Gas Utilities
			55103010 Multi-Utilities
	5520 Independent Power and Renewable Electricity Producers	552010 Independent Power and Renewable Electricity Producers	55104010 Water Utilities
			55105010 Independent Power Producers & Energy Traders
			55105020 Renewable Electricity
			55105020 Renewable Electricity
60 Real Estate	6010 Real Estate	601010 (REITs)	60101010 Diversified REITs
			60101020 Industrial REITs
			60101030 Hotel & Resort REITs
			60101040 Office REITs
	6020 Real Estate Management & Development	602010 Real Estate Management & Development	60101050 Health Care REITs
			60101060 Residential REITs
			60101070 Retail REITs
			60101080 Specialized REITs
			60102010 Diversified Real Estate Activities
			60102020 Real Estate Operating Companies

## GICS STRUCTURE REVIEW FREQUENCY

MSCI and S&P Global are committed to ensuring that the GICS structure remains relevant and up-to-date. This is accomplished through an annual review of the structure. This review includes a detailed internal analysis to develop a proposal for potential structural changes and public request for comments and in-depth client consultations with various market participants as a means of obtaining feedback on proposed structural changes.

## Summary of 2018 GICS Structure Changes

SECTOR LEVEL			
Type of change	Code	Current Sector Name	New Sector Name
Name Change	50	Telecommunication Services	Communication Services
INDUSTRY GROUP LEVEL			
Type of change	Code	Current Industry Group Name	New Industry Group Name
Discontinued	2540	Media	
New	5020		Media & Entertainment
INDUSTRY LEVEL			
Type of change	Code	Current Industry Name	New Industry Name
Discontinued	254010	Media	
Discontinued	451010	Internet Software & Services	
New	502010		Media
New	502020		Entertainment
New	502030		Interactive Media & Services
SUB-INDUSTRY LEVEL			
Type of change	Code	Current Sub-Industry Name	New Sub-Industry Name
Discontinued	25401010	Advertising	
Discontinued	25401020	Broadcasting	
Discontinued	25401025	Cable & Satellite	
Discontinued	25401030	Movies & Entertainment	
Discontinued	25401040	Publishing	
Discontinued	45101010	Internet Software & Services	
Discontinued	45103030	Home Entertainment Software	
New	45102030		Internet Services & Infrastructure
New	50201010		Advertising
New	50201020		Broadcasting
New	50201030		Cable & Satellite
New	50201040		Publishing
New	50202010		Movies & Entertainment
New	50202020		Interactive Home Entertainment
New	50203010		Interactive Media & Services
Definition Change	10102040	Oil & Gas Storage & Transportation	
Definition Change	25502020	Internet & Direct Marketing Retail	
Definition Change	45103010	Application Software	
Definition Change	50101020	Integrated Telecommunication Services	
Definition Change	50102010	Wireless Telecommunication Services	
Definition Change	55102010	Gas Utilities	



## APPENDIX IV: VARIABLE DEFINITIONS AND COMPUTATIONS

This appendix provides details on the definitions and computations of the eight variables used to define the value and growth investment style characteristics for index construction.

All forward variables are based on consensus analysts' estimates are provided by a specialized data vendor, which is currently Thomson I/B/E/S. For all other fundamental data, MSCI data are used. As a general rule, in order to avoid inconsistencies of data between the different providers, the fundamental data used in the forward variable calculations are also provided by Thomson I/B/E/S.

### VARIABLES USED TO DEFINE VALUE INVESTMENT STYLE CHARACTERISTICS

#### 1. Book Value to Price Ratio (BV / P)

The BV / P calculation is as follows:

$$BV / P = \text{book value per share} / \text{price of security}$$

The most recently reported book value is used to estimate book value per share.

#### 2. 12-month Forward Earnings to Price Ratio (E fwd / P)

The E fwd / P is calculated as follows:

$$E \text{ fwd} / P = EPS_{12F} / \text{price of security}$$

Where:

$EPS_{12F}$  is the 12-month forward EPS estimate and is derived on a rolling basis from the consensus of analysts' earnings estimates for fiscal year 1 and fiscal year 2.

$$EPS_{12F} = \frac{M * EPS_1 + (12 - M) * EPS_2}{12}$$

Where

- $EPS_1$  is the consensus of analysts' earnings estimates for fiscal year 1
- $EPS_2$  is the consensus of analysts' earnings estimates for fiscal year 2
- M is the number of months remaining before the fiscal year end
- The fiscal year 1 corresponds to the fiscal year following the last fiscal year for which the company has made its results publicly available

For cases where  $EPS_2$  is not available and  $M$  is greater than or equal to 8,  $EPS_1$  is used as an approximation of  $EPS_{12F}$ .

**Example:**

**Calculating the 12-month forward earnings as of January 20, 2005:**

	<i>Security A</i>	<i>Security B</i>	<i>Security C</i>
Latest reported Fiscal Year	Dec 31, 2004	Mar 31, 2004	Dec 31, 2003
M	11	2	11
$EPS_1$	0.64	1.04	1.04
$EPS_1$ date	Dec 31, 2005	Mar 31, 2005	Dec 31, 2004
$EPS_2$	0.74	1.52	1.52
$EPS_2$ date	Dec 31, 2006	Mar 31, 2006	Dec 31, 2005
$EPS_3$			1.72
$EPS_3$ date			Dec 31, 2006
$EPS_{12F}$	<b>0.65</b>	<b>1.44</b>	<b>1.54</b>

For Security C, the results for the fiscal year ending December 31, 2004 are not yet available. As a result, the  $EPS_1$  estimates still pertain to the fiscal year ending December 31, 2004. Therefore, in order to have meaningful 12-month forward earnings, the  $EPS_2$  and the  $EPS_3$  are used instead of the  $EPS_1$  and  $EPS_2$ .

**Example:**

**Calculating the 12-month forward earnings as of June 20, 2005 when  $EPS_2$  is missing:**

	<i>Security A</i>	<i>Security B</i>	<i>Security C</i>
Latest reported Fiscal Year	Sep 30, 2004	Jun 30, 2004	Dec 31, 2004
M	7	5	11
$EPS_1$	0.64	1.04	1.04
$EPS_1$ date	Sep 30, 2005	Jun 30, 2005	Dec 31, 2005
$EPS_2$	0.74		
$EPS_2$ date	Sep 30, 2006		
$EPS_{12F}$	<b>0.68</b>	<b>N/A</b>	<b>1.04</b>

For security B, estimates for June 30, 2006 are not available. Since  $M$  is smaller than 5,  $EPS_{12F}$  is not available. In the case of Security C, estimates for December 31, 2006 are not available but as  $M$  is greater than 8,  $EPS_1$  is used as  $EPS_{12F}$ .

### 3. Dividend yield (D / P)

$$D / P = \text{Current Annualized Dividend per Share} / \text{Price of Security}$$

The current annualized dividend per share is the trailing 12-month dividend per share derived from the current fiscal year end dividend per share plus the difference between the interim dividend per share of the current fiscal year and the previous fiscal year. For the USA and Canada, the current annualized dividend per share is calculated by annualizing the latest published quarterly dividend.

Yields are gross, before withholding tax, and take into account special tax credits when applicable.

## VARIABLES USED TO DEFINE GROWTH INVESTMENT STYLE CHARACTERISTICS

### 1. Long-term Forward Earnings per Share Growth Rate (LT fwd EPS G)

The LT fwd EPS G is the consensus of analysts' earnings growth rate estimates typically provided for the next 3 to 5 years. LT fwd EPS G with values above or equal to 50 or below or equal to -30 are not taken into account and considered as missing if contributed by only one analyst.

### 2. Short-term Forward Earnings per Share Growth Rate (ST fwd EPS G)

The ST fwd EPS G is a growth rate between the 12-month backward earnings per share and the 12-month forward earnings per share.

The ST fwd EPS G is computed as follows:

$$\text{ST forward EPS G} = \frac{EPS_{12F} - EPS_{12B}}{|EPS_{12B}|}$$

Where

$EPS_{12B}$  = 12-month backward EPS is derived in a similar fashion as the  $EPS_{12F}$  but from the last reported fiscal year and the consensus of analysts' earnings estimates for fiscal year 1

$$EPS_{12B} = \frac{M * EPS_0 + (12 - M) * EPS_1}{12}$$

Where

- $EPS_0$  is last fiscal year end reported earnings per share

For cases where  $EPS_1$  is used as an approximation of  $EPS_{12F}$ ,  $EPS_0$  is used as the value for  $EPS_{12B}$ .

#### Example:

#### Calculating the Short-term forward EPS growth rate as of the January 20, 2003:

	Security A	Security B
<i>Security C</i>		
Fiscal Year End	Dec 31, 2003	Nov 31, 2003
Mar 31, 2003		
M	11	10
2		
$EPS_0$	0.50	-0.30
0.89		
$EPS_1$	0.64	-0.15
1.04		

EPS <sub>2</sub>	0.74	0.25
EPS <sub>12F</sub>	0.65	-0.08
EPS <sub>12B</sub>	0.51	-0.28
ST fwd EPS G	26.7%	69.7%
	41.9%	

### 3. Current Internal Growth Rate (g)

The Current Internal Growth Rate is calculated as follows:

$$g = ROE * (1 - PO)$$

Return on Equity (ROE) is calculated using the trailing 12-month EPS divided by the most recently reported book value. The ROE is considered meaningful and is calculated if the following conditions are met:

- the book value is positive and
- the difference between the book value and earnings date is less than 18 months and
- the book value's date is older than the earnings date and
- the issuer results are consolidated or not consolidated for both book value and earnings.

Otherwise, the ROE value is considered missing.

Payout ratio (PO) is calculated using the current annualized dividend per share divided by the trailing 12-month EPS.

In the event of a missing value for either the payout ratio or the ROE, the g value is considered to be missing.

### 4. Long-term Historical EPS Growth Trend (LT his EPS G) and

### 5. Long-term Historical Sales per Share (SPS) Growth Trend (LT his SPS G)

For the calculation of the LT his EPS G and LT his SPS G, first a regression (ordinary least square method) is applied to the last 5 yearly restated EPS and SPS respectively.

$$EPS_t = a \times t + b$$

Where:

- a, the slope coefficient,
- b, the intercept,
- t, the year expressed in number of months.

Then, an average absolute EPS or SPS is estimated:

$$\tilde{EPS} = \sum_{i=1}^n \frac{|EPS_i|}{n} \quad \tilde{SPS} = \sum_{i=1}^n \frac{|SPS_i|}{n}$$

The growth trend is finally obtained as follows:

$$LT \text{ his EPS } G = \frac{a_{EPS}}{|\tilde{EPS}|} \quad LT \text{ his SPS } G = \frac{a_{SPS}}{|\tilde{SPS}|}$$

In order to compute a meaningful long-term historical growth trend for the EPS and SPS, 5 years of comparable data are required. In the event that comparable restated pro forma data are unavailable, MSCI may restate the data using adjustments. A minimum of the last four EPS or SPS values are needed to compute their historical growth trends. Growth trends for securities without sufficient EPS or SPS values are considered to be missing.

**Example:**

**Calculating Long-term historical EPS and SPS growth trend January 20, 2003:**

	Years	t	EPS	SPS
Fiscal Year End 0	Dec 31, 1998	0	-1.11	7.71
Fiscal Year End 1	Dec 31, 1999	12	-0.51	8.19
Fiscal Year End 2	Dec 31, 2000	24	0.29	8.57
Fiscal Year End 3	Dec 31, 2001	36	0.92	8.87
Fiscal Year End 4	Dec 31, 2002	48	1.41	11.50
<b>a</b>			<b>0.05</b>	<b>0.07</b>
<b>a, annualized</b>			<b>0.65</b>	<b>0.83</b>
<b>b</b>			<b>0.85</b>	<b>8.97</b>
<b>Growth Trend</b>			<b>76.3%</b>	<b>9.21%</b>

## APPENDIX V: CALCULATION OF MARKET MEAN AND STANDARD DEVIATION

This appendix explains the calculation of the market mean and standard deviation used in the determination of the z-score.

The calculation involves the following three steps:

- First, the variable values are winsorized using the 5th and 95th percentile cut-off.
- Second, the winsorized per share values are used to compute the market mean.
- Third, the market standard deviation is computed.

The market mean is the market capitalization weighted average of the variable and is computed as follows:

$$\mu_{\text{variable}} = \sum_i \left[ \left( \frac{\text{Shares}_i \times P_i \times DIF_i}{\sum_i \text{Shares}_i \times P_i \times DIF_i} \right) \times \text{Variable}_i^{\text{winsorized}} \right]$$

The market standard deviation is computed as follows:

$$\sigma_{\text{variable}} = \sqrt{\sum_i \left( \frac{\text{Shares}_i \times P_i \times DIF_i}{\sum_i \text{Shares}_i \times P_i \times DIF_i} \right) \times \left( \text{Variable}_i^{\text{winsorized}} - \mu_{\text{variable}} \right)^2}$$

For example, the market mean and the market standard deviation for BV/P are calculated as follows:

$$\mu_{BV/P} = \sum_i \left[ \left( \frac{\text{Shares}_i \times P_i \times DIF_i}{\sum_i \text{Shares}_i \times P_i \times DIF_i} \right) \times \left( \frac{BV}{P} \right)_i^{\text{winsorized}} \right]$$

$$\sigma_{BV/P} = \sqrt{\sum_i \left( \frac{\text{Shares}_i \times P_i \times DIF_i}{\sum_i \text{Shares}_i \times P_i \times DIF_i} \right) \times \left( \left( \frac{BV}{P} \right)_i^{\text{winsorized}} - \mu_{BV/P} \right)^2}$$

Only securities with non-missing variables are included in the market mean and standard deviation.

## APPENDIX VI: POLICY REGARDING TRADING SUSPENSIONS AND MARKET CLOSURES DURING INDEX REVIEWS

### POLICY REGARDING TRADING SUSPENSIONS FOR INDIVIDUAL SECURITIES DURING INDEX REVIEWS

MSCI will postpone the implementation of index review changes for the MSCI US Broad Market Index constituents when the affected securities are suspended on the day prior to the effective implementation date of the Index Review. The postponed index review changes will be implemented two days after the securities resume trading.

Index Review changes include:

- Additions to, deletions from or migrations between the MSCI US Large Cap 300, MSCI US Mid Cap 450, MSCI US Small Cap 1750 and MSCI US Micro Cap Indexes
- Changes in Foreign Inclusion Factor (FIF), Domestic Inclusion Factor (DIF), Number of Shares (NOS) or style for the relevant current and pro forma constituents of the MSCI US Broad Market Indexes

All index review changes that are postponed due to suspension will be cancelled two months after the effective date of the Index Review if the securities are still suspended and will be implemented at the Index Review following the securities' resumption of trading if still warranted.

### POLICY REGARDING MARKET CLOSURES DURING INDEX REVIEWS

For both the quarterly index reviews and the semi-annual index reviews, the following principles apply in case of market closures on the day of implementation. As a reminder, the effective implementation dates for quarterly index reviews are as of the close of the last business day of February and August. The effective implementation dates for the semi-annual index reviews are as of the close of the last business day of May and November.

### MARKET CLOSURES DUE TO SCHEDULED STOCK MARKET HOLIDAYS

When the NYSE and/or the NASDAQ are closed on the "as of the close of" date due to stock market holiday, the change will be effective on the next day, using the price of the previous day's close.

### **UNEXPECTED MARKET CLOSURES**

In the event that the NYSE and/or the NASDAQ fail to open for trading and remains closed for the entire trading day on the effective implementation date of the rebalancing due to an unexpected market closure, MSCI will, in principle, postpone the rebalancing of the US Equity Indexes. MSCI will rebalance the US Equity Indexes as of the close of the first business day that both the NYSE and the NASDAQ reopens for trading and closing prices are available.

### **MARKET OUTAGE DURING THE TRADING DAY**

In the event that the NYSE and/or the NASDAQ are affected by an outage during the trading day on the effective implementation date, MSCI will determine its pricing policy for on a case by case basis. In making its decision, MSCI will take into consideration a number of factors including, the time and duration of the outage, information on the outage provided by the specific stock exchange, and other relevant market information.

MSCI will communicate all decisions taken with respect to market outages during the day through the regular client communication channels.



## APPENDIX VII: QUARTERLY AND SEMI-ANNUAL INDEX REVIEW CHANGES IN DIFS

### QUARTERLY INDEX REVIEW CHANGES IN DIF

As stated under section 4.2.2 “Quarterly Index Review Changes in DIFs and Number of Shares”, significant changes in free float estimates and corresponding changes in the DIFs for constituents related to relatively large events are reflected in the indexes at the quarterly index reviews. DIF changes resulting from large market transactions involving strategic shareholders, that are publicly announced (For example transactions made by way of immediate bookbuilding and other processes, or secondary offerings that were not implemented immediately), will be implemented during a quarterly index review provided they satisfy one of the following conditions:

- The absolute size of the DIF change is 0.15 or more, or,
- For securities classified in the US, the change in free float-adjusted market capitalization resulting from the DIF change represents at least USD 1bn.

The thresholds above only apply to changes in DIFs at the quarterly index reviews.

### BUFFER RULE FOR DIF CHANGES AT QUARTERLY AND SEMI-ANNUAL INDEX REVIEWS

DIF changes resulting from a change in free float of less than 1% will not be implemented, except in cases of corrections.

## APPENDIX VIII: MSCI PROVISIONAL GICS INDEXES

The 2018 revisions to the Global Industry Classification Standard (GICS®) structure will result in the current Telecommunication Services Sector being renamed as the Communication Services Sector and will include certain companies that are currently classified in the Information Technology and Consumer Discretionary Sectors. A summary of the 2018 GICS Structure Changes is available in Appendix III.

The changes will be reflected in GICS Direct as of the close of September 28, 2018 and will be implemented in the MSCI Equity Indexes as of the close of November 30, 2018, coinciding with the November 2018 Semi-Annual Index Review.

To help clients manage the impact of the GICS Structure Review in the MSCI Equity Indexes, MSCI has made available a range of provisional indexes reflecting the GICS Structure Review ahead of the implementation in the MSCI Equity Indexes.

### CONSTRUCTION AND MAINTENANCE OF THE MSCI PROVISIONAL GICS INDEXES

The MSCI Provisional GICS Indexes are constructed and maintained primarily based on the US Equity Indexes methodology.

MSCI and S&P Dow Jones Indices released a list of expected company-level changes on July 2, 2018 with subsequent updates on August 1, 2018 and September 3, 2018.

Upon launch on July 26, 2018, the MSCI Provisional GICS Indexes reflected the expected constituent-level GICS changes resulting from the GICS Structure Review based on the list of impacted companies announced on July 2, 2018.

From July 26, 2018 to September 28, 2018, constituent changes resulting from corporate events where the post-event GICS classification of a security is one of the following GICS sub-industries under the current GICS structure will not be implemented in the MSCI Provisional GICS Indexes at the time of the event:

- Internet Software & Services (45101010)
- Internet & Direct Marketing Retail (25502020)
- Application Software (45103010)

The GICS classification under the new GICS structure for such securities will be reflected in the MSCI Provisional GICS Indexes coinciding with the next monthly update to the list of impacted companies (with two business days advance notice).

**Example:** A security is added to the MSCI US Prime Market 750 Index under Application Software on August 20, 2018 following its IPO

**Case 1:** If the security is expected to be classified under the new Interactive Media & Services sub-industry post the GICS Structure Review as reflected in the updated list to be released on September 3, 2018, the security will be added to the MSCI Provisional GICS US Prime Market Communication Services Index effective September 7, 2018 and not at the time of the event.

**Case 2:** If the security is expected to remain under Application Software post the GICS Structure Review, the security will be added to the MSCI Provisional GICS US Prime Market Information Technology Index effective September 7, 2018 and not at the time of the event.

As the GICS structure changes will be implemented in GICS Direct as of the close of September 28, 2018, beginning October 1, 2018, all such events will be implemented at the time of the event.

On December 3, 2018, the MSCI Provisional GICS Indexes will converge with the respective GICS-based MSCI Equity Indexes coinciding with the implementation of the November 2018 Semi-Annual Index.

## METHODOLOGY BOOK TRACKED CHANGES

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

Appendix VI: Policy Regarding Trading Suspensions and Market Closures during Index Review

- Added clarification for “Index Review changes”

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

Appendix III: Global Industry Classification Standard (GICS)

- Updated to reflect revised GICS structure effective September 1, 2016

### The following sections have been modified since February 2017:

Section 2.2.1 Liquidity

- Clarified ATVR calculation for securities with available data less than 12 months

Appendix VI: Policy Regarding Trading Suspensions and Market Closures During Index Reviews

- Clarified policy regarding trading suspensions for individual securities during index reviews

### The following sections have been modified since September 2017:

Section 1: Introduction

- Updated

Section 4.3: Ongoing Event-Related Changes

- Added clarification

### The following sections have been modified since November 2017:

Section 1.2.1: Defining the Equity Universe

- Updated NYSE MKT LLC to NYSE American LLC

Section 2.1 Creating the US Equity Universe

- Updated NYSE MKT LLC to NYSE American LLC

**The following sections have been modified since February 2018:**

Section 4.3.2.1 IPOs and Other Early Inclusions

- Added clarification

**The following sections have been modified since March 2018:**

Section 4.3.1.1: Changes in Characteristics of Existing Constituents

- Change of implementation thresholds for offerings at the time of the event

**The following sections have been modified since May 2018:**

Section 4.3.2.1: IPOs and Other Early Inclusions

- Clarification of the treatment of over-allotment

**The following sections have been modified since July 2018:**

Appendix VIII: Provisional GICS Indexes

- New Appendix

## 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 *
Thailand	0018 0015 6207 7181 *
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