

MSCI CORE REAL ESTATE INDEXES METHODOLOGY

Index Construction and Maintenance Methodology for the MSCI Core
Real Estate Indexes

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1 INTRODUCTION

The MSCI Core Real Estate Indexes, based on the MSCI ACWI Investable Market Indexes (IMI) Real Estate (the “Parent Index”), are designed to reflect the performance of stocks in the Parent Index engaged in the ownership, development and management of specific core property `real estate. Specifically, these indexes exclude companies that do not own properties. For example, companies active in real estate services and real estate financing are not included in the MSCI Core Real Estate Indexes.

The MSCI Core Real Estate Indexes are segmented by country and region, property type, REIT status and rental income.

In addition, the new MSCI Core Real Estate Factor Indexes seek to reflect the performance characteristics of a range of investment styles and strategies in the listed real estate space (such as small size, volatility and high yield) using transparent and rules-based methodologies. These indexes often use weighting methods other than market capitalization.

2 ELIGIBLE SECURITIES FOR THE MSCI CORE REAL ESTATE INDEXES

The MSCI Core Real Estate Indexes are derived from the MSCI ACWI IMI Real Estate Index, a global index consisting of developed and emerging market countries across the large, mid and small cap size segments. MSCI Core Real Estate Indexes seek to reflect a narrower definition of the real estate universe compared to the broader GICS based real estate classification to more closely reflect the public market of real estate investors. The MSCI Core Real Estate Indexes are weighted by free float adjusted market capitalization.

Constituents of the MSCI Core Real Estate Indexes are a sub-set of the Real Estate Global Industry Classification Standard (GICS®) industry group.

To be included in the index, a company needs to derive at least 75% of its revenues from real estate related to a combination of the following property types:

- Industrial
- Office
- Retail
- Residential
- Health Care
- Hotel & Resort
- Storage
- Data Centers

In addition, the following types of companies are not eligible for the index:

- Companies classified in the Real Estate Services GICS sub-industry
- Companies classified in the Mortgage REIT GICS sub-industry
- Real Estate holdings defined as companies having the majority of its assets invested in other listed real estate companies
- Specialized REITs that are not involved in core real estate property types listed above

For some regional indexes, eligible securities may be subject to liquidity screening as explained in Appendix I.

3 SEGMENTATION OF THE MSCI CORE REAL ESTATE INDEXES

Each company included in the MSCI Core Real Estate Indexes is classified into a country, attributed a property type, and has a REIT and rental status. These attributes aim to allow the MSCI Core Real Estate Indexes to be divided into segments meaningful to real estate investors. As an example, the MSCI USA IMI Core REIT Residential Index includes securities of companies from the MSCI ACWI IMI Core Real Estate Index that are classified in the US, as REITs and are classified in the Residential property type.

3.1 COUNTRY CLASSIFICATION

Companies are classified into countries and regions as per the MSCI Global Investable Market Indexes (GIMI) methodology. Consequently, the MSCI Core Real Estate Indexes are compatible and consistent with the MSCI ACWI IMI used as a policy benchmark by many asset owners.

3.2 PROPERTY TYPE CLASSIFICATION

Each core real estate index company is attributed one of the following property types:

- Industrial
- Office
- Retail
- Residential
- Health Care
- Hotel & Resort
- Storage
- Data Centers
- Diversified

To be included in a property type, the security needs to derive at least 60% of its revenues from real estate of that type. If no specific property type accounts for at least 60% of revenues, the company is classified as “Diversified”.

3.3 REIT STATUS

Securities that are part of the REIT GICS Industry are attributed a REIT status.

3.4 RENTAL STATUS

Companies deriving at least 75% of their revenues from rental activities are attributed a rental status. This allows the creation of indexes focusing on companies with rental revenue stream.

4 MAINTENANCE OF THE MSCI CORE REAL ESTATE INDEXES

The maintenance of the MSCI Core Real Estate Indexes includes:

- Quarterly and Semi-Annual Index Reviews coinciding with the Parent Index reviews in February, August, May and November
- Semi-Annual Liquidity Review in May and November
- Annual Eligibility Review in May
- Ongoing event-related changes

4.1 QUARTERLY AND SEMI-ANNUAL INDEX REVIEWS OF THE PARENT INDEX

During Semi-Annual and Quarterly Index Reviews, the Parent Index is reviewed under the guidelines of the MSCI Global Investable Market Indexes methodology. Changes in the Parent Index during Index Reviews impact the MSCI Core Real Estate Indexes as follows:

- Existing constituents of the MSCI Core Real Estate Indexes that are deleted from the Parent Index are also deleted from the MSCI Core Real Estate Indexes
- Eligible securities as per Sections 1,2 and Appendix I that are added to the Parent Index as part of the Quarterly Index Review or that have been added to the Parent index since the previous Quarterly Index Review are also added to the MSCI Core Real Estate Indexes
- Changes in the Foreign Inclusion Factors (FIF) and Number of Shares (NOS) for securities in the Parent Index are also applied to the securities included in the MSCI Core Real Estate Indexes
- Existing constituents of the MSCI Core Real Estate Indexes are subject to liquidity screening during semi-annual review in May and November every year, as explained in Appendix I.

For more information on Index Reviews for the MSCI Global Investable Market Indexes, please refer to Sections 3.1 and 3.2 of the MSCI Global Investable Market Indexes methodology book available at www.msci.com.

The impact of the Quarterly and Semi-Annual Index Reviews of the Parent Index on the MSCI Core Real Estate Indexes is announced nine business days before the effective date.

4.2 ANNUAL ELIGIBILITY REVIEW

In addition to changes from the reviews of the Parent Index, the eligibility of all constituents is reassessed once per year, coinciding with the May Semi-Annual Index Review of the Parent Index. Current constituents of the MSCI Core Real Estate Indexes remain eligible as long as the proportion of revenues derived from eligible property types as described in section 1 does not fall below 50%. Current constituents with a rental status remain eligible for the rental status as long as the proportion of revenues derived from rental activities as described in section 2.4 does not fall below 50%. The impact of the Annual Eligibility Review is announced nine business days before the effective date.

4.3 ONGOING EVENT-RELATED CHANGES

The Parent Index is updated to reflect ongoing event-related changes in accordance with the MSCI Global Investable Market Indexes methodology. Ongoing event-related changes in the Parent Index are reflected in the MSCI Core Real Estate Indexes at the time of the implementation of the event in the Parent Index:

- Existing constituents of the MSCI Core Real Estate Indexes that are deleted from the Parent Index are also deleted from the MSCI Core Real Estate Indexes
- Eligible securities not currently constituents of the MSCI Core Real Estate Index that are added to the Parent Index are reviewed for inclusion at the subsequent Index Review, with the exception of spun-off and converted securities that are added to the MSCI Core Real Estate Index at the time of the event.
- Changes in the Foreign Inclusion Factors (FIF) and Number of Shares (NOS) for securities in the Parent Index are also applied to the securities included in the MSCI Core Real Estate Indexes

For more information on the implementation of corporate events in the MSCI Global Investable Market Indexes, please refer to Section 3.3 of the MSCI Global Investable Market Indexes methodology book available at www.msci.com.

The impact of other ongoing event-related or GICS-related changes to the MSCI Core Real Estate Indexes are typically deferred to the next Index Review with the exception of changes in REIT status that are implemented simultaneously with the GICS classification change.

5 MSCI CORE REAL ESTATE FACTOR INDEXES

The MSCI Core Real Estate Factor Indexes seek to reflect the performance characteristics of a range of investment styles and strategies in the real estate industry using transparent and rules-based methodologies. The following factor indexes are currently part of the MSCI Core Real Estate Factor Index family:

- Equal weighted, aimed at capturing the size factor
- Volatility Tilt, aimed to reflect the performance of the Volatility factor by tilting the market capitalization weights of all the constituents in the parent index towards low volatility stocks
- Minimum Volatility, aimed to reflect the performance of a minimum variance strategy on listed real estate
- High Dividend Yield, aimed to represent the high dividend yield opportunity within listed real estate
- Liquid Real Estate Indexes, multi-asset class indexes aimed to achieve a risk/return profile similar to direct real estate indexes

5.1 MSCI EQUAL WEIGHTED, VOLATILITY TILT, MINIMUM VOLATILITY AND HIGH DIVIDEND YIELD FACTOR INDEXES

The corresponding factor index methodologies can be found on MSCI’s website at the following link:

<http://www.msci.com/products/indexes/strategy/factor/>

The High Dividend Yield methodology has been adjusted to better fit the specifics of listed real estate as follows:

- The payout screen is defined relative to cash earnings instead of earnings given the typical high depreciation and amortization expenses included in earnings of listed real estate companies.

5.2 MSCI LIQUID REAL ESTATE INDEXES

5.2.1 INTRODUCTION

The MSCI Liquid Real Estate Indexes are multi-asset class indexes aiming to achieve a risk/return profile similar to direct real estate indexes using liquid instruments. The

construction methodology for these indexes seeks to address key differences between listed and direct real estate indexes:

- The broad listed real estate opportunity set such as the one defined by the Real Estate industry group within the Global Industry Classification Standard (GICS®) includes companies that are not directly exposed to typical properties found in direct real estate indexes, such as Mortgage REITs or Real Estate Services companies
- Listed real estate indexes have higher volatility and equity beta than direct real estate indexes
- Performance of listed real estate companies reflects leverage whereas direct real estate indexes are calculated on an unlevered basis

These indexes are constructed by combining MSCI Core Real Estate Volatility Tilt Indexes and Markit iBoxx inflation-linked indexes. Historically¹, they have demonstrated the following characteristics:

- Lower volatility and maximum drawdown than pure equity listed real estate indexes
- Higher correlation with direct real estate indexes than pure equity listed real estate indexes
- Similar performance to direct real estate indexes
- Lower beta to the equity market than pure equity listed real estate indexes

As of July 2015, the following indexes are part of the MSCI Liquid Real Estate Index family:

- The MSCI USA IMI Liquid Real Estate Index
- The MSCI UK IMI Liquid Real Estate Index
- The MSCI Europe ex UK IMI Liquid Real Estate Index

5.2.2 INDEX CONSTRUCTION METHODOLOGY

The construction of an MSCI Liquid Real Estate Index involves the following steps:

1. Constructing the MSCI Core Real Estate Volatility Tilt Index
2. Combining the MSCI Core Real Estate Volatility Tilt Index with the Markit iBoxx short-duration inflation linked index

¹ Based on historical simulations of the MSCI USA IMI Liquid Real Estate Index, the MSCI UK IMI Liquid Real Estate Index and the MSCI Europe ex UK IMI Liquid Real Estate Index. Past performance is not indicative of future results, which may differ materially.

5.2.2.1 CONSTRUCTING THE MSCI CORE REAL ESTATE VOLATILITY TILT INDEX

The construction of the MSCI Core Real Estate Volatility Tilt Index is described in sections 2 and 4.1 of this document.

5.2.2.2 COMBINING THE MSCI CORE REAL ESTATE VOLATILITY TILT INDEX WITH MARKIT IBOXX SHORT-DURATION INFLATION LINKED INDEX

The MSCI Liquid Real Estate Index is constructed by deleveraging the MSCI Core Real Estate Volatility Tilt Index.

Deleveraging aims to reduce the impact of leverage used by listed real estate companies on the index and achieve a return closer to the unlevered return on the underlying properties. It is based on the following financial statement analogy:

$$Return(Listed Real Estate) = Leverage \times Return(Physical Property) - Cost of Debt$$

Leverage is determined by the index level debt-to-price ratio of the MSCI Core Real Estate Volatility Tilt Index and is calculated as follows

$$\frac{D}{P} = \sum_i \omega_i \times \left(\frac{D}{P}\right)_i$$

where

- ω_i is the weight of the constituent i in the MSCI USA IMI Core Real Estate Volatility Tilt Index
- $\left(\frac{D}{P}\right)_i$ is the debt-to-price ratio for constituent i

All data is taken as of the end of month preceding the Index Review date (for example, as of April end for the May index review). Securities with no debt-to-price ratio are assigned the median debt-to-price ratio of the constituents for which data is available.

The MSCI Liquid Real Estate Index is finally derived by combining the MSCI Core Real Estate Volatility Tilt Index with the Markit iBoxx short-duration inflation linked index in the following proportions:

- Weight of Fixed Income = $\left[\left(\frac{D}{P}\right)^{-1} + 1\right]^{-1}$
- Weight of Equity = $1 - \text{Weight of Fixed Income}$

These weights are reset semi-annually, coinciding with the May and November Semi-Annual Index Reviews. In between index reviews, the weights of the two components are allowed to fluctuate with the performance of each component.

As of July 2015, the following Markit iBoxx indexes are used for the construction of the MSCI Liquid Real Estate Indexes:

- The Markit iBoxx TIPS Inflation-Linked 1-5 year Index for the MSCI USA IMI Liquid Real Estate Index.
- The Markit iBoxx UK Gilt Inflation-Linked Short Index for the MSCI UK IMI Liquid Real Estate Index.
- The Markit iBoxx EUR Government Inflation-Linked Euro-Inflation Short TRI_Nominal for the MSCI EUROPE ex UK IMI Liquid Real Estate Index.

APPENDIX I: LIQUIDITY SCREEN

In order to balance the demands of representativeness and replicability for the index, eligible securities as defined in section 2 may be subject to additional liquidity screening.

As of July 2015, the liquidity screen is applied to the following index

- Europe ex UK IMI Core Real Estate Index

Liquidity Measure – Liquidity of an eligible security is measured by its last 12-month ATVR.

ATVR – Annual Traded Value Ratio, calculated as below (for latest description of ATVR please refer to MSCI Global Investable Market Indexes Methodology on <https://www.msci.com/index-methodology>)

Liquidity Screen

Securities that are not currently constituents of the index are included only if their 12-month ATVR is more than 30%, while existing constituents can remain in the index as long as their 12-month ATVR is more than 20%.

METHODOLOGY BOOK TRACKED CHANGES

The following sections have been modified since March 2015:

Section 4.3: Ongoing Even Related Changes

- Update to this section.

The following sections have been modified since June 2015:

Section 1: Introduction

- Change of the Parent Index

Section 2: Defining Eligible Securities for the MSCI Core Real Estate Indexes

- Update to the list of eligible property types

Section 3.2: Property Type Classification

- Update in this section

The following sections have been modified since July 2015:

Section 2 : Eligible Securities For The MSCI Core Real Estate Indexes

- Update in the section – Added reference to liquidity screen.

Section 4.1: Quarterly and Semi-Annual Index Reviews of the Parent Index

- Update in the section – Added reference to liquidity screen.

Section 5 : MSCI Liquid Real Estate Indexes

- Update in section – Added reference to MSCI Europe ex UK Liquid Index and Markit iBoxx EUR Government Inflation-Linked Euro-Inflation Short TRI_Nominal Index

Appendix I :

- Added Appendix I

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