

# **GROUND RULES FOR THE TOBAM MAXIMUM DIVERSIFICATION INDEX SERIES**

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## **SECTION 1**

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### **1.0 INTRODUCTION**

- 1.1 This document sets out the Ground Rules for the construction and management of the TOBAM Maximum Diversification Index Series.
- 1.2 TOBAM's core investment philosophy is to enhance diversification in order to capture the full risk premium of an asset class.  
Our research indicates that the systematic returns available from equity markets are higher than using market cap-weighted benchmarks, and seems to be far more stable over time. Using a biased benchmark as a reference carries heavy, costly, implicit bets which evolve dynamically. On the contrary, TOBAM's Maximum Diversification® approach is designed to access the full risk premium evenly from all the independent risk factors available in the investment universe. The Maximum Diversification® process is designed to create portfolios which lie closer to the ex-post efficient frontier than the market cap portfolio over a market cycle.
- 1.3 The TOBAM Maximum Diversification Index Series are calculated on an end of day basis. Price and Total Return Indices are published at the end of each working day. The Total Return Indices are based on ex-dividend adjustments.
- 1.4 The following indices will be calculated in the TOBAM Maximum Diversification Index Series:
  - TOBAM Maximum Diversification All World Developed Index (calculated in US Dollar)
  - TOBAM Maximum Diversification Emerging Index (calculated in US Dollar)
  - TOBAM Maximum Diversification All World Developed ex North America Index (calculated in US Dollar)
  - TOBAM Maximum Diversification North America Index (calculated in US Dollar)
  - TOBAM Maximum Diversification USA Index (calculated in US Dollar)
  - TOBAM Maximum Diversification Canada Index (calculated in Canadian Dollar)
  - TOBAM Maximum Diversification Developed Asia Pacific ex Japan Index (calculated in US Dollar)
  - TOBAM Maximum Diversification Japan Index (calculated in Japanese Yen)
  - TOBAM Maximum Diversification UK Index (calculated in UK Pound)
  - TOBAM Maximum Diversification Eurobloc Index (calculated in Euro)
  - TOBAM Maximum Diversification Developed Europe Index (calculated in Euro)

## **SECTION 2**

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### **2.0 INDEX MANAGEMENT**

#### **2.1 TOBAM**

2.1.1 TOBAM is the benchmark administrator as defined in the IOSCO principles.

2.1.2 TOBAM internal Scientific Committee

The construction of TOBAM Maximum Diversification Index Series is supervised by an internal Scientific Committee. The Scientific Committee is responsible for reviewing and amending the Ground Rules when he finds it necessary.

2.1.3 The Scientific Committee meets at least once a year to monitor the index methodology and management process. The Scientific Committee is composed of various investment professionals of TOBAM.

#### **2.2 FTSE International Limited (FTSE)**

2.2.1 FTSE is the calculation agent and is responsible for the operation of the TOBAM Maximum Diversification Index Series. FTSE will maintain records of the market capitalisation of all constituents and reserve list companies and will make changes to the constituents and their weightings in accordance with the Ground Rules. FTSE will carry out reviews and implement the resulting constituent changes as required by the Ground Rules.

2.2.2 Changes to constituent weightings will be made by FTSE in accordance with the Ground Rules. FTSE is responsible for publicising and keeping a record of all changes to constituent weightings. The weightings of constituents in the real time indices shall be used in the calculation of the end of day indices.

2.2.3 The calculation methodology and process is further detailed in section 8 of the Ground Rules.

#### **2.3 Status of these Ground Rules**

2.3.1 These Ground Rules set out the methodology and provide information about the publication of the TOBAM Maximum Diversification Index Series.

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## SECTION 3

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### 3.0 ELIGIBLE SECURITIES

- 3.1 The TOBAM Maximum Diversification Index Series are based on the constituents in the FTSE All-World Index Series.  
Please refer to the [FTSE Global Equity Index Series Ground Rules](#) for the eligible securities review dates. FTSE Global Equity Index Series Ground Rules are available on [www.ftse.com](http://www.ftse.com).
- 3.2 All classes of the ordinary shares in issue are eligible for inclusion in the TOBAM Maximum Diversification Index Series, subject to conforming to all other rules of eligibility, free float and liquidity. Please refer to the FTSE "[Guide to Calculation Method for the Median Liquidity Test](#)" for further details.
- 3.3 Companies from countries that are included in the FTSE All-World Index Series are eligible for inclusion in the TOBAM Maximum Diversification Index Series. For the list of countries that are eligible, please refer to the FTSE Global Equity Index Series Ground Rules.
- 3.4 All TOBAM Maximum Diversification Indices integrate socially responsible investment ("SRI") criteria consistent with TOBAM sustainable view. The exclusion list of stocks for SRI reason is available on <http://www.tobam.fr/maxdiv-indexes-exclusion/>.  
When an existing constituent is excluded for SRI reason, its deletion from the Index will be concurrent with the next quarterly rebalancing.  
More details on the TOBAM SRI policy are available on [www.tobam.fr](http://www.tobam.fr).
- 3.5 Convertible preferred shares and loan stocks are excluded - until converted.
- 3.6 Companies whose business is that of holding equity and other investments (e.g. Investment Trusts) which are assumed by the Industry Classification Benchmark as Subsector equity investment instruments (8985) and non-equity investment instruments which are assumed by the Industry Classification Benchmark as Subsector non-equity investment instruments (8995) will not be eligible for inclusion. For further details on the Industry Classification Benchmark (ICB), please visit the FTSE Russell website.
- 3.7 Each security will be required to have actively traded at least on 75% of the last 250 business days to be eligible for inclusion in the Index Series.  
Securities which do not satisfy this condition will not be eligible for inclusion in the Index Series.
- 3.8 The TOBAM Maximum Diversification Index Series will consist of the following underlying indices based on the FTSE All-World Index Series:
- TOBAM Maximum Diversification All World Developed Index  
FTSE Developed Index
  - TOBAM Maximum Diversification Emerging Index  
FTSE Emerging Index
  - TOBAM Maximum Diversification All World Developed ex North America Index  
FTSE Developed ex North America Index
  - TOBAM Maximum Diversification USA Index  
FTSE USA Index
  - TOBAM Maximum Diversification Canada Index  
FTSE Canada Index

TOBAM Maximum Diversification Japan Index  
FTSE Japan Index

TOBAM Maximum Diversification UK Index  
FTSE UK Index

TOBAM Maximum Diversification Eurobloc Index  
FTSE Eurobloc Index

TOBAM Maximum Diversification Developed Europe Index  
FTSE Developed Europe Index

TOBAM Maximum Diversification Developed Asia Pacific ex Japan Index  
FTSE Developed Asia Pacific ex Japan Index

TOBAM Maximum Diversification North America Index  
FTSE North America Index

## SECTION 4

### 4.0 QUALIFICATION CRITERIA & PERIODIC REVIEW OF CONSTITUENTS

#### 4.1 Review Dates

- 4.1.1 The TOBAM Maximum Diversification Index Series will be reviewed quarterly in March, June, September and December using data as of the close of business on the first Friday of the relevant month, hence after the close of business on the first Friday of March, June, September and December.

The new model will be computed using the underlying constituents effective on the Monday following the third Friday of the same month.

- 4.1.2 The quarterly review will be implemented after the close of business on the third Friday, i.e. on the following Monday, of March, June, September and December.

- 4.2 Any new Corporate Action or Event arising between the model computation and the Indices rebalancing implementation will be treated using the rules set out in section 6 of the Ground Rules (Corporate Actions and Events).

#### 4.3 Review Procedure

The procedure for index construction is composed of three steps:

1. A variance/covariance matrix is estimated for the investment universe.  
The matrix estimation applies a statistical treatment where prices are not available (bank holidays, suspension of trading...).
2. TOBAM's portfolio construction methodology is used to create the portfolio maximising the diversification ratio.

Formally, consider a universe of  $N$  stocks  $\{S_1, \dots, S_N\}$ , with volatility  $\sigma = (\sigma_i)$ , correlation matrix  $C = (\rho_{i,j})$  and covariance matrix  $\Sigma = (\sigma_i \sigma_j \rho_{i,j})$ , with  $1 \leq i, j \leq N$ . A long-only portfolio is defined as a vector with non-negative weights  $w = (w_i)$ , its volatility is noted  $\sigma(w)$ , and weighted average volatility  $\langle w | \sigma \rangle = \sum w_i \sigma_i$ .

The Diversification Ratio  $DR(w)$  of the portfolio is defined as the ratio of its weighted average volatility and its volatility:

$$DR(w) = \frac{\langle w | \sigma \rangle}{\sigma(w)}$$

The Diversification Ratio is subsequently maximised in order to create the TOBAM Maximum Diversification Index Series, under the following constraints:

- a) The maximum weight for a stock is set at the lower of 1.5% (3% for smaller universes like single country indices except for USA and Japan) and 20 times its weight in the parent FTSE market capitalisation index. The latter constraint is applied to ensure sufficient liquidity in the index's holdings.  
When relevant, this constraint may be applied at the issuer level.
- b) The Active Share of the Maximum Diversification Index Series is constrained at 50%.<sup>1</sup>  
The Active Share is measured as the percentage of stock holdings of the index that differ from its benchmark index.

<sup>1</sup> This constraint is implemented since June 2015 rebalancement.

- c) For the TOBAM Maximum Diversification Developed Markets World Index, a constraint by geographic area is added: the weight of a region cannot exceed by more than 5% the weight of the parent FTSE market capitalisation index. Regions are defined as North America, Europe and Asia.

For the TOBAM Maximum Diversification Developed Markets World ex North America Index, a constraint by geographic area is added: the weight of a region cannot exceed by more than 10% the weight of the parent FTSE market capitalisation index. Regions are defined as Europe and Asia.

- d) The TOBAM Maximum Diversification Emerging Index includes the following extra liquidity constraints:
  - The maximum benchmark weight multiple is set at 10 instead of 20;
  - A country maximum weight multiple is added at 5 time the benchmark level;
  - Egypt, Pakistan and United Arab Emirates are excluded from the investible universe.
- e) The optimization is penalized in order to reduce turnover.
- f) Any optimized weight that is inferior to 1 basis point will be considered to be zero in the TOBAM Maximum Diversification Index Series. The discarded part of the allocation will be redistributed between the remaining stocks, proportionally to their respective weights. This particular procedure can cause breaches to others constraints.

- 3. Any temporary abnormal behaviour linked to special situations is taken into account.

## **SECTION 5**

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### **5.0 CHANGES TO CONSTITUENT COMPANIES**

#### **5.1 Additions**

5.1.1 When a constituent is added to an underlying FTSE All-World Index, the constituent will be considered for inclusion in the corresponding TOBAM Maximum Diversification Index at the next quarterly review. New Issues will only be reviewed at the next quarterly review.

5.1.2 For the purpose of this Rule 5.1, a company issue which is re-listed following suspension or is reorganised or renamed or which arises from a demerger or complex reorganisation of another company which is not an existing constituent, shall not be considered as a new issue.

#### **5.2 Deletions and Replacements**

5.2.1 If a constituent is removed from the underlying FTSE All-World Index, the constituent will also be removed from the relevant TOBAM Maximum Diversification Index. The deletion will be concurrent with its deletion from the FTSE All-World Index.

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## SECTION 6

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### 6.0 CORPORATE ACTIONS AND EVENTS

- 6.1 On a general basis full details of changes to constituent companies due to corporate actions and events can be accessed in the Corporate Actions and Events Guide for Non Market Cap Weighted Indices using the following link:  
[Corporate Actions and Events Guide for Non Market Cap Weighted Indices](#)

A “Corporate Action” is an action on shareholders’ holdings with a prescribed ex-date. The share price will be subject to an adjustment on the ex-date. The index will be adjusted in line with the ex-date.

These include the following:

- Splits (sub-division) / Reverse splits (consolidation)
- Scrip issues (Capitalisation or Bonus Issue)
- Capital Repayments
- Rights Issues/Entitlement Offers
- Share Updates and Investable Weight Changes
- Takeovers & Mergers
- Spin-Offs
- Stock Conversion
- Deletions and Suspended Companies

A “Corporate Event” is a reaction to company news (event) that may impact the index depending on the index rules. For example, a company announces a strategic shareholder is offering to sell its shares (secondary share offer) – this could result in a free float weighting change in the index. Where an index adjustment is required FTSE will provide notice advising of the timing of the change.

## **SECTION 7**

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### **7.0 CHANGES TO THE CLASSIFICATION OF CONSTITUENT COMPANIES**

#### **7.1 Classification Structure**

- 7.1.1 The TOBAM Maximum Diversification Index Series constituents are classified into Industries, Supersectors, Sectors and Subsectors, as defined by the Industry Classification Benchmark (ICB).
- 7.1.2 Details of the Industry Classification Benchmark are available from FTSE and published on the FTSE website ([www.ftse.com](http://www.ftse.com)) and can be accessed using the following link:  
<http://www.ftse.com/products/indices/ICB>

#### **7.2 Classification Changes**

- 7.2.1 Changes to the classification of a company within the TOBAM Maximum Diversification Index Series are determined in accordance with the ICB rules.
- 7.2.2 Where a significant change occurs in a company's structure as a result of a corporate event (such as a merger or demerger), its ICB classification may be reassessed.
- 7.2.3 Any adjustment resulting from a change in a company's classification under Rule 7.2.2 will be implemented at the same time as any relevant constituent changes.
- 7.2.4 Periodic changes to the industry classification will be effective on the Monday after the third Friday of March, June, September and December. The cut-off date for the receipt of data or other justification relating to any such change is the second Friday of February, May, August and November.

Further details can be found in the Industry Classification Benchmark Ground Rules:  
[http://www.icbenchmark.com/ICBDocs/ICB\\_Rules.pdf](http://www.icbenchmark.com/ICBDocs/ICB_Rules.pdf)

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## SECTION 8

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### 8.0 INDICES ALGORITHM AND CALCULATION METHOD

#### 8.1 Prices

8.1.1 The TOBAM Maximum Diversification Index Series will use actual last trade prices, where available, for securities.

8.1.2 Reuters real time exchange rates are used in the real-time index calculations.

#### 8.2 Calculation Frequency

8.2.1 The TOBAM Maximum Diversification Index Series are calculated daily after the close of North American securities markets. Except for the 1st of January, the Index Series are calculated every weekday, when one or more of the constituent markets are open. There is no separate calculation to accommodate the Saturday or Sunday opening of any market.

#### 8.3 Index Calculation

8.3.1 The TOBAM Maximum Diversification Index Series is calculated using the following formula:

$$\sum_{i=1}^N \frac{(p_i \times e_i \times s_i \times f_i \times c_i)}{d}$$

Where,

- $i = 1, 2, \dots, N$
- $N$  is the number of securities in the Index.
- $p_i$  is the latest trade price of the component security (or the price at the close of the Index on the previous day).
- $e_i$  is the exchange rate required to convert the security's currency into the Index's base currency.
- $s_i$  is the number of shares in issue used by FTSE for the security, as defined in these Ground Rules.
- $f_i$  is the Investability Weighting Factor to be applied to a security to allow amendments to its weighting, expressed as a number between 0 and 1, where 1 represents a 100% free float. This factor is published by FTSE for each security in the underlying index.
- $c_i$  is the Capping Factor to be applied to a security to correctly weight that security in the index. This factor maps the investable market capitalisation of each stock to a notional market capitalisation for inclusion in the Index.
- $d$  is the divisor, a figure that represents the total issued share capital of the Index at the base date. The divisor can be adjusted to allow changes in the issued share capital of individual securities to be made without distorting the Index.

For more information regarding the calculation of the indices, please refer to the [FTSE Calculation Policy and Guidelines document](#) or contact [info@ftse.com](mailto:info@ftse.com).

## 8.4 **Recalculations**

- 8.4.1 Users of the TOBAM Maximum Diversification Index Series are notified through appropriate media of the occurrence of recalculation.

For more information regarding the recalculation of the indices, please refer to the [FTSE Recalculation Policy and Guidelines document](#) or contact [info@ftse.com](mailto:info@ftse.com).

## 8.5 **Market Disruption**

- 8.5.1 Special actions or Index treatments may occurs in case of external events that make it difficult or impossible for TOBAM clients to trade securities on certain markets. Such events include, but are not limited to, the temporary closure of a stock exchange, government, central bank or monetary authority imposing restrictions on the repatriation of foreign capital and/or sanctions preventing new investment in a determined country.

For more information regarding these circumstances and the way they are dealt with, please refer to the [FTSE Policy and Guidelines document](#) or contact [info@ftse.com](mailto:info@ftse.com).

## APPENDIX A

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### FURTHER INFORMATION

For further information on the TOBAM Maximum Diversification Index Series, please visit:

<http://www.tobam.fr/maxdiv.php>

Or contact TOBAM at: [ClientService@tobam.fr](mailto:ClientService@tobam.fr)

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