

INDEX CALCULATION AND PERIODICAL REVIEW RULEBOOK

Euronext Indices

Version 22-01

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indices.euronext.com

VERSION NOTES

Version	Effective date	New or changed parts	Reference/announcement
21-01	15 Dec 2021	Initial version based on rules previously in individual index rulebooks	EIA_2021-367
21-02	15 Dec 2021	Inclusion of Liability in 1.5 Removed Leverage /Short formula (included in specific index family rulebooks)	
22-01	29 June 2022	Addition of Index Level dropping below 0; addition of Review Weighting Date to 1.4 and small textual updates	

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Index

Version notes		2
1. Index reviews: Selection	5	
1.1 Introduction		5
1.2 Companies		5
1.3 Main Listing		5
1.4 Review Relevant Dates		5
1.5 Liability		5
1.6 Process for Selection and Reviews		5
1.7 Adjustments to the outcome of the review		6
2. Index Reviews: Weighting	7	
3. Index reviews: Selection data Definitions	8	
3.1 Turnover and Volume definition		8
3.2 Free float Factor		9
3.3 Free Float Market Capitalisation		9
4. Index Calculation Methodology	10	
4.1 Base Currency		10
4.2 Price Return Index		10
4.3 Net and Gross Return Index		10
4.4 Decrement Indices		11
4.5 Currency Hedged Index Calculation		12
4.6 Volatility Target Index formula		12
4.7 Dividend indices		13
4.8 Index level dropping below 0		13

1. INDEX REVIEWS: SELECTION

1.1 INTRODUCTION

1.2 COMPANIES

Each price Index is composed of shares in companies and other securities equivalent to shares in companies, partnerships or other entities, and depositary receipts in respect of shares ("Company").

Warrants, rights and other derivative securities are not included in the index unless temporarily and related to a corporate action.

1.3 MAIN LISTING

If a Company is admitted to listing in more than one market or if it is admitted in various forms of listings, a Main Listing ("Main Listing") is determined by Index Design based on the relevant volumes, the country of incorporation and the listing perceived or presented as primary (not an order of priority).

Mono-holdings, companies having as unique activity a direct or indirect participation in another company within the universe, are regarded as a form of listing of that Company.

The Main Listing for a Company is reviewed at least once per year.

1.4 REVIEW RELEVANT DATES

The composition of Indices are reviewed on a regular basis, the following dates are defined as the relevant dates.

The **Review Cut-Off Date** is the date on which, after the market close, relevant data are gathered that will serve as basis for the periodical review of the index.

The **Review Announcement Date** is the date on which, after the market close, the changes relating to the periodical review are announced.

The **Review Weighting Date** is the date from which the closing price of the Companies to be included in the index is used to calculate the final number of shares for Non-Market-Capitalisation Weighted and Capping Factors for Free Float Market-Capitalisation Weighted Indices.

The **Review Weighting Announcement Date** is after close, the full details are announced regarding the Companies in the Index. This includes numbers of shares, free float factors and capping factors of all Companies that will be included in the Index.

The **Review Effective Date** is the date on which, after the market close, the changes relating to the periodical review are being effectuated in the index portfolio.

1.5 LIABILITY

Euronext and -where applicable- the Independent Supervisor are not liable for any losses resulting from supplementing, amending, revising or withdrawing the rules for the Euronext indices.

Euronext will do everything within its power to ensure the accuracy of the composition, calculation, publication and adjustment of the indices in accordance with relevant rules. However, neither Euronext, nor the Independent Supervisor are liable for any inaccuracy in index composition, share prices, calculations and the publication of an index, the information used for making adjustments to an index and the actual adjustments. Furthermore, Euronext and the Independent Supervisor do not guarantee the continuity of the composition of the index, the continuity of the method of calculation of an index, the continuity of the dissemination of the index levels, and the continuity of the calculation of the index.

1.6 PROCESS FOR SELECTION AND REVIEWS

For each Index Family, the following steps will be followed to select the Companies that are included in the Indices from the Index Family. The specific Index Family rulebook will describe in detail the process for the specific Index Family. The aim of the selection and reviews process is to ensure that the selection and weighting of the constituents continues to reflect the market or economic reality the Index aims to measure.

Step 1 Index Universe

The first step is to define the Index Universe. In general this specifies the markets or regions that form the starting point of the index composition. In addition to this specific eligibility criteria may be formulated that Companies need to comply with on an ongoing basis.

Step 2 Eligibility at reviews

Companies that are part of the Index Universe are screened for eligibility at the Review based on additional criteria, these criteria are only applied at the Review.

Step 3 Ranking

At the Review Companies that are part of the Index Universe and fulfil the eligibility screening are ranked according to specific criteria.

Step 4 Selection

Based on the ranking specific Companies will be selected for inclusion for each of the Indices in the Index Family, these form the composition of the Index ("Composition").

1.7 ADJUSTMENTS TO THE OUTCOME OF THE REVIEW

In the event of a takeover or other exceptional circumstances, the Independent Supervisor has the right to revise the selection after it is published until 2 trading days before the Review Effective Date

For Indices without an Independent Supervisor, as specified in the specific Index Family rulebook, decisions on revising the outcome of the review will be taken by Index Design.

The selection and weightings of Companies of the Indices will not be changed for any events that happen after 2 days before the Review Effective Date. Corporate actions happening before the Review Effective Date will lead to an update of the new composition that is in line with the treatment of Corporate Actions as described in the Corporate Actions Rulebook.

2. INDEX REVIEWS: WEIGHTING

After the selection of the Review is done each Company in the Index is assigned a specific weight, for this purpose three factors are used:

- Number Of Shares
- Free Float Factor
- Capping Factor

Indices can be weighted in accordance with the following weighting methods:

Free Float Market-Capitalisation Weighted:

Companies are weighted relative to their market capitalisation, can be adjusted for free float and companies can be subject to a maximum weight. This will lead to the following weighting factors.

Number of Shares:

For Market-Capitalisation weighted Indices the number of shares included for a specific Company will be equal to the number of shares listed on a specific date, as specified in the Index Family Rulebook. The number of shares for a Company are adjusted for Corporate Actions before the Review Effective Date in line with the treatment as described in the Corporate Actions Rulebook.

Free Float Factor:

For Market-Capitalisation weighted Indices that are adjusted for free float, a factor between 0 and 1 will be assigned to the Companies in the index to adjust for the free float of the Company.

Capping Factor:

For Market-Capitalisation weighted Indices where the weight of a Company is capped at a specified maximum weight, a Capping Factor between is calculated based on a specific date, as specified in the Index Family Rulebook, such that the Companies included in the Index do not have a weight larger than the specified weight.

Non-Market-Capitalisation Weighted:

Companies are weighed based on a specific desired weight at a certain date. Non-Market-Capitalisation Weighted Indices include equally weighted Indices.

Number of Shares:

For Non-Market-Capitalisation Weighted Indices, the Number of Shares are calculated such that each Company in the Index has a specific pre-defined weight in the Index based on the closing prices on a specific day, as specified in the Index family rulebook. The number of shares for a Company are adjusted for Corporate Actions before the Review Effective Date in line with the treatment as described in the Corporate Actions Rulebook.

Free Float Factor:

No Free Float Factor will be applied for Non-Market-Capitalisation Weighted Indices. If no Free Float Factor is applied it will be set to 1.

Capping Factor:

No Capping Factor will be applied for Non-Market-Capitalisation Weighted Indices. If no Capping Factor is applied it will be set to 1.

3. INDEX REVIEWS: SELECTION DATA DEFINITIONS

3.1 TURNOVER AND VOLUME DEFINITION

Turnover

Turnover for a Company is based on the turnover on the listing used for the Company.

For Euronext listings Turnover consists of the value of Electronic order book transactions, exercise and assignments, Regulated reported trades reported via TCS as well as OBOE (off book on exchange) transactions.

For listings of a Company on other markets than Euronext the Turnover consists of the value of transactions of the specific listing of the Company.

Volume

The Volume of a Company is determined on the same basis as the Turnover, but is measured in numbers of shares.

Extrapolation of turnover and volume

If a company's value of Turnover is not available for the entire relevant period, the available value of turnover will be extrapolated to the entire Relevant Period. In such cases, the value of Turnover during the first twenty trading days that the company was admitted to listing will be ignored.

For Volume the same procedure is applied.

Average Daily Traded Value (ADTV)

Average Daily Traded Value (ADTV) consists of the average Turnover of a Company on a day over a certain period, if Turnover is not available for the entire period the average will be taken over the days it was listed excluding the first twenty days.

Free Float Velocity

Free Float Velocity is a measure used for liquidity analysis.

Velocity is calculated on a daily basis by dividing the number of shares traded by the number of shares listed. These daily figures are added up to calculate velocity over a certain period.

The Free Float Velocity is calculated by dividing the velocity by the Free Float Factor of a Company.

If the Volume for a Company is not available for the entire period, the Free Float Velocity will be extrapolated to the entire period. When determining the Free Float Velocity, the Volume during the first twenty trading days after the Company was admitted to listing will not be taken into consideration.

The Free Float Factor that is used in the Free Float Velocity calculation is based on the Free Float Factor based on the Review Cut-Off Date. However, the Free Float Factor used in the velocity calculation shall always be at least 25%.

Adaptation of Turnover

In the event of a spin-off, the value of Turnover and Volume before the corporate event will be assigned to the Companies resulting from the corporate event based on the ratio of the corporate event. The ratio is determined based on the market capitalisation of the resulting entities after the first day of trading. For the purpose of the adaptation of turnover, a spin off is meant to be a corporate event where existing shareholders receive shares in a newly listed Company. No adaptation will be performed in case of shareholders receiving shares in an already listed Company.

In case of a merger, Index Design will take into account the turnover and volume of the merging Companies prior to the event as well as the turnover and volume of the merged Company for the purpose of the selection. A merger is meant to mean any situation where a bid on the Company is paid in shares of another Company.

Additional analysis of turnover

Index Design may take into account additional factors like the distribution of the trading or may decide to disregard extraordinary spikes in volume. Examples of such additional analysis are:

- Companies making the threshold as a result of one day of trading that accounts for more than 50% of the total turnover;
- Companies with a changed turnover pattern after a corporate action or takeover attempt;
- Demergers or Mergers of companies;
- Companies that were subject to a takeover;
- Changes in free float.

3.2 FREE FLOAT FACTOR

The Free Float Factor is the percentage representing all listed securities of the selected line of the relevant company eligible for index inclusion, minus any shareholdings that are considered non-free float. The Free Float Factor is based on public information available on the Review Cut-Off Date. The Free Float Factor will be rounded to the nearest 5%.

The following shareholdings are considered non-free float (based on public information available on the Review Cut-Off Date):

- Any single shareholder who holds 5% or more of the listed securities in the selected line eligible for index inclusion, with the exception of collective entities or pension funds.
Collective entities are those entities that fulfill all the following criteria:
 - i. are open for investment to investors or tradable on the market; and
 - ii. have a diversified portfolio; and
 - iii. have an open ended structure.Collective entities include mutual funds and other open end-funds.
- Collective entities or pension funds that hold 5% or more of the listed securities in the selected line eligible for index inclusion and are represented in any governing body of the company in question.
- Parties acting in concert that collectively hold 5% or more of the listed securities in the selected line eligible for index inclusion.
- Employee shareholding plans, employee pension plans, individual employees, management or members of the board of directors of the relevant company when their cumulative shareholding is 5% or more of the listed securities in the selected line eligible for index inclusion.
- Shares held by the relevant company that represent 5% or more of the listed securities in the selected line eligible for index inclusion (e.g. treasury shares).

3.3 FREE FLOAT MARKET CAPITALISATION

Free Float Market Capitalisation, is a measure of the size of a Company and is calculated by multiplying the listed shares of a Company with the Free Float Factor of a Company and the closing price of a Company.

4. INDEX CALCULATION METHODOLOGY

Euronext calculates Indices in different versions applying different formulas, the exact methodology will be explained per for the most common type of indices.

4.1 BASE CURRENCY

For each Index calculated a Base Currency is defined, the Base Currency is the currency in which the Index is calculated. Prices in other currencies than the Base Currency will be converted to the Base Currency using the last known exchange rate observed on Reuters. Closing prices will be converted based on the most recent WM/Reuters spot rates, which are published each business day around 17:00 CET.

4.2 PRICE RETURN INDEX

Each Index is calculated as a basis on a Price Return basis, other Index versions are generally based on an underlying (Price Return) Index.

The general formula for the **Price Return Index** is:

$$I_t = \frac{\sum_{i=1}^N Q_{i,t} F_{i,t} C_{i,t} P_{i,t} X_{i,t}}{d_t}$$

Where:

t	Time of calculation
N	Number of constituent equities in index
$Q_{i,t}$	Number of shares of equity i included in the index on day t
$F_{i,t}$	Free Float Factor of equity i ¹
$C_{i,t}$	Capping factor of equity i ¹
$P_{i,t}$	Price of equity i on t
$X_{i,t}$	Current exchange rate on t ¹
d_t	Divisor of the index on day t

4.3 NET AND GROSS RETURN INDEX

Return indices

If applicable a **Net Return** index and/or a **Gross Return** index, is calculated and disseminated at the same frequency as the price index. The return indices are obtained by reinvesting the net and gross dividends respectively.

Calculation formula return indices

The **return index** calculation takes two steps: the first step is to transpose the announced dividend payment into index points. This is called the XD adjustment. This uses the following formula:

$$\text{XD adjustment} = \sum_{i=1}^N \frac{g_i * w_i}{d}$$

Where:

N	Number of constituent equities in index
g_i	The announced dividend per share of the i th component stock, if necessary converted to the Base Currency of the index. For Net Return index withholding tax is deducted from this dividend;
w_i	The weighting of the i th component stock in the index, based on Number of Shares included in the index, Free Float Factor and Capping factor ;
d	Divisor of the index.

¹ Factor is equal to 1 if not applied for the index

The second step of the calculation uses the figures calculated in step one (XD adjustment). The dividend is assumed to be reinvested at the close of the ex-date.

$$TR_t = TR_{t-1} * \left(\frac{I_t + XD}{I_{t-1}} \right)$$

Where:

- TR_{t-1}: Return index value yesterday;
- TR_t: Return index value on t;
- I_{t-1}: Underlying price index yesterday;
- I_t: Underlying price index on t;

Withholding tax rate

The net dividend is calculated as the gross dividend minus the applicable withholding tax. A table detailing the percentages that are applied is available on the website of Euronext: euronext.com/index-rules

Ordinary dividends in shares

If a dividend is distributed in the form of shares only and if this is regarded as ordinary dividend, the return index will be reinvesting a cash equivalent of the dividend. If shareholders may choose between cash or shares the amount which is reinvested will be based on the cash option.

Conversion of dividends declared in other currencies

If a dividend for a constituent is declared in another currency than the Base Currency of the index, then the Base Currency amount will be used if investors have the option to be paid in that currency. If the dividend amount is available only in currencies that deviate from the Base Currency, the dividend amount will be convert using the reference rate for the cum-day (the business day prior to the ex-date). In principle the reference rate will be based on the foreign exchange reference rates as published daily by the ECB.

4.4 DECREMENT INDICES

The **Decrement Return Index** uses the following formula:

$$DI_t = DI_{t-1} \left(\frac{UI_t}{UI_{t-1}} - Dcr * \frac{day}{365} \right)$$

Where:

- DI_{t-1} Decrement Return Index value on day t-1
- DI_t Decrement Return Index value on day t
- UI_{t-1} Decrement Underlying Index value on day t-1
- UI_t Decrement Underlying Index value on day t
- Dcr Decrement percentage per annum relevant for the index
- day Number of calendar days between day t and day t-1

Decrement Point Index Calculation

The **Decrement Point Index** uses the following formula:

$$DPI_t = DPI_{t-1} * \frac{DuR_t}{DuR_{t-1}} - Points * \frac{day}{365}$$

Where:

- DPI_{t-1} Decrement Point Index value on day t-1
- DPI_t Decrement Point Index value on day t
- DuR_{t-1} Decrement Underlying Index value on day t-1
- DuR_t Decrement Underlying Index value on day t
- Points Index points per annum relevant for the index
- day Number of calendar days between day t and day t-1

4.5 CURRENCY HEDGED INDEX CALCULATION

The currency hedged index replicates the strategy that aims to eliminate currency risk by selling 1-month forward contracts at the close of the last trading day of each month.

$$HI_t = HI_0 * \left[\frac{UI_t}{UI_0} - \left(\frac{FF}{FX} - 1 \right) \right]$$

Where

- HI_t is the hedge index at time of calculation,
- HI_0 is the hedge index at the close of the previous month,
- UI_t is the unhedged index at the time of calculation.
- UI_0 is the unhedged index at the close of the previous month.
- FF is the forward rate at the close of the previous month,
- and FX is the WM fixing on day T.

4.6 VOLATILITY TARGET INDEX FORMULA

The formula of the **Volatility Target Index** is defined as follows:

$$I_t = I_{t-1} * W_{t-2} * \frac{UI_t}{UI_{t-1}} + I_{t-1} * (1 - W_{t-2}) * \left(1 + IR * \frac{day}{360} \right)$$

Where:

- I_t = Volatility Target Index at time of calculation
- I_{t-1} = Last close of the Volatility Target Index
- W_{t-2} = Percentage weight of the underlying index in the index, based on D-2
- UI_t = Underlying index level at time of calculation
- UI_{t-1} = Last close of the Underlying Index
- IR = Applicable interest rate at time of calculation.
- day = Number of calendar days between Ind_D and Ind_{D-1}

Calculation of W_{t-2}

1st step: calculation of the 20 and 60 days annualized historical volatility

$$Vol_{ND} = \sqrt{\frac{252}{ND} * \sum \left[\ln \left(\frac{UI_t}{UI_{t-1}} \right) \right]^2}$$

Where:

- ND = 20 or 60 Days
- UI_t = Underlying index closing level at time "t", "t" ranging from today closing to today closing-N
- UI_{t-1} = Underlying index closing level at time "t-1", "t-1" ranging from last closing to last closing-N

2nd step: calculation of W_t

$$W_t = \text{Min} \left[\frac{Vol_{Tg}}{\text{Max}(Vol_{20D}; Vol_{60D})}; CapInd \right]$$

W_t = the percentage weight based on day t
 Vol_{Tg} = the targeted annual volatility
 $CapInd$ = the maximum percentage of Underlying index in the Index on rebalancing.

4.7 DIVIDEND INDICES

The Dividend Index is reset to zero after the calculation time on the settlement day.

$DI_{t1} = XD_{t1}$ on the first trading day following the settlement day

$DI_t = DI_{t-1} + XD_t$ on any day t (except t1), until the next settlement day

Where:

DI_t = the dividend index on day t

DI_{t-1} = the dividend index on the previous trading d-1

DI_{t1} = the dividend index on the first trading following the settlement day

and

$$XD = \sum_{i=1}^N \frac{g_i * w_i}{d}$$

is the value in index points of the sum of the ordinary gross dividend amounts (as defined in the Corporate Actions Rulebook) of the index constituents going ex-dividend on day t.

Where:

N Number of constituent equities in index

g_i The announced dividend per share of the i^{th} component stock, if necessary converted to the Base Currency of the index. For Net Return index withholding tax is deducted from this dividend;

w_i The weighting of the i^{th} component stock in the index, based on Number of Shares included in the index, Free Float Factor and Capping factor ;

d Divisor of the index.

4.8 INDEX LEVEL DROPPING BELOW 0

In case the level of an Index will drop below 0, the Index level will be kept at a level of 0.01. As a result of this, Euronext might decide to cease the Index in line with the Index Cessation Policy.

Overview of Rulebooks and other documents applicable for Euronext Indices

The following documents, all available on or via the following link: <https://www.euronext.com/en/indices/index-rules> should be read in conjunction with this document or provide other relevant information for the reader.

BENCHMARK STATEMENT

The Benchmark Statement identifies the primary features of an index family or families of indices in the context of the EU Benchmark regulation. For ESG based indices it also contains disclosure of ESG factors and reporting of scores.

COMPLIANCE STATEMENT

The Compliance Statement provides details, for both significant and non-significant benchmarks, for which provisions the Administrator has chosen not to apply, and offers an explanation as to why it is appropriate not to apply each provision.

GOVERNANCE EURONEXT INDICES

The purpose of the 'Governance Euronext Indices' is to describe the role and responsibilities of each of the governance bodies that are part of the Benchmark Administrators of Euronext.

RULEBOOK OF EACH FAMILY OF INDICES

Each index is part of an index family that shares the basis for selection (universe) and which is managed in a comparable way. A separate rulebook is provided for each index family that will describe the specific features of that index family as well as specific elements of each index within that family.

INDEX CALCULATION AND PERIODICAL REVIEW Euronext Indices

The Methodology Euronext describes all common aspects that apply for the

- periodical reviews, and
- the calculation of indices

EURONEXT INDICES CORPORATE ACTION RULES

- treatment of corporate actions

of indices provided by Euronext Indices.

EURONEXT ESG PROVIDERS METHODOLOGIES

An overview of various methods applied by providers of ESG scorings and labels

PROCEDURES EURONEXT INDICES

These rulebooks describe the various procedures that are applied for all Euronext Indices:

- Correction Policy
- Announcement Policy
- Complaints Procedure
- Consultations Procedure
- Procedure For Cessation of Indices

RULES OF PROCEDURE INDEPENDENT SUPERVISORS

For each Independent Supervisor Euronext publishes a 'Rules of Procedure' that describes the responsibilities and composition of each Independent Supervisor.

BENCHMARK OVERSIGHT COMMITTEE CHARTER

The Benchmark Oversight Committee Charter describes the role and responsibilities of the Benchmark Oversight Committee.