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1. INTRODUCTION TO THE STOXX INDEX GUIDES

The STOXX index guides are separated into the following sub-sets:

» The **STOXX Calculation guide** provides a general overview of the calculation of the STOXX equity indices, the dissemination, the index formulas and adjustments due to corporate actions

» The **STOXX Index Methodology guide** contains the equity index specific rules regarding the construction and derivation of the portfolio based indices, the individual component selection process and weighting schemes

» The **STOXX Strategy guide** contains the formulas and description of all strategy indices

» The **STOXX Dividend Points Calculation guide** describes the dividend points products

» The **STOXX Distribution Points Calculation guide** describes the distribution points products

» The **STOXX ESG guide** contains the index specific rules regarding the construction and derivation of the ESG indices, the individual component selection process and weighting schemes

» The **iSTOXX guide** contains the index specific rules regarding the construction and derivation of the iSTOXX indices, the individual component selection process and weighting schemes

» The **STOXX Reference Rates guide** contains the rules and methodologies of the reference rate indices

» The **STOXX Statistical Calculations** guide provides a detailed view of definitions and formulas of the statistical calculations as utilized in the reports, factsheets, indices and presentations produced by STOXX

» The **STOXX Bond Index guide** contains the bond index specific rules regarding the construction of the indices, the individual component selection process, weighting schemes and overview of the index and bond analytics formulas

All rule books are available for download on [http://www.stoxx.com/indices/rulebooks.html](http://www.stoxx.com/indices/rulebooks.html)
2. HISTORY OF CHANGES TO THE STOXX BOND INDEX GUIDE

» Apr. 07, 2016: Launch of EURO STOXX 50® Corporate Bond indices
» May 10, 2016: Launch of EURO STOXX 50® Corporate Bond in USD, JPY, CHF and GBP and EURO STOXX 50® Corporate Bond Hedged in USD, JPY, CHF and GBP indices
» Feb. 21, 2017: Launch of EURO STOXX 50® Corporate Bond maturity, industry and rating sub-indices
» Aug. 30, 2017: Clarification of section 4.3.1 Selection Criteria
3. GENERAL PRINCIPLES

3.1. INDEX RATIONALE

STOXX defines the index rationale as the basis for applying a certain methodology in order to achieve the index objective. STOXX performs intensive research and may conduct conversations with market participants and third parties for this purpose. STOXX discloses the index objective in every case.

3.2. METHODOLOGY REVIEW POLICIES

STOXX constantly monitors the execution of the index calculation rules in order to ensure the validity of the index methodology. STOXX also conducts general methodology reviews in a periodic and ad-hoc basis, to reflect economic and political changes and developments in the investment industry. As result of these activities, STOXX introduces changes to the methodology books. Material changes are notified to subscribers and the media through the usual communication channels. Clarifications of the methodology are updated in the rulebook. All changes are tracked in the section 2.1 History of changes to the STOXX bond index Guide.

3.3. INDEX TERMINATION POLICY

For the termination of an index or index family for which outstanding products are present in the market to the knowledge of STOXX, a market consultation with the involved clients will be initiated by STOXX to take into account their views and concerns related to the termination or transition. A consultation period will be opened. Its duration depends on the specific issue. After the consultation period and in case of further action needed, a notification will be issued and the process defined above will be followed. In the case of a transition, STOXX will launch the alternative index and will notify of its character as a suitable replacement for an existing index whose calculation should be discontinued in the future. This notification advises clients on the alternative recommended by STOXX as replacement. The timeframe in which both indices will be calculated in parallel will be disclosed in the notification’s text and will be no shorter than three months.

For the termination of an index or index family for which, to the knowledge of STOXX, no listed financial products are issued in the market, a press release notification or e-mail notification to subscribers will be communicated at least three months before coming into force. Clients or third parties with interest in the index or index family are urged to communicate as soon as possible their concerns to STOXX. Based on the feedback collected, STOXX may alter the index termination decision. For the termination of an index without financial product issued on there will be no market consultation. Changes to the original notification will be communicated in the same manner.

3.4 COMMUNICATION

Notifications are sent out for short-term changes, the periodic review announcements, index calculation and production issues and errors, new index launches and general information from STOXX.
4.1. OVERVIEW

The EURO STOXX 50® Corporate Bond Indices are corporate bond indices tracking the performance of bonds issued by the companies of the EURO STOXX 50® index, which represent highly liquid, blue-chip companies of the Eurozone. Exclusive selection criteria are applied in order to determine the most liquid and representative components. The EURO STOXX 50® Corporate Bond Indices combine the selection criteria for Eurozone equity indices with the internationally accepted European Federation of Financial Analysts Societies (EFFAS) principles of fixed income indices.

4.2. STRUCTURE

The indices are calculated based on real bonds, which facilitates easier tracking of the index. Only bonds issued by companies part of the EURO STOXX 50® index are eligible for the index. As not all companies issue bonds and the selection criteria is applied purely on a bond level (for details see 4.3.1 SELECTION CRITERIA), some equity issuer will not be represented in the bond index, for example as of December 2015 two EURO STOXX 50® companies do not issue bonds:

<table>
<thead>
<tr>
<th>EURO STOXX 50® Index companies</th>
<th>EURO STOXX 50® Corporate Bond Index bond issuing companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ L’OREAL</td>
<td>✓ L’OREAL</td>
</tr>
<tr>
<td>✓ INDITEX</td>
<td>✓ INDITEX</td>
</tr>
<tr>
<td>✓ BANCO SANTANDER</td>
<td>✓ BANCO SANTANDER</td>
</tr>
<tr>
<td>✓ BNP PARIBAS</td>
<td>✓ BNP PARIBAS</td>
</tr>
<tr>
<td>✓ ENI</td>
<td>✓ ENI</td>
</tr>
<tr>
<td>✓ BMW</td>
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</tr>
<tr>
<td>✓ VOLKSWAGEN</td>
<td>✓ VOLKSWAGEN</td>
</tr>
<tr>
<td>✓ TELEFONICA</td>
<td>✓ TELEFONICA</td>
</tr>
<tr>
<td>✓ ENEL</td>
<td>✓ ENEL</td>
</tr>
<tr>
<td>✓ ING</td>
<td>✓ ING</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
</tbody>
</table>
The following index variants are currently available:

- EURO STOXX 50 Corporate Bond
- EURO STOXX 50 Corporate Bond 1-3
- EURO STOXX 50 Corporate Bond 3-5
- EURO STOXX 50 Corporate Bond 5-7
- EURO STOXX 50 Corporate Bond 7+
- EURO STOXX 50 Corporate Bond Financials
- EURO STOXX 50 Corporate Bond Ex-Financials
- EURO STOXX 50 Corporate Bond Ex-Financials 1-3
- EURO STOXX 50 Corporate Bond Ex-Financials 3-5
- EURO STOXX 50 Corporate Bond Ex-Financials 5-7
- EURO STOXX 50 Corporate Bond Ex-Financials 7+
- EURO STOXX 50 Corporate Bond AAA-A
- EURO STOXX 50 Corporate Bond Monthly Hedged

The full list of indices can be found below:

<table>
<thead>
<tr>
<th>ISIN</th>
<th>Index</th>
<th>Currency</th>
<th>Version</th>
<th>Bloomberg Ticker</th>
<th>Reuters RIC</th>
</tr>
</thead>
<tbody>
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<td>DE000A0QZJL9</td>
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<td>SX5BPI</td>
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<td>EURO STOXX 50 Corporate Bond</td>
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<td>SX5BTR</td>
<td>SX5BTR</td>
</tr>
<tr>
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<tr>
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<td>-</td>
<td>SX5BTRU</td>
</tr>
<tr>
<td>DE000A0QZJO6</td>
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<td>CHF</td>
<td>Price</td>
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<td>-</td>
<td>SX5BTRC</td>
</tr>
<tr>
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<tr>
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<td>Total Return</td>
<td>-</td>
<td>SX5BTRG</td>
</tr>
<tr>
<td>DE000A0QZJO8</td>
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<td>SX5BPIJ</td>
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<tr>
<td>DE000A0QZJR6</td>
<td>EURO STOXX 50 Corporate Bond</td>
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<td>-</td>
<td>SX5BTRJ</td>
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<tr>
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</tr>
<tr>
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<td>-</td>
<td>SX5B13TR</td>
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<td>SX5B35TR</td>
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<tr>
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<td>-</td>
<td>SX5B57PI</td>
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<tr>
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</tr>
<tr>
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<td>-</td>
<td>SX5B7PI</td>
</tr>
<tr>
<td>DE000A2DBNX1</td>
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<td>Total Return</td>
<td>-</td>
<td>SX5B7TR</td>
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<tr>
<td>DE000A2DBNY9</td>
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<td>EUR</td>
<td>Price</td>
<td>-</td>
<td>SX5BFPI</td>
</tr>
<tr>
<td>DE000A2DBNZ6</td>
<td>EURO STOXX 50 Corporate Bond Financials</td>
<td>EUR</td>
<td>Total Return</td>
<td>-</td>
<td>SX5BFTR</td>
</tr>
</tbody>
</table>

1 Index currency versions other than EUR are calculated intraday using spot rates provided by Thomson Reuters. The WM/Reuters currency fixing rates from 5:00 pm CET are used to calculate the indices' closing values. For details, see https://www.stoxx.com/end-of-the-day-data?eodd=2
<table>
<thead>
<tr>
<th>ISIN</th>
<th>Index</th>
<th>Currency</th>
<th>Version</th>
<th>Bloomberg Ticker</th>
<th>Reuters RIC</th>
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<tr>
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<td>EURO STOXX 50 Corporate Bond Ex-Financials</td>
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<td>Price</td>
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<td>SX5BEF13PI</td>
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<td>DE000A2DBN35</td>
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<td>EUR</td>
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<td>-</td>
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<td>Price</td>
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</tr>
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<td>GBP</td>
<td>Total Return</td>
<td>-</td>
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<tr>
<td>DE000A0Z3M82</td>
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</tr>
<tr>
<td>DE000A0Z3M90</td>
<td>EURO STOXX 50 Corporate Bond Monthly Hedged</td>
<td>JPY</td>
<td>Total Return</td>
<td>-</td>
<td>SX5BTRJH</td>
</tr>
<tr>
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<td>Price</td>
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<td>SX5BTRJH</td>
</tr>
<tr>
<td>DE000A0Z3M33</td>
<td>EURO STOXX 50 Corporate Bond Monthly Hedged</td>
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<td>Total Return</td>
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<td>SX5BTRUH</td>
</tr>
<tr>
<td>DE000A0Z3M41</td>
<td>EURO STOXX 50 Corporate Bond Monthly Hedged</td>
<td>CHF</td>
<td>Price</td>
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<td>SX5BPICH</td>
</tr>
<tr>
<td>DE000A0Z3M58</td>
<td>EURO STOXX 50 Corporate Bond Monthly Hedged</td>
<td>CHF</td>
<td>Total Return</td>
<td>SX5BTRCH</td>
<td>SX5BTRCH</td>
</tr>
</tbody>
</table>
4.3. INDEX METHODOLOGY

The indices are based on a volume-weighted summation concept that analyzes relative changes in value compared to a reference date (i.e. the index review date): the composition and volume of the index portfolios are adjusted at this date. Therefore, corresponding adjustments to index-tracking portfolios are only required once, i.e. at the respective reference date. The constituent bonds are weighted by their amount outstanding. The calculation methodology is in line with the standards set by EFFAS².

4.3.1. SELECTION CRITERIA

The precondition for index eligibility is that a bond has reference data and pricing data (for details see 4.3.2 Index calculation). For the avoidance of doubt, securities without available data are not included in the index.

In order to determine the index constituents, the following selection criteria will be applied:

- Issuer type
- Bond type
- Currency
- Credit rating
- Time to maturity
- Nominal amount outstanding
- Seniority of debt
- Industry

For the bond indices, no explicit liquidity filter is applied, as bonds are largely traded over-the-counter (OTC) or off-exchange and thus the data availability is restricted. The applied selection criteria of the index constituents facilitate the selection of liquid constituents due to the filtering by issue size, credit rating, seniority of debt as well as minimum nominal amount outstanding for a bond. Consequently, stricter constraints on the selection criteria favor the selection of the most liquid constituents for the index.

Bonds with prices received in amount instead of percentage or with dirty price instead of clean price are not eligible for the index.

4.3.1.1. ISSUER TYPE

The EURO STOXX 50® Corporate Bond Index is comprised solely of corporate bonds from companies that are constituents of the EURO STOXX 50® index at the time of the rebalancing. Only bonds issued by the parent or a subsidiary entity of a corporate group are considered eligible. Intra-review changes in the EURO STOXX 50® index due to extraordinary composition changes or the application of fast exit and fast entry rules do not trigger extraordinary composition changes of the EURO STOXX 50® Corporate Bond index.

4.3.1.2. **BOND TYPE**
The eligible bond types are:
- Bullet fixed-coupon bonds
- Zero-coupon bonds (exception: stripped bonds are not included)

The following bond types are excluded:
- Bonds with call or put option
- Step-up bonds
- Multi-step and multi-step callable bonds
- Multi-coupon bonds
- Sinking funds and amortizing bonds
- Fix-to-float bonds
- Extendible bonds
- Private placements
- Perpetual bonds
- Floating rate notes
- Inflation-linked bonds
- Purchase fund bonds
- Convertible bonds
- Securitized (ABS/MBS/CDO)
- Dual-currency bonds
- Pay-in-kind bonds
- Schuldscheine
- Money-market instruments (deposit notes, banker’s acceptance).

4.3.1.3. **CURRENCY**
Only EUR denominated bonds are eligible for the index.

4.3.1.4. **CREDIT RATING**
STOXX composite rating is applied in order to determine a bond’s rating. The STOXX composite rating for the EURO STOXX 50® Corporate Bond index is derived by using the issue’s long term ratings from S&P and Moody’s. The following rating values are used within the composition logic: AAA, AA, A, BBB, BB, B, CCC, CC, C. If only one rating is available from a source for a bond, then that rating will be applied. If two ratings are available from the sources for a bond, then the lower of the two will be applied. Bonds which are in default or not rated are not eligible for the indices:

<table>
<thead>
<tr>
<th>MOODY’S</th>
<th>S&amp;P</th>
<th>STOXX Bond Composite Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaa</td>
<td>AAA</td>
<td>AAA</td>
</tr>
<tr>
<td>Aa1</td>
<td>AA+</td>
<td>AA</td>
</tr>
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<tr>
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<td>A</td>
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<td>BBB</td>
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**Investment Grade**
4. EURO STOXX 50® CORPORATE BOND INDICES

<table>
<thead>
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<th>S&amp;P</th>
<th>STOXX Bond Composite Rating</th>
</tr>
</thead>
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<td>BB+</td>
<td>BB</td>
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<tr>
<td>Ba2</td>
<td>BB</td>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Caa3</td>
<td>CCC-</td>
<td></td>
</tr>
<tr>
<td>Ca</td>
<td>CC</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

**EURO STOXX 50® Corporate Bond AAA-A Index:**
For the higher quality sub-index a minimum composite rating of A is required (i.e. only bonds with composite rating A and higher).

**EURO STOXX 50® Corporate Bond Index and all other sub-indices:**
A minimum rating of Investment Grade (BBB and higher) is required.

### 4.3.1.5. TIME TO MATURITY
The time to maturity is measured from the respective rebalancing date to the maturity date. All eligible bonds must have a remaining time to maturity of at least 1.25 years. This condition is not only valid for bonds to be included into the index, but also for bonds already part of the index (which will be excluded at next rebalancing date, in case of not fulfilling the condition). The following day count conventions are supported: ACT/360, ACT/365, ACT/ACT, ISMA 30/360.

For the purpose of calculating the maturity-bucket sub-indices, the following ranges are considered:
- 1-3 (exclude bonds with years to maturity < 1.25 and >= 3)
- 3-5 (exclude bonds with years to maturity < 3 and >= 5)
- 5-7 (exclude bonds with years to maturity < 5 and >= 7)
- 7+ (exclude bonds with years to maturity < 7).

### 4.3.1.6. NOMINAL AMOUNT OUTSTANDING
The minimum nominal amount outstanding for a bond to be eligible is EUR 750 million. The amount outstanding of each bond is used to calculate its index weight. The index is capitalization-weighted.

### 4.3.1.7. SENIORITY OF DEBT
Subordinated bonds carry additional risk as higher ranked bonds, hence subordinated bonds are not eligible and excluded from the index.

### 4.3.1.8. INDUSTRY
The industry of the corresponding equity company used for the EURO STOXX 50® index is used for selection of the Financials and Ex-Financials corporate bond sub-indices.
4.3.2. INDEX CALCULATION

4.3.2.1. REFERENCE DATA
Bond reference data used for the selection and in the index calculation are sourced from third data providers and verified against offering circulars as appropriate.

4.3.2.2. BOND PRICES
On-going calculation:
The indices are calculated in real time on the basis of bid prices. If no new prices for a particular bond are received, the index will continue to be calculated based on the last available prices. Prices are always clean prices in percentage.

Insertions:
New bonds are factored into the respective index when its composition is updated, using the ask price. From a portfolio perspective, this calculation methodology incorporates transaction costs incurred by investors who want to track the indices and have to buy additional bonds at the respective ask quote.

Cost factor:
Bonds which are already in the index and their weight increases as a result of rebalancing are valued at the bid price. In fact if a portfolio manager tracks the index, those bonds will be purchased at the ask price as well, which implies tracking cost. In order to offset this effect and accordingly to reflect the costs a cost factor is applied to the price and total return indices (for details see 4.3.2.4 Calculation Formulas).

Evaluated prices:
The indices are calculated on the basis of continuously evaluated prices, sourced from Interactive Data. Evaluated prices provide high quality information about the current price level. These evaluations represent the third data provider good faith opinion about the fair price for a security in a current sale, typically in an institutional round lot position. They are sourced from an independent data provider, who is not affiliated with or owned by a securities broker, dealer or underwriter, nor is it actively involved in the business of investment management or securities trading. The quality of the evaluated prices is continuously verified from a broad client base, ranging from asset managers, investment banks, custodians, insurance companies to central banks. The evaluated prices can be challenged if there is a reason to believe certain price does not correspond to the appropriate current price level.

4.3.2.3. PERIODICAL ADJUSTMENT

4.3.2.3.1. Rebalancing timeframe
The EURO STOXX 50® Corporate Bond Index is rebalanced on a quarterly basis, at the end of March, June, September and December using as a basis the latest EURO STOXX 50® index composition from the same month. The equity index composition is effective one trading day after every third Friday in March, June, September and December.
Four trading days before the end of the last month of the quarter the nominal amount outstanding for each bond is determined and the index constituents list is published (a forecast
file is published. Three and two trading days before end of the last month of the period, bonds may drop out of this list due to rating or other relevant reference data changes (a second and third forecast file is published). The cut-off date for the final membership list for the following period is the list published two trading days before end of the last month of the period. On the last business day of each period, the new membership list with closing prices resp. weights of all bonds after close of business is published. The prices are bid prices for index constituents or ask prices for insertions. The list is effective from the first trading day of next month.

4.3.2.3.2. Weighting adjustments
Within an index, each bond is weighted according to its market capitalization. Intra-month changes of the amount outstanding for each bond are reflected in the index through the rebalancing procedure.

4.3.2.3.3. Coupon adjustments
In case coupon changes, those changes are taken into account in the calculation of the indices from the exact date on which the coupon was altered.

4.3.2.3.4. Monthly bond exclusions between scheduled rebalancing
Bonds can become intra-month not eligible for the index. In this case they will be kept in the index until end of month and the proceeds from the sale will be invested in cash. Following scenarios are applicable:
- Bond or issuer default
- Rating downgrade of the bond to non-investment grade (i.e. below threshold)
- Reduction of the amount outstanding
- other changes in bond reference data, which would make the bond not eligible applying again the selection criteria
4.3.2.3.5. Monthly cash reinvestment between scheduled rebalancing
Cash from coupon payments or from bonds which exit the index will be invested at the end of each month in the money market for one month at the STOXX GC Pooling EUR Deferred Funding Rate, or a rate of zero in case of negative interest levels (i.e. floor at 0%). At rebalancing the cash is set to zero, because invested in the index.

4.3.2.3.6. Index size
Indices have no limitation in regards to size.

4.3.2.3.7. Cap Limit
The capping procedure is performed at issuer level first and subsequently at issuer industry level in order to prevent those dominating the index. In case capping at both levels is not possible, preference is given to capping at issuer level and the capping at issuer industry level is disregarded. The issuer industry capping procedure does not apply to single industry sector sub-indices (e.g. for EURO STOXX 50 Corporate Bond Financials Index).

4.3.2.3.7.1. Bond Issuer Capping
The weight of a bond issuer is capped at 20%. If the combined weight of all bonds from any individual issuer within the index exceeds 20%, the market capitalization of these bonds will be proportionally reduced to 20% of the reduced index capitalization. If this is not possible, bond issuer will be equal-weighted (e.g. in case of 5 or less issuer). The capping procedure is applied at each quarterly review, when on the last business day of each period the final capped weights are published and effective from the first trading day of next month.

4.3.2.3.7.2. Issuer Industry Capping
Based on the industry classification used for the EURO STOXX 50® index, the weight of a single industry in the index is capped at 40% at each quarterly review. If the combined weight of all bonds associated with a certain the industry exceeds 40%, the market capitalization of these bonds will be proportionally reduced to 40% of the reduced index capitalization. If this is not possible, issuer industry capping will not be performed, but only bond issuer capping.

4.3.2.4. CALCULATION FORMULAS

4.3.2.4.1. Price Index
Price indices are calculated as follows:

\[
P_I = P_{I-1} \cdot \sum_{j=1}^{n} \frac{P_{i,j} \cdot N_{i,j-1} + cash_{i-1}}{\sum_{j=1}^{n} P_{i,j-1} \cdot N_{i,j-1} + cash_{i-1}} \cdot CF_{PI}
\]

Where, in case of non-rebalancing month:

\[CF_{PI} = 1\]
Else, in case of rebalancing month:

\[
CF_{Pl} = \frac{\sum_{i=1}^{n} N_i^+ \cdot P_i^{PI}}{\sum_{i=1}^{n} N_i^- \cdot P_i^{PI} + cash_{t-s}} \cdot \frac{\sum_{i=1}^{n} N_i^- \cdot P_i^{B/A}}{\sum_{i=1}^{n} N_i^+ \cdot P_i^{B/A}}
\]

\[
P_i^{A/B} \begin{cases} 
= P_i^A, 
\sum_{i=1}^{n} N_i^+ \cdot P_i^{PI} > \sum_{i=1}^{n} N_i^- \cdot P_i^{PI} + cash_{t-s} 
\implies w_i^+ > w_i^- \\
= P_i^B, 
\text{else}
\end{cases}
\]

Whereby:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P_{Pl})</td>
<td>Price index value at time (t)</td>
</tr>
<tr>
<td>(P_{Pl-s})</td>
<td>Price index value on the last calendar day of the previous month</td>
</tr>
<tr>
<td>(P_i)</td>
<td>Price of bond (i) at time (t)</td>
</tr>
<tr>
<td>(P_{i,t-s})</td>
<td>Closing price of bond (i) on the last trading day of the previous month</td>
</tr>
<tr>
<td>(N_{i,t-s})</td>
<td>Capped nominal amount outstanding issue size of bond (i) on the last trading day of the previous month</td>
</tr>
<tr>
<td>(n)</td>
<td>Number of bonds in the index</td>
</tr>
<tr>
<td>(t-s)</td>
<td>Time of the last rebalancing</td>
</tr>
<tr>
<td>(t)</td>
<td>Calculation date</td>
</tr>
<tr>
<td>(CF_{Pl})</td>
<td>Cost factor for price index, valid from last rebalancing date</td>
</tr>
<tr>
<td>(N_i^+)</td>
<td>Nominal amount outstanding issue size of bond (i) after rebalancing</td>
</tr>
<tr>
<td>(N_i^-)</td>
<td>Nominal amount outstanding issue size of bond (i) before rebalancing</td>
</tr>
<tr>
<td>(w_i^+)</td>
<td>Weight of bond (i) after rebalancing</td>
</tr>
<tr>
<td>(w_i^-)</td>
<td>Weight of bond (i) before rebalancing</td>
</tr>
<tr>
<td>(P_i^{A/B})</td>
<td>Either closing ask or bid price of bond (i) depending on the change in the weight resulting from the rebalancing</td>
</tr>
<tr>
<td>(P_i^A)</td>
<td>Closing ask price of bond (i) on the rebalancing day</td>
</tr>
<tr>
<td>(P_i^B)</td>
<td>Closing bid price of bond (i) on the rebalancing day</td>
</tr>
<tr>
<td>(cash_{t-s})</td>
<td>Cash at the end of last month</td>
</tr>
</tbody>
</table>
4.3.2.4.2. Total Return Index

For total return indices, the monthly rebalancing involves the reinvestment of coupon payments in the overall portfolio at the rebalancing date fixed for any adjustment of the index composition. Consequently, total return indices are calculated as follows:

\[
TR_n = TR_{n-1} + \sum_{i=1}^{n} \left( P_{i,t} + A_{i,t} + XD_{i,t-1} \cdot (CP_{i,t} + G_{i,t}) \right) \cdot N_{i,t-1} + cash_{t-1} \left( 1 + r_{t-1} \cdot \frac{days_{t-1}}{360} \right) \cdot CF_{TR}
\]

Where, in case of non-rebalancing month:

\[
CF_{TR} = 1
\]

Else, in case of rebalancing month:

\[
CF_{TR} = \frac{\sum_{i=1}^{n} N_i^+ \cdot (P_{i}^{TR} + A_i)}{\sum_{i=1}^{n} N_i^- \cdot (P_{i}^{TR} + A_i) + cash_{t-1} \left( 1 + r_{t-1} \cdot \frac{days_{reb}}{360} \right) + \sum_{i}^n N_i^- \cdot G_{i,t}}
\]

\[
N_i^+ \cdot (P_{i}^{TR} + A_i)
\]

\[
N_i^- \cdot (P_{i}^{TR} + A_i) + cash_{t-1} \left( 1 + r_{t-1} \cdot \frac{days_{reb}}{360} \right) + \sum_{i}^n N_i^- \cdot G_{i,t}
\]

\[
\sum_{i=1}^{n} N_i^+ \cdot (P_{i}^{B/A} + A_i)
\]

\[
\sum_{i=1}^{n} N_i^- \cdot (P_{i}^{TR} + A_i) + cash_{t-1} \left( 1 + r_{t-1} \cdot \frac{days_{reb}}{360} \right) + \sum_{i}^n N_i^- \cdot G_{i,t}
\]

\[
p_{i}^{A/B} = \begin{cases} 
  p_i^A, & \text{if } N_i^+ \cdot (P_{i}^{TR} + A_i) > \sum_{i=1}^{n} N_i^+ \cdot (P_{i}^{TR} + A_i)  \\
p_i^B, & \text{else}
\end{cases}
\]

\[
p_{i}^{TR} = \begin{cases} 
  p_i^A, & \text{for insertions} \\
p_i^B, & \text{else}
\end{cases}
\]

Whereby (in addition to the denotations used in 3.3.4.1):
### Parameter Legend

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_{i,t}$</td>
<td>Accrued interest of bond i at time t</td>
</tr>
<tr>
<td>$A_{i,t-s}$</td>
<td>Accrued interest of bond i on the last calendar day of the previous month</td>
</tr>
<tr>
<td>$G_{i,t}$</td>
<td>Value of a coupon payment of bond i at time t, made at the coupon date or within the period s. If there has been no payment within the respective month, the value equals zero.</td>
</tr>
<tr>
<td>$TR_t$</td>
<td>Total return index value at time t</td>
</tr>
<tr>
<td>$TR_{t-s}$</td>
<td>Total return index value on the last calendar day of the previous month</td>
</tr>
<tr>
<td>$CP_{i,t}$</td>
<td>Value of the next coupon payment of bond i at date t during an ex-dividend period (as the next coupon payment of bond i is not included in the dirty price calculation at date t because of the ex-dividend period). Outside the ex-dividend period, the value is 0.</td>
</tr>
<tr>
<td>$CP_{i,t-s}$</td>
<td>Value of the next coupon payment of bond i at rebalancing date during an ex-dividend period (as the next coupon payment of bond i is not included in the dirty price calculation at date t because of the ex-dividend period). Outside the ex-dividend period, the value is 0.</td>
</tr>
<tr>
<td>$XD_{i,t-s}$</td>
<td>Flag that ensures the correct treatment of bond i with ex-dividend features at the last rebalancing (during the ex-dividend period the buyer of a security will not receive the next coupon payment): If the bond enters the index within the ex-dividend period, flag is set to 0. If bond is not ex-dividend, or has not entered the index during an ex-dividend period, or entered the index during a previous ex-dividend period, flag is set to 1.</td>
</tr>
<tr>
<td>$CF_{TR}$</td>
<td>Cost factor total return index, valid since last rebalancing date</td>
</tr>
<tr>
<td>$N_{i+}$</td>
<td>Nominal outstanding issue size of bond i after rebalancing</td>
</tr>
<tr>
<td>$N_i$</td>
<td>Nominal outstanding issue size of bond i before rebalancing</td>
</tr>
<tr>
<td>$w_{i+}$</td>
<td>Weight of bond i after rebalancing</td>
</tr>
<tr>
<td>$w_i$</td>
<td>Weight of bond i before rebalancing</td>
</tr>
<tr>
<td>$p_{A/B}^i$</td>
<td>Either closing ask or bid price of bond i depending on the change in the weight resulting of the re-composition</td>
</tr>
<tr>
<td>$p^A_i$</td>
<td>Closing ask price of bond i on the rebalancing day</td>
</tr>
<tr>
<td>$p^B_i$</td>
<td>Closing bid price of bond i on the rebalancing day</td>
</tr>
</tbody>
</table>
4.2.2.4.1. Currency Index
The EURO STOXX 50® Corporate Bond Index is also converted from EUR in CHF, GBP, JPY and USD, like follows:

$$UH_{c,t} = \text{IDX}_t \cdot FX_{c,t} \cdot CRF_c$$

4.2.2.4.2. Currency Hedged Index
The monthly hedged index versions follow the standard STOXX methodology and therefore are not described in this guide, for more details refer to the STOXX Strategy Guide: https://www.stoxx.com/document/Indices/Common/Indexguide/stoxx_strategy_guide.pdf

4.2.2.4.3. Index Analytics
There are several analytics that are calculated in addition to the index values. The following analytics are calculated and distributed for each index separately:

4.2.2.4.3.1. Average Yield
The average yield is calculated by weighting the yield of each bond by the market capitalization and duration of the respective bond.

$$RY_i = \frac{\sum_{i=1}^{n} Y_{i,j} \cdot (P_{i,j} + A_{i,j}) \cdot N_{i,s-j} \cdot D_{i,s}}{\sum_{i=1}^{n} (P_{i,j} + A_{i,j}) \cdot N_{i,s-j} \cdot D_{i,s}}$$
4.3.2.4.3.2. **Average Duration**

The average duration is calculated by weighting the duration of each bond by the market capitalization of the respective bond.

\[
DU_t = \frac{\sum_{i=1}^{n} D_{i,t} \cdot (P_{i,t} + A_{i,t}) \cdot N_{i,s,t}}{\sum_{i=1}^{n} (P_{i,t} + A_{i,t}) \cdot N_{i,s,t}}
\]

Whereby:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Legend</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(DU_t)</td>
<td>Average duration at time (t)</td>
<td></td>
</tr>
<tr>
<td>(D_{i,t})</td>
<td>Duration of bond (i) at time (t)</td>
<td></td>
</tr>
</tbody>
</table>

4.3.2.4.3.3. **Average Modified Duration**

The average modified duration is calculated by weighting the modified duration of each bond by the market capitalization of the respective bond.

\[
MDU_t = \frac{\sum_{i=1}^{n} MD_{i,t} \cdot (P_{i,t} + A_{i,t}) \cdot N_{i,s,t}}{\sum_{i=1}^{n} (P_{i,t} + A_{i,t}) \cdot N_{i,s,t}}
\]

Whereby:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Legend</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(MDU_t)</td>
<td>Average modified duration at time (t)</td>
<td></td>
</tr>
<tr>
<td>(MD_{i,t})</td>
<td>Modified duration of bond (i) at time (t)</td>
<td></td>
</tr>
</tbody>
</table>
4.3.2.4.3.4.  Average Convexity
The average convexity is calculated by weighting the convexity of each bond by the market
capitalization of the respective bond.

\[
CX_t = \frac{\sum_{i=1}^{n} X_{i,t} \cdot (P_{i,t} + A_{i,t}) \cdot N_{i,t-3}}{\sum_{i=1}^{n} (P_{i,t} + A_{i,t}) \cdot N_{i,t-3}}
\]

Whereby:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX_t</td>
<td>Average convexity at time t</td>
</tr>
<tr>
<td>X_{i,t}</td>
<td>Convexity of bond i at time t</td>
</tr>
</tbody>
</table>

4.3.2.4.3.5.  Average Coupon
The average coupon is calculated by weighting the coupon of each bond by its nominal
outstanding issue size.

\[
CO_t = \frac{\sum_{i=1}^{n} C_{i,t} \cdot N_{i,t-3}}{\sum_{i=1}^{n} N_{i,t-3}}
\]

Whereby:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO_t</td>
<td>Average coupon at time t</td>
</tr>
<tr>
<td>C_{i,t}</td>
<td>Coupon of bond i at time t</td>
</tr>
</tbody>
</table>

4.3.2.4.3.6.  Average Remaining Years to Maturity
The average remaining years to maturity is calculated by weighting the remaining years to
maturity of each bond by its nominal outstanding issue size.

\[
LF_t = \frac{\sum_{i=1}^{n} L_{i,t} \cdot N_{i,t-3}}{\sum_{i=1}^{n} N_{i,t-3}}
\]
4.3.2.4.3.7. Nominal Value
The nominal value of the index is calculated by adding nominal outstanding issue size of each bond together:

\[ NV = \sum_{i=1}^{n} N_{i,j-i} \]

4.3.2.4.3.8. Market Value
The market value of the index at time t is calculated as follows:

\[ MV_t = \sum_{i=1}^{n} \left( P_{i,j-i} + A_{i,j} + XD_{i,j-i} \cdot (CP_{i,j} + G_{i,j}) \right) \cdot N_{i,j-i} \]

4.3.2.4.3.9. Base Market Value
The base market value (i.e. market value as at the base date) of the index is calculated as follows:

\[ MV_0 = \sum_{i=1}^{n} \left( P_{i,j-i} + A_{i,j} + XD_{i,j-i} \cdot CP_{i,j-i} \right) \cdot N_{i,j-i} \]

4.3.2.4.4. Bond Analytics
There are several bond analytics that are calculated in addition to the index values and index analytics. In this chapter, the following annotations are used throughout the bond analytics formulas:

4.3.2.4.4.1. Yield
The yield of a bond at time t is calculated as follows:

\[ P_{i,j} + A_{i,j} = \sum_{j=1}^{n} CashFlow_{i,j} \cdot (1 + Y_{i,j})^{-L_{i,j}} \]
The Newton iteration method is used to solve the equation for \( Y_{i,t} \).

Whereby:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>CashFlow(_{i,j})</td>
<td>Cash flow of bond ( i ) within period ( j )</td>
</tr>
<tr>
<td>( L_{i,t,j} )</td>
<td>Time in coupon periods for bond ( i ) between date ( t ) and the ( j )th cash flow</td>
</tr>
<tr>
<td>( n )</td>
<td>Number of future cash flows</td>
</tr>
</tbody>
</table>

### 4.3.2.4.4.2. Duration

The duration of a bond at time \( t \) is calculated as follows:

\[
D_{i,t} = \frac{\sum_{j=1}^{n} \text{CashFlow}_{i,j} \cdot L_{i,t,j} \cdot (1 + Y_{i,t})^{L_{i,t,j}}}{\sum_{j=1}^{n} \text{CashFlow}_{i,j} \cdot (1 + Y_{i,t})^{L_{i,t,j}}} = \frac{1}{P_{i,t} + A_{i,t}} \cdot \sum_{j=1}^{n} \text{CashFlow}_{i,j} \cdot L_{i,t,j} \cdot (1 + Y_{i,t})^{L_{i,t,j}}
\]

### 4.3.2.4.4.3. Modified Duration

The modified duration of a bond at time \( t \) is calculated as follows:

\[
MD_{i,t} = D_{i,t} \cdot \frac{1}{1 + Y_{i,t}}
\]

### 4.3.2.4.4.4. Convexity

The convexity of a bond at time \( t \) is calculated as follows:

\[
X_{i,t} = \frac{1}{P_{i,t} + A_{i,t}} \cdot \sum_{j=1}^{n} L_{i,t,j} \cdot \left(L_{i,t,j} + 1\right) \cdot \text{CashFlow}_{i,j} \cdot (1 + Y_{i,t})^{L_{i,t,j} + 2}
\]

### 4.3.2.5. SETTLEMENT CONVENTIONS

The indices are calculated assuming \( t+0 \) settlement.

### 4.3.2.6. CALCULATION PERIODS AND CALENDAR

The indices are calculated and distributed every minute in real-time, between 9:00 a.m. and 17:15 p.m. Frankfurt time. Index calculation is based on the STOXX trading calendar - closed on Saturdays and Sundays and on the following Bank holidays:

- New Year's Day
- Good Friday
• Easter Monday
• Christmas Day
• St. Stephen's Day / Boxing day

4.3.2.7. REPORTING
A snapshot of the indices taken at 1:00 p.m. Frankfurt time is published on each STOXX calendar trading day. Index closing values, corresponding bond prices and analytics are published daily on STOXX website, after the close of business. In cases where the last trading day of any given month does not coincide with the last calendar day, separate index levels, will be published for that day.

All data concerning the up-to-date index final composition is published at the evening of index rebalancing. Forecast composition files are available every day starting four trading days before the end of the last month of the rebalancing period. In case of early close days, which depends on the pricing data availability, the reports will be produced close of business, as usual.

4.3.3. INDEX CORRECTION POLICIES
In the event of index value changes more than 2% against the previous index value, the corresponding index is labelled with “U” (unchecked). The calculated index value is subsequently checked for errors. In the case of a deviation in excess of 2% where no error occurred, the index is revalidated (i.e. labelled in line with its corresponding status).

4.3.3.1. INTERNAL ERRORS
If STOXX becomes aware of internal index calculation errors within a trading day, intraday values of the respective index are corrected for that specific day, if technically feasible and economically reasonable. Intraday values, which are not detected within the same trading day are not corrected but will retroactively be flagged as invalid.

If there are deviations that are considered significant by STOXX, index close values also will be corrected retroactively, if technically feasible and economically reasonable.

4.3.3.2. EXTERNAL ERRORS
Calculation errors that are based on incorrect external data are corrected as soon as possible, if technically feasible and economically reasonable. If there are deviations that are considered significant by STOXX, index close values will also be corrected retroactively, if technically feasible and economically reasonable. Intraday values that are not corrected will retroactively be flagged as invalid.

4.3.3.3. CORRECTION OF INDEX PARAMETER VALUES
All index parameters that are published by STOXX in the context of the index review are only corrected or adjusted at the subsequent rebalancing date. This rule applies regardless of when STOXX became aware of facts that would change the index parameter values during the index review process.

4.3.4. EXCEPTIONAL RULES
4.3.4.1. HANDLING OF UNFORSEEABLE EVENTS
In the case of an exceptional unforeseeable event that is not considered in this rulebook, STOXX may under consideration of the respective facts, apply procedures that differ from the aforementioned rules in this rulebook. This holds true especially in cases where i) there are no
applicable rules, ii) the application of present rules does not lead to a clear result, iii) the rules contradict each other, and/or iv) the application of these rules lead to an inappropriate situation in the bond market. An example of an inappropriate situation is if the strict application of the rules heavily influences the liquidity of a company's emissions in the bond market. In the case that STOXX makes a decision that is outside the parameters of the rulebook, the decision will be published within an appropriate notice period.

4.3.4.2. CONSIDERATION OF EXTREME ECONOMIC SITUATIONS AND MARKET DISRUPTIONS

In times of extreme economic situations and market disruptions, especially in cases where the price source is unavailable (e.g. market suspension or restriction), STOXX will generally use the last available price data. Also in times of extreme economic cases, additional exceptions from this rulebook can be made, e.g. postponement of an ordinary review date. All changes will be published within an appropriate notice period.

4.3.5. HISTORICAL DATA

Historical data is available since December, 31st 2010. The base value for all indices is 100 on that date.