

**Markit iBoxx EUR Liquid
Sovereigns Capped AAA-
AA 1.5-5.5 Index**

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1 Markit iBoxx EUR Liquid Indices

The Markit iBoxx EUR Liquid indices are published by Markit and consist of a subset of the bonds in the Markit iBoxx EUR index family of benchmark indices. The index rules have been designed to offer a broad coverage of the market with emphasis on liquidity to be suitable for OTC and exchanged-traded derivatives, and Exchange Traded Funds (ETFs). The indices are an integral part of the global suite of Markit iBoxx Liquid Indices which provide the marketplace with liquid and investable versions of the broader Markit iBoxx benchmark index families.

Broad benchmark indices generally consist of a large number of bonds, especially within the corporate sector. Portfolio managers tracking an index from the broad benchmark Markit iBoxx EUR index family will therefore incur substantial costs in attempting to replicate or hedge the individual bonds in the portfolio. Furthermore, bonds with special features or smaller amounts outstanding usually suffer from illiquid trading, resulting in relatively large bid-ask spreads.

The Markit iBoxx EUR Liquid indices are intended to address these deficiencies by limiting the number of bonds per index and excluding special bond types, thus reducing tracking and hedging costs.

All iBoxx indices are multi-contributor priced. Prices for the bonds in the Markit iBoxx EUR indices are sourced from a number of leading market makers. The received quotes are subject to a rigorous quality control process which excludes stale or off-market prices, and the remaining quotes that pass the quality control are consolidated to the index price. Additionally, the index rules and their application will be governed by two committees:

- **Technical Index Committee:** consists of representatives from market makers / banks and meets on a monthly basis in order to arbitrate monthly rebalancing and to monitor any market developments.
- **Oversight Committee:** consists of representatives from mostly the buy side and meets in order to discuss the decisions of the technical index committee, the wider index rules and any market developments which may warrant rule changes.

This document covers the index rules and calculation methodology.

2 Markit iBoxx € Liquid Sovereign Capped AAA-AA 1.5-5.5 Index Selection Rules

The following selection criteria are used to determine the index constituents:

- Bond type
- Credit Rating
- Time to maturity
- Amount outstanding

2.1 Bond Type

T-Bills and other money market instruments are not eligible for inclusion in the indices.

The list of eligible bond types is as follows:

- Bullet fixed coupon bonds (plain vanilla bonds)

The following bond types are specifically excluded from the index:

- All callable and perpetual debt – including callable dated and undated hybrid bank/insurance capital
- Zero-coupon bonds
- Bonds with odd last coupons
- Sinking funds
- Amortizing bonds

2.2 Credit Rating

All bonds in the Markit iBoxx EUR index family must have a Markit iBoxx Rating of investment grade. Ratings from the following three credit rating agencies are considered for the calculation of the Markit iBoxx Rating:

- Fitch Ratings
- Moody's Investor Service
- Standard & Poor's Rating Services

Investment grade is defined as BBB- or higher from Fitch and Standard & Poor's and Baa3 or higher from Moody's. If a bond is rated by more than one of the above agencies, then the Markit iBoxx rating is the average of the provided ratings. The rating is consolidated to the nearest rating grade. Rating notches are not used. For more information on how the average rating is determined, please refer to the Markit iBoxx Rating Rules. The Rules can be found on www.markit.com/indices under *Markit Bond Indices – Markit iBoxx → Markit iBoxx Rules*.

In order to be eligible for the Markit iBoxx € Liquid Sovereign Capped AAA-AA 1 -5 index, bonds must have a Markit iBoxx rating of AAA or AA.

2.3 Time to Maturity

To qualify for the index all eligible bonds must have a remaining time to maturity of no less than 1.5 years, and no greater than 5.5 years, measured from the respective re-balancing date to the maturity date.

Bonds in the index with a remaining time to maturity of less than 1.25 years will be excluded from the indices at the next re-balancing.

2.4 Amount Outstanding

All bonds require a minimum amount outstanding of EUR 2 bn in order to be eligible for the indices.

2.5 Index Size, Issuer Ordering and Bond Selection

This chapter describes the selection procedure that is applied to determine the liquid bonds for the index.

2.5.1 Index size

The maximum number of bonds in the index is 15

2.5.2 Minimum Number of Bonds

An index is calculated if there are at least three bonds available that match all index criteria. If less than three bonds qualify for an index, then the index level will remain constant. Should at least three bonds qualify again, the index calculation is resumed from the last calculated level.

2.5.3 Ranking Criteria

Should more than the maximum number of bonds be available for the index, the following ordering criteria are applied in order to rank the eligible bonds:

The following five criteria are applied to establish a bond hierarchy:

- Higher amount outstanding
- More recent first settlement date
- Longer time to maturity
- Higher rating
- Lower coupon

These criteria are applied to each pair of bonds in the order stated above until a difference can be established (i.e. if two bonds have the same amount outstanding and the same first settlement date, but one has a longer time to maturity, then criteria 1 to 3 are applied, but 4 and 5 are not). With the help of the ranking criteria, a bond hierarchy can be defined, with the bond that has the highest amount outstanding at the top of the hierarchy.

2.5.4 Limit on Number of Bonds from any Issuer in an Index

The number of bonds from an issuing institution that may enter an index is limited to three bonds.

2.5.5 Weighting

The weight of a country in an index is capped at 30%.

3 Index Calculation

3.1 Static Data

Information used in the index calculation is sourced from offering circulars and checked against standard data providers.

3.2 Bond Prices

The Markit iBoxx EUR Liquid indices is a multiple contributor index. Prices are collected from multiple sources, quality controlled and averaged. The resulting consolidated price is used in the index calculation.

Bid and ask price quotes for bonds in the eligible universe are provided by the contributing price providers on an end-of-day basis. Quotes are sent for all trading days in the respective local currency bond market. Currently, the following market makers submit prices:

- Barclays Capital
- BNP Paribas
- Commerzbank
- Deutsche Bank
- Goldman Sachs
- HSBC
- JP Morgan
- Morgan Stanley
- Royal Bank of Scotland
- UBS

The price consolidation process is described in the Bond Price Consolidation Rules available in the indices section on www.markit.com/indices under *Publications* → *Rules* for registered users.

3.3 Rebalancing Process

The Markit iBoxx EUR Liquid indices are rebalanced every three months at the end of February, May, August and November.

The indices are re-balanced on the last calendar day of the month after the last index calculation. Rebalancing also takes place if the last day of the month falls on a non-business day.

Changes to amounts outstanding are only taken into account if they are publicly known three business days before the end of the month. Changes in ratings are only taken into account if they are publicly known two business days before the end of the month. New bonds issued are taken into account if they are publicly known to settle until the last calendar day of the month, inclusive, and if their rating has become known at least three trading days before the end of the month.

The rebalancing procedure for the Markit iBoxx EUR Liquid indices is analogous to the rebalancing of the Markit iBoxx EUR Benchmark indices.

Four business days before the end of each month, a preliminary membership list is published on the FTP server.

Three business days before the end of each month, a membership list with final amount outstanding for each bond is published. This list contains the maximum number of constituents for the next month.

Two business days before the end of each month, the rating information for the constituents is updated and the list is adjusted for all rating changes which are known to have taken place two trading days before the end of the month. Bonds which are known to have been upgraded to investment grade two trading days before the end of the month are not included in the membership, but bonds which are known to have been downgraded to sub-investment grade two trading days before the end of the month do get excluded from the membership.

On the last business day of each month, Markit publishes the final membership with closing prices for the bonds, and various bonds analytics based on the index prices of the bonds.

3.3.1 Rebalancing Procedure

In a first step the selection criteria are applied to determine an eligible universe for the Markit iBoxx EUR Liquid indices:

- Bond ratings and amounts outstanding are applied as of three business days before the re-balancing date
- A bond remains in its respective maturity bucket until the next re-balancing
- Only bonds with a first settlement date on or before the re-balancing date are included in the selection process

Once the eligible bond universe has been defined, the ranking criteria are employed to determine a distinct hierarchy of bonds in the universe.

Bonds enter the respective index according to their rank in the hierarchy (with the highest rank entering first) until the maximum number of bonds per index has been reached. This does not apply to the Markit iBoxx EUR Liquid Corporates Overall where a special procedure is applied:

3.4 Index Data

The calculation of the index is based on bid quotes. Bonds that are not in the Markit iBoxx EUR Liquid indices for the current month, but become eligible for them at the next re-balancing, enter the indices at their ask price. For the avoidance of doubt, each index is treated separately, so a bond will enter a certain index at its ask price, even if it is already included in a different Markit iBoxx EUR Liquid index. In the event that no consolidated price can be established for a particular bond, the index continues to be calculated based on the last-available consolidated price.

On the last trading day of a month, the rebalancing takes place after the daily index calculation for the current month's list, including the calculation of the last calendar day's indices, has been performed. On the last trading day of the month price contributors submit bid and ask quotes for all new bonds, which are to be included in the index for the new month.

The indices are also calculated on the last calendar day of each month irrespective of holidays and weekends. If the index is calculated on a day that is a non-business day, then the consolidated prices from the previous trading day will be carried forward and the index will be calculated using those prices and the current accrued interest and coupon payment data.

3.5 Index calculus

For specific index formulae please contact iBoxx@markit.com.

3.6 Treatment of the special intra-month events

3.6.1 Index Adjustments between Scheduled Rebalancings

Coupon changes: While most index adjustments are made during the quarterly re-balancing procedure, coupon changes will be effective immediately and the indices are adjusted in the same way.

Bonds no longer in benchmark index: Bonds may drop out of the Liquid index at the end of a month, because they have left the benchmark indices. In this case they are replaced by suitable substitutes, or the proceeds are invested in existing bonds.

Cash Investment: Cash from coupon payments and proceeds from bonds that could not be used to buy other suitable bonds is invested in the money market at the end of each month.

3.6.2 Monthly Bond Substitution between Scheduled Rebalancings

Bonds can leave the Markit iBoxx EUR index universe due to:

- Default of the issue or issuer
- Rating downgrade to sub-investment grade of the issue or issuer
- Reduction in the amount outstanding due to repurchases below threshold level
- Other reasons

Bonds dropping out of the benchmark index will also leave the liquid index at month-end. The procedures in chapters 4.7.2.1 and 4.7.2.2 are applied only if a bond has left a liquid index between re-balancing dates.

4.7.2.1 Substitution List

At the end of the month, the eligible bond universe for the coming month is compiled and published for all liquid indices in accordance with the selection and ranking criteria. These are applied to establish a hierarchy within the eligible bond universe. For each index, all bonds already in the index are eliminated from the hierarchy, resulting in a substitution list for each index. A separate list that contains bonds dropped and the selected substitutes with their fictitious amounts outstanding is published for each index.

In case of multiple substitutions, a ranking should be done for substitutes and deleted bonds in order to assign deleted bond to the substitute. Ranking criteria from section 2.8.3 are applied. The assignment is essential for the determination of the fictitious amount outstanding (formula (11) is applied).

4.7.2.2 Bond Substitution

If the bonds are no longer in the Markit iBoxx EUR Overall benchmark index, they will also leave the liquid indices. For each bond that has left, one other bond will become the substitute and enter the index. The proceeds from the sale of a dropped bond are invested in its substitute. The substitute will have a fictitious amount outstanding:

$$(11) \quad O_{\text{substitute}} = \frac{(P_{\text{dropped}}^b + A_{\text{dropped}}) \cdot O_{\text{dropped}}}{P_{\text{substitute}}^a + A_{\text{substitute}}}$$

where:

A_{dropped}	Accrued interest of dropped bond
$A_{\text{substitute}}$	Accrued interest of substitute bond
O_{dropped}	Amount outstanding of dropped bond
$O_{\text{substitute}}$	Fictitious amount outstanding of substitute bond
$P_{\text{substitute}}^a$	Ask price of substitute bond
P_{dropped}^b	Bid price of dropped bond

If no suitable substitute is available after applying the selection criteria, then the rule concerning the maximum number of bonds from one issuer will be relaxed and the most suitable substitute determined using the other selection and ranking criteria.

For specific cost factor calculation formulae please contact iBoxx@markit.com. The substitute will have a notional amount outstanding based on formula (11).

For the Markit iBoxx EUR Liquid indices a substitute bond enters the index at the ask price.

In the event that no substitute is available, the proceeds from the sale of the dropped bond are invested as cash.

3.6.3 Monthly Cash Re-investment between Scheduled Re-balancing Dates

Cash from received coupons and non-substituted bonds is re-invested at the end of each month in the money market until the end of the following month. Cash from earlier months is also re-invested at the end of each month. The interest rate used is one-month LIBID.

LIBID is defined as the relevant one month EURIBOR less 1/8 (12.5 basis points). At the next rebalancing cash is invested in the index.

3.7 Determination of Benchmarks

Benchmark spreads are calculated for every constituent bond as the difference between the annual or semi-annual yield of the bond and the annual or semi-annual yield of its benchmark. The benchmark assignment for the bonds is reviewed monthly.

Benchmarks for the bonds in the Markit iBoxx EUR Liquid indices are equivalent to the benchmarks for the respective bonds in the Markit iBoxx EUR Benchmark universe. Benchmark bond is defined as the most liquid and low risk bond in each of the maturity bands listed below.

The procedure starts at first running a regression algorithm on all bonds in the Markit iBoxx Eurozone index in order to determine the benchmark curve, and bonds with a positive spread to the curve are eliminated. The procedure is then repeated until one of the following is met:

- (i) R-square above 0.99
- (ii) Standard deviation of yield-spread to curve is less than 3.5 b.p.s.

- (iii) Number of bonds left is between 15 and 40.

The bonds remaining after running the procedure above are assigned to Sets A or B depending on their age. An eligible bond is assigned to Set A within a maturity band if it is not older than two years. Otherwise, it is assigned to Set B. The age of a bond is calculated from the first settlement date to the current rebalancing date. The largest bond (by amount outstanding) of all bonds in Set A is selected as the respective benchmark for each defined maturity band. If Set A is empty, then the most recently issued bond of Set B is chosen as the respective benchmark of the band.

Maturity bands are defined as follows:

- 1 year: Maturity < 1.5 years
- 2 years: Maturity 1.5 to < 2.5 years
- 3 years: Maturity 2.5 to < 3.5 years
- 4 years: Maturity 3.5 to < 4.5 years
- 5 years: Maturity 4.5 to < 5.5 years
- 6 years: Maturity 5.5 to < 6.5 years
- 7 years: Maturity 6.5 to < 7.5 years
- 8 years: Maturity 7.5 to < 8.5 years
- 9 years: Maturity 8.5 to < 9.5 years
- 10 years: Maturity 9.5 to < 12.5 years
- 15 years: Maturity 12.5 to < 17.5 years
- 20 years: Maturity 17.5 to < 25 years
- Long: Maturity 25 years and greater

For every bond in the Markit iBoxx EUR indices, the benchmark bond with the closest maturity is selected as a benchmark. Therefore, the chosen benchmark is not necessarily the same as the benchmark for the maturity band of the bond. If the time to maturity distance of a bond to its two neighboring benchmarks is exactly the same, then the benchmark bond with the closer coupon is chosen. If the coupon distance of the two neighboring bonds is also exactly the same, then the younger of the two benchmark bonds is chosen.

3.8 Index History

The base date of the Markit iBoxx EUR Liquid indices is 31 December 1998.

All indices have a value of 100 on their base dates.

3.9 Settlement Conventions

All Markit iBoxx indices are calculated using the assumption of t+0 settlement days.

3.10 Withholding Tax Clause

The European Union sometimes discusses the introduction of a withholding tax on coupons. This may lead to a situation where the index is calculated using the full coupon, yet a trading desk only receives a net coupon. Should this issue arise, it will be addressed in the index calculation.

3.11 Calendar

Markit publishes an index calculation calendar which is available in the indices section on www.markit.com/indices under *Calendar* for registered users. This calendar provides an overview of the index calculation times of the Markit iBoxx bond index families in a given year.

3.12 Data publication and Access

The table below summarises the publication of Markit iBoxx EUR in the indices section of the Markit website, www.markit.com/indices and on the FTP server.

Daily Files	Access
<ul style="list-style-type: none"> • Underlying file – Bond level • Indices files – Index level 	Markit FTP Server Markit FTP Server/ Markit website/ Bloomberg and Reuters for index levels only
Weekly Files	

<ul style="list-style-type: none">• Previews_components	Markit FTP Server/ Markit website
Monthly files	
<ul style="list-style-type: none">• End of Month Components• XREF files	Markit FTP Server/ Markit website Markit FTP Server

3.13 Further Information

- For contractual or content issues please refer to

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