

Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index Guide

May 2023

Table of Contents

1) Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index	3
2) Selection criteria for the Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index	4
3) Index calculation	5
3.1) Bond and futures prices	5
3.2) Index rebalancing	5
3.3) Index data	5
3.4) Determination of Cheapest-To-Deliver bond	5
3.5) Underlying bond assignment	6
3.6) Calculation of the notional of the futures contracts	6
3.7) Weight of futures contracts	6
3.8) Index calculation	7
3.9) Roll process	8
3.10) Monthly re-investment	8
3.11) Index history	8
3.12) Settlement conventions	8
3.13) Calendar	8
3.14) Publication of the Index	8
3.15) Data publication and access	8
3.16) Annual index review	9
4) Governance and regulatory compliance	10
5) Changes to the Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index	11
6) Further information	12
A) ESG Disclosures	13
Disclaimer	14

1) Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index

The Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index aims to track the performance of a portfolio comprised of EUR-denominated investment grade government bonds issued by the five highest yielding countries chosen among the member countries of the Eurozone while minimising the effect of changes in market interest rates as represented by German government bond yields. The Index aims to achieve a zero duration by taking a long position in the Markit iBoxx EUR Sovereigns Eurozone Yield Plus Index (“Underlying Index”) and short positions in German government bond futures contracts. Duration herein refers to the sensitivity of bond prices to movements in interest rates.

The Underlying Index is a total return index designed to track the performance of a portfolio comprised of EUR-denominated investment grade government bonds issued by the five highest yielding countries chosen among the member countries of the Eurozone.

The eligible contracts for the short position include: Euro-Schatz Futures, Euro-Bobl Futures and the Euro-Bund Futures.

The Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index is rebalanced once a month at the month-end (the “rebalancing date”).

Additionally, the index rules and their application will be governed by two Index Advisory Committees.

This document covers the index family structure, rules and calculation methodology.

2) Selection criteria for the Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index

The index has long positions in the Markit iBoxx EUR Sovereigns Eurozone Yield Plus Index and short positions in the Euro-Schatz, Euro-Bobl and Euro-Bund front month quarterly futures contracts.

Long Position

Markit iBoxx EUR Sovereigns Eurozone Yield Plus Index is a total return index designed to track the performance of a portfolio comprised of EUR-denominated investment grade government bonds issued by the five highest yielding countries chosen among the member countries of the Eurozone. Detailed methodology for the Markit iBoxx EUR Sovereigns Eurozone Yield Plus Index is available on www.ihsmarkit.com.

Short Position

The eligible front month contracts for the short position include the Euro-Schatz, Euro-Bobl and Euro-Bund futures. The contracts follow a quarterly cycle and expire in March, June, September and December.

The “Cheapest-To-Deliver” bonds (“CTD”) for each futures contract are determined at every rebalancing.

3) Index calculation

3.1) Bond and futures prices

The closing prices from Eurex from 5:15 CET are used for the futures.

The Markit iBoxx EUR Sovereigns Eurozone Yield Plus indices are priced based on multiple data inputs.

For more details on the bond prices, please refer to the *Markit iBoxx Pricing Rules* document, publicly available under Methodology on www.ihsmarkit.com.

3.2) Index rebalancing

The Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index is rebalanced monthly on the last business day of the month after the close of business.

The Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index uses futures contracts to fully hedge the duration of the Underlying Index. The hedge positions are reset to achieve zero duration at each monthly rebalancing day.

On the last business day of each month, IHS Markit publishes the final membership.

Rebalancing procedure

At each rebalancing day the notional of each futures contract is determined using the following steps:

- Determine the Cheapest-To-Deliver bond ("CTD") of each futures contract
- Associate each bond with futures contract based on the annual modified duration of the bonds
- Calculate the notional of each futures contract

3.3) Index data

The calculation of the index is based on bid prices. New securities are included in the index at their respective ask prices when they enter the index family. In the event that no price can be established for a particular security, the index continues to be calculated based on the last available price. This might be the case in periods of market stress, or disruption as well as in illiquid or fragmented markets. If the required inputs become impossible to obtain, IHS Markit may consult market participants prior to the next rebalancing date. Decisions are made publicly available on a timely basis and IHS Markit may refer back to previous cases.

The rebalancing takes place after close of market on the last trading day of a rebalancing month.

The indices are transaction cost adjusted. For specific cost factor calculation formulae please refer to the Markit iBoxx Bond Index Calculus document, available in the Methodology section of the Markit iBoxx Documentation page on www.ihsmarkit.com.

3.4) Determination of Cheapest-To-Deliver bond

The CTD bond is the least expensive bond that can be delivered upon expiry to satisfy the requirements of a futures contract.

The CTD bond is used as the proxy of a futures contract in determining the number of contracts required to fully hedge the index.

3.5) Underlying bond assignment

All bonds are associated with one of the futures contract as follows:

- Bonds from, but excluding, 0 years to and including 3 years' annual modified duration are hedged using the Euro-Schatz futures contract.
- Bonds from, but excluding, 3 years to and including 7 years' annual modified duration are hedged using the Euro-Bobl futures contract.
- Bonds with more than 7 years' annual modified duration are hedged using the Euro-Bund futures contract.

3.6) Calculation of the notional of the futures contracts

The notional of the j -th futures contract on the rebalancing day is calculated as below:

$$N_{j,t-s}^F = \frac{CF_{j,t-s}^{CTD} \sum_{i=1}^n \delta_{i,j,t-s} BMV_{i,t-s} MD_{i,t-s}}{P_{j,t-s}^{CTD} MD_{j,t-s}^{CTD} FCS_j}$$

where:	
$N_{j,t-s}^F$	denotes the notional of the j -th futures contract on the rebalancing day
CF_j^{CTD}	denotes the conversion factor of the j -th CTD bond
FCS_j	denotes the contract size (EUR face value) of the j -th futures*
$P_{j,t-s}^{CTD}$	denotes the price of the CTD of the j -th futures contract on the rebalancing day
$MD_{j,t-s}^{CTD}$	denotes the annual modified duration of the j -th CTD bond on the rebalancing day
$MD_{i,t-s}$	denotes the annual modified duration of the i -th bond on the rebalancing day
$\delta_{i,j,t-s}$	is equal to 1 for bond i , if the bond is assigned to the associated j -th futures contract, otherwise 0
i	denotes the i -th bond on rebalancing day
j	denotes the j -th futures contract on rebalancing day

*The contract size is EUR100,000 for the Euro-Bund Futures, Euro-Bobl and Euro-Schatz Futures contracts.

3.7) Weight of futures contracts

The weight of futures contract in the overall short position on rebalancing day $t - s$ is calculated as below:

$$W_{j,t-s}^S = \frac{N_{j,t-s}^F}{\sum_{i=1}^n \frac{BMV_{i,t-s}}{FCS_j}}$$

where:	
$W_{j,t-s}^S$	denotes the weight of the j -th futures contract in short position on the rebalancing day
$N_{j,t-s}^F$	denotes the notional of the j -th futures contract on the rebalancing day
FCS_j	denotes the contract size (EUR face value) of the j -th futures*
i	denotes the i -th bond on rebalancing day
j	denotes the j -th futures contract on rebalancing day

*The contract size is EUR100,000 for the Euro-Bund Futures, Euro-Bobl and Euro-Schatz Futures contracts.

3.8) Index calculation

The Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index is calculated on every index business day.

The index level on index day t is:

$$IL_t = IL_{t-s} \cdot (1 - v_{t-s}^{roll} \cdot rollcost) \cdot \left(1 + \left(\frac{IL_t^{long}}{IL_{t-s}^{long}} - 1 \right) - \sum_{j=1}^3 W_{j,t-s}^S \cdot (P_{j,t}^F - P_{j,t-s}^F) \right)$$

where:	
IL_t	denotes the index level on day
IL_{t-s}	denotes the index level on rebalancing day
v_{t-s}^{roll}	denotes the roll cost indicator. The indicator will be 1 if t is the month following the roll date, otherwise 0
IL_t^{long}	denotes the index level of the long position on day
IL_{t-s}^{long}	denotes the index level of the long position on rebalancing day
$W_{j,t-s}^S$	denotes the weight of the j -th futures contract in short position on the rebalancing day
$P_{j,t}^F$	denotes the price of the j -th futures contract on day t
$P_{j,t-s}^F$	denotes the price of the j -th futures on the rebalancing day
$rollcost$	denotes the actual rollcost; it is assumed to be 1bp

For specific index formulae please refer to *Markit iBoxx Bond Calculus* document, available on the Markit iBoxx Documentation page of www.ihsmarkit.com in the *Methodology* section.

3.9) Roll process

At the rebalancing day prior to the delivery month the futures contract is rolled into the new front month quarterly futures contract. The roll cost is assumed to be 1bp.

3.10) Monthly re-investment

Cash from the long position and positive P/L from the short futures positions is reinvested in the Underlying Index. Negative P/L from the short futures positions is deducted from the long position.

3.11) Index history

The Index history starts on 31 December 2004. The index has a base value of 100 on that date.

3.12) Settlement conventions

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

3.13) Calendar

IHS Markit publishes an index calculation calendar in the *iBoxx Calendars* section of the iBoxx Documentation page on www.ihsmarkit.com. This calendar provides an overview of the index calculation holidays of the iBoxx bond index families in a given year.

3.14) Publication of the Index

The Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index is calculated as end-of-day index and distributed once daily after market close.

Bond and index analytical values are calculated end of day Monday to Friday using that day's closing prices. In addition, bond and index analytical values are calculated using the previous trading day's closing prices on the last calendar day of each month if that day is not a regular trading day as well as on common bank holidays as published in the iBoxx index calculation calendar. This index calculation calendar is available on www.ihsmarkit.com under *iBoxx Calendars*. Index data is also available from the main information vendors.

Closing index values and key statistics are published at the end of each calculation day in the *Indices* section on www.ihsmarkit.com for registered users.

3.15) Data publication and access

The table below summarizes the publication of Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index in the *Indices* section of the IHS Markit website www.ihsmarkit.com for registered users and on the FTP server.

Table 1: Publication frequency, file types and access

Frequency	File Type	Access
Daily	Underlying file – Bond level	IHS Markit FTP Server
	Indices file – Index level	IHS Markit FTP Server / IHS Markit website / Bloomberg for index levels only
Daily from the 6th calendar day of the month (or the next index publication day if the 6th calendar day falls on a non-business day)	Forwards	IHS Markit FTP Server
Monthly	End of Month Components	IHS Markit FTP Server / IHS Markit website

Below is a summary of the identifiers for each publication channel:

Index Name	Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index
Return Type	TRi
SEDOL	BGJZKP2
ISIN	GB00BGJZKP29
Ticker	IBXXH7EU
RIC	.IBXXH7EU

3.16) Annual index review

The rules for the index are reviewed at least once per year during the public annual index review consultation process to ensure that the index provides a balanced representation of the EUR denominated debt market. Decisions made following feedback from market participants, the annual index review and External Advisory Committees (EAC) will be published on www.ihsmarkit.com shortly after the EAC meetings have been held. The publication will contain a detailed overview and timelines for implementation of any rules changes.

4) Governance and regulatory compliance

IHS Markit Benchmark Administration Limited (IMBA UK) is the Index Administrator of iBoxx indices. Information on IMBA UK's governance and compliance approach can be found [here](#). This document covers:

- Governance arrangements, including external committees
- Input data integrity
- Conflicts of interest management
- Market disruption and Force Majeure
- Methodology changes and cessations
- Complaints
- Errors and restatements
- Reporting of infringements and misconduct
- Methodology reviews
- Business continuity

More details about IMBA UK can be found on the [Administrator's website](#).

5) Changes to the Markit iBoxx EUR Sovereigns Eurozone Yield Plus Interest Rate Hedged Index

30 Jun 2022	Monthly forward start date updated from 10th calendar day to 6th calendar day
01 Sep 2021	Monthly forward start date updated from 12th calendar day to 10th calendar day
31 Mar 2021	Governance and Regulatory Compliance section added
01 Dec 2014	- Markit iBoxx EUR index family will follow the pricing methodology described in the document 'Markit iBoxx Pricing Rules' - Index restatement, complaints sections added
30 Nov 2013	Launch of Markit iBoxx EUR Liquid Corporates 100 Interest Rate Hedged Indices

6) Further information

Glossary of key terms

The Markit iBoxx Glossary document of key terms is available in the *Methodology* section of the iBoxx *Documentation* page on www.ihsmarkit.com.

Contractual and content issues

For contractual or content issues please contact:

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EXPLANATION OF HOW ENVIRONMENTAL, SOCIAL & GOVERNANCE (ESG) FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY [1]		
1	Name of the benchmark administrator.	IHS Markit Benchmark Administration Limited (IMBA)
2	Underlying asset class of the ESG benchmark. [2]	N/A
3	Name of the S&P Dow Jones Indices benchmark or family of benchmarks.	iBoxx Benchmark Statement
4	Do any of the indices maintained by this methodology take into account ESG factors?	No
Appendix latest update:		May 2023
Appendix first publication		May 2023

[1] The information contained in this Appendix is intended to meet the requirements of the European Union Commission Delegated Regulation (EU) 2020/1817 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards the minimum content of the explanation of how environmental, social and governance factors are reflected in the benchmark methodology and the retained EU law in the UK (The Benchmarks (amendment and Transitional Provision) (EU Exit) Regulations 2019).

[2] The 'underlying assets' are defined in European Union Commission Delegated Regulation (EU) 2020/1816 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards the explanation in the benchmark statement of how environmental, social and governance factors are reflected in each benchmark provided and published.

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Performance Disclosure/Back-Tested Data

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Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Information presented prior to an index’s launch date is hypothetical back-tested performance, not actual performance, and is based on the index methodology in effect on the launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

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