**S&P Dow Jones
Indices**

A Division of S&P Global

iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices Guide

November 2023

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1) iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices

The iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices aim to provide an inflation hedge to the iBoxx GBP Non-Gilts ex-Financials Indices ("Underlying Indices").

The indices hedge long positions in the Underlying Indices with positions in GBP UK RPI zero coupon inflation rate swaps. The eligible contracts for the swap position include: 3-Year, 5-Year, 7-Year, 10-Year, 15-Year, 20-Year, 25-Year, 30-Year, and 50-Year GBP UK RPI zero coupon inflation rate swaps.

The iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices are rebalanced once a month at the month-end (the "rebalancing date").

This document covers the index selection rules and calculation methodology.

2) Selection criteria for the iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices

The indices have long positions in the iBoxx GBP Non-Gilts ex-Financials Underlying Indices and short positions in GBP UK RPI zero coupon inflation rate swaps.

2.1) Long position

The Underlying Indices in the long position are subsets of the Markit iBoxx GBP Benchmark universe, with additional filters for average life and sector as follows:

Index Name	Level 1	Level 2	Average Life
iBoxx GBP Non-Gilts ex-Financials 1-5	Non-Gilts	ex-Financials	Greater Than Equal to 1 & Less Than 5
iBoxx GBP Non-Gilts ex-Financials 5-10	Non-Gilts	ex-Financials	Greater Than Equal to 5 & Less Than 10
iBoxx GBP Non-Gilts ex-Financials 10-15	Non-Gilts	ex-Financials	Greater Than Equal to 10 & Less Than 15
iBoxx GBP Non-Gilts ex-Financials 15-20	Non-Gilts	ex-Financials	Greater Than Equal to 15 & Less Than 20
iBoxx GBP Non-Gilts ex-Financials 20-25	Non-Gilts	ex-Financials	Greater Than Equal to 20 & Less Than 25
iBoxx GBP Non-Gilts ex-Financials 25-30	Non-Gilts	ex-Financials	Greater Than Equal to 25 & Less Than 30
iBoxx GBP Non-Gilts ex-Financials 30-40	Non-Gilts	ex-Financials	Greater Than Equal to 30 & Less Than 40

 Detailed methodology for the Markit iBoxx GBP Benchmark index is available at https://www.spglobal.com/spdji/en/.

2.2) Inflation swap position

The eligible contracts for the swap position include: 3-Year, 5-Year, 7-Year, 10-Year, 15-Year, 20-Year, 25-Year, 30-Year, and 50-Year GBP UK RPI zero coupon inflation rate swaps with a notional value of GBP 1,000,000 each.

3) Index calculation

3.1) Bond and inflation swap prices

Inflation swap prices are provided by S&P DJI's Portfolio Valuation team.

For more details, please refer to the iBoxx Pricing Methodology document, available at https://www.spglobal.com/spdji/en/.

3.2) Rebalancing process

The iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices are rebalanced monthly on the last business day of the month.

The iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices use GBP UK RPI zero coupon inflation rate swaps to hedge inflation. The hedge positions are reset at each monthly rebalancing day.

A preliminary membership list is published on the 6th calendar day of the month (moved to the next business day in case of holiday/weekend).

Three business days before the end of each month an updated membership list is published.

On the last business day of each month, S&P DJI publishes the final membership.

3.2.1) Rebalancing procedure

On the rebalancing day each bond in the underlying index is paired to a certain number of specific inflation swap contracts. These bond/swap pairs are then aggregated into the inflation hedged index.

The rebalancing process follows the following steps:

- Determine the term for each *j* swap contract, with *j* = {3, 5, 7, 10, 15, 20, 25, 30, 50}
- Each bond is assigned to the two neighboring swap contracts, where available, based on the distance between the bond´s annual modified duration and the term of the inflation swap. If only one neighboring swap is available, the bond is assigned to the swap solely.
- The *delta distribution ratio* $\delta_{i,j,t-s}$ is determined for each bond/swap pair. The distribution weight can be between 0 and 1.
- Determine the notional for each swap contract.
- Calculate the index.

3.3) Determining the distribution weight

The "*delta distribution ratio"* is determined for each bond and swap combination:

1. For all bonds with an annual modified duration below the term of the 3-Year inflation swap contract or greater than the term of the 50-Year inflation swap contract, the "*delta distribution ratio*" is 1. The "*delta distribution ratio*" ratio is 1 also for bonds with an annual modified duration of exactly 3, 5, 7, 10, 15, 20, 25, 30 or 50 years.
2. For all bonds where the annual modified duration is in between the terms of two neighboring swap contracts the "*delta distribution ratio*" is calculated as:

$$\delta_{i,j,t-s} = 1 - \frac{abs(AMD_{i,t-s} - SwapTerm_{j,t-s}^S)}{SwapTerm_{j+1,t-s}^S - SwapTerm_{j,t-s}^S}$$

and

$$\delta_{i,j+1,t-s} = 1 - \delta_{i,j,t-s}$$

Where

$$SwapTerm_{j,t-s}^S \le AMD_{i,t-s} \le SwapTerm_{j+1,t-s}^S$$

3.4) Index calculation

Step 1: Calculate the hedge ratio for each of the two swaps used to hedge each bond

$$HR_{i,j,t-s} = \frac{(DV01_{i,t-s} * \delta_{i,j,t-s})}{SwapIE01_{j,t-s}^S}$$

Step 2: Calculate the number of contracts for each swap needed to hedge the bond

$$S_{i,j,t-s} = \frac{(HR_{i,j,t-s} * N_{i,t-s})}{N_{j,t-s}^S}$$

Step 3: Aggregate the number of swap contracts needed each month

$$\#contracts_{j,t-s}^S = round(\sum_{i=1}^{n} S_{i,j,t-s}, 0)$$

Step 4: Calculate the ratio of each swap contract

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

With $N_{j,t-s}^S$ = GBP 1,000,000

Step 5: Calculate the index level

$$IL_t = IL_{t-s} * (\frac{IL_t^{long}}{IL_{t-s}^{long}} + \sum_{j \in Swap} W_{j,t-s}^S [P_{j,t}^S - P_{j,t-s}^S])$$

For specific index formulae please refer to the iBoxx Bond Index Calculus document, available on https://www.spglobal.com/spdji/en/ under Methodology.

3.5) Monthly reinvestment

P/L from the index is reinvested in the Underlying Indices.

3.6) Index history

The Index history starts on 31 December 2017. The indices have a base value of 100 on that date.

3.7) Settlement conventions

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

3.8) Calendar

S&P DJI publishes an index calculation calendar available on https://www.spglobal.com/spdji/en/ under *iBoxx Indices Calendars*. This calendar provides an overview of the index calculation holidays of the iBoxx bond index families each year.

3.9) Publication of the iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices

The iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices are calculated as end-of-day indices and distributed once daily after close of UK markets.

Bond and index analytical values are calculated end of day Monday to Friday using that day's closing prices and inflation swap valuations. In addition, bond and index analytical values are calculated using the previous trading day's closing prices and inflation swap valuations 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 Indices Calendar available at https://www.spglobal.com/spdji/en/. 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 at https://www.spglobal.com/spdji/en/ for registered users.

3.10) Data publication and access

The table below summarizes the publication of iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices at https://www.spglobal.com/spdji/en/ for registered users and on the FTP server.

Table 1: Frequency, File type and Access

Frequency	File Type	Access
Daily	Underlying file – Bond level	FTP Server
	Indices file – Index level	FTP Server / 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	FTP Server
Monthly	End of Month Components	FTP Server / website

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

Index Name	Return Type	ISIN	Bloomberg	RIC
iBoxx GBP Non-Gilts ex-Financials 1-5 RPI Inflation Hedged	TRI	GB00BRWSL185		.IBXXGRP1
iBoxx GBP Non-Gilts ex-Financials 5-10 RPI Inflation Hedged	TRI	GB00BRWSL292		.IBXXGRP2
iBoxx GBP Non-Gilts ex-Financials 10-15 RPI Inflation Hedged	TRI	GB00BRWSL300		.IBXXGRP3
iBoxx GBP Non-Gilts ex-Financials 15-20 RPI Inflation Hedged	TRI	GB00BRWSL417		.IBXXGRP4
iBoxx GBP Non-Gilts ex-Financials 20-25 RPI Inflation Hedged	TRI	GB00BRWSL524		.IBXXGRP5
iBoxx GBP Non-Gilts ex-Financials 25-30 RPI Inflation Hedged	TRI	GB00BRWSL631		.IBXXGRP6
iBoxx GBP Non-Gilts ex-Financials 30-40 RPI Inflation Hedged	TRI	GB00BRWSL748		.IBXXGRP7

3.11) Annual index review

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

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
- 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) Appendix

5.1) Annotations

$BMV_{i,t-s}$	Base market value of the *i-th* bond constituent at the rebalancing day *t-s*
$\delta_{i,j,t-s}$	"*delta distribution ratio*" for bond *i* and *j-th* swap contract at the rebalancing day *t-s*
IL_t	Index level on day *t*
IL_t^{long}	Index level of the long index on day *t*
$AMD_{i,t-s}$	Annual modified duration of the *i-th* bond constituent at the rebalancing day *t-s*
$SwapTerm_{j,t-s}^{S}$	Term of the *j-th* swap contract at the rebalancing day *t-s*
$N_{j,t-s}^{S}$	Notional of the *j-th* swap contract at the rebalancing day *t-s* [1]
$N_{i,t-s}$	Notional of the *i-th* bond constituent at the rebalancing day *t-s*
$P_{j,t-s}^{S}$	Price of the *j-th* swap contract at the rebalancing day *t-s*
$\#contracts_{j,t-s}^{S}$	Number of the *j-th* swap contract at the rebalancing day *t-s*
Swap	Set of eligible swap contracts (3-Year, 5-Year, 7-Year, 10-Year, 15-Year, 20-Year, 25-Year, 30-Year and 50-Year)
$W_{j,t-s}^{S}$	Ratio of the *j-th* swap contract on the rebalancing day *t-s*

[1] The notional is GBP 1,000,000 for the 3Y, 5Y, 7Y,10Y,15Y,20Y,25Y, 30Y, 50Y GBP UK RPI zero coupon inflation rate swaps.

6) Changes to the iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices

26 Sep 2023	Launch of the iBoxx GBP Non-Gilts ex-Financials RPI Inflation Hedged Indices

7) Further information

Client support

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Formal complaints

Formal complaints should be emailed to spdji_compliance@spglobal.com.

Please note: spdji_compliance@spglobal.com should only be used to log formal complaints.

General index inquiries

For general index inquiries, please contact indices@ihsmarkit.com.

A) ESG Disclosures

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:		September 2023
Appendix first publication:		September 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.

Disclaimer

Performance Disclosure/Back-Tested Data

Where applicable, S&P Dow Jones Indices and its index-related affiliates ("S&P DJI") defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P DJI defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

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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