S&P Dow Jones Indices

A Division of S&P Global

Short Markit iBoxx JPY Total Return Indices

May 2023

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1) Short Markit iBoxx JPY Total Return Indices

This document details the technical calculation of the Short Markit iBoxx JPY Total Return Indices:

- Short Markit iBoxx Sovereign Japan Index.

The above index measures the performance of holding a short position in the Markit iBoxx Sovereign Japan Index (hereafter referred to as the “Underlying index”). The Markit iBoxx Sovereigns Japan index contains central government bonds issued by Japan (JGBs) of at least JPY 200 bn in size.

The Markit iBoxx Sovereign Japan Total Return Index, the MUTAN rate and a repo rate are used as inputs.

The returns from MUTAN and the repo rate stem from the fact that the indices are long funding from investors’ subscriptions and the funding received from holding short positions in the constituent bonds of the indices. This means that the fund can invest twice the funding in the money market.

The repo rate is the difference between the MUTAN rate and an indicative market cost of borrowing the bonds in order to short them.

2) Index Calculation

2.1) Description

The indices are calculated daily one each Tokyo Business Day. The daily returns for the indices are calculated as follows:

$$tr_t^{Daily} = -(\frac{TR_t^{underlyingindex}}{TR_{t-1}^{underlyingindex}} - 1) + (r_{t-1}^{MUTAN} + r_{t-1}^{Repo}) * \frac{days(t-1,t)}{365}$$

The corresponding index levels are calculated as follows:

$$TR_t^{ShortiBoxx} = (1 + tr_t^{daily}) * TR_{t-1}^{ShortiBoxx}$$

where:

$days(t-1,t)$ is the number of calendar days between (t-1) and t, including t but excluding (t-1)

r_{t-1}^{MUTAN} is the MUTAN rate on day (t-1)

r_{t-1}^{Repo} is the assumed repo rate on day (t-1)

t is the calculation day t

(t-1) is the previous calculation day

tr_t^{Daily} is the daily return of the index on day t

$TR_t^{underlyingindex}$ is the total return index level of underlying index on day t

$TR_t^{ShortiBoxx}$ is the index level of the Short iBoxx index on day t

2.2) Other Input Factors

MUTAN: The Uncollateralized Overnight Call Rate as published by the Bank of Japan (Series ST'STRDCLUCON).

Repo rate: The assumed repo rate is MUTAN – COST_repo %. The COST_repo rate is published on www.ihsmarkit.com for each index and period.

In the event that no rate is available, the indices continue to be calculated based on the last available rate. This might be the case in periods of market stress, or disruption.

The assumed repo rate may vary at the discretion of IHS Markit, the index calculator, if, following discussion with market participants, it is determined that a different rate is a better reflection of market conditions. A notice announcing the change and the new rate will be posted on www.ihsmarkit.com at least one week before the change becomes effective.

3) 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.

4) Changes to the Short Markit iBoxx JPY Total Return Indices

31 Mar 2021	Governance and Regulatory Compliance section added
23 Oct 2002	• Introduction of the Short Markit iBoxx JPY Total Return Indices

5) 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

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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:		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.

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.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate certain ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using “Backward Data Assumption” (or pulling back) of ESG data for the calculation of back-tested historical performance. “Backward Data Assumption” is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as “product involvement”) were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on “Backward Data Assumption” please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used. Index returns shown do not represent the results of actual trading of investable assets/securities. S&P DJI maintains the index and calculates the index levels and performance shown or discussed but does not manage any assets.

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