S&P Dow Jones Indices

A Division of S&P Global

iBoxx USD Breakeven 10-Year Inflation Index Methodology

March 2025

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1 Introduction

The Markit iBoxx USD Breakeven 10-Year Inflation Index is designed to provide exposure to breakeven inflation by entering into a long position in US 10-Year Treasury Inflation-Protected securities (TIPS) and a short position in 10-Year US Treasury bonds with adjacent durations.

The Markit iBoxx USD Breakeven 10-Year Inflation Index shorts US Treasury bonds and invests into TIPS from the eligible universe described later in the document. The base inflation index for the TIPS is US CPI. The Treasury position is constructed in a way that the duration of the Markit iBoxx USD Breakeven 10-Year Inflation Index is neutralized.

Exposure to any TIPS within the TIPS portion of the Markit iBoxx USD Breakeven 10-Year Inflation Index and to any Treasury bond within the Treasuries portion of the index cannot exceed 30% at any rebalance date. In addition, Markit iBoxx USD Breakeven 10-Year Inflation Index must contain a total of six TIPS and at least six Treasury bonds, at any point in time.

This document covers the index rules and calculation methodology.

2 Bond selection criteria

2.1 Bond type

2.1.1 Markit iBoxx USD 10-Year TIPS

The index is comprised of USD- denominated 10-year TIPS. The base inflation index for the TIPS is US CPI. The coupon of the bond must be fixed.

2.1.2 Markit iBoxx USD 10-Year Treasuries

The index is comprised of USD- denominated 10-year Treasury bonds. The coupon of the bond must be fixed.

2.2 Time to maturity

Markit iBoxx USD Breakeven 10-Year Inflation Index includes only bonds that have been issued at a 10-year maturity. All bonds must have a minimum remaining time to maturity of at least one year at the rebalance date. Bonds with a remaining life of less than one year are no longer eligible.

2.3 Outstanding amount

Bonds require a minimum outstanding par amount of USD 500 million in order to be eligible for the index.

2.4 Bond selection procedure

2.4.1 Eligible universe for the Markit iBoxx USD 10-Year TIPS

The eligible universe consists of on-the-run (OTR) and off-the-run 10-year TIPS.

2.4.2 Eligible universe for the Markit iBoxx USD 10-Year Treasuries

The eligible universe consists of on-the-run (OTR) and off-the-run 10-year US Treasury bonds.

2.4.3 Bond selection process

At each rebalance date, constituents are determined as follows:

1. Determine whether there is a new OTR TIPS added to the index ("TIPS roll month")[1]. If there is no new OTR TIPS, the relationship between the TIPS and Treasury bonds is kept unchanged from the previous month-end, with notional amounts unchanged but bond weights and scaling factors allowed to drift with market prices, as long as the index weights remain within the weight threshold described later in the document. If the weight threshold is breached, or if the month of rebalance is a TIPS roll month, the relationship between the TIPS and Treasury bonds is determined as described below:
    a. TIPS constituents are determined as follows:
        1. Rank all TIPS in the eligible universe in ascending order of age, and select the first six bonds.

2. Allocate a weight of 28% to the on-the-run (OTR) TIPS.
3. The remaining five off-the-run TIPS are weighed based on age, using an exponential decay and a maximum weight cap of 28%, with the newest bond having the largest weight.

2. Determine the real annual modified duration for the six TIPS constituents.
3. Rank the eligible Treasury bonds by nominal annual duration, in descending order.
4. For each TIPS at least one "comparable" Treasury bond is identified from the available universe, as follows:
   a. Each TIPS is associated with two neighboring Treasury bonds with closest annual modified duration to the annual modified duration of the TIPS (referred to as "comparable" bonds).[2,3,4,5]
   b. In order to determine the amount of the "comparable" bond that needs to be shorted, the weighted distance ("distribution ratio") between the "comparable" bonds and the TIPS is calculated:
      1. If the TIPS can be paired with two Treasury bonds, the distribution ratio is determined as follows:

         $$\delta_{i,j,t-s} = 1 - \frac{abs(DUR^{ILB}_{i,t-s} - DUR^{NSov}_{i,j,t-s})}{DUR^{NSov}_{i,j+1,t-s} - DUR^{NSov}_{i,j,t-s}}$$

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

         where[3]

         $$DUR^{NSov}_{i,j,t-s} \leq DUR^{ILB}_{i,t-s} \leq DUR^{NSov}_{i,j+1,t-s}$$

         In this case, distribution ratios are between 0 and 1. The weights for the two Treasury bonds are calculated as follows[6]:

         and

         Therefore the following relationship will hold:
      2. If only one "comparable" bond is available, the distribution ratio is 1. The weight of the Treasury bond is[6]: $w^{NSov}_{i,j,t-s} = \frac{w^{ILB}_{i,t-s} * DUR^{ILB}_{i,t-s}}{DUR^{NSov}_{i,j,t-s}}$ And the following relationship will hold:

         $$w^{ILB}_{i,t-s} * DUR^{ILB}_{i,t-s} = w^{NSov}_{i,j,t-s} * DUR^{NSov}_{i,j,t-s}$$

5. Once all the six TIPS have been paired, the weight of each Treasury bond is[7]: $w'^{NSov}_{j,t-s} = \sum_{i=1}^{m} w^{NSov}_{i,j,t-s}$
6. The amount that needs to be shorted is based on the cumulative weight of the Treasury bonds. The notional that needs to be shorted is determined at the bond selection date (*t-2*). The scaling factor between the total TIPS and the total "comparable" Treasury bonds is calculated as:

   $$\Delta_{t-s} = \frac{\sum_{j=1}^{n} w'^{NSov}_{j,t-s}}{\sum_{i=1}^{m} w^{ILB}_{i,t-s}}$$

7. The weight of each Treasury bond within the Treasury index is calculated by normalizing the $w^{NSov}_{i,j,t-s}$ weights.

[1] The roll into a new OTR TIPS takes place at the end of the month following the first settlement date of the newly issued TIPS. The roll into a new OTR Treasury can only take place in a TIPS roll month.

[2] In the formulas below, the comparable bond with lower duration than the TIPS will be identified using the subscript *j*, while the comparable bond with higher duration than the TIPS will be identified with the subscript *j+1*

[3] Real annual modified duration is used for TIPS, and nominal annual modified duration is used for Treasuries.

[4] If two bonds have identical annual modified duration, the one with higher notional amount outstanding is prioritized. If there is still a tie, the bond with the higher ISIN (ranked in alpha-numerical order) is selected.

[5] There are instances when only one neighboring nominal "comparable" bond is available, either because;

- The inflation-linked bond has the longest tenor and there is no nominal sovereign bond with a higher duration, or
- The inflation-linked bond has the shortest tenor and there is no nominal sovereign bond with a lower duration.

[6] The total exposure to any Treasury bond within the Treasury position is monitored throughout the process to ensure compliance with the maximum weight rule described in the document. If the weight capping restriction is breached at any point in time, the excess weight is allocated to the next available Treasury bond with closest annual modified duration. The process is iterated until the weight threshold is met for all Treasury bonds. As a result of the iterations, each TIPS can be ultimately paired with more than two Treasury bonds.

[7] Weights before normalization.

3 Index calculation

The index is calculated and published as a total return index.

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 index calculation is based on mid-prices[1].

For more details, please refer to the *iBoxx Pricing Methodology,* available at www.spglobal.com/spdji.

[1] Calculation is based on bid prices prior to 9/30/2010.

3.3 Total return calculation

Total return index level of the Markit iBoxx USD Breakeven 10-Year Inflation index is calculated as follows:

$$TR_t = TR_{t-1} * [R^{ILB}_{t-1,t} - \Delta_{t-s} * (R^{NSov}_{t-1,t} - \frac{daysACT(t-1,t)}{360} * r^{Repo}_{t-1} - 1)]$$

The total return for the TIPS index and Treasury index is calculated based on the standard iBoxx calculation.

The “repo return” is calculated as the difference between the Federal Funds rate (FFR) and the indicative market cost (“Indicative fee”) of borrowing the bonds:

After the rebalancing, the index level for next month is adjusted for transaction costs as follows:

For specific index formulae please refer to Markit iBoxx Bond Calculus document, available on the Markit iBoxx Documentation page of www.markit.com in the Methodology section on the left-hand side of the page.

3.3.1 Rebalancing costs

To incorporate costs at rebalancing, which might occur, the following procedure is applied. The cost factor is split into cost that might occur due to rebalancing in the TIPS component of the index and the Treasuries component of the index.

The index is always evaluated at mid prices. For the TIPS portfolio, bonds are sold at bid price and bought at ask price; for the Treasuries portfolio, short positions of bonds are reduced at ask price and increased at bid price. Hence, portfolio prices can be determined by bond weight difference before rebalancing and after rebalancing. For a detailed description of the cost factor calculation please see the Appendix.

3.4 Re-investment of cash

Payments from coupons and scheduled partial and unscheduled full redemptions are held as cash, without interest, until the next rebalancing, when the cash is reinvested in the index.

3.5 Index data

The following inputs are used for the index calculation:

3.5.1 Federal funds rate

The Federal Funds rate as published by the Federal Reserve.

3.5.2 Indicative fee for the index

The $IndicativeFee_{t-s}^{Index}$ is calculated as the weighted-average indicative fee of the current index constituents bonds where an indicative fee is available from Markit Security Finance. The indicative fee is observed as the 10-day average over the period from 12 previous business days prior to month-end (t-12) to (t-3). The $IndicativeFee_{t-s}^{Index}$ is published after the close of business two business days prior to month-end (t-2).

3.6 Rebalancing process

The Markit iBoxx USD Breakeven 10-Year Inflation Index is rebalanced monthly, on the last business day of the month after the close of business.

The relationship between the TIPS and the Treasury bonds changes when new on-the-run US10-year TIPS are added to the index (“TIPS roll month”). In all other months, the relationship between the TIPS and Treasury bonds is kept unchanged from the previous month-end, with notional amounts unchanged but bond weights and scaling factors allowed to drift with market prices, as long as the index weights remain within the weight threshold described in the document. In instances when the weights of either the TIPS or the Treasury bonds exceed the weight threshold in a month other than the TIPS roll month, the relationship between the TIPS and Treasury bonds is determined following the alternative procedure found earlier in the document.

From the 6th day of the month (or the next index publication day if the 6th calendar day falls on a non-business day), a preliminary membership list is published. This list contains preliminary information on amount outstanding of all bonds.

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

Two business days prior to month end the indicative fee for the following month is published.

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

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

3.7 Index weights

Exposure to any TIPS within the TIPS portion of the Markit iBoxx USD Breakeven 10-Year Inflation Index and to any Treasury bond within the Treasuries portion of the index cannot exceed 30% at any rebalance date. In addition, Markit iBoxx USD Breakeven 10-Year Inflation Index must contain a total of six TIPS and at least six Treasury bonds, at any point in time.

3.8 Index history

The Index history starts on 28 February 2007. The index has a base value of 100 on that date.

3.9 Settlement conventions

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

3.10 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.

3.11 Publication of the Markit iBoxx USD Breakeven 10-Year Inflation Index

All indices are calculated as end-of-day and distributed once daily. The publication schedule is presented in the iBoxx Indices SFTP Guide available on *http://www.spglobal.com/spdji* in the Methodology section. The indices are calculated every day where the Federal Funds rate is expected to be published by the Federal Reserve Bank except on common US bank holidays. In addition, the indices are calculated on the last calendar day of each month if that day is not a trading day. S&P DJI publishes an index calculation calendar which is available on *http://www.spglobal.com/spdji*in the Documentation section. Index data and bond price information is also available from the main information vendors.

Bond and index analytical values are calculated each trading day using the daily closing prices. Closing index values and key statistics are published at the end of each business day in the indices section on *http://www.spglobal.com/spdji* for registered users.

3.12 Data publication and access

The table below summarizes the publication of the Markit iBoxx USD Breakeven 10-Year Inflation Index at https://www.spglobal.com/spdji/en/ for registered users and on the FTP server.

In addition to the indices detailed in this methodology, other indices covered by this document may be available. For a list of available indices, please refer here.

Table 1: ***Frequency, file type and access***

Frequency	File Type	Access
Daily	Underlying files – Bond level	FTP Server
	Indices files – 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)	Forward Files	FTP Server
Monthly	End of Month Components	FTP Server / website
	XREF files	FTP Server

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

Name of index	ISIN (TRI)	Sedol	BBG Ticker	RIC
Markit iBoxx USD Breakeven 10-Year Inflation	GB00BYVXD172	BYVXD17	IBXXUBF1	.IBXXUBF1
Markit iBoxx USD Breakeven 10-Year Inflation (EUR Hedged)	GB00BDGJ2271	BDGJ227	IBXXIN24	.IBXXIN24
Markit iBoxx USD Breakeven 10-Year Inflation (EUR Unhedged)	GB00BDGJ2388	BDGJ238	IBXXIN25	.IBXXIN25
Markit iBoxx USD Breakeven 10-Year Inflation (GBP Hedged)	GB00BL09ZZ34	BL09ZZ3	IBXXUBY1	.IBXXUBY1
Markit iBoxx USD Breakeven 10-Year Inflation (GBP Unhedged)	GB00BL0B0094	BL0B009	IBXXUBY2	.IBXXUBY2
Markit iBoxx USD Breakeven 10-Year Inflation TIPS (Nominal)	GB00BYVXD735	BYVXD73		
Markit iBoxx USD Breakeven 10-Year Inflation TIPS (Real)	GB00BYW8NG66	BYW8NG6		
Markit iBoxx USD Breakeven 10-Year Inflation Treasuries	GB00BYW8NJ97	BYW8NJ9		

3.13 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.

3.14 Index Governance

Index Committee

An S&P Dow Jones Indices Index Committee maintains the indices. All committee members are full-time professionals at S&P Dow Jones Indices. Meetings are held regularly. The Index Committee oversees the management of the indices, including determinations of intra-rebalancing changes, maintenance and inclusion policies, and other matters affecting the maintenance and calculation of the indices.

In fulfilling its responsibilities, the Index Committee has full and complete discretion to (i) amend, apply, or exempt the application of index rules and policies as circumstances may require and (ii) add, remove, or by-pass any bond in determining the composition of an index.

The Index Committee may rely on any information or documentation submitted to it or gathered by it that the Index Committee believes to be accurate. The Index Committee reserves the right to reinterpret publicly available information and to make changes to the indices based on a new interpretation of that information at its sole discretion. All Index Committee discussions are confidential.

The Index Committee is separate from and independent of other analytical groups at S&P Global. In particular, the Index Committee has no access to or influence on decisions by S&P Global Ratings analysts.

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

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.

For more information on index governance policies, please refer here.

4 Appendix

4.1 Cost factor calculation

To determine the cost factor at each rebalancing the following information is used:

Transaction cost summary for the long portfolio

Region	Description	Portfolio price[2]	Index Price	New Portion	Old Portion	Cost
1	Bond drops out	Bid	Mid	0	f^-	Yes
2	Bond needs to be sold partially	Bid	Mid	f^+	f^-	Yes
3	(2$^-$) Bond does not need to be purchased	Mid	Mid	f^+	f^-	No
	(2$^+$) Bond has to be purchased[1]	Ask	Mid	f^+	f^-	Yes
4	New bond to the index	Ask	Mid	f^+	0	Yes

Transaction cost summary for the short portfolio

Region	Description	Portfolio price[2]	Index Price	New Portion	Old Portion	Cost
1	Bond drops out	Ask	Mid	0	f^-	Yes
2	Short position needs to be reduced partially	Ask	Mid	f^+	f^-	Yes
3	(2$^-$) Bond's position does not change	Mid	Mid	f^+	f^-	No
	(2$^+$) short position has to be increased[1]	Bid	Mid	f^+	f^-	Yes
4	New bond to the index	Bid	Mid	f^+	0	Yes

[1] 2+: Region of all bonds with a weight increase in the portfolio: f+ > f-

[2] For the change in amount outstanding during the rebalancing

The cost factor is calculated as follows:

$$CostFactor = (1 - Cost_{t-s}^{ILB}) * (1 - Cost_{t-s}^{SovLong}) * (1 - Cost_{t-s}^{SovShort})$$

and

where[3, 4]

and

where[5, 6]

and

where

[3] $w^{ILB}_{i,t-}$ is normalized.

[4] In the formula for $w^{ILB}_{i,t-}$, since it is right before rebalancing, t-s stands for the last calendar day of the previous month. For example, if calculation date is Aug 31st, t-s in the formula of $w^{ILB}_{i,t-}$ is Jul 31st.

[5] $w^{NSov}_{i,t-}$ is normalized

[6] In the formula for $w^{NSov}_{i,t-}$, since it is right before rebalancing, t-s stands for the last calendar day of the previous months. For example, if calculation date is Aug 31st, t-s in the formula of $w^{NSov}_{j,t-}$ is Jul 31st.

4.2 Calculation of cost factor weights

For any index, the weighting per bond before and after rebalancing can be described as follows:

Before:

$$w_i^- = \frac{(P_i^I + A_i) * f_i^-}{M^-}$$

After:

The same applies to cash. Solving for f^+_i and f^-_i leads to:

Before:

After:

The market value using index prices can be expressed using the new amount:

And using transaction prices:

Since no cash is added or taken from the portfolio at the rebalancing, the assumption of no further cash addition leads us to the following equation:

That is the market value of the portfolio before the rebalancing equals the market value after rebalancing using transaction prices.

Combining the formulas above:

Or simplified:

f^+_i and f_i can be replaced in the previous formula:

Solving for M^+_I gives:

Cost means the relative difference between market value of the portfolio using transaction prices to the portfolio valued with index prices:

Since $M^- = M^+_P$, it leads to:

4.3 Annotations

A_i = Accrued interest for bond i

$BidOffer_j^{NSov}$ = Bid-offer spread of Treasury bond j

$w^{NSov}_{i,j,t-s}$ = Weight of Treasury bond j assigned from its pairing TIPS i at last rebalancing

$w'^{NSov}_{j,t-s}$ = Total weight (before normalization) of Treasury bond j at last rebalancing

$DUR^{ILB}_{i,t-s}$ = Annual modified duration in real term for TIPS i at last rebalancing

$DUR^{NSov}_{i,j,t-s}$ = Annual modified duration for Treasury bond j at last rebalancing which paired with TIPS i

f_i = Amount invested for bond if^+_i = Amount invested per bond after the rebalancingf_i = Amount invested per bond before the rebalancing

i = Bonds in the TIPS portfolio

j = Bonds in the Treasuries portfolio

$LCR^M_{i,t-}$ = Month to date local return for bond i before the rebalancing

m = Number of bonds in the TIPS portfolio

M^- = Market value of the breakeven inflation portfolio before the rebalancing

M^+_I = Market value of the breakeven inflation portfolio after rebalancing based upon index prices

M^+_P = Market value of the breakeven inflation portfolio after rebalancing based upon transaction prices

$MV_{i,t}$ = Market value of bond i at date t

MV_t = Market value of all bonds in the index at time t

MV^+_i = Market value of bond i after rebalancing

MV^-_i = Market value of bond i before rebalancing

n = Number of bonds in the Treasuries portfolio

P^I_i = Index price of bond i in the TIPS index

P^{P}_{i} = Portfolio price of bond i in the TIPS index

P^{I}_{j} = Index price of bond j in the Treasury bond index

P^{P}_{j} = Portfolio price of bond j in the Treasury bond index

$R^{ILB}_{t-1,t}$ = Daily total return of the TIPS portfolio

$R^{NSov}_{t-1,t}$ = Daily total return of the Treasuries portfolio

TR_{t} = Total return index level at time t

TR_{t-} = Total return index level right before rebalancing

TR_{t-s} = Total return index level at last rebalancing

$w^{ILB}_{i,t-s}$ = Weight of bond i in the TIPS index at last rebalancing

$w^{ILB}_{i,t-}$ = Weight of bond i in the TIPS index right before rebalancing

$w^{ILB}_{i,t+}$ = Weight of bond i in the TIPS index right after rebalancing

$w^{NSov}_{j,t-s}$ = Weight of bond j in the Treasuries index at last rebalancing

$w^{NSov}_{j,t-}$ = Weight of bond j in the Treasuries index right before rebalancing

$w^{NSov}_{j,t+}$ = Weight of bond j in the Treasuries index right after rebalancing

$w_{cash,t-}$ = Weight of cash in the index prior to the rebalancing

$w_{cash,t+}$ = Weight of cash in the index after the rebalancing

$\delta_{i,j,t-s}$ = Distribution ratio from TIPS i to the pairing Treasury bond j at last rebalancing date

Δ_{t-s} = Scaling factor for the short Treasuries index at last rebalancing

5 Changes to the Markit iBoxx USD Breakeven 10-Year Inflation Index

31 Mar 2025	**Annual Index Review 2024** • Update to minimum amount outstanding
30 Jun 2022	• Monthly forward start date updated from 10th calendar day to 6th calendar day
09 Dec 2021	• Launch of Markit iBoxx USD Breakeven 10-Year Inflation Index (GBP Hedged)
01 Sep 2021	• Monthly forward start date updated from 12th calendar day to 10th calendar day
28 Feb 2021	• Governance and Regulatory Compliance section added
31 Oct 2020	• Changes on ranking criteria implemented following consultation
09 Feb 2016	• Launch of the Markit iBoxx USD Breakeven 10-Year Inflation Index

6 Further information

Client support

For client support please contact index_services@spglobal.com.

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 index_services@spglobal.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.**	S&P Dow Jones Indices Limited
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 by 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. Also, the treatment of corporate actions in back-tested performance may differ from treatment for live indices due to limitations in replicating index management decisions. 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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