

iBoxx Trepp CMBS Benchmark Index Methodology

November 2025

Table of Contents

Markit iBoxx Trepp CMBS Benchmark Index	3
Table: The Markit iBoxx Trepp CMBS Benchmark Index family	3
Publication of the Markit iBoxx Trepp CMBS Benchmark Index	4
Bond selection rules	5
Market issue	5
Deal type	5
Bond type	5
Country	6
Deal notional	6
Bond notional	6
Weighted average life (WAL)	6
Credit rating	6
Bond classification	8
Overall bond classification scheme	8
Index calculation	10
Static data	10
Bond prices	10
Rebalancing process	10
Index data	10
Index calculus	10
Treatment of the special intra-month events	11
Missing prices and analytics	11
Newly issued bonds	11
Distressed bonds	11
Index weighting	11
Index history	11
Settlement conventions	11
Calendar	11
Data publication and access	11
Index review	12
Appendix	13
Index calculation	13

Index analytics	15
Annotations	18
Changes to the Markit iBoxx Trepp CMBS Benchmark Index	26
Further information	27
Formal complaints	27
ESG Disclosures	28
Disclaimer	29
Performance Disclosure/Back-Tested Data	29
Intellectual Property Notices/Disclaimer	30
ESG Indices Disclaimer	32

Markit iBoxx Trepp CMBS Benchmark Index

The Markit iBoxx Trepp CMBS Benchmark Index is designed to reflect the performance of USD denominated commercial mortgage backed securities which are rated as investment grade at issuance. The index rules aim to offer a broad coverage of the USD CMBS universe and ensure minimum standards of investability and liquidity. The indices are an integral part of the global iBoxx index families, which provide the marketplace with accurate and objective reference indices by which to assess the performance of bond markets and investments.

The Markit iBoxx Trepp CMBS Benchmark Index is broken down into sub-indices based on the following features: ratings, seniority, vintage, sector, top state, weighted-average-life (WAL) and delinquency rate.

All iBoxx CMBS indices static and pricing data are provided by Trepp, LLC.

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

Table: The Markit iBoxx Trepp CMBS Benchmark Index family

Markit iBoxx Overall Indices Trepp CMBS Benchmark Index
Initial Rating Indices (AAA, AA, A, BBB)
Current Rating Indices (AAA, AA, A, BBB, BB, B, CCC, CC, C)
Seniority Indices (SuperSenior, MezzSenior, SubSenior, Subordinated)
Vintage Indices (By year)
Sector Indices (Retail, Office, Multifamily, Hotel, Health Care, Industrials, Specialty, Diversified)
State Indices (By top 1 state)
Weighted Average Life Indices (1-3, 3-5, 5-7, 7-10, 10+)
Delinquency Rate Indices (0, 0-0.01, 0.01-0.05, 0.05-0.1, 0.1+)

The Initial rating indices are the Benchmark Overall Index grouped by the average initial ratings that include AAA, AA, A and BBB.

The current rating indices are the Benchmark Overall Index grouped by the average current ratings that include AAA, AA, A, BBB, BB, B, CCC, CC to C.

The seniority indices are the Benchmark Overall Index divided into indices for SuperSenior, MezzSenior, SubSenior and Subordinated bonds.

As CMBS deals revived after the crisis, some deal characteristics have changed. Hence, the Benchmark Overall Index is divided into sub-indices by year of issuance.

The sector indices are the Benchmark Overall Index divided into indices for CMBS bonds mainly backed by retail, office, multifamily, hotel, health care, industrials, specialty or diversified types of loans.

The state indices are the Benchmark Overall Index divided into indices by top state of the loans supporting CMBS bonds.

The WAL indices are the Benchmark Overall Index divided into indices for bonds with a weighted average life of 1-3, 3-5, 5-7, 7-10, 10+ years.

The delinquency rate Indices are the Benchmark Overall Index divided into indices for bonds with a delinquency rate of 0, 0-0.01, 0.01-0.05, 0.05-0.1 and 0.1+.

The bond classification schema is shown in Section 3.1. Bonds are assigned to an index using the classification levels in Section 3.

Publication of the Markit iBoxx Trepp CMBS Benchmark Index

All indices are calculated at the end of each business day and are re-balanced at the end of each month. The indices are calculated on the basis of end-of-day Trepp prices on each trading day defined in the iBoxx CMBS Index calculation calendar. The index calculation calendar is available on the S&P DJI website. Index data and bond price information are also available from the main information vendors.

The index calculation calendar conforms to the recommendations of the Securities Industry and Financial Markets Association (SIFMA):

- The indices are calculated on each SIFMA recommended US trading day and on the last calendar day of each month.

Prices for all bonds are taken at 4pm EST. Following collection of prices, price consolidation and index and analytics calculations take place. Index data is published and distributed approximately 2 hours after price delivery.

Bond selection rules

The following seven selection criteria are used to derive the Benchmark Index constituents from the USD denominated CMBS bond universe:

- Market issue
- Deal type
- Bond type
- Country
- Deal notional
- Bond notional
- Weighted average life (WAL)
- Rating

Market issue

For liquidity reasons, the following market types are excluded from the bond universe:

- Private placements

If S&P DJI has reasonable cause to believe that a bond is a retail bond or private placement, and is unable to determine otherwise from the issuer or lead manager(s), the classification of a bond as a retail bond or private placement will be made at S&P DJI's discretion based on information available at the time of determination.

Deal type

For liquidity reasons, only conduit deals with public information available are eligible. The following deal types are specially excluded:

- Agency CMBS bonds
- Large loan
- Single-borrower/Single-asset

Bond type

General inclusion criteria:

- Pass-through CMBS bonds without pre-determined prepayment schedule are eligible for the indices

In particular, the following bond types are eligible:

- Fixed-rate bonds
- WAC/pass-through bonds

The following bond types are specially excluded:

- Bonds that have ever been floating-rate

- Planned Amortization Class (PAC) bonds
- Interest-only (IO) bonds
- Principal-only (PO) bonds
- Modeling bonds
- Non-pooled single-asset bonds
- Accretion (Z) bonds
- Non-floater variable bonds, including PEZ, PEX, PST, EC tranches
- Bonds secured by underlying assets that are credit-linked notes, synthetic CDOs or any similar synthetic obligations

For retail bonds and private placements, publicly available information is not always conclusive and the classification of a bond as a retail bond or a private placement will be made at S&P DJI's discretion based on the information available at the time of determination. S&P DJI may consult with the specific Index Advisory Committees to review potential retail bonds or private placements. Any bond classified as retail or private placement is added to the list of excluded private placements and retail bonds. The list is published on <https://www.spglobal.com/spdji/en/> under *Indices News* for future reference and to ensure decision's consistency.

In instances where a new bond type is not specifically excluded or included according to the published index rules, S&P DJI will analyze the features of such securities in line with the principles set out in this guide. S&P DJI may consult the specific Index Advisory Committees. Any decision as to the eligibility or ineligibility of a new bond type will be published and the index rules will be updated accordingly.

Country

All constituents should be bonds in US conduit deals and denominated in USD.

Deal notional

All deals in the Markit iBoxx Trepp CMBS Benchmark Index must have a minimum deal notional of USD 500 million at issuance and a minimum outstanding deal notional of USD 100 million on the rebalancing day.

Bond notional

All bonds in the Markit iBoxx Trepp CMBS Benchmark Index must have a minimum bond notional of USD 10 million at issuance and a minimum outstanding bond notional of USD 1 million on the rebalancing day.

Weighted average life (WAL)

For liquidity reasons, all bonds in the Markit iBoxx Trepp CMBS Benchmark Index must have a minimum weighted average life of one year on the rebalancing day. If the weighted average life of a constituent falls below one year during the month, the constituent will be removed from the index on the next rebalancing day. If the weighted average life of the bond goes above one year afterwards, it is eligible to come back to the index on the next rebalancing day if the bond satisfies all other criteria.

Credit rating

All bonds in the Markit iBoxx Trepp CMBS Benchmark Index must have an initial iBoxx Rating of investment grade. Ratings from the following three credit rating agencies are considered for the calculation of the iBoxx Rating:

- Fitch Ratings

- Moody's Investor Service
- S&P Global Ratings

Investment grade is defined as BBB- or higher from Fitch Ratings and S&P Global Ratings and Baa3 or higher from Moody's Investor Service.

If a bond is rated by more than one of the above agencies, then the 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 *iBoxx Rating Methodology* document. The methodology can be found on <https://www.spglobal.com/spdji/en/> under *Methodology*.

iBoxx ratings are consolidated (e.g. BBB+, BBB and BBB- are consolidated to BBB; A+, A and A- are consolidated to A etc.) and determine which rating sub-index the bond belongs to. For more detail on how ratings are determined please see the iBoxx Rating Methodology report on <https://www.spglobal.com/spdji/en/>. Only issue ratings are considered in the bond selection process. Issuer ratings are not taken into account.

Bond classification

All bonds are classified based on the principal activities of the issuer and the main sources of the cash flows used to pay coupons and redemptions. In addition, a bond's specific collateral type or legal provisions are evaluated. Hence, it is possible that bonds issued from different subsidiaries of the same issuer carry different classifications.

The issuer classification is reviewed regularly based on updated information received by S&P DJI, and status changes are included in the indices at the next rebalancing if necessary.

Where the sector classification of a specific entity is not clear due to the diversified business of the entity, a decision is made at S&P DJI's discretion. S&P DJI assigns the classification according to its evaluation of the business risk presented in the security prospectus and annual reports, if available. S&P DJI also compares the classification to peers in the potential sectors. Membership lists including classification are published on the FTP server and in the *Indices* section of the webpage for registered users.

Overall bond classification scheme

The following classification scheme is used for the bonds:

Table: Bond classification scheme

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Retail	Retail	Retail Anchored
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Retail	Retail	Retail Unanchored
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Office	Office	*
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Residential	Multifamily	*
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Travel & Leisure	Hotel	Hotel Full
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Travel & Leisure	Hotel	Hotel Limited
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Travel & Leisure	Hotel	Hotel Other
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Health Care	Health Care	*
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Industrials	Industrials	*
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Speciality	Speciality	Credit Tenant Loan (CTL)
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Speciality	Speciality	Mobile Home
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Speciality	Speciality	Mobile Use
USD	D	Non-Treasuries	Collateralized	CMBS	Dominant ^{*1}	Speciality	Speciality	Others
USD	D	Non-Treasuries	Collateralized	CMBS	Diversified ^{*2}	Diversified	A combination of 2-3 sectors out of level 7	*

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8
							sectors under "Dominant"	

*1 Dominant: when the most concentrated real estate type in the deal is not lower than 50%

- Level 6-7: Top 1 real estate type

*2 Diversified: when the most concentrated real estate type in the deal is lower than 50%

- Level 6-7: Top 3 real estate types which are higher than 10%

The following seniority classification scheme is used for bonds:

Table: Seniority classification

Seniority Level 1	Seniority Level 2	Seniority Level 3 (sequence of payment)
SEN	Supersenior	1
	MezzSenior	1-24
	SubSenior	1-24
SUB	Subordinated	2-24

Seniority Level 2 is derived from both sequence of payment (Seniority Level 3) and tranche names:

Table: Seniority level 2

Seniority Level 2	
Supersenior	Eligible bonds should satisfy one of the following criteria: 1> SubLevel =1, excluding AM(or A-M) and AJ(or A-J) and AS (or A-S) by tranche name; 2> the bond is ASB (A-SB) tranche
MezzSenior	Eligible bonds should satisfy one of the following criteria: 1> By tranche name, AM(or A-M) bonds and other A- tranches with SubLevel>=2 except AJ(or A-J) and AS(or A-S); 2> the bond is ASM (A-SM) tranche
SubSenior	If not classified as "Supersenior" or "MezzSenior": By tranche name, AJ(or A-J) and AS(or A-S) bonds, except ASB (A-SB) and ASM (A-SM) tranches
Subordinated	All others

Index calculation

Static data

Information used in the Markit iBoxx Trepp CMBS Benchmark Index calculation, including bond/deal static data and payment information, is sourced from Trepp, LLC.

Bond prices

Bond price information used in the Markit iBoxx Trepp CMBS Benchmark Index is sourced from Trepp, LLC. Ask prices are derived from Trepp, LLC, bid prices are derived by applying a bid-ask spread provided by S&P DJI Pricing Data Service.

Rebalancing process

All Markit iBoxx Trepp CMBS Benchmark Index are rebalanced monthly at the month-end (“rebalancing day”). Classifications are determined four business days before the end of the month. Except ratings, changes to bond reference data such as notional outstanding are only taken into account if they are publicly known three business days before the end of the month. Any changes after the index cut-off day (t-3) will not be considered in this re-balancing process, but will become effective at the end of the following month. Rating cut-off day for index membership is two business days before the end of the month (t-2). New bonds issued are taken into account if they are publicly known to close three business days before the last calendar day of the month, inclusive, and if their rating and amount outstanding has become known at least three business days before the end of the month.

Two business days before the end of the month the final index membership list for the following month is published at the close of business.

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

Index data

Calculation occurs on a daily basis as soon as Trepp, LLC, prices are available. Price quotes are provided and the indices calculated every day in the SIFMA calendar and for the last calendar day of each month. Index calculation is based on bid quotes. New bonds are included in the indices at their respective ask prices when they enter the index family. In the event that no new quotes for a particular bond are received, the index will continue to be calculated based on the last available Trepp, LLC, prices. This might be the case in periods of market stress, or disruption as well as in illiquid or fragmented markets.

All bonds are assigned to sub-indices according to their classification. The assignment of a bond to a certain maturity bucket is based on its expected remaining life. All bonds remain in their maturity bucket for the entire month.

Index calculus

Cash received from interest payment, principal payment or prepayment will not be reinvested into the index until the end of month (next rebalancing day). For specific index formulae please see appendix.

Treatment of the special intra-month events

Missing prices and analytics

There are several circumstances that some bonds may stop being priced for a few days by data providers. To avoid unnecessary turnover, for index membership, Markit iBoxx Trepp CMBS Benchmark Indices can use prices and analytics carried forward for at most seven business days. If a bond has been included in the index and does not have prices during the month, the latest price will be carried forward until the earlier of a) next rebalancing for index calculation b) when the bond resumes being priced. The bond will be excluded for index analytics calculations such as yield, spread and duration during the month.

Newly issued bonds

In normal cases, accrued interests and unrealized cash are calculated using the bond coupon rate at the last ex-dividend day. For newly issued bonds, the coupon rate at the last ex-dividend day is not available, so the first available coupon rate is used instead for the first accrual period.

Distressed bonds

Distressed bonds are defined as bonds with bid prices lower than 10. Markit iBoxx Trepp CMBS Benchmark Indices do not include distressed bonds. If a constituent turns into a distressed bond during the month, it will be excluded from index analytics calculations such as yield, spread and duration during the month and removed from the index on the next rebalancing day.

Distressed bonds that satisfy all other criteria will enter a separate distressed bond index, which will not provide index analytics except price.

Index weighting

All Markit iBoxx Trepp CMBS Benchmark Index is base-market-value weighted indices, with the bond's market value on the rebalancing day as the weighting factor. The weight of a bond is only adjusted at the monthly rebalancing at the end of each month.

Index history

The Index history starts on 31 December 2006. The index has a base value of 100 on that date.

Settlement conventions

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

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.

Data publication and access

The table below summarizes the publication of Markit iBoxx Trepp CMBS Benchmark Index in the *Indices* section of the website 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: Data publication frequency, file types and access

Frequency	File Type	Access
Daily	Underlying file – Bond level	FTP Server
	Indices files – Index level	FTP Server / website / Bloomberg (index levels only)
Weekly	Preview components	FTP Server / website
Monthly	End of month components	FTP Server / website
	XREF files	FTP Server

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.

Appendix

Index calculation

All iBoxx indices are basket indices that express relative changes in value compared to the beginning of the respective period. The composition and weightings of the index are adjusted at the beginning of each period. Accordingly, adjustments to index-tracking portfolios are only needed at the end of each period.

Benchmark price index

$$PI_t = PI_{t-s} \cdot \frac{\sum_{i=1}^n P_{i,t} \cdot F_{i,t-s} \cdot N_{i,t-s} \cdot F_{i,t-s}^{Cap}}{\sum_{i=1}^n P_{i,t-s} \cdot F_{i,t-s} \cdot N_{i,t-s} \cdot F_{i,t-s}^{Cap}}$$

Current factor

The current factor, $F_{i,t}$, is a mix of real current factor and projected factor throughout a month. For each bond, from the start of each accrual period to the day before next distribution day, projected factor is used; for the rest, real current factor is used. The indices are based on consolidated bid quotes. Bonds not currently in the iBoxx universe enter the indices at the next rebalancing and are included in the index calculation at the beginning of the next period using the closing ask prices from the last trading day of the previous period.

Total Return Index components

Nominal value

The nominal value of the index is the sum of the individual bond nominal values and is calculated as follows:

$$NV_t = \sum_{i=1}^n F_{i,t-s} \cdot N_{i,t-s} \cdot F_{i,t-s}^{Cap}$$

Market value

The market value of a single bond at time t is calculated as follows:

$$MV_{i,t} = [P_{i,t} + (A_{i,t} + \chi D_{i,t-s} \cdot CP_{i,t}) \cdot FA_{i,t}] \cdot F_{i,t} \cdot N_{i,t-s} \cdot F_{i,t-s}^{Cap}$$

The capping factor,

$$F_{i,t-s}^{Cap}$$

will normally be 1, unless in cases where capping is applied.

The market value of the index is the sum of the market values of all bonds at time t and is calculated as follows:

$$MV_t = \sum_{i=1}^n MV_{i,t}$$

Base market value

The base market value is the market value of the bond calculated at the rebalancing date (t-s); it also does not take cash payments into account. The base market value of a single bond at time t is calculated as follows:

$$BMV_{i,t-s} = (P_{i,t-s} + A_{i,t-s} \cdot FA_{i,t-s} \cdot N_{i,t-s} \cdot F_{i,t-s}^{Cap})$$

The base market value of the index is the sum of the base market values of all bonds and is calculated as follows:

$$BMV_{t-s} = \sum_{i=1}^n BMV_{i,t-s}$$

Accrued interest

Interests accrued are calculated and provided by trepp daily. For index history, it was assumed that all bonds accrued during the calendar month preceding the actual bond payment and pay on a 30/360 basis.

Accrued interest for the first coupon period:

$$A_{i,t} = \frac{days_{30}(FSD,t)}{360} \cdot C \cdot FA_{t,i,t}$$

Accrued interest for the 2nd and subsequent coupon periods:

The days between the settlement date and the last coupon date are calculated as follows:

$$A_{i,t} = \frac{days_{30}(Dat(C_{i-1}),t)}{360} \cdot C \cdot FA_{t,i,t}$$

Cash payment

The cash payment for a single bond at time t is the sum of all coupon and scheduled redemption payments since the last index rebalancing plus the redemption value if the bond has already been fully redeemed:

$$CV_{i,t-s} = CV_{i,t-s}^{Coupons} + CV_{i,t}^{Redemptions}$$

$$CV_{i,t}^{Coupons} = \sum_{t-s < j \leq t} G_{i,j} \cdot XD_{i,j-1} \cdot F_{i,j-1} \cdot FA_{t,i,j} \cdot N_{i,t-s} \cdot F_{i,ts}^{Cap}$$

$$CV_{i,t}^{Redemptions} = \sum_{t-s < j \leq t} R_{i,j} \cdot RP_{i,j} \cdot FA_{t,i,j} \cdot N_{i,t-s} \cdot F_{i,t-s}^{Cap}$$

Generally, it is assumed that there is only one coupon payment and one redemption payment per calculation period. The XD factor only applies for the first coupon payment in the given period. In situations where this is not the case, special cash payments are dealt with as follows:

$$CV_{i,t-s < j \leq t} = (XD_{i,t-s} \cdot G_{i,t1} \cdot FA_{t,i,t1} \cdot F_{i,t1-1} + \sum_{t1 < j \leq t}^n G_{i,j} \cdot F_{i,j-1} \cdot FA_{t,i,j} + \sum_{t-s < j \leq t}^n R_{i,j} \cdot RP_{i,j} \cdot FA_{t,i,j}) \cdot N_{i,t-s} \cdot F_{i,t-s}^{Cap}$$

The different adjustment factors

$$F_{i,t}, F_{i,t-s}$$

are used for sinking funds, amortizing bonds, pay-in-kind bonds, and unscheduled full redemptions. For other bond types, F always equals 1.

The cash payment of all bonds in an index is calculated as follows:

$$CV_t = \sum_{i=1}^n CV_{i,t}$$

Benchmark total return index

The calculation of the local currency total return index is below.

The total return index can be expressed in terms of market values and cash:

$$TR_t = TR_{t-s} \cdot \frac{MV_t + CV_t}{BMV_{t-s}}$$

Benchmark Income indices

The benchmark coupon income index is calculated as follows:

$$IC_t = IC_{t-s} + Gl_{t-s} \cdot \frac{CV_{i,t}^{Coupons}}{BMV_{t-s}}$$

The benchmark redemption income index is calculated as follows:

$$IR_t = IR_{t-s} + Gl_{t-s} \cdot \frac{CV_{i,t}^{Redemptions}}{BMV_{t-s}}$$

The benchmark income index is calculated as follows:

$$IN_t = IN_{t-s} + Gl_{t-s} \cdot \frac{CV_{i,t}^{Coupons} + CV_{i,t}^{Redemptions}}{BMV_{t-s}}$$

Or simplified:

$$IN_t = IC_t + IR_t$$

Index analytics

The average annual yield is calculated by weighting the yield of each bond with the corresponding market capitalization and duration of the respective bond.

$$RY_t = \begin{cases} \sum_{i=1}^n Y_{i,t}^a \cdot W_{i,t}^D \text{Indexofbonds} \\ \sum_{i=1}^n RY_{i,t} \cdot W_{i,t}^D \text{Indexofindices} \end{cases}$$

The average duration is weighted by the market capitalization of the respective bonds.

$$DU_t = \begin{cases} \sum_{i=1}^n D_{i,t} \cdot W_{i,t}^{MV} \text{Indexofbonds} \\ \sum_{i=1}^n DU_{i,t} \cdot W_{i,t}^{MV} \text{Indexofindices} \end{cases}$$

The average portfolio duration is calculated as follows:

$$DPU_t = \begin{cases} \sum_{i=1}^n D_{i,t} \cdot W_{i,t}^{MVC} \text{Indexofbonds} \\ \sum_{i=1}^n DPU_{i,t} \cdot W_{i,t}^{MV} \text{Indexofindices} \end{cases}$$

The average coupon is nominally weighted. For bonds with a multi-coupon schedule, the current coupon is included.

$$CO_t = \begin{cases} \sum_{i=1}^n C_{i,t} \cdot W_{i,t}^N \text{Indexofbonds} \\ \sum_{i=1}^n CO_{i,t} \cdot W_{i,t}^N \text{Indexofindices} \end{cases}$$

The average weighted average life (WAL) for CMBS bonds is weighted by nominal value of the respective bonds.

$$CO_t = \begin{cases} \sum_{i=1}^n WAL_{i,t} \cdot W_{i,t}^N \text{Indexofbonds} \\ \sum_{i=1}^n WAL_{i,t} \cdot W_{i,t}^N \text{Indexofindices} \end{cases}$$

The average rating calculation requires that the ratings first be converted to numbers according to iBoxx Rating Methodology, then weighted by market value of the respective bonds and converted from numbers to ratings. The average rating is calculated as follows:

$$CO_t = \begin{cases} \sum_{i=1}^n RA_{i,t} \cdot W_{i,t}^{MV} \text{Indexofbonds} \\ \sum_{i=1}^n RA_{i,t} \cdot W_{i,t}^{MV} \text{Indexofindices} \end{cases}$$

The average delinquency rate for CMBS bonds is weighted by nominal value of the respective bonds.

$$\mathcal{C}_t = \begin{cases} \sum_{i=1}^n DL_{i,t} \cdot W_{i,t}^N \text{Indexofbonds} \\ \sum_{i=1}^n DL_{i,t} \cdot W_{i,t}^N \text{Indexofindices} \end{cases}$$

The average credit enhancement rate for CMBS bonds is weighted by nominal value of the respective bonds.

$$\mathcal{C}_t = \begin{cases} \sum_{i=1}^n CE_{i,t} \cdot W_{i,t}^N \text{Indexofbonds} \\ \sum_{i=1}^n CE_{i,t} \cdot W_{i,t}^N \text{Indexofindices} \end{cases}$$

Index Asset Swap Spread

$$\mathcal{C}_t = \begin{cases} \sum_{i=1}^n ASW_{i,t} \cdot W_{i,t}^D \text{Indexofbonds} \\ \sum_{i=1}^n ASW_{i,t} \cdot W_{i,t}^D \text{Indexofindices} \end{cases}$$

Annotations

Δy	Parallel shift amount of the sport rate yield curve
$\Delta j, t$	Change in amount outstanding of bond j at time j
$A_{i,t}$	Accrued interest of bond j at time t
$A_{i,t-s}$	Accrued interest of bond j at the last rebalancing
$A_{i,t}^N$	Nominal accrued interest for bond j at date t
$A_{i,t}^R$	Real accrued interest for bond j at date t
$ASW_{i,t}$	Asset swap spread of a bond j at time t
$bdays$	<u>business</u> days
BMS_t^a	Annualized index benchmark spread at time t
BMS_t^S	Semi-annualized index benchmark spread at time t
$BMS_{i,t}^a$	Annualized benchmark spread of bond j at time t
$BMS_{i,t}^S$	Semi-annualized benchmark spread of bond j at time t
BMV_{t-s}	Base market value of the index at the rebalancing
$BMV_{i,t-s}$	Base market value of bond j at the rebalancing
C	Annual Coupon
C_a	Accrued interest for bond j
C_b	Next coupon after the coupon change $C_i \equiv$ (Next) coupon payment

$C_{i,t}$ = Current coupon of bond i at time t

C_{i+1} = Coupon payment in the period of the coupon change

C^{annual}_i = Annual coupon of bond i

C^N_{i,t,t^\wedge} = Nominal coupon payment for bond i payable at t^\wedge as of the calculation date

C^R_{i,t^\wedge} = Real coupon payment for bond i payable at t^\wedge

C_t = Coupon payment

CASH_t = Cash at time t

CASH_{t-1} = Cash at the previous trading day CASH_{t-S} = Cash at the end of the last month

$\text{CF}_{i,j}$ = Cash flow of bond i in the jth period

$\text{CF}_{i,t}$ = Cash-flow of bond i at date t quoted to a notional of 100

$\text{CF}^K_{i,j}$ = Cash flow of a bond

CO_t = Average coupon at date t

$\text{CO}_{i,t}$ = Average coupon for bond i at time t

Cost = Cost factor

$\text{CP}_{i,t}$ = Value of the next coupon payment of bond i during an ex-dividend period (because the next coupon is separated from the bond during the ex-dividend period). Outside the ex-dividend period, the value is 0

$\text{CP}_{i,t-S}$ = Value of the next coupon payment of bond i (at the last rebalancing) during an ex-dividend period

(because the next coupon is separated from the bond during the ex-dividend period). Outside the exdividend period, the value is 0

CPI_t = CPI level on the calculation date

$\text{CPI}_{i,t0}$ = CPI level on the base date of bond i

$\text{CPI}_{t(y-1)}$ = CPI level one year prior to the calculation date

CV_t = Cash payment of all bonds at time t

$\text{CV}_{i,t}$ = Cash payment of bond i at time t

$\text{CV}^{\text{Coupons}}_t$ = Coupon payments of all bonds i at time t

$\text{CV}^{\text{Redemptions}}_t$ = Redemption payments of all bonds at time t

$\text{CV}^{\text{Coupons}}_{i,t}$ = Coupon payment of bond i at time t

$\text{CV}^{\text{Redemptions}}_{i,t}$ = Redemption payment of bond i at time t

$\text{CX}^a_{i,t}$ = Annual convexity of bond i at time t

$\text{CX}_{i,t}$ = Convexity of bond i at time t

$\text{CX}^S_{i,t}$ = Semi-annualized convexity of bond i at time t

CXPU^S_t = Average semi-annualized portfolio convexity at time t

$\text{CXPU}^S_{i,t}$ = Average semi-annualized portfolio convexity for bond i at time t

CXPU^a_t = Average annual portfolio convexity at time t

$CXPU^a_{i,t}$ = Average annual portfolio convexity for bond i at time t

CXU^s_t = Average semi-annualized convexity at time t

$CXU^s_{i,t}$ = Average semi-annualized convexity for bond i at time t

CXU^a_t = Average annual convexity at time t

$CXU^a_{i,t}$ = Average annual convexity for bond i at time t

$D_{i,t}$ = Duration of bond i at time t d_1, d_2 = Day of date $\frac{1}{2}$

$Dat(C_a, C_b)$ = Date of coupon change

$Dat(C_i)$ = Date of i -th coupon payment

$Dat(C_{i+1})$ = Date of the (next) coupon payment

$Dat(C_F)$ = Fictitious coupon date one exact coupon period before the first coupon payment date

$Dat(C_{F-1})$ = Fictitious coupon date one exact coupon period prior to $Dat(C_F)$

$days(date1, date2)$ = Function to calculate the number of days between two dates for the ACT/ACT day count convention

$days_{ACT}$ = Day count fraction using the actual number of days in the period

$days_{MM}(t-s, t)$ = Day count fraction between dates $t-s$ and t according to the prevailing money market day count

DP = Dirty Price

DPU_t = Average portfolio duration at time t

$DPU_{i,t}$ = Average portfolio duration for bond i at time t

DU_t = Average duration at time t

$DU_{i,t}$ = Average duration for bond i at time t

f_i = Amount invested for bond i

f_i^+ = Amount invested per bond after the rebalancing

f_i^- = Amount invested per bond before the rebalancing

$F_{i,t}$ = The product of the redemption adjustment and the pay-in-kind adjustment factors for bond i at date t

$F_{i,j-1}$ = The product of the redemption adjustment and the pay-in-kind adjustment factors for sinking funds, amortizing and pay-in-kind bonds of fully redeemed bond i at date $j-1$, i.e. one day before j

$F_{i,t-s}$ = The product of the redemption adjustment and the pay-in-kind adjustment factors for bond i at the last rebalancing

F^{Cap}_i = Capping factor for bond i

$F^{Cap}_{i,t-s}$ = Capping factor for bond i at the last rebalancing

$FA_{i,t}$ = Flat of accrued flag of bond i and date t (0 if the bond is trading flat of accrued, 1 otherwise)

$FA_{i,t-s}$ = Flat of accrued flag of bond i at the last rebalancing (0 if the bond is trading flat of accrued, 1 otherwise)

$FA_{t,i,t}$ = Flat of accrued flag of bond i and date t that is valid on date t (0 if the bond is trading flat of accrued, 1 otherwise)

FSD = First settlement date

$FX^{LCY/CCY}_t$ = Spot exchange rate at t (rebalancing)

$FX^{LCY/CCY}_{t-s}$ = Spot exchange rate at t-s (last rebalancing)

$FX^{LCY/CCY}_{t-s,t}$ = Forward exchange rate at t-s for the period t-s, t

$G_{i,j}$ = Coupon payment received from bond i between the day of the payment and month-end. If none the value is set to 0.

$G_{i,t}$ = Value of any coupon payment received from bond i at time t. If none the value is 0.

$G_{i,t1}$ = Value of any coupon payment received from bond i at the first payment date. If none the value is 0.

GI_t = Gross price index at date t

GI_{t-s} = Gross price index at the last rebalancing before t

IC_t = Coupon income index at date t

IC_{t-s} = Coupon income index at the last rebalancing before t

IN_t = Income index at date t

IN_{t-s} = Income index at the last rebalancing before t

IR_t = Redemption income index at date t

IR_{t-s} = Redemption income index at the last rebalancing before t

$IR_{i,t}$ = Index ratio applicable to bond i on the calculation date

IR_{i,t,t^+} = Index ratio based on the most recently published CPI level on the calculation date applicable to t+

$IR_{i,t,t^{\wedge}}$ = Index ratio applicable to the cash flow at t* for bond i estimated as of the calculation date t

IV_t = Index market value at time t

IV^{Hedge}_{t-s} = Hedged index market value at the rebalancing

$IV^{HedgedPortion}_t$ = Hedged portion of the index market value at time t

$IV^{UnhedgedResidual}_t$ = Unhedged portion of the index market value at time t

LXR^{LCY}_t = Local currency index return level at time t

LXR^{LCY}_{t-s} = Local currency index return level at the last rebalancing, can apply to both total return and price return

LXR^H_t = Hedged index returns at time t, can apply to both total return and price return

LXR^U_t = Unhedged index returns at time t, can apply to both total return and price return

$L^a_{i,t,j}$ = Time in years for bond i between date t and the jth cash flow

$L_{i,t,j}$ = Time in coupon periods for bond i between date t and the jth cash flow

$L_{t,j}$ = Time difference in coupon periods between t and j

L_t = Number of days between floating rate payments
 $LCR^D_{i,t}$ = Daily local index return for bond i at time t
 $LCR^M_{i,t}$ = Daily local index return for bond i at time t
 $LF_{i,t}$ = Expected remaining life of bond i at time t; average life for amortizing bonds and sinking funds
 LFU_t = Average expected remaining life at time t
 $LFU_{i,t}$ = Average expected remaining life for bond i at time t
 m = Number of coupon payments per year
 m_1, m_2 = Month of date $\frac{1}{2}$
 M^- = Market value of portfolio before rebalancing
 $MD_{i,t}$ = Modified duration of bond i at time t
 MDU^a_t = Average annualized modified duration at time t
 $MDU^a_{i,t}$ = Average annualized modified duration for bond i at time t
 MDU^s_t = Average semi-annualized modified duration at time t
 $MDU^s_{i,t}$ = Average semi-annualized modified duration for bond i at time t
 $MDPU^a_t$ = Average annualized modified portfolio duration at time t
 $MDPU^a_{i,t}$ = Average annualized modified portfolio duration for bond i at time t
 $MDPU^s_t$ = Average semi-annualized modified portfolio duration at time t
 $MDPU^s_{i,t}$ = Average semi-annualized modified portfolio duration for bond i at time t
 M^+_I = Market value of portfolio after rebalancing based upon index prices
 M^+_P = Market value of 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
 $MV_{i,t-S}$ = Base market value of bond i at the last rebalancing
 MV_{t-S} = Base market value of the index at the last rebalancing
 MV^P_i = Market value of bond i referring to transaction prices
 MV^I_i = Market value of bond i referring to index price
 n = Number of bonds (number of future cash flows in the index)
 $N_{i,t}$ = Adjusted amount issued of bond i at date t
 $N_{i,t-S}$ = Notional of bond i at the last rebalancing = (a) Notional amount outstanding of bond i at the last rebalancing = (b) Fictitious nominal of bond i (substitutes) = (c) Zero (0) for dropped bonds
 $MV^N_{i,t}$ = Inflation-adjusted notional for bond i on the calculation date
 NV_t = Nominal value at date t
 π_t = Assumed annual inflation on the calculation date
 $OAS_{i,t}$ = is the OAS of a bond i at time t
 $P_{i,t}$ = Clean price of bond i at time t

P^I_i = Index price of bond i
 $P^N_{i,t}$ = Nominal clean price for bond i on the calculation date
 P^P_i = Portfolio price of bond i
 $P^R_{i,t}$ = Real clean price for bond i on the calculation date
 $P_{i,t-s}$ = Closing price of bond i on the last trading day of the previous month
 PI_t = Price index level at time t
 PI_{t-s} = Closing price index level on the last calendar day of the previous month
 PV_{Fixed} = Present value of fixed payments
 $PV_{Floating}$ = Present value of floating payments
 PV_t = Present value of the bond at time t
 PV_- = Present value of the bond after yield curve shifting by $-\Delta y$
 PV_+ = Present value of the bond after yield curve shifting by $+\Delta y$
 $R_{i,t}$ = Redeemed portion of the issue (in % of par) of bond i at date t
 $R_{i,j}$ = Redeemed portion of the issue (in % of par) of bond i in the jth period
 R_i = Index return for bond i
 $R_{t-1,t}$ = Daily index return
 $R_{t-s,t}$ = Month-to-date index return r
 $r_{i,t-s,t}$ = Total return of sub-index i from the last rebalancing (t-s) to t
 r^H_t = Hedged return at time t
 RMU_t = Value of the real monetary unit on the calculation date
 $RP_{i,t}$ = Redemption price of a redeemed portion of bond i at date t
 $RP_{i,j}$ = Redemption price of a redeemed portion of bond i in the jth period
 $RYPSt$ = Average semi-annual portfolio yield at time t
 RYS_t = Average semi-annual yield at time t
 $RYS_{i,t}$ = Average semi-annual yield for bond i at time t
 RY_t = Average annual yield at time t s = Time since last rebalancing
 $SBC^a_{i,t}$ = Annual spread to benchmark curve of bond i at time
 $SBC^s_{i,t}$ = Semi-annual spread to benchmark curve of bond i at time t
 SD = Settlement date
 $SLC^a_{i,t}$ = Annual spread to LIBOR curve of bond i at time t
 $SLC^s_{i,t}$ = Annual spread to LIBOR curve of bond i at time t
 $SWAP_n$ = Markit SWAP curve rate at the next coupon payment day

t = Time of calculation

t^* = Date of the coupon payment t^* in the same month as the settlement date t , but before or at t

t^\wedge = Date of a cash flow

t_+ = Calculation date for which most recently published CPI is valid

t_0 = Base date of an inflation linked bond

$t(y-1)$ = One year prior to the calculation date

t_1 = Next coupon payment after the settlement date t

t_2 = Next-but-one coupon payment after the settlement date t

t_i = Date t_i (the date of the i -th cash flow)

TR_t = Total return index level at time t

TR_t^{Final} = Total Return index level after cost adjustment

TR_t^{Ideal} = Total Return index level before cost adjustment

$TR_{i,t}^{\text{LCY}}$ = Local currency total return index level for bond i at time t

TR_t^{LCY} = Local currency total return index level at time t

TR_{t-s}^{LCY} = Local currency total return index level at the last rebalancing

TR_{t-s} = Total Return index level after rebalancing / adjustment from the end of last month

$t-s$ = Date of last rebalancing

w_i = Weight of bond i

w_i^+ = Weight of bond i before rebalancing

w_{cash} = Weight of cash in the index prior to the rebalancing

w_i^+ = Weight of bond i after rebalancing

w_{cash}^+ = Weight of cash in the index after the rebalancing

$w_{i,t}^D$ = Duration weight of bond i at time t

$w_{i,t}^N$ = Nominal weight of bond i at time t

$w_{i,t-s}^{\text{Fix}}$ = Fixed weight of bond i at the last rebalancing

$w_{i,t}^{\text{BMV}}$ = Base market value weight of bond i at time t

$w_{i,t}^{\text{MV}}$ = Market value weight of bond i at time t

$w_{i,t}^{\text{MVC}}$ = Market value weighting adjusted for cash of bond i at time t

$XD_{i,t}$ = Variable indicating whether bond i entered the index at the last rebalancing ($t-s$) during its ex-dividend period

$XD_{i,t-s} = 0$, if the bond enters the index at the ex-dividend period (to ensure that the next coupon payment is excluded from the total return calculation) = 1, if (a) coupon payments are not ex-dividend, (b) has not entered the index during an exdividend period, or (c) entered the index during a previous ex-dividend period

$XD_{i,j-1}$ = The ex-dividend factor of bond i at date $j-1$, i.e. one day before j . = 0, if the bond enters the index at the ex-dividend period (to ensure that the next coupon payment is excluded from the total return calculation) = 1, if (a) coupon payments are not ex-dividend, (b) has not entered the index during an ex-dividend period, or (c) entered the index during a previous ex-dividend period

XR_t = Rebalancing flag. It is linked to whether an index rebalancing occurs on the day. It is 1 on calculation days where the index re-balances and zero elsewhere. XR applies to full rebalancings as well as partial rebalancings (e.g. month-ends between quarters for liquid indices).

$Y_{i,t}$ = Yield of bond i at time t

y_1, y_2 = Year of date 1/2

$Y^a_{i,t}$ = Annualized yield of bond i at time t

$Y^s_{i,t}$ = Semi-annualized yield of a bond at time

$Y^a_{BM(i),t}$ = Annual benchmark yield of bond i at time t

$Y^s_{BM(i),t}$ = Semi-annual benchmark yield of bond i at time t

$Y^a_{lnBMi,t}$ = Annualized yield of the interpolated benchmark of bond i at time t

$Y^s_{lnBMi,t}$ = Semi-annualized yield of the interpolated benchmark of bond i at time t

Y^a_{SWAPt} = Annualized value of SWAP curve at time t

Y^s_{SWAPt} = Semi-annualized value of SWAP curve at time t

$Y_{2i,t}$ = Semi-annual yield of bond i at time t

$Y_{LIBIDt-s}^{1m}$ = 1-month interest rate for cash at the last rebalancing

$Z_t(L)$ = the function constructed by natural splines with defined knots

Z-Spread $_{i,t}$ = is the Z-spread of a bond i at time t

Changes to the Markit iBoxx Trepp CMBS Benchmark Index

31 Mar 2021	Governance and Regulatory Compliance section added
31 Oct 2015	Launch of Markit iBoxx Trepp CMBS Index Family

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.

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.

Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

Intellectual Property Notices/Disclaimer

© 2025 S&P Dow Jones Indices. All rights reserved. S&P, S&P 500, SPX, SPY, The 500, US500, US 30, S&P 100, S&P COMPOSITE 1500, S&P 400, S&P MIDCAP 400, S&P 600, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, Select Sector, S&P MAESTRO, S&P PRISM, S&P STRIDE, GICS, SPIVA, SPDR, INDEXOLOGY, iTraxx, iBoxx, ABX, ADBI, CDX, CMBX, MBX, MCDX, PRIMEX, HHPI, and SOVX are registered trademarks of S&P Global, Inc. ("S&P Global") or its affiliates. DOW JONES, DJIA, THE DOW and DOW JONES INDUSTRIAL AVERAGE are trademarks of Dow Jones Trademark Holdings LLC ("Dow Jones"). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P DJI does not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P DJI is impersonal and not tailored to the needs of any person, entity, or group of persons. S&P DJI receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P DJI does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P DJI makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P DJI is not an investment advisor, commodity trading advisor, fiduciary, "promoter" (as defined in the Investment Company Act of 1940, as amended) or "expert" as enumerated within 15 U.S.C. § 77k(a), and S&P DJI makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. S&P DJI is not a tax advisor. Inclusion of a security, commodity, crypto currency, or other asset within an index is not a recommendation by S&P DJI to buy, sell, or hold such security, commodity, crypto currency, or other asset, nor is it considered to be investment or trading advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse engineered, reproduced, or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P DJI. The Content shall not be used for any unlawful or unauthorized purposes. S&P DJI and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness, or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" "WHERE IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF

MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special, or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

Credit-related information and other analyses, including ratings, research and valuations are generally provided by licensors and/or affiliates of S&P Dow Jones Indices, including but not limited to S&P Global's other divisions such as S&P Global Market Intelligence. Any credit-related information and other related analyses and statements in the Content are statements of opinion as of the date they are expressed and not statements of fact. Any opinion, analyses and rating acknowledgement decisions are not recommendations to purchase, hold, or sell any securities or to make any investment decisions, and do not address the suitability of any security. S&P Dow Jones Indices does not assume any obligation to update the Content following publication in any form or format. The Content should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. S&P DJI does not act as a fiduciary or an investment advisor. While S&P DJI has obtained information from sources it believes to be reliable, S&P DJI does not perform an audit or undertake independent verification of any information it receives. S&P DJI reserves the right to vary or discontinue any index at any time for regulatory or other reasons. Various factors, including external factors beyond S&P DJI's control might necessitate material changes to indices.

To the extent that regulatory authorities allow a rating agency to acknowledge in one jurisdiction a rating issued in another jurisdiction for certain regulatory purposes, S&P Global Ratings reserves the right to assign, withdraw or suspend such acknowledgement at any time and in its sole discretion. S&P Dow Jones Indices, including S&P Global Ratings, disclaim any duty whatsoever arising out of the assignment, withdrawal, or suspension of an acknowledgement as well as any liability for any damage alleged to have been suffered on account thereof. Affiliates of S&P Dow Jones Indices LLC, including S&P Global Ratings, may receive compensation for its ratings and certain credit-related analyses, normally from issuers or underwriters of securities or from obligors. Such affiliates of S&P Dow Jones Indices LLC, including S&P Global Ratings, reserve the right to disseminate its opinions and analyses. Public ratings and analyses from S&P Global Ratings are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription), and may be distributed through other means, including via S&P Global Ratings publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.

S&P Global keeps certain activities of its various divisions and business units separate from each other to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions, and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate, or otherwise address.

Some indices use the Global Industry Classification Standard (GICS®), which was developed by, and is the exclusive property and a trademark of, S&P Global and MSCI. Neither MSCI, S&P DJI nor any other party involved in making or compiling any GICS classifications makes any express or implied warranties or representations with respect to such standard or classification (or the results to be obtained by the use

thereof), and all such parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability, or fitness for a particular purpose with respect to any of such standard or classification. Without limiting any of the foregoing, in no event shall MSCI, S&P DJI, any of their affiliates or any third party involved in making or compiling any GICS classifications have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

S&P Dow Jones Indices products are governed by the terms and conditions of the agreements under which they may be provided. A license is required from S&P Dow Jones Indices to display, create derivative works of and/or distribute any product or service that uses, is based upon and/or refers to any S&P Dow Jones Indices and/or index data.

ESG Indices Disclaimer

S&P DJI provides indices that seek to select, exclude, and/or weight index constituents based on, but not limited to, certain environmental, social or governance (ESG) indicators, or a combination of those indicators, including the following: environmental indicators (including the efficient use of natural resources, the production of waste, greenhouse gas emissions, or impact on biodiversity); social indicators (such as, inequality and investment in human capital); governance indicators (such as sound management structures, employee relations, remuneration of staff, tax compliance, respect for human rights, anti-corruption and anti-bribery matters), specific sustainability or values-related company involvement indicators (for example, production/distribution of controversial weapons, tobacco products, or thermal coal), or controversies monitoring (including research of media outlets to identify companies involved in ESG-related incidents).

S&P DJI ESG indices use ESG metrics and scores in the selection and/or weighting of index constituents. ESG scores or ratings seek to measure or evaluate a company's, or an asset's, performance with respect to environmental, social and corporate governance issues.

The ESG scores, ratings, and other data used in S&P DJI ESG indices is supplied directly or indirectly by third parties (note these parties can be independent affiliates of S&P Global or unaffiliated entities) so an S&P DJI ESG index's ability to reflect ESG factors depends on these third parties' data accuracy and availability.

ESG scores, ratings, and other data may be reported (meaning that the data is provided as disclosed by companies, or an asset, or as made publicly available), modelled (meaning that the data is derived using a proprietary modelling process with only proxies used in the creation of the data), or reported and modelled (meaning that the data is either a mix of reported and modelled data or is derived from the vendor using reported data /information in a proprietary scoring or determination process).

ESG scores, ratings, and other data, whether from an external and/or internal source, is based on a qualitative and judgmental assessment, especially in the absence of well-defined market standards, and due to the existence of multiple approaches and methodologies to assess ESG factors and considerations. An element of subjectivity and discretion is therefore inherent in any ESG score, rating, or other data and different ESG scoring, rating, and/or data sources may use different ESG assessment or estimation methodologies. Different persons (including ESG data ratings, or scoring providers, index administrators or users) may arrive at different conclusions regarding the sustainability or impact of a particular company, asset, or index.

Where an index uses ESG scores, ratings or other data supplied directly or indirectly by third parties, S&P DJI does not accept responsibility for the accuracy or completeness of such ESG scores, ratings, or data.

No single clear, definitive test or framework (legal, regulatory, or otherwise) exists to determine 'ESG', 'sustainable', 'good governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled objectives. In the absence of well-defined market standards and due to the existence of multitude approaches, the exercise of judgment is necessary. Accordingly, different persons may classify the same investment, product and/or strategy differently regarding 'ESG', 'sustainable', 'good

governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled objectives. Furthermore, the legal and/or market position on what constitutes an 'ESG', 'sustainable', 'good governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled objectives may change over time, especially as further regulatory or industry rules and guidance are issued and the ESG sustainable finance framework becomes more sophisticated.

Prospective users of an S&P DJI ESG Index are encouraged to read the relevant index methodology and related disclosures carefully to determine whether the index is suitable for their potential use case or investment objective.