Bond Index Methodologies

Includes ICE ESG and Climate-Related Bond Index methodologies

June 10, 2024

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Index Administration

This report provides details of the methodologies used by ICE Data Indices, LLC (IDI) to compile the ICE Bond Indices, inclusive of indices marketed under both the ICE and ICE BofA brands (individually referred to as an "Index", and collectively, the "Indices"). The Indices are constructed based on a defined set of rules which spell out all pertinent details of how an Index is compiled. The rules for compiling an Index are established when the Index is first created and specify the criteria for selecting constituent securities. The rules also establish the methodologies for weighting, valuing and rebalancing the constituents. Detailed rule documents are publicly available on IDI's systems.[1]

Annual rules review

IDI conducts an annual rules review to consider potential rule changes. An initial set of proposed changes under consideration is generally published in April. Clients are encouraged to comment on the proposals by way of an online survey. At the end of the commentary period, final decisions are announced generally in July and adopted changes, if any, are generally implemented at the September month end rebalancing.

Custom Indices that are based off standard Indices affected by these rule changes automatically pick up the new rules of the standard Indices from which they are derived unless the sponsor of the Index notifies us in advance of their desire to modify the rules for their custom Index.

IDI, at its sole discretion, reserves the right to issue rule changes apart from this annual cycle.

Limitation

All of the Indices produced by IDI may be subject to potential limitations in terms of the number of qualifying constituents and diversification. In some cases, this is by design. For example, the ICE BofA Current 2-Year US Treasury Index will always have a single constituent security. In other cases, there can be a decline in the pool of qualifying constituents due to changes in issuance trends and other factors that can affect the underlying market measured by an Index. In addition, some Indices are designed to measure smaller subdivisions of larger Indices. As an example, many of the Indices have a standard set of sub-Indices that segment the larger Index by maturity and/or rating as well as other factors. In some cases, one or more of the sub-Indices may be thinly populated, but by publishing the entire set IDI allows for a complete representation of the broader Index across key factors.

It may occur that a particular sub-Index may not have any qualifying constituents for a period of time. During any period in which there are no qualifying constituents for a given Index, IDI suspends its publication. Publication of that Index is resumed when it once again is populated

[1] Website: **indices.ice.com**

with at least one qualifying constituent; however, its Index value is reset to 100 at the point of resumption.

Other limitations may include the ability of an Index to operate in illiquid or fragmented markets.

Intraday calculation and publication of Index levels may be impacted by price fluctuation tolerance thresholds. These tolerance thresholds, which are set in terms of the absolute percentage change versus the prior day Index close, can be adjusted for a given Index to take account of the volatility of its underlying constituents and prevailing market conditions. If an Index has breached its tolerance threshold, an alert is generated for the IDI operations team to investigate and take appropriate action to resolve any discovered issue. During this time, Index values continue to be calculated and published.

Certain of the Indices utilize environmental, social, governance or similar factors in selection, weighting, or exclusion, as specified in individual Index rules. Limitations in data, scoring, or ratings availability may lead to outcomes that may not match expectations and clients should carefully review Index rules, this document and Index constituents to determine if the index is suitable for their needs.

IDI seeks to manage and mitigate these limitations through the disclosure and the Benchmark design, review and oversight process.

Expert Judgement

“Expert Judgment” refers to the exercise of discretion by an Administrator or Submitter with respect to the use of data in determining a Benchmark. Expert Judgment includes extrapolating values from prior or related transactions, adjusting values for factors that might influence the quality of data such as market events or impairment of a buyer or seller’s credit quality, or weighting firm bids or offers greater than a particular concluded transaction.

While IDI mostly relies on input data obtained from its sources, on certain occasions, where decisions relating to the pricing of a Benchmark are required to maintain the integrity of the values and ensure that the Benchmark continues to operate in line with the methodology, IDI may apply Expert Judgment. Where it is required in a Benchmark determination, it may only be applied by suitably experienced and qualified staff members on the IDI team. Using their expertise and knowledge, and the information available to them, they will make an assessment of what input data or security evaluation would be most appropriate to use to correctly reflect the Benchmark objective.

Ultimately, any exercise of Expert Judgment is overseen by the Governance Committee of IDI, which ensures that the published Methodologies have been followed.

Exceptional market conditions and corrections

IDI retains the right to delay the publication of the Index level. Furthermore, IDI retains the right to suspend the publication of the level of the Index if it believes that circumstances prevent the proper calculation of the Index.

If evaluated prices are not available, the Index will not be recalculated unless IDI decides otherwise.

Reasonable efforts are made to ensure the correctness and validity of data used in Index calculations. Where errors have occurred in the determination or calculation of an Index, the decision to make a restatement will be assessed on a case-by-case basis. Such decision will take account of the significance; impact; age; and scale of the error. Errors involving security reference data discovered after the rebalancing will typically not result in a restatement.

In the event that there is a market-wide event resulting in evaluated prices not being available, IDI will determine its approach on a case by case basis, taking into account information and notifications provided by the relevant pricing source. Market-wide events include, but are not limited to, the following:

- Technical Problems / Failures
- Natural Disaster or Other BCP Event

IDI will communicate any issues with publication of the Indices during the day through the regular client communication channels; in addition, IDI may also contact clients directly; post a notice on the IDI website; send a message via the market data portal, or use other such forms of communication.

Rebalancing

Unless otherwise specified, the Indices are rebalanced on the last calendar day of the month, based on information available up to and including the third business day before the last business day of the month (the "lock-out date"). New issues must settle on or before the following calendar month end rebalancing date in order to qualify for the coming month. No changes are made to constituent holdings other than on month end rebalancing dates.

Accrued interests and cash

With the exception of US securitized products (MBS, CMBS, CMO and ABS), accrued interest is calculated assuming next-day settlement. Accrued interest for US securitized products assumes same-day settlement. Cash flows from bond payments that are received during the month are retained in the Index until the end of the month and then are removed as part of the rebalancing. Cash does not earn any reinvestment income while it is held in the Index.

Default definition

Securities are considered in default based on their individual legal terms. In accordance with this, securities covered by a valid stand-still or forebearance agreement are not viewed in default, nor are instances where a court-appointed administration status prevents acceleration. A rating of "D" by a major rating agency is not a consideration for default status.

Any preferred securities issued by an entity associated with a receivership, conservatorship or other form of administration will not qualify for inclusion and will be removed from the Indices at the next rebalancing.

Required pricing/calculation availability

In order to be included in the Indices, including in the preview files, in addition to all other qualifying criteria securities must (a) be priced by the designated pricing source for that market, and (b) have the necessary inputs to support price/yield/accrued interest calculations. If a bond that is a constituent of one or more of the Indices is removed due to lack of pricing or calculations that bond will not qualify for entry into any Index at a later date even if adequate pricing or calculations subsequently becomes available.

Treatment of Closely Held Securities

Securities that are brought to market as part of a direct or closed sale are excluded from all Indices. If information that a security was part of a direct or closed sale becomes available after it is already included in the Indices, it will be removed at the next rebalancing. Additionally, if during the rebalancing preview period IDI receives a challenge that a new issue that is anticipated to enter the Indices for the first time is a privately placed or retained security, it shall have the option to defer the addition of that security to the following rebalancing in order to allow time for review.

Sanctions affecting index inclusion

Sanctions policies from US, EU, UK and other regulatory authorities sometimes affect the ability of investors to transact in and/or hold securities of certain issuers or countries. IDI reviews such sanctions and the impact on a case-by-case basis. Where specific securities are impacted by sanctions, IDI will either remove the securities from the Indices or they will be ineligible for addition to the Indices.

IDI may also consult on rule updates to Indices affected by the sanctions where needed. The following sanctioned issuer exclusions are currently in effect:

- **Venezuela**: debt issued on or after August 25, 2017 by the Government of Venezuela and PDVSA is excluded from the Indices.
- **China**: debt issued on or after January 11, 2021 by sanctioned Communist Chinese Military Companies are excluded from the Indices. The sanctioned entities include those originally named in Executive Order 13959 issued on November 12, 2020, and those subsequently added, as well as all subsidiaries with names that exactly or closely match the names of the covered entities as identified by the U.S. Office of Foreign Assets Control.
- **Russia/Belarus**: all debt denominated in Russian ruble (RUB) or Belarusian ruble (BYN), or was issued by an entity with a Russian or Belarusian country of risk does not qualify for any index.

Special treatment for particular security types

144a for life

Unless otherwise specified, 144a-for-life securities qualify for inclusion in the Indices. In cases where both a 144a and Reg S identifier are issued, the 144a identifier is used for USD- and CAD-denominated bonds and the Reg S identifier is used for all other currencies.

Perpetual securities

The first call date is used as the assumed final maturity for perpetual bonds when determining qualification with respect to maturity criteria of a given Index. For example, a perpetual bond with a call date in less than five years is included in the 1-5 year Index and excluded from the 5+ year Index; whereas a regular callable bond with a fixed final maturity in 30 years that is callable within 5 years is excluded from the 1-5 year Index and included in the 10+ year Index.

Fixed-to-floating rate securities

Fixed-to-floating rate securities qualify for inclusion in the fixed-rate Indices provided the security is callable within the fixed rate period. The last date on the call schedule that falls within the fixed rate period is used as the assumed final maturity for purposes of determining inclusion in maturity sub-Indices. Securities that are not called on or before the coupon transition date qualify for the floating-rate Indices.

Fixed-to-variable rate securities

Fixed-to-variable rate securities (eg, such as a security that resets to a spread off a current 5 year swap rate) provided they are callable within the initial fixed rate period. The first call date is used as the assumed final maturity for purposes of determining inclusion in maturity sub-Indices.

Contingent capital securities (cocos)

Contingent capital securities (cocos) qualify only for the stand-alone Contingent Capital Securities Index (ticker COCO), its sub-Indices and any blended Index that includes a Contingent Capital Index/sub-Index as a component. For purposes of Index qualification, we define a contingent capital security as a security having a conversion feature with a mechanical trigger at a specified capital level that typically transforms the debt into common equity or writes it down. Other capital securities, where conversion can be mandated by a regulatory authority but which have no specified trigger, are not treated as contingent capital securities and qualify for inclusion in the corporate Indices.

Mandatory Convertible Securities

For mandatory convertible securities the last business day before the mandatory conversion effective date is used for purposes of determining qualification with respect to maturity criteria.

Securitized corporate securities

Securitized corporate securities, such as pass-through trust certificates, EETCs and similar hybrid securitized debt, do not qualify for inclusion in any investment grade or high yield corporate Index.

Securities issued by Intercontinental Exchange or Black Knight

Securities issued by Intercontinental Exchange (ticker ICE) or Black Knight (ticker BKFS) are not included in the Indices because they are not evaluated by IDI's price provider, ICE Data Pricing & Reference Data, LLC.

Treatment of security events

All bond and securitized constituents

Type	Treatment
Full call	The security is removed at the next month-end rebalancing following the effective date of the call. The constituent price at point of removal is the price at which the security is called.

Type	Treatment
Partial call	The amount of the partial call is reduced from the constituent's amount outstanding at the next month-end rebalancing following the call announcement, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the amount is reduced at the following month-end rebalancing.
Tender	The amount of the tender is reduced from the security's amount outstanding at the next month-end rebalancing following the results announcement, provided that announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the amount is reduced at the following month-end rebalancing.
Repurchase/Increase	The amount repurchased and retired is reduced from the security's amount outstanding at the next month-end rebalancing following the call announcement, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the amount is reduced at the following month-end rebalancing. Likewise, any increase in amount outstanding due to add-on or tap issuance is added to the security's amount outstanding at the next month-end rebalancing following the issue date, provided the issue date is on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the amount is added at the following month-end rebalancing.
Exchange	The legacy security is held in the index until the next month-end rebalancing after the exchange announcement, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the legacy security is held in the index until the following month-end rebalancing. The price of the legacy security between the effective date of the exchange and the month-end rebalancing date when it is removed reflects the value of the new securities if they are index eligible, or the cash value of the exchanged securities at point of exchange if they are not.
Identifier/name change	The identifier/name is updated at the next month-end rebalancing following the effective date of the identifier/name change, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the identifier/name change is made at the following month-end rebalancing.
Payment in kind	Any additional securities paid as interest or dividend are assumed received and sold at the index price (based on next-day settlement assumption) and held as cash until the next month-end rebalancing.
Sinking fund payments	The amount of any sinking fund payments is reduced from the security's amount outstanding at the next month-end rebalancing following the scheduled sink date,

Type	Treatment
Prepayment of principal	For securitized products, the face amount retired due to any prepayment of principal is reduced from the security's amount outstanding at the next month-end rebalancing following the results announcement, provided that announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the amount is reduced at the following month-end rebalancing. The performance impact of prepayments are reflected in the index the day the information is received.
Maturity	The cash proceeds of securities that mature are held in the index until the end of the month and are then removed as part of the rebalancing. The security's price between the maturity date and the next rebalancing is the redemption price.
Listing or delisting from primary exchange	For Indices with listing criteria, the listing status of a security or its underlying equity is updated at the next month-end rebalancing following the effective date of the change, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the listing status change is made at the following month-end rebalancing.
Default	Securities in legal default are removed at the next month-end rebalancing following the default event, provided the event occurs on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the security is removed at the following month-end rebalancing. The security is removed from the index at the market price on the date of removal.

Preferred constituents

Type	Treatment
Full call	The preferred security's amount outstanding is reduced on the effective date of the call. The cash value of the called face amount is based on the call price. The cash proceeds are removed from the index at the next month-end rebalancing.
Partial call	The preferred security's amount outstanding is reduced on the effective date of the call. The cash value of the called face amount is based on the call price. The cash proceeds are removed from the index at the next month-end rebalancing.
Tender	The amount of the tender is reduced from the security's amount outstanding after the announced results are publicly available. The cash value of the tendered face amount is based on the tender price. The cash proceeds are removed from the index at the next month-end rebalancing.
Repurchase/Increase	The amount repurchased and retired is reduced from the security's amount outstanding after the announced results are publicly available. The cash value of the repurchased face amount is based on the index price on the date implemented. The cash proceeds are removed from the index at the next month-end rebalancing. Any increase in amount outstanding due to add-on or tap issuance is added to the security's

Type	Treatment
	amount outstanding at the next month-end rebalancing following the issue date, provided the issue date is on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the amount is added at the following month-end rebalancing.
Exchange	The legacy security is held in the index until the next month-end rebalancing after the exchange announcement, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the legacy security is held in the index until the following month-end rebalancing. The price of the legacy security between the effective date of the exchange and the month-end rebalancing date when it is removed reflects the value of the new securities if they are index eligible, or the cash value of the exchanged securities at point of exchange if they are not.
Identifier/name change	The identifier/name is updated at the next month-end rebalancing following the effective date of the identifier/name change, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the identifier/name change is made at the following month-end rebalancing.
Maturity	The cash proceeds of securities that mature are held in the index until the end of the month and are then removed as part of the rebalancing. The security's price between the maturity date and the next rebalancing is the redemption price.
Listing or delisting from primary exchange	For Indices with listing criteria, the listing status of a security or its underlying equity is updated at the next month-end rebalancing following the effective date of the change, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the listing status change is made at the following month-end rebalancing.
Default	Securities in legal default are removed at the next month-end rebalancing following the default event, provided the event occurs on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the security is removed at the following month-end rebalancing. The security is removed from the index at the market price on the date of removal.

Convertible constituents

Type	Treatment
Full call	The convertible security's amount outstanding is reduced on the effective date of the call. The cash value of the called face amount is based on the call price. The cash proceeds are removed from the index at the next month-end rebalancing.
Partial call	The convertible security's amount outstanding is reduced on the effective date of the call. The cash value of the called face

Type	Treatment
	amount is based on the call price. The cash proceeds are removed from the index at the next month-end rebalancing.
Tender	The convertible security's amount outstanding is reduced after the announced results are publicly available. The cash value of the tendered face amount is based on the tender price. The cash proceeds are removed from the index at the next month-end rebalancing.
Repurchase/Increase	The amount repurchased and retired is reduced from the security's amount outstanding after the announced results are publicly available. The cash value of the repurchased face amount is based on the index price on the date implemented. The cash proceeds are removed from the index at the next month-end rebalancing. Any increase in amount outstanding due to add-on or tap issuance is added to the security's amount outstanding at the next month-end rebalancing following the issue date, provided the issue date is on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the amount is added at the following month-end rebalancing.
Exchange	The legacy security is held in the index until the next month-end rebalancing after the exchange announcement, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the legacy security is held in the index until the following month-end rebalancing. The price of the legacy security between the effective date of the exchange and the month-end rebalancing date when it is removed reflects the value of the new securities if they are index eligible, or the cash value of the exchanged securities at point of exchange if they are not.
Identifier/name change	The identifier/name is updated at the next month-end rebalancing following the effective date of the identifier/name change, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the identifier/name change is made at the following month-end rebalancing.
Special payments and interest/dividends in shares	Any special payments are held as cash and reinvested at the next month-end rebalancing. Equity shares received as interest, dividend or special payment are converted into cash at the ex-date and reinvested at the next month-end rebalancing.
Mergers, acquisitions and other corporate events	Corporate events affecting a convertible security's underlying equity or basket are updated on the effective date of the event.
Voluntary conversion	The convertible security's amount outstanding is reduced following a one-day notification period. The cash value of the converted shares is based on the closing equity price on the day of the amount outstanding reduction. The cash is held in the index and reinvested at the next month-end rebalancing.
Mandatory conversion	For convertible securities undergoing a mandatory conversion the price on the last trading date is used to calculate a total

Type	Treatment
	cash value on the conversion effective date. If the effective date falls on a weekend or a Global Holiday then the cash value is calculated on the next business day. The cash is held in the index until the next rebalancing date at which point it is removed.
Maturity	Securities reaching maturity while an index constituent remain in the index until the next month-end rebalancing. The security's price between the maturity date and the next rebalancing is the redemption price.
Listing or delisting from primary exchange	For Indices with listing criteria, the listing status of a security or its underlying equity is updated at the next month-end rebalancing following the effective date of the change, provided the announcement is made on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the listing status change is made at the following month-end rebalancing. This rule also applies to securities that are de-listed from a stock exchange and begin trading on an OTC Markets platform.
Default	Securities in legal default are removed at the next month-end rebalancing following the default event, provided the event occurs on or before three business days before the last business day of the month (rebalancing lock-out date). Otherwise the security is removed at the following month-end rebalancing. The security is removed from the index at the market price on the date of removal.

Synthetic security Indices

US Constant Maturity STRIP Index Series

Each Index tracks the performance of a single synthetic US Treasury STRIP purchased at the beginning of the month, held for one month, and then sold at the end of the month with the proceeds rolled into a new instrument. Therefore, on the purchase date, the bond has a maturity exactly equal to the stated maturity of the Index, and at the point it is sold it is one month short of the Index stated maturity.

The synthetic STRIP has a zero coupon, a purchase yield equal to the yield of the corresponding point on the coupon STRIP curve, and a purchase price which is derived from the purchase yield. The coupon STRIP curve is fitted from the observed prices of all outstanding US Treasury coupon STRIPs. Each day thereafter, the instrument is priced by discounting its cash flow at the current day's coupon STRIP curve, while taking account of the passage of time. At the end of the month, the security is sold and the proceeds are rolled into a new instrument with a maturity equal to the stated maturity of the Index.

Deposit Rate Constant Maturity Index Series

Each Index tracks the performance of a synthetic asset paying a short-term deposit rate to a stated maturity. The Index is based on the assumed purchase at par of a synthetic instrument having exactly its stated maturity and with a coupon equal to that day's fixing rate. That issue is

assumed to be sold the following business day (priced at a yield equal to the current day fixing rate) and rolled into a new instrument.

The following example illustrates the calculation of a swap or deposit rate constant maturity Index over a period of three days using the US Dollar 1-Month Deposit Offered Rate Constant Maturity Index (ticker LUS1) on January 8, 2008, as an example. On January 7, a new instrument is purchased at par, with a coupon equal to the quoted deposit rate, 4.441%. On January 8, we calculate the current market price of that security based on a yield equal to the new quoted deposit rate of 4.411%. Using the current day "market price" and a starting value of par, we calculate price return, in this case 0.002%. Income return is accrued on a 30/360 basis and equals 0.012%. That instrument is then assumed to be sold and a new security is created, again priced at par and with a coupon equal to the quoted deposit rate for January 8 of 4.411%. On January 9, we repeat the process. Security 2 is sold at the current market price and a new instrument is purchased at par. Therefore, the average maturity of a 3-month deposit rate Index is always three months, a 1-month deposit rate Index is always one month, and an overnight Index is always one day.

Tradeable Swap Index Series

Each Index tracks the performance of a funded investment that combines a short term asset earning a 1-month deposit bid rate with a par or zero coupon interest rate swap, of an equal notional value, where the Index pays floating and receives fixed. The tenor of the swap is matched to the stated maturity of the Index on the day the position is established. The two instruments are held for one month at which point the swap is rolled into a new maturity and the cash is reinvested.

Valuation of the par or zero coupon swap

The swap is priced using discount functions derived from the par or zero coupon swap curve. Observed rates that form the basis for constructing the par coupon swap curve include a combination of closing futures prices and mid-market closing swap rates. All swap calculations assume regular settlement (i.e., T+2 for USD and EUR and T+0 for GBP).

Valuation of the short term cash asset

Cash, in an amount equal to the notional value of the swap, is invested in a short term asset earning the 1-month deposit bid rate. The coupon for the short term asset is equal to the yield of the ICE BofA 1-Month Deposit Bid Rate Constant Maturity Index for the corresponding currency on the day it is purchased and the maturity is set to the settlement date associated with the next rebalancing date. The short term asset is priced at par and accrues interest daily using the same settlement date as the corresponding swap (i.e., T+2 for USD and EUR and T+0 for GBP).

Rebalancing procedures

The Index is rebalanced on the last business day of the month. If the last calendar day of the month falls on a non-business day, the Index value for that date is equal to the Index value on the last business day. On the rebalancing day, cash is invested in a new asset earning the current day 1-month deposit bid rate, the old swap position is unwound and a new swap position is established so that the fixed leg of the swap once again matches the stated maturity of the Index.

Yield/spread boundary conditions

We follow a two-step process to address securities that are very close to their call dates or have extreme values, both negative and positive:

1. If the YTW is negative, the calculated workout date is within 30 days and the bond is continuously callable, YTW will be recalculated using a workout date 60 days from the current date. Yield, spread, duration and convexity to worst will all be based on this second calculation. No further recalculation is done if the second YTW result is also negative.

2. If any yield calculations (to worst, to maturity, effective), after adjustments that may have taken place in step 1, fall outside of a +100%/-10% range they will be adjusted to the closest boundary (-10% or +100%). Likewise, if any spread (to worst, OAS vs Govt, OAS vs Swap and Asset Swap Spread) falls outside of a +10,000bp/-1,000bp range it will be adjusted to -1,000bp or +10,000bp. No changes will be made to the corresponding duration or convexity calculations for bonds that have yield and/or spread adjustments applied based on this rule.

Sinking fund securities

To-maturity calculations (yield, duration and convexity) are calculated to the “average life” based on the sinking fund schedule. To-worst calculations are based on a comparison of the average life yield and the yield to all early redemption dates, if any. For example, if the yield to call is 3% and the yield to average life is 4%, the YTW will be 3% and the spread to worst will be calculated to the call date. If the yield to call is 5% and the yield to average life is 4%, the YTW will be 4% and the spread to worst will be calculated to the average life date.

U.S. MBS cohort construction and identifier assignment

Individual pools are grouped into constituent cohorts based on program (UMBS, legacy Freddie Mac, Ginnie Mae, Ginnie Mae II), product (30 year, 20 year, 15 year), coupon and production year. These four attributes are used to derive the cohort’s identifier that appears in the CUSIP field. The identifier that appears in the ISIN field is then derived by using the identifier provided under the CUSIP field preceded by “US” and followed by “00”.

1st - 3rd characters: Agency and Product	**Translation**
FGI	Freddie Gold 15-yr
FGL	Freddie Gold 30-yr
FGT	Freddie Gold 20-yr
QZI	UMBS 15-yr
QZL	UMBS 30-yr
QZT	UMBS 20-yr
G2S	Ginnie II 30-yr
GNJ	Ginnie 15-yr
GNS	Ginnie 30-yr
G2J	Ginnie II 15-yr
4th - 6th characters: Coupon	**Translation**
030	3.00%

1st - 3rd characters: Agency and Product	Translation
035	3.50%
050	5.00%
055	5.50%
7th & 8th characters: Production Year	**Translation**
03	2003
04	2004
13	2013
14	2014

Classifying convertible value and growth constituents

The following methodology is used to assign securities to Convertible Value and Growth sub-Indices:

Growth factors: (1) Absolute value of 12-month change in earnings per share (2) Absolute value of 12-month change in free cash flow (3) Absolute value of 12-month change in sales per share (4) Return on common equity

Value factors: (1) Earnings per share (2) Book value per share (3) Sales per share (4) Free cash flow per share

The factors for each company are then winsorized to reduce the impact of outliers, then standardized by calculating z-scores to the full universe of U.S. equities in the ICE US 3000 Index. The resulting standardized factor values are then averaged for each security to produce a Growth Score and a Value Score. A Composite Score is calculated next by normalizing the individual Growth and Value scores over a range of 0 to 1.

For Composite Scores between 0 and 0.2, 100% of the market cap of the security is assigned to the Value sub-index. Similarly, for Composite Scores between 0.8 and 1, 100% of the market cap of the security is assigned to the Growth sub-index. For Composite Scores between 0.2 and 0.8 a non-linear function is used to assign a ratio of the security's market cap to both the Value and Growth sub-Indices.

ESG and climate-related methodologies

Climate Data

Unless otherwise specified in individual Index rules, all Scope 1, Scope 2 and Scope 3 greenhouse gas (GHG) emissions and carbon intensity data is obtained from **Sustainalytics**. That data represents both company-reported data, as reviewed, monitored and corrected (where needed) by a dedicated research team, as well as Sustainalytics-estimated data. Use of company reported and/or Sustainalytics estimated carbon data is inherently subject to certain limitations, including but not limited to: distortions due to company acquisitions or divestments; lack of clarity regarding domestic versus international boundaries in reported figures; switches from an operational control to equity share of assets reporting approach; changes in Scope 2 accounting

method from a location-based to market-based method. Where possible, Sustainalytics takes steps to identify and resolve errors and distortions in the data they provide.

With respect to company reported data, Sustainalytics aggregates all applicable reported greenhouse gas emissions expressed in tons of CO_2 equivalent, in line with the GHG Protocol Corporate Standard. Sustainalytics relies on the procedures of individual reporting companies to convert amounts of greenhouse gases other than CO_2 into CO_2 equivalent, using global warming potential (GWP) factors provided by the Intergovernmental Panel on Climate Change (IPCC).

Sustainalytics uses company-reported GHG emissions to generate estimates for non-reporting companies through statistical estimation. Estimates of absolute Scope 1 and Scope 2 GHG emissions are calculated separately. The statistical models used by Sustainalytics are built at two different modelling group levels – subindustry or peer group. The more granular subindustry level is the preferred model and if there are too few reporting companies available in a subindustry, Sustainalytics use the average intensity at the broader peer group level.
To estimate Scope 3 emissions, Sustainalytics uses a proprietary multi-factor regression model to predict the emissions for companies that do not yet directly report the data. The model considers multiple size-related factors as well as business-model related characteristics (proxied by Revenues, Number of Employees Plant, Property & Equipment (PP&E), Cost of Revenues), as reflected in certain industry- and country-specific characteristics.

All absolute emissions and intensity data is reported by Sustainalytics in USD terms using currency conversion rates as of each company's reporting date.
For more information regarding Sustainalytics' methodologies and procedures, refer to **https://www.sustainalytics.com/**

Carbon Measures

Carbon Emissions

"Carbon Emissions" data provided by Sustainalytics is the combined Scope 1, 2 and 3 absolute emissions data, expressed in metric tonnes of CO2 equivalent.

EVIC-based Carbon Intensity

"EVIC-based Carbon Intensity" data provided by Sustainalytics is determined by dividing each constituent company's Carbon Emissions by the company's enterprise value including cash ("EVIC"). EVIC is the sum of a company's market capitalization of ordinary and preferred shares plus the book value of debt and non-controlling interests, including cash ("EVIC").

Revenue-based Carbon Intensity

"Revenue-based Carbon Intensity" data provided by Sustainalytics is determined by dividing each constituent company's Carbon Emissions by the company's revenues in USD terms.

Inflation Adjusted Carbon Intensity

Constituent EVIC-based and Revenue-based Carbon Intensity levels are adjusted by an inflation factor (the "Inflation Factor") that is calculated for the Climate Index 's Parent Index.

- For EVIC-based Carbon Intensity levels the factor is based on the overall change in the weighted average EVIC of the Parent Index constituents.

- For Revenue-based Carbon Intensity levels, the factor is based on the overall change in the weighted average Revenue of the Parent Index constituents.

On the Climate Index inception date, the Inflation Factor for the Parent Index is set equal to 1. Each calendar year-end thereafter the Inflation Factor is updated by the ratio of the new to previous factors.

$$Inflation\ Factor_{Y} = Inflation\ Factor_{Y-1} * \frac{[EVIC/Revenue]_{Parent,Y}}{[EVIC/Revenue]_{Parent,Y-1}}$$

Where:

$[EVIC/Revenue]_{Parent,\ Y}$ = the weighted average [EVIC/Revenue] of all constituents that (i) were in the index on the most recent calendar year-end date, (ii) were in the index on the previous calendar year-end date, (iii) whose associated entity did not change during the year due to merger, acquisition, etc., and (iv) where the issuer has [EVIC/Revenue] data on both dates. The weighted average is calculated using the weights of included constituents as of the most recent calendar year-end date.

$$[EVIC/Revenue]_{Parent,\ Y} = \sum(Bond\ Weight_{bond,i,Y} * [EVIC/Revenue]_{bond\ i,Y})$$

$[EVIC/Revenue]_{Parent,\ Y-1}$ = the weighted average [EVIC/Revenue] of all constituents that (i) were in the index on the most recent calendar year-end date, (ii) were in the index on the previous calendar year-end date, (iii) whose associated entity did not change during the year due to merger, acquisition, etc., and (iv) where the issuer has [EVIC/Revenue] data on both dates. The weighted average is calculated using the weights of included constituents as of the most recent calendar year-end date.

$$[EVIC/Revenue]_{Parent,\ Y-1} = \sum(Bond\ Weight_{bond\ i,Y} * [EVIC/Revenue]_{bond\ i,Y-1})$$

Each month, the most recently calculated Inflation Factor is applied to the [EVIC/Revenue-based] Carbon Intensity level for each security in the Climate Index.

$$Inflation\ Adjusted\ Carbon\ Intensity = [EVIC/Revenue\text{-}based]\ Carbon\ Intensity * Inflation\ Factor_{Y}$$

Calculation formulas

Calculating index values

The daily closing index value is a function of the prior month-end index value and the current month-to-date return:

$$IV_{n,t} = IV_{0,t} \times (1 + TRR_{n,t})$$

where:

$IV_{n,t}$ = closing index value on day *n* of month *t*

$IV_{0,t}$ = closing index value on prior month-end of month *t*

$TRR_{n,t}$ = month-to-date Index total return on day *n* of month *t*

The month-to-date return of an Index ($TRR_{n,t}$) is equal to the sum of the individual constituent returns times their respective beginning of month weights, minus the impact of transaction costs:

$$TRR_{n,t} = \sum_{i=1}^{k} (BTRR_{i,n,t} * Wt_{i,0,t}) - TC_t$$

where:

$TRR_{n,t}$ = Index month-to-date total return on day *n* for month *t*

$BTRR_{i,n,t}$ = month-to-date total return on day *n* of security for month *t*

$Wt_{i,0,t}$= beginning of month weight of security for month *t*

TC_t = transaction cost of the index for current month *t*

Transaction cost

The transaction cost applied is based on the bid-offer price spread of each security as a percentage of its index price plus accrued interest. The return adjustment will be applied to new additions to an index, and to any securities whose weights increase in the index, at each monthly rebalancing. The calculated transaction cost will be applied to the first day's performance and will be constant throughout the calendar month until the following rebalancing.
For each index security the transaction cost is calculated at each month-end rebalancing as follows:

$$TC_{i,t} = \frac{spread_{i,t}}{price_{i,t} + accrued_{i,t}}$$

Where:
TC = the transaction cost of security *i* at calendar month end date *t*
spread is the ask price minus the bid price for security *i* at calendar month end date *t*
price represents the price of security *i* at calendar month end date *t*
accrued is the accrued interest for security *i* at calendar month end date *t*.
NOTE: For securities evaluated at the mid price, the *spread* is the ask price minus the mid price, or one-half the spread represented by the ask price minus the bid price.

The transaction cost is applied to each security in an index based on its percentage **market value added** (*MVA*) to the index at the rebalancing.

$$MVA_{i,t} = \max\left(0, \frac{Wt_{i,tNEW} - Wt_{i,tOLD}}{Wt_{i,tNEW}}\right)$$

Where *Wt* is the security percentage weight in the index at point *t* for the upcoming month (*tNEW*) and the ending weight of the security at point *t* for the prior month (*tOLD*). Thus, any new additions to an index would see the full impact of the transaction cost applied to the position, where an increase in weight for an existing security would see the impact applied proportional to increase in weighting for the coming month.

$$Transaction\ Cost\ (index)\% = TC_t = \sum_{i=1}^{k} TC_{i,t} * Wt_{i,t} * \ MVA_{i,t}$$

The impact of transaction costs is calculated at each month end rebalancing date (t) for the upcoming month.

Index returns are also available excluding the impact of transaction costs. The calculation simply excludes the transaction cost term (TC_t):

$$TRR_{n,t} = \sum_{i=1}^{k} BTRR_{i,n,t} * Wt_{i,0,t}$$

Periodic and annualized returns

Periodic returns between any two dates can be derived from the beginning and end of period Index values. Since Index values represent closing levels, period returns will include market movement on the end of period date but exclude market movement on the beginning of period date. Therefore, to capture returns for the month of June, divide the June 30 Index value by the May 31 Index value:

$$TRR = \frac{IV_n}{IV_0} - 1$$

where:

TRR = periodic total return

IV_n = closing index value on the end of period date

IV_0 = closing index value on the beginning of period date

Annualized returns are derived from period total returns:

$$AnnTRR_n = (1 + TRR_n)^{365/d} - 1$$

where:

$AnnTRR_n$ = annualized total return for period *n*

TRR_n = periodic total return for period *n*

d = number of actual days in period *n*

Converting Index returns into another base currency unhedged

For multi-currency Indices, each currency segment is calculated separately and aggregated. Unhedged returns are converted into a given base currency using the following formulas:

$$CRR_i = \frac{FX_{i,n}}{FX_{i,0}} - 1$$

$$TRR_{converted} = \left[(1 + TRR_{local}) \times \left(1 + \sum_{i}^{k} Wt_i \, CRR_i\right) - TC_t\right] - 1$$

where:

CRR_i = currency return of currency segment *i* in base currency

Wt_i = weight of currency segment *i* at the beginning of month *t*

$FX_{i,n}$ = end-of-period FX rate to base currency for currency *i* (stated in terms of the number of units of the base currency per one unit of the currency of denomination of the bond)

$FXi_{,0}$ = beginning-of-period FX rate to base currency for currency *i* (stated in terms of the number of units of the base currency per one unit of the currency of denomination of the bond)

$TRR_{converted}$ = total return of the Index converted into the base currency unhedged

TRR_{local} = local total return of the Index excluding transaction cost

TC_t = transaction cost of the Index for current month *t*[2]

Converting Index returns into another base currency hedged

Currency hedged Index returns assume a rolling 1-month forward hedge where forward contracts are purchased in an amount equal to the full market value of the Index (including accrued interest) at the beginning of the month. For multi-currency Indices, each currency segment is calculated separately and aggregated. In addition to the formulas used to calculated unhedged converted returns, hedged returns require the following additional formulas:

$$Currency\ return\ on\ unhedged\ local\ total\ return = \ CRUTRR_i = CRR_i \times (1 + TRR_{local})$$

$$Forward\ return = \ FCR_i = \frac{FWD_{i,0}}{FX_{i,0}} - 1$$

[2] See "Transaction cost" section of Calculation formulas for additional detail.

$$Return\ on\ reversal\ of\ forward^{3} = \ RFCR_i = \frac{FWD_{i,n}}{FX_{i,n}} - 1$$

$$Return\ of\ the\ hedge = \ HR_i = HPct \times [(1 + FCR_i) - (1 + RFCR_i) \times (1 + CRR_i)]$$

$$Hedged\ total\ return = \ TRR_{hedged} = TRR_{local} + \sum_{i}^{k} CRUTRR + \sum_{i}^{k} HR - TC_t$$

$$Hedged\ total\ return\ index\ value = \ HIV_n = HIV_0 \times \left(1 + TRR_{hedged}\right)$$

Where:

$CRUTRR_i$ = currency return on unhedged local total return in base currency for currency *i*

FCR_i = forward contract return to base currency for currency *i*

$RFCR_i$ = return on the reversal of the forward contracts to base currency for currency *i* (Note: This term is only applicable for performance periods where the end date does not correspond to calendar month end rebalancing date.)

$FWD_{i,0}$ = previous month end forward rate to base currency for currency *i* (stated in terms of the number of units of the base currency per one unit of the currency of denomination of the index currency segment)

$FWD_{i,n}$ = end-of-period forward rate to base currency for currency *i* (stated in terms of the number of units of the base currency per one unit of the currency of denomination of the index currency segment)

HR_i = hedge return to base currency for currency *i*

HPct = percentage hedged

TRR_{hedged} = total return hedged into the base currency

HIV_n = closing hedged index value on day *n*

HIV_0 = closing hedged index value on prior month-end

TC_t = transaction cost of the Index for current month *t*[4]

[3] Only applicable for performance periods where the end date is not a calendar month end date.

[4] See "Transaction cost" section of Calculation formulas for additional detail.

Index Calculations on weekends and holidays

Definitions:

- Global Holiday: weekdays on which WM /Refinitiv does not publish closing FX rates. Typical Global Holidays are New Year's Day, Good Friday and Christmas Day. In cases where the U.S. Securities Industry and Financial Markets Association (SIFMA) recommends trading on a day which is otherwise a Global Holiday (occasionally Good Friday), this will be treated as a Global Business Day and FX rates are rolled from the prior Global Business Day.
- Global Business Day: any weekday that is not a Global Holiday

Date	Treatment
Global Holiday	No Indices are published unless a Global Holiday falls on the last business day of the month. See "Last business day of the month falls on a weekday that is a Global Holiday".
Global Business Day	All Indices are published.
Local market holiday on a Global Business Day	For any market that is closed on a Global Business Day, all prices are rolled from the prior business day and the accrued interest is calculated for the new settlement date.
Last business day of the month falls on a weekday that is a Global Holiday	Prices are updated for all local markets that are open and prices in all markets that are closed are rolled from the prior business day. Accrued interest is calculated for the new settlement date for all markets. FX rates are rolled from the prior Global Business Day.
Calendar Month-end Date falls on a weekend	All prices are rolled from the last business day and accrued interest is calculated for the new settlement date. FX rates are rolled from the prior Global Business Day.

Calculating security total returns in local currency terms

Month-to-date total returns are calculated daily for each bond in its currency of denomination (i.e., local total return). Cash flows from bond payments that are received during the month are retained in the Index as a separate line item until the end of the month and then are removed as part of the rebalancing. Cash does not earn any reinvestment income while it is held in the Index. With the exception of US mortgage pass-through and US structured products (ABS, CMBS and CMOs), accrued interest is calculated assuming next calendar day settlement (including when the next calendar day is a non-business day). Accrued interest for US mortgage pass-through and US structured products is calculated assuming same-day settlement.

$$BTRR_n = \frac{(P_n + AI_n) - (P_0 + AI_0) + C \times \left(1 + \frac{r}{d}\right)^t}{P_0 + AI_0}$$

where:

$BTRR_n$ = individual security month-to-date total return on day n

P_n = current day price

P_0 = prior month-end price

AI_n = current day accrued interest

AI_0 = prior month-end accrued interest

C = coupon payments received during the period (including capital payments at current market value)

r = reinvestment rate (currently zero)

t = number of days between the receipt of the cash flow and day n

d = day count convention for reinvestment asset

Calculating inflation-linked security total returns in local currency terms

Month-to-date total returns for inflation-linked securities are calculated daily for each bond in its currency of denomination (i.e., local total return). Inflation-linked returns include the impact of the change in inflation factor over time. Cash flows from bond payments that are received during the month are retained in the Index as a separate line item until the end of the month and then are removed as part of the rebalancing. Cash does not earn any reinvestment income while it is held in the Index. Accrued interest is calculated assuming next calendar day settlement (including when the next calendar day is a non-business day).

$$BTRR_n = \frac{f_n\left(P_n + AI_n + C * \left(1 + \frac{r}{d}\right)^t\right) - f_0(P_0 + AI_0)}{f_0(P_0 + AI_0)}$$

where:

$BTRR_n$ = individual security month-to-date total return on day n

f_n = *current day inflation factor*

f_0 = *prior month-end inflation factor*

P_n = current day price

P_0 = prior month-end price

AI_n = current day accrued interest

AI_0 = prior month-end accrued interest

C = coupon payments received during the period (including capital payments at current market value)

r = reinvestment rate (currently zero)

t = number of days between the receipt of the cash flow and day n

d = day count convention for reinvestment asset

Calculating preferred and convertible security total returns in local currency terms

Month-to-date total returns are calculated daily for each bond in its currency of denomination (i.e., local total return). Preferred and convertible returns include the impact of conversions/redemptions which occur during the month. Cash flows from bond payments that are received during the month are retained in the Index as a separate line item until the end of the month and then are removed as part of the rebalancing. Cash does not earn any reinvestment income while it is held in the Index. Accrued interest is calculated assuming next calendar day settlement (including when the next calendar day is a non-business day).

$$BTRR_n = \frac{(1 - f_n)(P_n + AI_n) + C * \left(1 + \frac{r}{d}\right)^t}{(P_0 + AI_0)} - 1$$

$$C = I_c + AI_c + R_c$$

where:

$BTRR_n$ = individual security month-to-date total return on day *n*

f_n = *percentage reduction in face on day n*

P_n = current day price

P_0 = prior month-end price

AI_n = current day accrued interest

AI_0 = prior month-end accrued interest

C = cash received during the period including coupon payments as well as capital payments at current market value

I_c = interest/dividend payments received during the period

AI_c = current day redemption accrued, defined as the percentage change in face times accrued interest paid, if any

R_c = current day principal cash, defined as the percentage change in face times the redemption price

r = reinvestment rate (currently zero)

t = number of days between the receipt of the cash flow and day *n*

d = day count convention for reinvestment asset

US agency mortgage-backed security total return formula

$$TRR = \frac{\left((P_n + AI_n) - (P_0 + AI_0) + \left[\frac{C}{12} \times \left(1 + \frac{r}{d \times 100}\right)^t\right]\right)}{P_0 + AI_0} + (1 - f) \times \frac{\left[\left(100 \times \left(1 + \frac{r}{d \times 100}\right)^t\right) - (P_n + AI_n)\right]}{P_0 + AI_0}$$

$$f = (1 - SPP) \times (1 - SMM)$$

$$SMM = 1 - \left(1 - \frac{CPR}{100}\right)^{1/12}$$

$$SPP = \left(\frac{\frac{WAC_0}{1200}}{\left(1 + \frac{WAC_0}{1200}\right)^{WAM_0} - 1}\right)$$

where:

TRR = month to date total return

P_n = current day price (assuming cash settlement)

P_0 = prior month-end price (assuming cash settlement)

AI_n = current day accrued interest (assuming cash settlement)

AI_0 = prior month-end accrued interest (assuming cash settlement)

C = net coupon stated in percentage terms

r = reinvestment rate stated in percentage terms (currently zero)

f = relative factor

d = day count for reinvestment asset

t = time to/since cash flow payment date (settlement date minus cash flow payment date)

SPP = schedule principal payment percentage

SMM = single monthly mortality

CPR = most recently reported constant prepayment rate

WAC_0 = weighted average gross coupon rate as of the previous month stated in percentage terms

WAM_0 = remaining maturity (in terms of number of months) as of the previous month

US agency mortgage-backed security cash settlement price calculation

US agency mortgage pass-through cash settle prices are derived from the current month regular (forward) settlement price up to the date before the roll date using the following formula:

$$P_c = \left[(P_r + AI_r) \times \left(\frac{1}{\left(1 + \frac{r}{d \times 100}\right)^n}\right)\right] - AI_c$$

where:

Pc = cash settle price

Pr = regular (forward) settle price for current month settlement

AIc = cash settle accrued interest

AIr = regular (forward) settle accrued interest for current month settlement

r = rate for the US Dollar 1-Month Deposit Bid Rate Constant Maturity Index (LUS1) stated in percentage terms

n = number of days between cash settle date and regular (forward) settle date

d = number of days in the year based on 360 day count

US mortgage pass-through cash settle prices are derived from the next month regular (forward) settlement price on the roll date through the end of the month using the following formula:

$$P_c = \left[\left(\frac{C}{12} + 100 \times (1 - f_e)\right) \times \left(\frac{1}{\left(1 + \frac{r}{d \times 100}\right)^{n_1}}\right)\right] + \left[(P_r + AI_r) \times f_e \times \left(\frac{1}{\left(1 + \frac{r}{d \times 100}\right)^{n_2}}\right)\right] - AI_c$$

where:

P_c = cash settle price

P_r = regular (forward) settle price for next month settlement

AI_c = cash settle accrued interest

AI_r = regular (forward) settle accrued interest for next month settlement

r = rate for the US Dollar 1-Month Deposit Bid Rate Constant Maturity Index (LUS1) stated in percentage terms

n_1 = number of days between cash settle date and the next month cash flow payment date

n_2 = number of days between cash settle date and regular (forward) settle date

C = net coupon stated in percentage terms

f_e = estimated factor based on most recently reported actual CPR

d = number of days in the year based on 360 day count

US ABS, CMBS and CMO security total return formula

$$TRR = \frac{(P_n + AI_n) - (P_0 + AI_0) + (P_{CF} + I_{CF})\left(1 + \frac{r}{d \times 100}\right)^t}{(P_0 + AI_0)} - \frac{(1 - f)(P_n + AI_n)}{(P_0 + AI_0)}$$

where:

TRR = individual bond month-to-date total return

P_n = current day price (assuming cash settlement)

P_0 = prior month-end price (assuming cash settlement)

AI_n = current day accrued interest (assuming cash settlement)

AI_0 = prior month-end accrued interest (assuming cash settlement)

I_{CF} = interest cash flow received

P_{CF} = principal cash flow received

f = end of period factor divided by the beginning of period factor

r = reinvestment rate (currently zero)

t = number of days between the receipt of the cash flow and day *n*

d = day count convention for the reinvestment asset

Return attribution methodology

A decision to purchase a bond brings with it many different types of risk. A corporate bond, for example, holds the obvious exposure to the credit worthiness of the issuer. But it also contributes to the aggregate interest rate exposure of the portfolio. On top of that, inclusion of a call, put or sinking fund feature may mean an additional element of optionality risk. And finally, depending on the currency of denomination of the cash flows, there may be foreign exchange risk to contend with as well. This complicates the bond selection process, as a particular issue under consideration may look very attractive from one risk perspective (eg, the issuer and spread), but go counter to the desired risk profile of the portfolio in other respects (eg, duration, currency, etc.). As a result, the portfolio manager is constantly working to make the individual positions in the portfolio fit together like an intricate jigsaw puzzle so as to achieve a portfolio profile that, in the aggregate, is aligned with both market views and tolerance levels for each of the major sources of risk.

Performance measurement – the periodic comparison of portfolio returns to those of a selected benchmark Index – provides an excellent macro level view of results, but offers little by way of explanation as to how those results were achieved. Performance attribution is a critical portfolio management technique in which each of the major sources contributing to overall portfolio performance is identified. Performance attribution requires a model for determining how much of a bond's return is affected by key risk factors.

Decomposing asset returns by source

Return attribution is a process by which the total return of a bond, portfolio, or Index is decomposed into a series of primary risk/return factors. The Index return attribution model has identified six key factors[5], summarized in Table 1, each of which isolates the degree to which changes in a specific market variable contributed to the total return of a bond. The starting point for the attribution process is the bond's beginning price, accrued interest, spread and implied volatility. There are a number of ways to define spread – we use option-adjusted spread[6] (OAS) as the basis for the model as it allows us to measure bonds with and without embedded options (eg, call, put, or sink features) in common and consistent terms. We then calculate a series of theoretical prices for the bond by sequentially changing a single pricing assumption while holding all other variables constant until we get to the ending price. A more detailed explanation of the step by step derivation of the factor prices is provided below.

All of the factors are calculated at the security level and then aggregated and reported at the index level. One additional factor is included as part of the index level return attribution: Transaction Cost. While Transaction Cost is reported at the security level, it is not part of the

[5] For US mortgage backed securities, one additional factor, "MBS Principal Paydown", is required. Refer to Table 1 for more detail on the US Mortgage attribution model

[6] Option-adjusted spread is the number of basis points that the fair value government spot curve is shifted in order to equate a bond's discounted cash flows with its market price. See "Option-adjusted spreads" for more detail.

total return decomposition for individual securities. This is because this calculation impact depends on weighting changes specific to each index in which the security is a constituent

Factor 1: Coupon

Coupon Return measures the contribution to total return of the stated coupon currently in effect. Price is held constant and accrued interest is recalculated to the end of period date. The change in price (always zero since price is held constant) plus the change in accrued interest along with coupons received during the period, if any, divided by the beginning price plus accrued interest is the Coupon Return. An obvious limitation to the explanatory power of Coupon Return is that it does not reflect the automatic change in price that occurs with the passage of time as premium and discount bonds converge to par while approaching maturity. This can amount to a significant portion of price movement for any bond priced at a steep premium or discount – particularly zero coupon and deferred interest bonds. Factor 2, Amortization/Roll, captures the impact of par convergence, thereby allowing for a more complete measure of the net interest return of a bond.

Factor 2: Amortization/Roll

Amortization[7]/Roll return measures the degree to which a bond's price changed simply due to the passage of time. The settlement date is changed to the end of the measurement period, and a theoretical price is derived using the beginning of period OAS, yield curve and implied volatility. The difference between the theoretical Amortization/Roll price and the beginning price divided by the beginning price plus accrued interest is the Amortization/Roll return. Shifting settlement date forward will affect the price of a bond in three ways:

1. Cash flows are closer to their maturity, which means that associated present values converge toward par.
2. Since the cash flows are closer to maturity, the corresponding discount rates are taken from a slightly shorter point on the yield curve. Therefore, in a normal yield curve environment cash flows are discounted at progressively lower rates, while the reverse is true in an inverted yield curve environment.
3. In the case of bonds with embedded options, the change in settlement date will affect the time value of the option.

Together, Coupon and Amortization/Roll Return measure the net interest return of a bond

Factor 3: Curve Shift

Curve Shift return measures the degree to which a bond's price changed as a result of shifts in the general level of interest rates. To establish the amount that the yield curve has shifted, we take an average of the yield changes along the fair value government par coupon curve from year 2 to year 30 (see "Fair value yield curves"). This shift factor is then added to the beginning yield curve and a theoretical Curve Shift price is derived using the beginning OAS and implied volatility along with the shifted yield curve. The difference between the theoretical Curve Shift price and

[7] We have abbreviated the Factor 2 label as "Amortization/Roll" return. This attribution factor, however, includes the accretion of discount as well as amortization of premium bonds.

the theoretical Amortization/Roll price divided by the beginning price plus accrued interest is the Curve Shift return.

Factor 4: Curve Reshape

Curve Reshape return measures the degree to which a bond's price changed as a result of changes in the shape of the fair value government yield curve. A theoretical Curve Reshape price is derived using the beginning OAS and implied volatility along with the actual ending yield curve. The difference between the theoretical Curve Reshape price and the theoretical Curve Shift price divided by the beginning price plus accrued interest is the Curve Reshape return.

Factor 5: Volatility Change

Volatility Change return measures the degree to which a bond's price changed as a result of changes in implied volatility. A theoretical Volatility Change price is derived using the beginning OAS along with the actual ending yield curve and implied volatility. The difference between the theoretical Volatility Change price and the theoretical Curve Reshape price divided by the beginning price plus accrued interest is the Volatility Change return.

Factor 6: Spread Change

Spread Change return measures the degree to which a bond's price changed as a result of changes in its spread to the government curve. In theory, the theoretical Spread Change price is derived using the actual ending yield curve, OAS and implied volatility. Since it is the last factor in the price decomposition, we can eliminate this step as the theoretical price calculated in this manner will equal the actual ending price of the bond. Thus, the difference between the actual ending price of the bond and its theoretical Volatility Change price divided by the beginning price plus accrued interest is the Spread Change return.

Factor 7: Transaction Cost

Transaction Cost is the difference between the bid and ask price of a security as a percentage of its bid price. This is not part of the return attribution at the security level, but is reported for informational purposes, as it will potentially impact index level performance for Indices in which the security is a constituent. At the index level, Transaction Cost measures the impact of security additions to the index, and is applied to each security in an index based on its percentage market value added at the previous month-end rebalancing

Table 1: Description of the Index Return Attribution Model

Return Factor	Description	Calculation Methodology
Coupon	The return attributed to that portion of the nominal coupon earned or received during the period.	Coupons received during the period plus the change in accrued interest divided by the starting price plus accrued interest (other than US MBS, ABS and CMBS, also equal to total return minus price return).

Table 1: Description of the Index Return Attribution Model

Return Factor	Description	Calculation Methodology
MBS Principal Paydown[8]	The return of a mortgage security attributed to the receipt of scheduled and unscheduled principal payments at par.	Paydown return equals par minus the ending price plus ending accrued interest divided by the starting price plus accrued interest times the percentage of outstanding principal repaid during the period.
Amortization/Roll	The portion of price return attributed to the passage of time. This includes the amortization of premium bonds and the accretion of discount bonds along with the effect on the present value of a bond's cash flows as they "roll down the yield curve".	Calculate the Option-Adjusted Spread[9] (OAS) of the bond at the beginning of the measurement period. Next, change settlement to the end of period date, and using the beginning yield curve, OAS and implied volatility solve for price. The difference between the "Amortization/Roll" price and the beginning price divided by beginning price plus accrued interest is the Amortization/Roll return. (Note: for mortgage securities, the prepayment model is used to generate a new set of projected cash flows for the new settlement date, but based on the old yield curve and volatility assumptions.)
Curve Shift	The impact on a bond's price resulting from general changes in the level of interest rates defined as the average parallel shift in the government fair value yield curve[10].	Price is recalculated using the beginning OAS and implied volatility along with the starting yield curve plus the parallel shift amount. The parallel shift amount is equal to the average change in the fair value government par coupon curve (from 2 to 30 years). The difference between the "Curve Shift" price and the "Amortization/Roll" price divided by beginning price plus accrued interest is the Curve Shift return. (Note: for mortgage securities, the prepayment model is used to generate a new set of projected cash flows based on the old volatility assumptions and the starting yield curve plus parallel shift amount.)
Curve Reshape	The impact on a bond's price resulting from changes in the shape of the fair value	Price is recalculated using the beginning OAS and implied volatility along with the actual ending yield curve. The difference between the "Curve Reshape" price and

[8] MBS Principal Paydown applies to US mortgage backed securities.

[9] Option-adjusted spread is the number of basis points that the fair value government spot curve is shifted in order to equate a bond's discounted cash flows with its market price. See "Option-adjusted spread" for more detail.

[10] The German government fair value curve is used as the baseline for purposes of attributing returns for all EUR-denominated bonds. The U.S. Treasury fair value curve excludes all on the run notes and bonds. See "Fair value yield curves" for more detail.

Table 1: Description of the Index Return Attribution Model

Return Factor	Description	Calculation Methodology
	government par coupon yield curve[11].	the "Curve Shift" price divided by beginning price plus accrued interest is the Curve Reshape return. (Note: for mortgage securities, the prepayment model is used to generate a new set of projected cash flows based on the old volatility assumptions and the ending yield curve).
Volatility Change	The impact on the price of a security resulting from changes in implied volatility.	Price is recalculated using the beginning OAS along with the ending yield curve and implied volatility. The difference between the "Volatility Change" price and the "Curve Reshape" price divided by beginning price plus accrued interest is the Volatility Change return. (Note: For U.S. Mortgages, the prepayment model is used to generate a new set of projected cash flows based on the ending yield curve and new volatility assumptions.)
Spread Change	The change in price resulting from changes in spread.	The difference between the actual ending price and the "Volatility Change" price divided by beginning price plus accrued interest is the Spread Change return.
Transaction Cost	The impact of the security additions to the index.	The difference between the bid and ask price of securities as a percentage of their bid price, For an index, this value multiplied by the share of their market value added percentage from the prior month.
Total Return	For a security, the sum of the above return factors excluding Transaction Cost. For an index, the sum of all of the above return factors. (Note: Since the above factors do not take currency into account, the sum of these factors is equal to the local currency return.)	For a security, the ending price plus accrued interest minus beginning price plus accrued interest, plus any coupon payment and/or principal paydown received during the period, divided by beginning price plus accrued interest. For an index, the published total return.

[11] The German government fair value curve is used as the baseline for purposes of attributing returns for all EUR-denominated bonds. The U.S. Treasury fair value curve excludes all on the run notes and bonds. See "Fair value yield curves" for more detail.

Excess return methodology

Excess return is a measure of relative value that neutralizes the interest rate and yield curve risk of a bond, thereby isolating that portion of its performance that is attributed solely to credit and optionality risks. Excess return is equal to a bond's total return minus the total return of a risk-matched basket of governments or interest rate swaps. There are two main components to excess return:

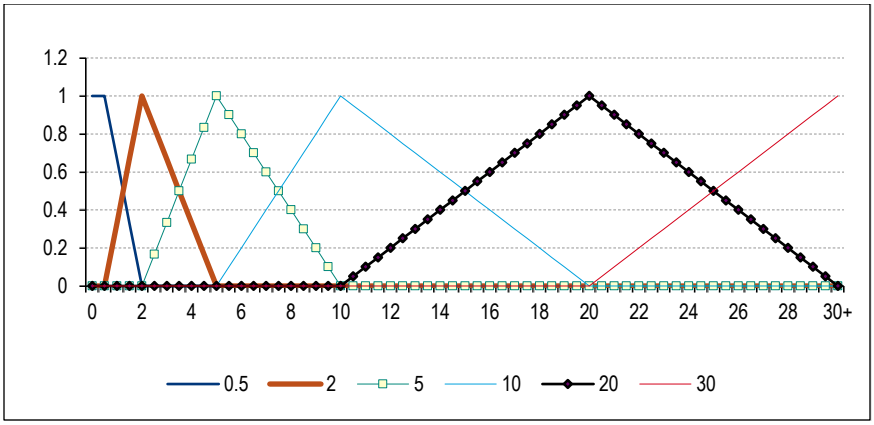
1. the additional interest income that accrues to the security during the period as a result of a higher starting yield relative to duration-matched governments or swaps, and
2. the effect of any change in spread during the period on the relative price movement of the security versus risk-matched governments or swaps.

The hedge basket is comprised of fair value governments (or swaps) that together are key rate duration-matched to the bond at six key nodes: the 6-month, 2-year, 5-year, 10-year, 20-year and 30-year points on the curve. The hedge basket is also matched to the bond's currency of denomination. For example, a sterling-denominated corporate bond is compared to UK Gilts or sterling interest rate swaps.

Calculating key rate durations

The key rate duration calculation is similar to calculating effective duration but the par coupon yield curve is shifted at only one node at a time while the other five nodes are held unchanged. The shift amounts for the points on the curve in between the node that is shifted and the preceding and subsequent nodes are linearly interpolated (Chart 1). The sum of a bond's six key rate durations will, in most cases, closely match its effective duration.

Chart 1: Shifting the curve at each key rate duration node



Creating fair value government and swap hedge securities

The governments (or swaps) used to construct the hedge basket are synthetic securities that are derived from the par coupon fair value government (or swap) yield curve in each market[12]. At the beginning of each month (ie, the last calendar day of the preceding month), a series of synthetic securities are created for 6-month, 2-year, 5-year, 10-year, 20-year and 30-year points on the curve. On that day, each synthetic security is priced at par, has a coupon and yield equal to the corresponding rate (in semi-annual terms) for the comparable maturity point on the fair value curve, and has an interest accrual date equal to the beginning of period date. Since these are initially par coupon securities priced exactly at the par coupon fair value curve, 100% of the hedge security's key rate duration exposure will fall on the node that corresponds to its maturity on the start date

Weighting the key rate duration-matched basket

At the beginning of each month (i.e., the last calendar day of the preceding month), a key rate duration-matched basket of fair value synthetic government (or swap) securities is created for each Index constituent. Each par coupon government (or swap) in the hedge basket (and the residual cash position) has key rate duration exposure at only one of the six nodes, whereas a constituent bond will typically have exposure at several nodes. The key rate duration of each hedge security, times its percentage weight, equals the constituent bond key rate duration for that corresponding node. For example, on November 30, 2013, the USD-denominated AIG 4.125% 2/24 issue had an 8.043 key rate duration exposure to the 10-year node (Table 2). That exposure was matched by allocating 89.041% of the government hedge basket to the 10-year fair value US Treasury security, which had an 9.032 key rate duration at that node (9.032 x 89.041% = 8.043). The sum of the hedge basket key rate durations and the AIG key rate durations both equal 8.552, which also matches the AIG effective duration

Table 2: AMER INTL GRP 4.125 2/24 excess return hedge basket as of November 30, 2013

		Fair value par coupon government bond hedge basket							
KRD node	**AIG KRD**	**Cash**	**6mo**	**2yr**	**5yr**	**10yr**	**20yr**	**weight**	**Wgt KRD**
Cash	0.000	0.000						-1.729%	0.000
6mo	0.010		0.418					2.472%	0.010
2yr	0.071			1.912				3.735%	0.071
5yr	0.256				4.808			5.334%	0.256
10yr	8.043					9.032		89.041%	8.043
20yr	0.172						14.971	1.146%	0.172
Total	8.552								8.552

[12] Euro and euro legacy currency denominated securities are compared to synthetic fair value governments based on the German government curve. The U.S. Treasury fair value curve excludes the current and previous on-the-run notes and bonds from its sample population. All markets exclude callable governments from the sample population. See "Fair value yield curves" for more detail.

Calculating excess return

Over the course of the month, the fair value government (or swap) securities roll down the curve and are priced by discounting their cash flows at the corresponding spot rates that are derived from the par coupon fair value yield curve. A total return is then calculated for each security in the hedge basket and multiplied by its beginning weight. The sum of the weighted hedge security total returns is subtracted from the constituent bond total return to arrive at the excess return. In the AIG example discussed previously, the 10-year fair value government bond began the month with a maturity of exactly 10-years and a price of 100.00. At the end of the month it had a remaining maturity of 9 years and 11 months, and was priced by discounting its cash flows using the December 31, 2013 spot curve. That produced a -2.079% total return for that security. The product of the hedge security returns and their respective weights equaled -1.949%. The AIG total return was -1.245%, leaving an excess return of +0.704%.

Table 3: AMER INTL GRP 4.125 2/24 excess return for December 2013

Term	Start value 30-Nov-13	End value[1] 31-Dec-13 (PV of cash flows)	Weight 30-Nov	Hedge basket total return
Cash			-1.73%	0.01%
6mo	100	100.017272	2.47%	0.02%
2yr	100	99.828209	3.74%	-0.17%
5yr	100	98.668987	5.33%	-1.33%
10yr	100	97.921493	89.04%	-2.08%
20yr	100	98.15202	1.15%	-1.85%
Hedge basket total return				-1.95%
AMER INTL GRP 4.125 2/24 total return				-1.25%
Transaction Cost				0.00%
AMER INTL GRP 4.125 2/24 excess return				0.70%

[1] Ending value is based synthetic bond cash flows discounted at the December 31, 2013 fair value government spot curve

The month-to-date excess return of an Index is equal to the weighted average of the individual excess returns of its constituents based on beginning of period weights, minus the impact of transaction costs.

$$ER_{Index} = \sum_{i=1}^{k} ER_i W_i - TC_t$$

where:

ER_{Index} = excess return of the Index

ER_i = excess return of Index constituent security *i*

W_i = beginning of month weight of Index security *i*

k = the number of securities in the Index

TC_t = transaction cost of the index for current month *t*[13]

[13] See "Transaction cost" section of Calculation formulas for additional detail.

For annualized excess return the annualized total return of the hedge basket is subtracted from the annualized total return of the Index/bond.

Fair value yield curves

Government nominal yield curves

Fair value government spot yield curves are derived from a universe of bond prices using government Index constituents. Specifically, the zero discount function is parameterized as a linear combination of a family of exponential functions. When a coupon bond is stripped as a set of coupon and principle payments, each cash flow is discounted using this parameterized discount function and the optimal fit is obtained by minimizing the sum of the squares of the differences of the individual bond theoretical and actual prices:

$$obj = min \sum_i \Delta P_i^2$$

$$\Delta P_i = P_i - \sum_j C_{ij} df_j$$

Where:

P_i = the actual bond price,

C_{ij} = the bond cash flows

df_j = the discount function

The goodness of fit and stiffness of the curve can be adjusted by increasing or decreasing the number of exponential basis functions and the exponent parameter.

A closer look at the fitted values of long and short bond prices using this method shows that, while long and short bond price discrepancies are comparable, the fitted bond yield discrepancy deteriorates rapidly towards zero maturity, creating instability on the front of the fitted yield curve. That is due to the fact that the price of a very short duration bond is minimally sensitive to yield changes. For example, a 10bp move for a bond with only 3 months to maturity amounts to 0.025 price change, whereas the same move would translate into a 1.50 price change for a 15 year duration bond. Therefore any adjustment to the front end of the curve does not improve the objective function by much and therefore the method will do a better job fitting long yields than short yields.

For that reason, we modify the formula and look at both price and yield discrepancies, using a method that increases the weight of short duration bonds and improves the stability of the front end as follows:

$$obj = min \sum_i \Delta P_i^2 + \Delta y_i^2$$

This can be restated as follows:

$$obj = min \sum_i \Delta P_i^2 (1 + \Delta y_i^2 / \Delta P_i^2) = min \sum_i \Delta P_i^2 w_i$$

$$w_i = 1 + \frac{1}{risk_i^2}$$

Where risk is the dollar risk of the bond (dP_i/dy_i)

Notes on security selection:

1. The US Treasury fair value curve excludes the current and previous on-the-run issues, any notes or bonds that are the cheapest to deliver for a futures contract, 30-year bonds with less than 10 years remaining term to maturity and 10-year bonds with less than 5 year remaining term to maturity.
2. The euro government fair value curve is comprised of all Index qualifying German government bonds.
3. All markets exclude callable governments from the sample population.

Government real yield curves

Real yield curves are derived from inflation-linked bonds using the same principle that a single curve is used to discount all bonds' cash flows, all of which are stated in real terms. The real curve is bootstrapped from the observed market prices. As a result, the curve will exactly match the real yields of the observed inflation-linked securities and there will be no rich/cheap spreads. A bootstrap approach is used largely due to the fact there are comparatively fewer observed securities to work with than in the nominal bond markets. While the resulting curve accurately prices the bonds, it is not useful for purposes of comparing richness or cheapness of the observed securities.

Corporate fair value curves

Our corporate spread curve model assumes that spread and spread duration are the two factors driving bond price movement. This greatly simplifies the relationship of a bond's price versus characteristics such as coupon, maturity, amortization, call schedule etc. Unlike other methods where price is directly modeled against the curve, and only bullet bonds can be used, our approach may use all bonds in a given Index universe. This is important in markets where a significant portion of outstanding bonds have embedded options.

We use the Nelson-Siegel model to build the corporate spread curves. It is a four-parameter formula that can account for the many shapes observed in the curvature of term structures. While this approach was originally applied to building traditional rate-maturity curves, we borrow the model and simply apply it to fitting OAS-duration curves.

The universe of bonds is pre-screened from the relevant Index universe (eg, US corporates, AA-rated). While ratings are updated only monthly for purposes of selecting constituents for rating sub-Indices, they are updated daily for purposes of determining observations for rating category corporate spread curves. Next, the median OAS and the average of deviates (the absolute difference of the OAS and median OAS) are calculated. A spread outside the band of four-times the average of deviates is excluded from the fitting. Finally, the parameters are adjusted to achieve an optimal solution by minimizing the sum of the square of the differences between the bonds and the fitted curve. The bonds are duration-weighted for purposes of calculating the best

fit. In addition, depending on the curve, the bonds may be additionally market-weighted, or equal-weighted.

Once the OAS-duration curve is fit, it is just a matter of overlaying it on the underlying government curve to generate the resulting spot and par-coupon corporate yield curves. Since the corporate par curve is a function of maturity, an iterative process is applied to guarantee the resulting par curve is consistent with the OAS-duration curve. The iterative process adjusts the corporate par coupon rate at each maturity point to match the OAS-duration curve.

Option-adjusted calculations

Fixed rate corporate and government bonds

Option-adjusted spread (OAS) is the number of basis points that the fair value government spot curve is shifted in order to match the present value of discounted cash flows to the bond's price. For securities with embedded options, such as call, sink or put features, a log normal short interest rate model is used to evaluate the present value of the securities potential cash flows. In this case, the OAS is equal to the number of basis points that the short interest rate tree must be shifted in order to match discounted cash flows to the bond's price.

Effective, or option-adjusted, duration (OAD) is calculated by parallel shifting the par yield curve to get the price sensitivity to interest rates, while spread duration is calculated by shifting the OAS. The impact of shifting yield curve or OAS is similar, but there is a term structure dependency which renders parallel shifting par curve not exactly equivalent to parallel shifting discount curve (shifting the OAS is equivalent to parallel shifting the discount curve), resulting in the difference between effective duration and spread duration.

Floating rate and fixed-to-floating rate corporate bonds

For floating rate and fixed-to-floating rate securities with embedded options (e.g., call, put, etc.), OAS is assumed to follow a Gaussian (normal) distribution based on a given spread volatility that is derived from the actual historical spread volatility (monthly spread volatility for currency-rating buckets is based on data from July 1998 with a 90% exponential decay – ie, a five-year half-life) for the bond's peer group (summary rating category buckets within each currency of denomination). This randomized spread is added to the government interest rate tree to discount projected cash flows (based on the floating Index forward curve). The OAS is equal to the number of basis points that the short interest rate tree plus the randomized spread must be shifted in order to match discounted cash flows to the bond's price.

To understand how the spread dynamics are impacting a floating-rate security's valuation, we begin with a static calculation where the credit spread is deterministic. If the credit spread is above the stated floating term margin the bond would be traded below par and the economic assumption is that the bond should not be called. On the other hand, if the credit spread is lower than the stated floating term margin the security is priced at a premium and should be called. However, credit spreads are not static over time, changing constantly with market valuations. Introducing spread volatility accounts for the future uncertainty of a security's credit spread and makes the decision to call or not to call a dynamic and probabilistic process. While the calculation's implementation is mathematically complex, the following illustrates the approach:

Floating rate bond price (or floating rate tail on a fixed-to-float security)

= sum of [(interest rate + margin) * discount (interest rate + OAS)]

= sum of [(interest rate + OAS) * discount (interest rate + OAS)] + sum of [(margin-OAS) * discount (interest rate + OAS)]

The first sum is evaluated to par, as the OAS is the market spread for the issuer. The second sum is equivalent to an annuity. Effective duration is the sensitivity to interest rates, and the first sum is rate neutral (always priced to par) providing zero duration. The second sum is a stream of interest income and the price direction is dependent on the sign of (margin-OAS). For example, if bond is priced at a discount (margin<OAS), the rising rate increases the bond price, therefore the floating rate tail's contribution to effective duration is negative.

Mortgage pass-through securities and CMOs

For US mortgage pass-through securities, interest rate/prepayment models are used to generate projected cash flows and forward curves (256 scenarios). OAS is the number of basis points that is added to the semi-annually compounded forward one-month rate curve to discount the corresponding cash flows for each scenario to arrive at a present value for each scenario. OAS is calculated in order to match the average of present values of all scenarios to the bond's price.

Structured products (ABS and CMBS)

For US structured products, a projected cash flow is generated (single scenario) using the pricing speed (provided by IDC). OAS is the number of basis points that is added to the semi-annually compounded forward one-month rate curve in order to match the present value of cash flows to the bond's price.

Floating rate ABS

For US floating rate ABS, yield is calculated based on the assumption that the current index rate will be constant over the remaining life of the bond. OAS is the number of basis points that is added to the semi-annually compounded forward one-month rate curve in order to match the present value of cash flows to the bond's price. For the OAS calculation, projected cash flows are based on the forward rate curve. Therefore, the coupon rate will vary over the remaining life of the bond.

Composite rating algorithm

Index constituent composite ratings are updated once a month as part of the rebalancing process. Composite rating changes take effect on the last calendar day of the month based on information available up to and including the rebalancing lock-out date (the third business day prior to the last business day of the month). Rating upgrades or downgrades occurring after that day will not be considered in the current month rebalancing and will get incorporated at the following month's rebalancing.

For example, assuming there are no Global Holidays in between, if August 31 fell on a Friday the rebalancing lock-out date would occur on August 28. Therefore, a bond that was downgraded to below investment grade on August 28 would transition from the investment grade Index to the high yield Index at the August 31 rebalancing. Conversely, if the bond was downgraded on August 29, it would remain in the investment grade Index for the month of September and transition to high yield at the September 30 rebalancing.

Composite ratings are the simple averages of ratings from Moody's, S&P and Fitch. Ratings must be public and any expected or anticipated ratings are not used. The composite rating is calculated by assigning a numeric equivalent to the ratings in each agency's scale (Table 4). The average of the numeric equivalents for each agency that rates a bond is rounded to the nearest integer and then converted back to an equivalent composite rating using the scale in Table 4. If only two of the designated agencies rate a bond, the composite rating is based on an average of the two. Likewise, if only one of the designated agencies rates a bond, the composite rating is based on that one rating. Provisional or estimated ratings are excluded from the composite rating calculation.

Table 4: Ratings scale for calculating composite rating

Numeric	Composite	Moody's	S&P	Fitch
1	AAA	Aaa	AAA	AAA
2	AA1	Aa1	AA+	AA+
3	AA2	Aa2	AA	AA
4	AA3	Aa3	AA-	AA-
5	A1	A1	A+	A+
6	A2	A2	A	A
7	A3	A3	A-	A-
8	BBB1	Baa1	BBB+	BBB+
9	BBB2	Baa2	BBB	BBB
10	BBB3	Baa3	BBB-	BBB-
11	BB1	Ba1	BB+	BB+
12	BB2	Ba2	BB	BB
13	BB3	Ba3	BB-	BB-
14	B1	B1	B+	B+
15	B2	B2	B	B
16	B3	B3	B-	B-
17	CCC1	Caa1	CCC+	CCC+
18	CCC2	Caa2	CCC	CCC
19	CCC3	Caa3	CCC-	CCC-
20	CC	Ca	CC	CC
21	C	C	C	C
22	D		D	D

Sample calculations

The following examples demonstrate the composite rating calculation for several Index constituents as of August 31, 2008 (rebalancing lock-out date = August 26, 2008):

Coventry Health, CVH 5.95% March 15, 2017
Moody's: Ba1 = 11
S&P: BBB = 9
Fitch: BBB- = 10
$(11+9+10)/3=10 \Rightarrow BBB3$

Tyson Foods, TSN 6.60% April 1, 2016
Moody's: Ba1 = 11
S&P: BBB- = 10
Fitch: BB+ = 11
$(11+10+11)/3=10.667 \Rightarrow 11 \Rightarrow BB1$

Rating hierarchy for asset classes

While our composite rating is generally derived from individual bond ratings, in some cases other ratings are used as an alternative. Table 5 lists the rating types, in order of priority, used for each issuer group to calculate the composite rating. For example, if a government guaranteed security has a bond rating from at least one of the three designated agencies, then its composite rating will be based on the bond rating(s). If the bond is not rated by any of the three agencies, then issuer ratings from the three agencies are used as an alternative. On the other hand, corporate bonds only use bond ratings.

Table 5: Hierarchy of rating types used by asset class

Issuer group	Composite rating based on
Sovereigns (i.e., sovereign debt denominated in the issuer's local currency)	Local currency long term sovereign debt rating
Foreign Sovereigns (i.e., sovereign debt denominated in a foreign currency)	Foreign currency long term sovereign debt rating
Quasi-Governments (i.e., Agency, Local Authority, Government Sponsored/Guaranteed, Supranational)	1) Bond rating 2) Senior unsecured debt issuer rating (foreign currency issuer rating is used for bonds denominated in a currency other than the local currency of the issuer's country of domicile). Note: issuer rating is used only for unsubordinated debt.
US Agency MBS and CMOs	Ginnie Mae collateral: US local currency long-term debt sovereign rating Fannie Mae & Freddie Mac collateral: senior unsecured debt issuer rating
Covered bonds	Bond rating
US Municipals	Bond rating

Table 5: Hierarchy of rating types used by asset class

Issuer group	Composite rating based on
ABS and CMBS	Bond rating
Corporate bonds	Bond rating
Preferreds	Bond rating

Subordination types

Subordination types indicating payment ranking are assigned to all corporate, quasi-government and securitized/collateralized securities in the Index universe. Table 6 lists the subordination types along with notes on the conventions followed.

Table 6: Subordination type classifications

Code	Description	Notes
Non-bank and bank holding company corporates and collateralized		
SECR	Secured	Senior secured, collateralized and covered
SENR	Senior	Senior unsecured; unsubordinated
SUB	Subordinated	Ranking below senior debt; senior subordinated
JSUB	Junior subordinated	Ranking below other subordinated debt
PFD	Preferred	Ranking below junior subordinated debt but above common equity; preferred stock
Bank and bank holding company corporates		
SECR	Secured	Senior secured, collateralized
SENR	Senior	Senior unsecured; unsubordinated
SNPR	Senior Non-Preferred	Senior unsecured but can be written down upon occurrence of a capital event, or senior unsecured issued by a bank holding company
T2	Tier 2	Subordinated; includes legacy lower tier 2
UT2	Upper Tier 2	Includes only legacy upper tier 2 debt
T1	Tier 1	Originally issued as qualifying tier 1 capital under the issuer's regulatory regime
AT1	Alternative Tier 1	Originally issued as additional tier 1 capital under issuer's regulatory regime
PFD	Preferred	Ranking below junior subordinated debt but above common equity; preferred stock
Securitized		
SSEN	Securitized senior	Senior tranche of a securitized deal
SSUB	Securitized subordinated	Subordinated tranche of a securitized deal
SMEZ	Securitized mezzanine	Mezzanine tranche of a securitized deal

Country designation

Unless otherwise noted the standard country designation used in Indices is country of risk. The methodology for determining country of risk is as follows:

- Sovereign debt (both local and foreign currency debt): the country of risk is the same as the issuing country
- Agency and Local Authority debt: the country of risk is the country in which the obligor resides
- Supranational debt: the country of risk is “Supranational”
- Collateralized and securitized asset classes: the country of risk is based on the location of the underlying collateral
- Corporate debt: the country of risk is based on the physical location of the issuer’s operating headquarters with the following exceptions:
- Holding company issuers are assigned a country of risk based on the location of the majority of operating assets. If no single country represents a majority of operating assets, or if this cannot be determined, the country or risk is the issuer’s operating headquarters
- Bank branch issues are assigned the country of risk of the parent entity
- Securities with a guarantee are assigned the guarantor’s country of risk
- For indirect corporate and government issuers such as Sukuks and loan participation notes, the country of risk is based on the obligor
- Convertible securities are assigned the country of risk of the underlying equity. The equity country of risk is assigned in the same manner as Corporate debt as described above.

Country status, region and code assignments

The ICE Indices use standard ISO codes for country and currency designations. We also have developed a geographic schema to group countries by region and sub-region.

Defining market status: Emerging vs Developed

A country is defined as a developed market if it is a member of the FX-G10, Western Europe or a territory of the US or Western Europe. The FX-G10 includes all Euro members, the US, Japan, the UK, Canada, Australia, New Zealand, Switzerland, Norway and Sweden. All other countries are emerging markets by definition.

Geographical Region	Geographical Sub-Region
Africa	North Africa
	Sub-Saharan Africa
Americas	Caribbean
	Central America
	North America
	South America
Asia/Pacific	East Asia
	Oceania
	South Asia
	Southeast Asia
Caucasus & Central Asia	Caucasus
	Central Asia
Europe	Central & Eastern Europe
	Western Europe
Middle East	Middle East
Multinational	Multinational
Supranational	Supranational

In the Emerging Markets index series sub-Indices exist that segment constituents by country into three regions: Latin America; EMEA (Europe, Middle East, Africa) and Asia. For purposes of qualifying these regional sub-Indices the following definitions are used:

- Latin America – all Emerging Markets countries in the Americas region
- EMEA (also referred to as CEEMEA) – all Emerging Markets countries in the Africa, Caucuses & Central Asia and Middle East regions, along with all Emerging Markets countries in the Central & Eastern Europe sub-region
- Asia – all Emerging Markets countries in the Asia/Pacific region

Country	Code	Currency	Status	Geographical Region	Geographical Sub-Region
Afghanistan	AF	AFN	Emerging	Asia/Pacific	South Asia
Aland Islands	AX	EUR	Developed	Europe	Western Europe
Albania	AL	ALL	Emerging	Europe	Central & Eastern Europe
Algeria	DZ	DZD	Emerging	Africa	North Africa
American Samoa	AS	USD	Developed	Asia/Pacific	Oceania
Andorra	AD	EUR	Developed	Europe	Western Europe
Angola	AO	AOA	Emerging	Africa	Sub-Saharan Africa
Anguilla	AI	XCD	Developed	Americas	Caribbean
Antigua and Barbuda	AG	XCD	Emerging	Americas	Caribbean
Argentina	AR	ARS	Emerging	Americas	South America
Armenia	AM	AMD	Emerging	Caucasus & Central Asia	Caucasus
Aruba	AW	AWG	Developed	Americas	Caribbean
Australia	AU	AUD	Developed	Asia/Pacific	Oceania
Austria	AT	EUR	Developed	Europe	Western Europe
Azerbaijan	AZ	AZN	Emerging	Caucasus & Central Asia	Caucasus
Bahamas	BS	BSD	Emerging	Americas	Caribbean
Bahrain	BH	BHD	Emerging	Middle East	Middle East
Bangladesh	BD	BDT	Emerging	Asia/Pacific	South Asia
Barbados	BB	BBD	Emerging	Americas	Caribbean
Belarus	BY	BYN	Emerging	Europe	Central & Eastern Europe
Belgium	BE	EUR	Developed	Europe	Western Europe
Belize	BZ	BZD	Emerging	Americas	Central America
Benin	BJ	XOF	Emerging	Africa	Sub-Saharan Africa
Bermuda	BM	BMD	Developed	Americas	North America
Bhutan	BT	BTN	Emerging	Asia/Pacific	South Asia
Bolivia	BO	BOB	Emerging	Americas	South America
Bonaire, Sint Eustatius and Saba	BQ	USD	Developed	Americas	Caribbean
Bosnia & Herzegovina	BA	BAM	Emerging	Europe	Central & Eastern Europe
Botswana	BW	BWP	Emerging	Africa	Sub-Saharan Africa
Bouvet Island	BV	NOK	Developed	Americas	Sub-Saharan Africa
Brazil	BR	BRL	Emerging	Americas	South America
British Indian Ocean Territory	IO	USD	Developed	Asia/Pacific	South Asia
British Virgin Islands	VG	USD	Developed	Americas	Caribbean
Brunei Darussalam	BN	BND	Emerging	Asia/Pacific	Southeast Asia
Bulgaria	BG	BGN	Emerging	Europe	Central & Eastern Europe
Burkina Faso	BF	XOF	Emerging	Africa	Sub-Saharan Africa
Burundi	BI	BIF	Emerging	Africa	Sub-Saharan Africa
Cambodia	KH	KHR	Emerging	Asia/Pacific	Southeast Asia
Cameroon	CM	XAF	Emerging	Africa	Sub-Saharan Africa
Canada	CA	CAD	Developed	Americas	North America
Cape Verde	CV	CVE	Emerging	Africa	Sub-Saharan Africa
Cayman Islands	KY	KYD	Developed	Americas	Caribbean
Central Africa	CF	XAF	Emerging	Africa	Sub-Saharan Africa
Chad	TD	XAF	Emerging	Africa	Sub-Saharan Africa
Channel Islands	CHNL	GBP	Developed	Europe	Western Europe
Chile	CL	CLP	Emerging	Americas	South America
China	CN	CNY	Emerging	Asia/Pacific	East Asia
Christmas Island	CX	AUD	Emerging	Asia/Pacific	Southeast Asia
Cocos Islands	CC	AUD	Emerging	Asia/Pacific	Southeast Asia
Colombia	CO	COP	Emerging	Americas	South America
Comoros	KM	KMF	Emerging	Africa	Sub-Saharan Africa
Congo	CG	XAF	Emerging	Africa	Sub-Saharan Africa
Congo, Democratic Republic	CD	CDF	Emerging	Africa	Sub-Saharan Africa
Cook Islands	CK	NZD	Emerging	Asia/Pacific	Oceania
Costa Rica	CR	CRC	Emerging	Americas	Central America

Country	Code	Currency	Status	Geographical Region	Geographical Sub-Region
Croatia	HR	EUR	Developed	Europe	Central & Eastern Europe
Cuba	CU	CUC	Emerging	Americas	Caribbean
Curacao	CW	ANG	Developed	Americas	Caribbean
Cyprus	CY	EUR	Developed	Europe	Western Europe
Czech Republic	CZ	CZK	Emerging	Europe	Central & Eastern Europe
Denmark	DK	DKK	Developed	Europe	Western Europe
Djibouti	DJ	DJF	Emerging	Africa	Sub-Saharan Africa
Dominica	DM	XCD	Emerging	Americas	Caribbean
Dominican Republic	DO	DOP	Emerging	Americas	Caribbean
East Timor	TP	USD	Emerging	Asia/Pacific	Southeast Asia
Ecuador	EC	USD	Emerging	Americas	South America
Egypt	EG	EGP	Emerging	Africa	North Africa
El Salvador	SV	USD	Emerging	Americas	Central America
Equatorial Guinea	GQ	XAF	Emerging	Africa	Sub-Saharan Africa
Eritrea	ER	ERN	Emerging	Africa	Sub-Saharan Africa
Estonia	EE	EUR	Developed	Europe	Central & Eastern Europe
Eswatini	SZ	SZL	Emerging	Africa	Sub-Saharan Africa
Ethiopia	ET	ETB	Emerging	Africa	Sub-Saharan Africa
Faeroe Islands	FO	DKK	Developed	Europe	Western Europe
Falkland Islands	FK	FKP	Developed	Americas	South America
Federated States of Micronesia	FM	USD	Emerging	Asia/Pacific	Oceania
Fiji	FJ	FJD	Emerging	Asia/Pacific	Oceania
Finland	FI	EUR	Developed	Europe	Western Europe
France	FR	EUR	Developed	Europe	Western Europe
French Guiana	GF	EUR	Developed	Americas	South America
French Polynesia	PF	XPF	Developed	Asia/Pacific	Oceania
French Southern and Antarctic Lands	TF	EUR	Developed	Africa	Sub-Saharan Africa
Gabon	GA	XAF	Emerging	Africa	Sub-Saharan Africa
Gambia	GM	GMD	Emerging	Africa	Sub-Saharan Africa
Georgia	GE	GEL	Emerging	Caucasus & Central Asia	Caucasus
Germany	DE	EUR	Developed	Europe	Western Europe
Ghana	GH	GHS	Emerging	Africa	Sub-Saharan Africa
Gibraltar	GI	GIP	Developed	Europe	Western Europe
Greece	GR	EUR	Developed	Europe	Western Europe
Greenland	GL	DKK	Developed	Americas	North America
Grenada	GD	XCD	Emerging	Americas	Caribbean
Guadeloupe	GP	EUR	Developed	Americas	Caribbean
Guam	GU	USD	Developed	Asia/Pacific	Oceania
Guatemala	GT	GTQ	Emerging	Americas	Central America
Guernsey, Channel Islands	GG	GBP	Developed	Europe	Western Europe
Guinea	GN	GNF	Emerging	Africa	Sub-Saharan Africa
Guinea-Bissau	GW	XOF	Emerging	Africa	Sub-Saharan Africa
Guyana	GY	GYD	Emerging	Americas	South America
Haiti	HT	USD	Emerging	Americas	Caribbean
Heard and Macdonald Islands	HM	AUD	Emerging	Asia/Pacific	Oceania
Holy See (Vatican)	VA	EUR	Developed	Europe	Western Europe
Honduras	HN	HNL	Emerging	Americas	Central America
Hong Kong	HK	HKD	Emerging	Asia/Pacific	East Asia
Hungary	HU	HUF	Emerging	Europe	Central & Eastern Europe
Iceland	IS	ISK	Developed	Europe	Western Europe
India	IN	INR	Emerging	Asia/Pacific	South Asia
Indonesia	ID	IDR	Emerging	Asia/Pacific	Southeast Asia
Iran	IR	IRR	Emerging	Middle East	Middle East
Iraq	IQ	IQD	Emerging	Middle East	Middle East
Ireland	IE	EUR	Developed	Europe	Western Europe

Country	Code	Currency	Status	Geographical Region	Geographical Sub-Region
Isle Of Man	IM	GBP	Developed	Europe	Western Europe
Israel	IL	ILS	Emerging	Middle East	Middle East
Italy	IT	EUR	Developed	Europe	Western Europe
Ivory Coast	CI	XOF	Emerging	Africa	Sub-Saharan Africa
Jamaica	JM	JMD	Emerging	Americas	Caribbean
Japan	JP	JPY	Developed	Asia/Pacific	East Asia
Jersey, Channel Islands	JE	GBP	Developed	Europe	Western Europe
Jordan	JO	JOD	Emerging	Middle East	Middle East
Kazakhstan	KZ	KZT	Emerging	Caucasus & Central Asia	Central Asia
Kenya	KE	KES	Emerging	Africa	Sub-Saharan Africa
Kiribati	KI	AUD	Emerging	Asia/Pacific	Oceania
Kosovo	KV	EUR	Emerging	Europe	Central & Eastern Europe
Kuwait	KW	KWD	Emerging	Middle East	Middle East
Kyrgyzstan	KG	KGS	Emerging	Caucasus & Central Asia	Central Asia
Laos	LA	LAK	Emerging	Asia/Pacific	Southeast Asia
Latvia	LV	EUR	Developed	Europe	Central & Eastern Europe
Lebanon	LB	LBP	Emerging	Middle East	Middle East
Lesotho	LS	ZAR	Emerging	Africa	Sub-Saharan Africa
Liberia	LR	LRD	Emerging	Africa	Sub-Saharan Africa
Libya	LY	LYD	Emerging	Africa	North Africa
Liechtenstein	LI	CHF	Developed	Europe	Western Europe
Lithuania	LT	EUR	Developed	Europe	Central & Eastern Europe
Luxembourg	LU	EUR	Developed	Europe	Western Europe
Macau	MO	MOP	Emerging	Asia/Pacific	East Asia
Madagascar	MG	MGA	Emerging	Africa	Sub-Saharan Africa
Malawi	MW	MWK	Emerging	Africa	Sub-Saharan Africa
Malaysia	MY	MYR	Emerging	Asia/Pacific	Southeast Asia
Maldives	MV	MVR	Emerging	Asia/Pacific	South Asia
Mali	ML	XOF	Emerging	Africa	Sub-Saharan Africa
Malta	MT	EUR	Developed	Europe	Western Europe
Marshall Islands	MH	USD	Developed	Asia/Pacific	Oceania
Martinique	MQ	EUR	Developed	Americas	Caribbean
Mauritania	MR	MRU	Emerging	Africa	Sub-Saharan Africa
Mauritius	MU	MUR	Emerging	Africa	Sub-Saharan Africa
Mayotte	YT	EUR	Developed	Africa	Sub-Saharan Africa
Mexico	MX	MXN	Emerging	Americas	Central America
Micronesia	FM	USD	Emerging	Asia/Pacific	Oceania
Moldova	MD	MDL	Emerging	Europe	Central & Eastern Europe
Monaco	MC	EUR	Developed	Europe	Western Europe
Mongolia	MN	MNT	Emerging	Asia/Pacific	East Asia
Montenegro	ME	EUR	Emerging	Europe	Central & Eastern Europe
Montserrat	MS	XCD	Developed	Americas	Caribbean
Morocco	MA	MAD	Emerging	Africa	North Africa
Mozambique	MZ	MZN	Emerging	Africa	Sub-Saharan Africa
Multi-National	MNAT	NA	Developed	Multinational	Multinational
Myanmar	MM	MMK	Emerging	Asia/Pacific	Southeast Asia
Namibia	NA	ZAR	Emerging	Africa	Sub-Saharan Africa
Nauru Island	NR	AUD	Emerging	Asia/Pacific	Oceania
Nepal	NP	NPR	Emerging	Asia/Pacific	South Asia
Netherlands	NL	EUR	Developed	Europe	Western Europe
Netherlands Antilles	AN	ANG	Developed	Americas	Caribbean
New Caledonia	NC	XPF	Developed	Asia/Pacific	Oceania
New Zealand	NZ	NZD	Developed	Asia/Pacific	Oceania
Nicaragua	NI	NIO	Emerging	Americas	Central America
Niger	NE	XOF	Emerging	Africa	Sub-Saharan Africa

Country	Code	Currency	Status	Geographical Region	Geographical Sub-Region
Nigeria	NG	NGN	Emerging	Africa	Sub-Saharan Africa
Niue	NU	NZD	Emerging	Asia/Pacific	Oceania
Norfolk Island	NF	AUD	Emerging	Asia/Pacific	Oceania
North Korea	KP	KPW	Emerging	Asia/Pacific	East Asia
Northern Macedonia	MK	MKD	Emerging	Europe	Central & Eastern Europe
Northern Mariana Islands	MP	USD	Developed	Asia/Pacific	Oceania
Norway	NO	NOK	Developed	Europe	Western Europe
Oman	OM	OMR	Emerging	Middle East	Middle East
Pakistan	PK	PKR	Emerging	Asia/Pacific	South Asia
Palau	PW	USD	Emerging	Asia/Pacific	Southeast Asia
Palestine	PS	NA	Emerging	Middle East	Middle East
Panama	PA	USD	Emerging	Americas	Central America
Panama Canal Zone	PZ	USD	Emerging	Americas	Central America
Papua New Guinea	PG	PGK	Emerging	Asia/Pacific	Oceania
Paraguay	PY	PYG	Emerging	Americas	South America
Peru	PE	PEN	Emerging	Americas	South America
Philippines	PH	PHP	Emerging	Asia/Pacific	Southeast Asia
Pitcairn Island	PN	NZD	Developed	Asia/Pacific	Oceania
Poland	PL	PLN	Emerging	Europe	Central & Eastern Europe
Portugal	PT	EUR	Developed	Europe	Western Europe
Puerto Rico	PR	USD	Developed	Americas	Caribbean
Qatar	QA	QAR	Emerging	Middle East	Middle East
Reunion	RE	EUR	Developed	Africa	Sub-Saharan Africa
Romania	RO	RON	Emerging	Europe	Central & Eastern Europe
Russia	RU	RUB	Emerging	Europe	Central & Eastern Europe
Rwanda	RW	RWF	Emerging	Africa	Sub-Saharan Africa
Samoa	WS	WST	Emerging	Asia/Pacific	Oceania
Saint Barthelemy	BL	EUR	Developed	Americas	Caribbean
Saint Helena, Ascension and Tristan da Cunha	SH	SHP	Developed	Africa	Sub-Saharan Africa
Saint Kitts and Nevis	KN	XCD	Emerging	Americas	Caribbean
Saint Lucia	LC	XCD	Emerging	Americas	Caribbean
Saint Pierre and Miquelon	PM	EUR	Developed	Americas	North America
Saint Vincent and the Grenadines	VC	XCD	Emerging	Americas	Caribbean
San Marino	SM	EUR	Developed	Europe	Western Europe
Sao Tome	ST	STN	Emerging	Africa	Sub-Saharan Africa
Saudi Arabia	SA	SAR	Emerging	Middle East	Middle East
Senegal	SN	XOF	Emerging	Africa	Sub-Saharan Africa
Serbia	RS	RSD	Emerging	Europe	Central & Eastern Europe
Seychelles	SC	SCR	Emerging	Africa	Sub-Saharan Africa
Sierra Leone	SL	SLL	Emerging	Africa	Sub-Saharan Africa
Singapore	SG	SGD	Emerging	Asia/Pacific	Southeast Asia
Sint Maarten	SX	ANG	Developed	Americas	Caribbean
Slovakia	SK	EUR	Developed	Europe	Central & Eastern Europe
Slovenia	SI	EUR	Developed	Europe	Central & Eastern Europe
Solomon Islands	SB1	SBD	Emerging	Asia/Pacific	Oceania
Somalia	SO	SOS	Emerging	Africa	Sub-Saharan Africa
South Africa	ZA	ZAR	Emerging	Africa	Sub-Saharan Africa
South Georgia and the South Sandwich Islands	GS	NA	Developed	Americas	South America
South Sudan	SS	SSP	Emerging	Africa	Sub-Saharan Africa
South Korea	KR	KRW	Emerging	Asia/Pacific	East Asia
Spain	ES	EUR	Developed	Europe	Western Europe
Sri Lanka	LK	LKR	Emerging	Asia/Pacific	South Asia
Sudan	SD	SDG	Emerging	Africa	North Africa
Supra-National	XB	n/a	Developed	Supranational	Supranational
Suriname	SR	SRD	Emerging	Americas	South America

Country	Code	Currency	Status	Geographical Region	Geographical Sub-Region
Svalbard and Jan Mayen	SJ	NOK	Developed	Europe	Western Europe
Swaziland	SZ	SZL	Emerging	Africa	Sub-Saharan Africa
Sweden	SE	SEK	Developed	Europe	Western Europe
Switzerland	CH	CHF	Developed	Europe	Western Europe
Syria	SY	SYP	Emerging	Middle East	Middle East
Taiwan	TW	TWD	Emerging	Asia/Pacific	East Asia
Tajikistan	TJ	TJS	Emerging	Caucasus & Central Asia	Central Asia
Tanzania	TZ	TZS	Emerging	Africa	Sub-Saharan Africa
Thailand	TH	THB	Emerging	Asia/Pacific	Southeast Asia
Togo	TG	XOF	Emerging	Africa	Sub-Saharan Africa
Tokelau	TK	NZD	Emerging	Asia/Pacific	Oceania
Tonga	TO	TOP	Emerging	Asia/Pacific	Oceania
Trinidad & Tobago	TT	TTD	Emerging	Americas	Caribbean
Tunisia	TN	TND	Emerging	Africa	North Africa
Turkey	TR	TRY	Emerging	Europe	Central & Eastern Europe
Turkmenistan	TM	TMT	Emerging	Caucasus & Central Asia	Central Asia
Turks & Caicos	TC	USD	Developed	Americas	Caribbean
Tuvalu	TV	AUD	Emerging	Asia/Pacific	Oceania
U.S. Virgin Islands	VI	USD	Developed	Americas	Caribbean
UAE	AE	AED	Emerging	Middle East	Middle East
Uganda	UG	UGX	Emerging	Africa	Sub-Saharan Africa
Ukraine	UA	UAH	Emerging	Europe	Central & Eastern Europe
United Kingdom	GB	GBP	Developed	Europe	Western Europe
United States	US	USD	Developed	Americas	North America
Uruguay	UY	UYU	Emerging	Americas	South America
US Minor Outlying Islands	UM	USD	Developed	Asia/Pacific	Oceania
Uzbekistan	UZ	UZS	Emerging	Caucasus & Central Asia	Central Asia
Vanuatu	VU	VUV	Emerging	Asia/Pacific	Oceania
Venezuela	VE	VES	Emerging	Americas	South America
Vietnam	VN	VND	Emerging	Asia/Pacific	Southeast Asia
Wallis and Futuna	WF	XPF	Developed	Asia/Pacific	Oceania
Western Sahara	EH	MAD	Emerging	Africa	North Africa
Yemen	YE	YER	Emerging	Middle East	Middle East
Zambia	ZM	ZMW	Emerging	Africa	Sub-Saharan Africa
Zimbabwe	ZW	ZWL	Emerging	Africa	Sub-Saharan Africa

ICE Fixed Income Sector Classification Schema

The Indices use a four-tier classification schema segmenting constituent securities by asset class (Level 1co), group (Level 2), category (Level 3) and sub-category (Level 4). A description of the Sovereign, Quasi-Government and Corporate sectors can be found below, followed by a table of the entire schema.

Sovereign

The Sovereign asset class is comprised of debt issued by an independent country's central government denominated in that country's official currency. There are no subdivisions of this asset class, so Sovereign is also a Level 2, 3, and 4 sector.

Quasi & Foreign Government

The Quasi & Foreign Government asset class is comprised of debt issued by a range of sub-sovereign entities, but also includes debt issued by an independent country's central government denominated in a foreign currency. Government ownership, whether in whole or in part, is not a consideration for inclusion in this asset class. The Quasi & Foreign Government asset class does not have any Level 2 groups, but is divided into six Level 3 categories and 26 sub-categories, each described below.

Agency

The Agency category is comprised of debt issued by entities associated with implementing policy on behalf of an independent country's central government. An Agency is an entity that meets the following conditions:

- Exclusively serves an explicit public policy purpose, where profitability is not the sole concern, though profit-maximization is not precluded; and
- Was created by a specific statute and at the behest of a government, even if subsequent legislation has allowed for its transformation into a stockholder owned company or other private entity.

Debt issued by central banks is assigned to the Agency sector except in cases where the central bank is acting as the primary issuing agent for the central government, in which case it is classified as Sovereign/Foreign Sovereign. The Agency sector includes debt of local government funding vehicles, which issue securities on behalf of local authorities. There are no subdivisions of this Level 3 category, so Agency is also a Level 4 sub-category.

Foreign Sovereign

The Foreign Sovereign category is comprised of debt issued by an independent country's central government denominated in a foreign currency. There are no subdivisions of this category, so Foreign Sovereign is also a Level 4 sub-category.

Government Guaranteed

The Government Guaranteed category is comprised of debt with an explicit guarantee from an independent country's central government. There are no subdivisions of this category, so Government Guaranteed is also a Level 4 sub-category.

Local-Authority

The Local-Authority category is comprised of debt issued by sub-sovereign entities with jurisdiction over specific regions. The debt of local government funding vehicles, which issue securities on behalf of local authorities, is included in the Agency sector. There are no subdivisions of this category, so Local-Authority is also a Level 4 sub-category.

Supranational

The Supranational category is comprised of debt issued by international agencies. There are no subdivisions of this category, so Supranational is also a Level 4 sub-category.

U.S. Taxable Municipal

The U.S. Taxable Municipal category is comprised of debt issued by U.S. local governments that are subject to taxes in the U.S. This category is divided into 21 sub-categories corresponding to those of the U.S. Tax-Exempt Municipals asset class.

Corporate

The Level 1 Corporate asset class is comprised of unsecured or secured debt obligations issued by corporations. Government control or ownership, whether in whole or in part, is not a consideration when determining inclusion in this asset class.

Financial

The Level 2 Financial group includes Corporate securities issued by all banking, brokerage, finance, investment and insurance companies. The debt of financial and commodity exchanges is also included in the Financial group. The Financial group is further divided into three Level 3 categories: Banking; Financial Services; Insurance.

Banking

The Level 3 Banking category is comprised of debt issued by deposit-taking companies. There are no subdivisions of this Level 3 category, so Banking is also a Level 4 sub-category.

Financial Services

The Level 3 Financial Services category is comprised of debt issued by brokers, exchanges, commercial and consumer lenders, leasing companies, and investment companies. This category also includes the financial data service providers. The Financial Services category is further divided into three Level 4 sub-categories: Brokerage; Cons/Comm/Lease Financing; Investments & Misc Financial Services.

Brokerage

The Level 4 Brokerage sub-category is comprised of debt issued by financial and commodity securities dealers and bank holding companies involved in a wide range of capital markets activities on behalf of clients.

Cons/Comm/Lease Financing

The Level 4 Consumer/Commercial/Lease Financing sub-category is comprised of debt issued by finance companies engaged in consumer and commercial lending and leasing, including bank and financial holding companies and real estate lenders.

Investments & Misc Financial Services

The Level 4 Investments & Miscellaneous Financial Services sub-category is comprised of debt issued by all forms of institutional investors, clearing houses, exchanges, industrial conglomerates and data service providers, including payments and payment processing companies.

Insurance

The Level 3 Insurance category is comprised of debt issued by companies engaged in all aspects of the insurance business except for health insurance. The Insurance category is further divided into six Level 4 sub-categories: Insurance Brokerage; Life Insurance; Monoline Insurance; Multi-Line Insurance; P&C; and Reinsurance.

Insurance Brokerage

The Level 4 Insurance Brokerage sub-category is comprised of debt issued by companies whose primary revenue is derived from fee-based insurance contract sales.

Life Insurance

The Level 4 Life Insurance sub-category is comprised of debt issued by companies whose primary revenue is derived from direct sales of life insurance contracts.

Monoline Insurance

The Level 4 Life Insurance sub-category is comprised of debt issued by companies whose primary revenue is derived from bond payment guarantees as a form of credit enhancement. Title guarantee insurance companies are also included in this sub-category.

Multi-Line Insurance

The Level 4 Multi-Line Insurance sub-category is comprised of debt issued by companies where a substantial part of revenue comes from both Life and P&C business lines.

P&C

The Level 4 P&C sub-category is comprised of debt issued by companies whose primary revenue is derived from direct sales of property and casualty accident insurance contracts.

Reinsurance

The Level 4 Reinsurance sub-category is comprised of debt issued by companies whose primary revenue is derived from direct sales of various stop-loss insurance contracts to other insurers.

Industrials

The Level 2 Industrials group includes Corporate securities issued by companies associated with the manufacture and distribution of goods. The Industrials group also includes companies engaged in various input markets, including raw materials and real estate. The Industrials group is further divided into 14 Level 3 categories and 56 Level 4 sub-categories.

Automotive

The Level 3 Automotive category is comprised of debt issued by companies involved in the manufacture of automobiles and automotive components, including their captive finance

subsidiaries. The Automotive category is further divided into three Level 4 sub-categories: Auto Loans; Auto Parts & Equipment; and Automakers.

Auto Loans

The Level 4 Auto Loans sub-category is comprised of debt issued by captive finance subsidiaries of automobile manufacturers.

Auto Parts & Equipment

The Level 4 Auto Parts & Equipment sub-category is comprised of debt issued by companies involved in the manufacture and distribution of both original equipment manufacturer (OEM) and aftermarket automotive components.

Automakers

The Level 4 Automakers sub-category is comprised of debt issued by automobile manufacturers.

Basic Industry

The Level 3 Basic Industry category is comprised of debt issued by companies involved in the production of input factors and raw materials. Companies involved in construction are also included in this category. The Basic Industry category is further divided into six Level 4 sub-categories: Building & Construction; Building Materials; Chemicals; Forestry/Paper; Metals/Mining Excluding Steel; and Steel Producers/Products.

Building & Construction

The Level 4 Building & Construction sub-category is comprised of debt issued by companies involved in the both commercial and residential construction, including construction services companies.

Building Materials

The Level 4 Building Materials sub-category is comprised of debt issued by companies involved in the production of raw materials such as sand, clay, gypsum, lime and aggregates, as well as processed materials such as cement, concrete and bricks. The Building Materials sub-category also includes the debt of manufacturers of building components and home improvement products, but excludes lumber and plywood which are included in the Forestry/Paper sub-category.

Chemicals

The Level 4 Chemicals sub-category is comprised of debt issued by companies involved in the production of commodity and specialty chemicals, including plastics and synthetic fiber as well as paints and pigments. Fertilizers, pesticides and other agricultural chemicals are also included in this sub-category.

Forestry/Paper

The Level 4 Forestry/Paper sub-category is comprised of debt issued by companies involved in the production of timber and lumber and all paper products excluding paper and paperboard packaging, which is included in the Packaging sub-category.

Metals/Mining Excluding Steel

The Level 4 Metals/Mining Excluding Steel sub-category is comprised of debt issued by companies engaged in the production or extraction of metals and minerals, excluding that of iron ore and steel producers. In addition to input and raw material companies, this sub-category includes manufacturers of highly engineered specialty metal components. Coal miners are also included in this sub-category.

Steel Producers/Products

The Level 4 Metals/Mining Excluding Steel sub-category is comprised of debt issued by companies engaged in the production or extraction of steel or iron ore, including that of manufacturers of specialized steel products.

Capital Goods

The Level 3 Capital Goods category is comprised of debt issued by companies involved in the production of goods, components and equipment used in the manufacture or delivery of other goods and services. The Capital Goods category is further divided into four Level 4 sub-categories: Aerospace/Defense; Diversified Capital Goods; Machinery; and Packaging.

Aerospace/Defense

The Level 4 Aerospace/Defense sub-category is comprised of debt issued by companies involved in the manufacture of civil or military aerospace and defense equipment, parts and products. All defense contractors are included in this sub-category.

Diversified Capital Goods

The Level 4 Diversified Capital Goods sub-category is comprised of debt issued by companies involved in the production of a diverse range of industrial input products and components, but excludes that of aerospace/defense, machinery and packaging companies, which have their own sub-categories.

Machinery

The Level 4 Machinery sub-category is comprised of debt issued by companies involved in the manufacture of industrial machinery and automation equipment. This sub-category also includes the debt of all manufacturers of farm and agricultural equipment.

Packaging

The Level 4 Packaging sub-category is comprised of debt issued by companies involved in the manufacture of paper, metal, glass or plastic packaging and containers and container fittings.

Consumer Goods

The Level 3 Consumer Goods category is comprised of debt issued by companies involved in the manufacture of goods sold directly to the end consumer. The Consumer Goods category is further divided into four Level 4 sub-categories: Beverage; Food – Wholesale; Personal & Household Products; and Tobacco.

Beverage

The Level 4 Beverage sub-category is comprised of debt issued by companies involved in the production of consumable liquids, including brewers, distillers and vintners as well as producers of soft drinks, juices and mineral water.

Food – Wholesale

The Level 4 Food – Wholesale sub-category is comprised of debt issued by companies involved in the growth, production, processing or distribution of consumable solids. This includes producers of meat, poultry or fish products, as well as producers of processed and packaged foods including dairy products, meats, poultry, fish and pet foods.

Personal & Household Products

The Level 4 Personal & Household Products sub-category is comprised of debt issued by companies involved in the production of personal consumer and household products. This

includes manufacturers of detergents, soaps, diapers and other household paper products as well as personal and beauty care products, including cosmetics and perfumes. This sub-sector also includes manufacturers of power and hand tools, as well as leisure products and equipment. Also included are manufacturers of houseware and durable household products, such as kitchenware and appliances. Excluded from this sub-sector are consumer electronics manufacturers, which are classified in the Level 4 Tech Hardware & Equipment sub-sector.

Tobacco

The Level 4 Tobacco sub-category is comprised of debt issued by companies involved in the production of tobacco and tobacco products. Also included in this sub-category are manufacturers of vaping and marijuana products.

Energy

The Level 3 Energy category is comprised of debt issued by companies involved in the production of oil and gas fuel. The Energy category is further divided into five Level 4 sub-categories: Energy – Exploration & Production; Gas Distribution; Integrated Energy; Oil Field Equipment & Services; and Oil Refining & Marketing.

Energy – Exploration & Production

The Level 4 Energy – Exploration & Production sub-category is comprised of debt issued by companies primarily involved in the upstream businesses of search, access and extraction of underground oil and gas reserves.

Gas Distribution

The Level 4 Gas Distribution sub-category is comprised of debt issued by companies primarily involved in the midstream business of transporting and storing oil and gas. This includes companies running compressors, pipelines and terminals.

Integrated Energy

The Level 4 Integrated Energy sub-category is comprised of debt issued by companies involved in both upstream and downstream oil and gas businesses.

Oil Field Equipment & Services

The Level 4 Oil Field Equipment & Services sub-category is comprised of debt issued by companies involved in providing goods and services facilitating the extraction of oil and gas. This includes manufacturers of drilling rigs and equipment and providers of services to companies involved in the drilling, operating and maintenance of oil and gas wells.

Oil Refining & Marketing

The Level 4 Oil Refining & Marketing sub-category is comprised of debt issued by companies involved in the downstream businesses of refining, processing, distribution and sale of oil and gas fuel. This sub-category also includes alternative energy fuels companies.

Healthcare

The Level 3 Healthcare category is comprised of debt issued by companies involved in the provision of medical products and services. The Healthcare category is further divided into five Level 4 sub-categories: Health Facilities; Health Services; Managed Care; Medical Products; and Pharmaceuticals.

Health Facilities

The Level 4 Health Facilities sub-category is comprised of debt issued by operators of health care facilities, including hospitals, specialist outpatient clinics, nursing homes, rehabilitation and retirement centers and veterinary clinics.

Health Services

The Level 4 Health Services sub-category is comprised of debt issued by companies providing health care services including dialysis, transportation, lab testing services, and pharmacy management services. This sub-sector also includes the debt of companies providing information technology and business support services to health care providers, such as records, diagnosis, imaging, consulting, clerical support and staffing services.

Managed Care

The Level 4 Managed Care sub-category is comprised of debt issued by companies engaged in the operation of health maintenance organizations (HMOs) and other managed health plans.

Medical Products

The Level 4 Medical Products sub-category is comprised of debt issued by manufacturers of health care equipment and devices, including medical instruments, drug delivery systems, diagnostic equipment, as well as cardiovascular and orthopedic devices. Also included in this sub-sector is debt issued by manufacturers and distributors of all other health care supplies and medical products.

Pharmaceuticals

The Level 4 Pharmaceuticals sub-category is comprised of debt issued by companies primarily engaged in the research, development or production of medicinal drugs, including veterinary drugs.

Leisure

The Level 3 Leisure category is comprised of debt issued by companies involved in the full range of recreation and entertainment service businesses. The Leisure category is further divided into four Level 4 sub-categories: Gaming; Hotels; Recreation & Travel; and Theaters & Entertainment.

Gaming

The Level 4 Gaming sub-category is comprised of debt issued by operators of casinos and gaming facilities, including companies providing lottery and betting services.

Hotels

The Level 4 Hotels sub-category is comprised of debt issued by operators of hotels and hotel resorts, where room, board and hospitality services are the main business activity.

Recreation & Travel

The Level 4 Recreation & Travel sub-category is comprised of debt issued by theme parks and resorts, cruise lines, travel agencies, tour operators and related services. This sub-sector also includes debt issued by operators of all other leisure facilities, including sport and fitness centers, stadiums, golf courses and amusement parks.

Theaters & Entertainment

The Level 4 Theaters & Entertainment sub-category is comprised of debt issued by operators of cinemas, live theatres and concert venues as well as event promoters and production support service providers.

Media

The Level 3 Media category is comprised of debt issued by companies primarily involved in the creation and distribution of creative content, as well as those involved in providing advertising services. The Media category is further divided into five Level 4 sub-categories: Advertising; Cable & Satellite TV; Media – Diversified; Media Content; and Printing & Publishing.

Advertising

The Level 4 Advertising sub-category is comprised of debt issued by companies providing advertising, marketing or public relations services, and also includes online social media and search platforms.

Cable & Satellite TV

The Level 4 Cable & Satellite TV sub-category is comprised of debt issued by companies providing video content via fixed-line cable or satellite receiver.

Media – Diversified

The Level 4 Media – Diversified sub-category is comprised of debt issued by companies involved in more than one form of content creation or distribution, most frequently broadcasting and publishing.

Media Content

The Level 4 Media Content sub-category is comprised of debt issued by companies broadcasting or producing original creative material. This includes owners and operators of television or radio broadcasting systems, as well companies involved in creating original programming for radio and television. Also included in this sub-category is debt issued by companies making original filmed entertainment and video games.

Printing & Publishing

The Level 4 Printing & Publishing sub-category is comprised of debt issued by companies providing commercial printing and distribution services. This includes publishers of newspapers, magazines and books as well as all providers of information in print or electronic formats.

Real Estate

The Level 3 Real Estate category is comprised of debt issued by companies engaged in real estate ownership, development or management. The Real Estate category is further divided into three Level 4 sub-categories: Housing Association; RealEstate Dev & Mgt; and REITs.

Housing Association

The Level 4 Housing Association sub-category is comprised of debt issued by companies involved in social housing projects, including military housing.

RealEstate Dev & Mgt

The Level 4 Real Estate Development & Management sub-category is comprised of debt issued by companies involved in diverse property-related activities including development and sales, as well as those operating real estate properties for the purpose of leasing & management.

REITs

The Level 4 REITs sub-category is comprised of debt issued by companies engaged in real estate as an investor, with a portfolio of properties managed for income and capital appreciation.

Retail

The Level 3 Retail category is comprised of debt issued by companies engaged in selling goods directly to end consumers. Included in this category are issuers specializing in online and mail-order sales as well as those with physical locations. The Retail category is further divided into five Level 4 sub-categories: Department Stores; Discount Stores; Food & Drug Retailers; Restaurants; and Specialty Retail.

Department Stores

The Level 4 Department Stores sub-category is comprised of debt issued by operators of stores offering a wide range of consumer goods in different product categories, competing not just on lowest price but on brand and shopping experience.

Discount Stores

The Level 4 Discount Stores sub-category is comprised of debt issued by operators of stores offering merchandise at a lower price than competing stores, expecting to make up the difference on volume. This sub-category includes hypermarkets, supercenters and membership-based warehouse stores.

Food & Drug Retailers

The Level 4 Food & Drug Retailers sub-category is comprised of debt issued by operators of grocery stores, convenience stores, drug stores and pharmacies.

Restaurants

The Level 4 Restaurants sub-category is comprised of debt issued by operators of restaurants, bars, pubs, fast-food and take-out facilities.

Specialty Retail

The Level 4 Specialty Retail sub-category is comprised of debt issued by operators of any online and/or physical store specializing in a particular type of merchandise.

Services

The Level 3 Services category is comprised of debt issued by companies engaged in providing a wide range of environmental, business and social support services. The Services category is further divided into two Level 4 sub-categories: Environmental and Support-Services.

Environmental

The Level 4 Environmental sub-category is comprised of debt issued by companies providing environmental services, including waste management, recycling and pollution control services. This sub-sector excludes large-scale water treatment systems classified in the Non-Electric Utilities sub-sector.

Support-Services

The Level 4 Support-Services sub-category is comprised of debt issued by companies engaged in a wide variety of business and consumer services. Services provided by companies in this sub-category include the following: rental; catering; cleaning and maintenance; storage and warehousing; human resources; education and training; engineering and consulting; prisons and corrections. This sub-category also includes all distributors, regardless of their product specialty or market served.

Technology & Electronics

The Level 3 Technology & Electronics category is comprised of debt issued by manufacturers of electronic products and components, computer hardware and software. The Technology & Electronics category is further divided into three Level 4 sub-categories: Electronics; Software/Services; and Tech Hardware & Equipment.

Electronics

The Level 4 Electronics sub-category is comprised of debt issued by companies manufacturing a wide variety of electronic products and components, including consumer electronics, semi-conductors, connectors, electron tubes, capacitors and resistors, electronic coil, printed circuit board, transformers and inductors.

Software/Services

The Level 4 Software/Services sub-category is comprised of debt issued by companies engaged in in developing and producing software designed for specialized applications for the business or consumer market, including enterprise and technical software. Also included in this subsector is debt issued by companies engaged in developing and producing systems and database management software, as well as developing and marketing internet software and/or providing internet services including online databases.

Tech Hardware & Equipment

The Level 4 Technology Hardware & Equipment sub-category is comprised of debt issued by companies manufacturing computers, computer components, as well as equipment for telecommunications, networking and business productivity.

Telecommunications

The Level 3 Telecommunications category is comprised of debt issued by companies engaged in the transmission of voice, data and video communications. The Telecommunications category is

further divided into three Level 4 sub-categories: Telecom - Satellite; Telecom - Wireless; and Telecom – Wireline Integrated & Services.

Telecom – Satellite

The Level 4 Telecom - Satellite sub-category is comprised of debt issued by companies engaged in transmitting communications via satellites.

Telecom – Wireless

The Level 4 Telecom – Wireless sub-category is comprised of debt issued by companies that are primarily providers of cellular or wireless telecommunication services.

Telecom – Wireline Integrated & Services

The Level 4 Telecom – Wireline Integrated & Services sub-category is comprised of debt issued by companies that are providers of fixed-line telecommunication services, or offer both fixed-line and wireless services. Also included in this sub-sector are internet service providers, connectivity and networking service providers, as well as data center operators.

Transportation

The Level 3 Transportation category is comprised of debt issued by companies engaged in transporting or facilitating the movement of people and merchandise. The Transportation category is further divided into four Level 4 sub-categories: Air Transportation; Rail; Transport Infrastructure/Services; and Trucking & Delivery.

Air Transportation

The Level 4 Air Transportation sub-category is comprised of debt issued by companies engaged primarily in passenger and goods transportation via airplanes.

Rail

The Level 4 Rail sub-category is comprised of debt issued by companies engaged in passenger and goods transportation via railroad.

Transport Infrastructure/Services

The Level 4 Transport Infrastructure/Services sub-category is comprised of debt issued by companies engaged in a wide range of activities relating to the transportation of passengers and goods. This sub-category includes companies engaged in the operation of ports and marine transportation, airports, storage and logistics facilities, as well as roads, tunnels and railtracks.

Trucking & Delivery

The Level 4 Trucking & Delivery sub-category is comprised of debt issued by companies engaged in goods transportation via land, but also includes all courier, package and mail delivery providers.

Utility

The Level 2 Utility group includes Corporate securities issued by all companies involved in generating and transmitting electricity as well as providing water, sewer and gas services to end consumers. There are no subdivisions of this Level 2 category at Level 3, so Utility is also a Level 3 category. The Level 3 Utility category is further divided into four Level 4 sub-categories: Electric-Distr/Trans; Electric-Generation; Electric-Integrated; and Non-Electric Utilities.

Electric-Distr/Trans

The Level 4 Electric-Distribution/Transmission sub-category is comprised of debt issued by companies primarily engaged in the sale and delivery of electricity to end consumers.

Electric-Generation

The Level 4 Electric-Generation sub-category is comprised of debt issued by companies primarily engaged in the generation and sale of electricity, and includes alternative-source generators such as those using wind and solar energy.

Electric-Integrated

The Level 4 Electric-Integrated sub-category is comprised of debt issued by companies engaged in both the generation and distribution of electricity.

Non-Electric Utilities

The Level 4 Non-Electric Utilities sub-category is comprised of debt issued by companies engaged in the supply of water, sewer and gas services to end consumers.

Table 7: ICE fixed income sector classification schema

Level 1 - Asset Class	Level 2 - Group	Level 3 - Category	Level 4 - Sub-category
Sovereign (SOV)	Sovereign (SOV)	Sovereign (Sov)	Sovereign (Sov)
Quasi & Foreign Government (QGVT)	Quasi & Foreign Government (QGVT)	Agency (Agcy)	Agency (Agcy)
		Foreign Sovereign (FSov)	Foreign Sovereign (FSov)
		Government Guaranteed (Guar)	Government Guaranteed (Guar)
		Local-Authority (LGvt)	Local-Authority (LGvt)
		Supranational (Supr)	Supranational (Supr)
		U.S. Taxable Municipal (TaxM)	Pre-Refunded (TPre)
			Taxable ETM (TEtm)
			Taxable GO - Local (TGol)
			Taxable GO - State (TGos)
			Taxable Revenue - Airport (TAir)
			Taxable Revenue - Education (TEdu)
			Taxable Revenue - Health (THlt)
			Taxable Revenue - Hospitals (THos)
			Taxable Revenue - Industrial Development Revenue (TIdr)
			Taxable Revenue - Leasing COPS & Appropriations (TLea)
			Taxable Revenue - Misc (TMis)
			Taxable Revenue - Multi-Family Housing (TMhn)
			Taxable Revenue - Pollution Control (TPcr)
			Taxable Revenue - Power (TPow)
			Taxable Revenue - Single Family Housing (TShn)
			Taxable Revenue - Tax (TTax)
			Taxable Revenue - Tobacco (TTob)
			Taxable Revenue - Toll & Turnpike (TTol)
			Taxable Revenue - Transportation (TTrn)
			Taxable Revenue - Utilities - Other (TUtl)
			Taxable Revenue - Water & Sewer (TWtr)

Table 7: ICE fixed income sector classification schema

Level 1 - Asset Class	Level 2 - Group	Level 3 - Category	Level 4 - Sub-category
Securitized/Collateralized (COLL)	Covered (COVR)	Covered Bonds (Cvrd)	Mortgage Covered Bonds (CovM)
			Other Covered Bonds (CovO)
			Public Loan Covered Bonds (CovP)
	Securitized (SEC)	Asset Backed (ABS)	ABS Airline Leases
			ABS Automobile (ABau)
			ABS Consumer Loans
			ABS Credit Cards (ABcc)
			ABS Equipment Leases
			ABS Home Equity Loans (ABhe)
			ABS Manufactured Housing (ABmh)
			ABS Miscellaneous ABS (ABmi)
			ABS Student Loans
			Abs Timeshares
			ABS Utilities (ABut)
			ABS Whole Business & Franchise Loans
		Collateralized Mortgage Obligation (CMO)	CMO Other (CMOT)
			PAC (PAC)
			PAC Z (PACZ)
			Sequential (SEQL)
			Sequential Z (SEQZ)
			Structured IO (STIO)
			Structured PO (STPO)
			Support Z (SUPZ)
			Trust IO (TRIO)
			Trust PO (TRPO)
		Commercial Mortgage Backed (CMBS)	Agency CMBS
			Non-Agency CMBS
		Mortgage Backed (MBS)	Mortgage Backed (MBS)
Corporate (CORP)	Financial (FNCL)	Banking (Bank)	Banking (Bank)
		Financial Services (FinS)	Brokerage (Brkg)
			Cons/Comm/Lease Financing (CFin)
			Investments & Misc Financial Services (Invs)
		Insurance (Insr)	Insurance Brokerage (InsB)
			Life Insurance (InsL)
			Monoline Insurance (InsG)
			Multi-Line Insurance (InsM)
			P&C (InsP)
			Reinsurance (InsR)
	Industrials (INDU)	Automotive (Auto)	Auto Loans (AuLn)
			Auto Parts & Equipment (AuPt)
			Automakers (Autm)
		Basic Industry (Basc)	Building & Construction (Bldg)
			Building Materials (BldM)
			Chemicals (Chem)
			Forestry/Paper (Papr)
			Metals/Mining Excluding Steel (Metl)

Table 7: ICE fixed income sector classification schema

Level 1 - Asset Class	Level 2 - Group	Level 3 - Category	Level 4 - Sub-category
			Steel Producers/Products (Stee)
		Capital Goods (CapG)	Aerospace/Defense (Aero)
			Diversified Capital Goods (DCap)
			Machinery (Mach)
			Packaging (Pack)
		Consumer Goods (Cons)	Beverage (Bevg)
			Food - Wholesale (FWhl)
			Personal & Household Products (ConP)
			Tobacco (Toba)
		Energy (Enrg)	Energy - Exploration & Production (EnEx)
			Gas Distribution (GasD)
			Integrated Energy (EngI)
			Oil Field Equipment & Services (OilE)
			Oil Refining & Marketing (OilR)
		Healthcare (Hcar)	Health Facilities (HFac)
			Health Services (Hlth)
			Managed Care (MCar)
			Medical Products (HDev)
			Pharmaceuticals (Phar)
		Leisure (RnR)	Gaming (Game)
			Hotels (Hotl)
			Recreation & Travel (Leis)
			Theaters & Entertainment (Thea)
		Media (Medi)	Advertising (MedS)
			Cable & Satellite TV (MedC)
			Media - Diversified (MedD)
			Media Content (MedB)
			Printing & Publishing (Prnt)
		Real Estate (REst)	Housing Association (Hous)
			RealEstate Dev & Mgt (ReDM)
			REITs (REIT)
		Retail (Retl)	Department Stores (Dept)
			Discount Stores (Disc)
			Food & Drug Retailers (FRet)
			Restaurants (Rest)
			Specialty Retail (Spec)
		Services (Serv)	Environmental (Evir)
			Support-Services (Supp)
		Technology & Electronics (Tech)	Electronics (Elec)
			Software/Services (SWar)
			Tech Hardware & Equipment (Comp)
		Telecommunications (TCom)	Telecom - Satellite (TSat)
			Telecom - Wireless (TWis)
			Telecom - Wireline Integrated & Services (TInt)
		Transportation (Move)	Air Transportation (Airl)
			Rail (Rail)

Table 7: ICE fixed income sector classification schema

Level 1 - Asset Class	Level 2 - Group	Level 3 - Category	Level 4 - Sub-category
			Transport Infrastructure/Services (Trin)
			Trucking & Delivery (Truc)
	Utility (UTIL)	Utility (Util)	Electric-Distr/Trans (EleD)
			Electric-Generation (EleG)
			Electric-Integrated (EleI)
			Non-Electric Utilities (UtlN)
U.S. Tax-Exempt Municipals (MUNI)	GO (GO)	GO - Local (Golo)	GO - Local (Golo)
		GO - State (Gost)	GO - State (Gost)
	Refunded (REFD)	Refunded (Refd)	ETM (Etm)
			Pre-Refunded (Pref)
	Revenue (REV)	Revenue - Airport (Airp)	Revenue - Airport (Airp)
		Revenue - Education (Edu)	Revenue - Education (Edu)
		Revenue - Health (Heal)	Revenue - Health (Heal)
		Revenue - Hospitals (Hosp)	Revenue - Hospitals (Hosp)
		Revenue - Industrial Development Revenue (Idr)	Revenue - Industrial Development Revenue (Idr)
		Revenue - Leasing COPS & Appropriations (Leas)	Revenue - Leasing COPS & Appropriations (Leas)
		Revenue - Misc (Misc)	Revenue - Misc (Misc)
		Revenue - Multi-Family Housing (Mhng)	Revenue - Multi-Family Housing (Mhng)
		Revenue - Pollution Control (Pcr)	Revenue - Pollution Control (Pcr)
		Revenue - Power (Powr)	Revenue - Power (Powr)
		Revenue - Single Family Housing (Shng)	Revenue - Single Family Housing (Shng)
		Revenue - Tax (Taxr)	Revenue - Tax (Taxr)
		Revenue - Tobacco (Tob)	Revenue - Tobacco (Tob)
		Revenue - Toll & Turnpike (Toll)	Revenue - Toll & Turnpike (Toll)
		Revenue - Transportation (Trns)	Revenue - Transportation (Trns)
		Revenue - Utilities - Other (Utly)	Revenue - Utilities - Other (Utly)
		Revenue - Water & Sewer (Watr)	Revenue - Water & Sewer (Watr)
Preferred Securities (PFD)	Pfd-Financial (PFNC)	Pfd-Banking (Pban)	Pfd-Banking (Pban)
		Pfd-Financial Services (Pfin)	Pfd-Brokerage (Pbrk)
			Pfd-Cons/Comm/Lease Financing (Pccl)
			Pfd-Investments & Misc Financial Services (Pinv)
		Pfd-Insurance (Pins)	Pfd-Insurance Brokerage (Pinb)
			Pfd-Life Insurance (Pinl)
			Pfd-Monoline Insurance (Ping)
			Pfd-Multi-Line Insurance (Pinm)
			Pfd-P&C (Pinp)
			Pfd-Reinsurance (Pinr)
	Pfd-Industrials (PIND)	Pfd-Automotive (Paut)	Pfd-Auto Loans (Paul)
			Pfd-Auto Parts & Equipment (Paup)
			Pfd-Automakers (Patm)
		Pfd-Basic Industry (Pbas)	Pfd-Building & Construction (Pbld)
			Pfd-Building Materials (Pblm)
			Pfd-Chemicals (Pchm)

Table 7: ICE fixed income sector classification schema

Level 1 - Asset Class	Level 2 - Group	Level 3 - Category	Level 4 - Sub-category
			Pfd-Forestry/Paper (Ppap)
			Pfd-Metals/Mining Excluding Steel (Pmet)
			Pfd-Steel Producers/Products (Pstl)
		Pfd-Capital Goods (Pcap)	Pfd-Aerospace/Defense (Paer)
			Pfd-Diversified Capital Goods (Pdcp)
			Pfd-Machinery (Pmac)
			Pfd-Packaging (Ppac)
		Pfd-Consumer Goods (Pcon)	Pfd-Beverage (Pbev)
			Pfd-Food - Wholesale (Pfoo)
			Pfd-Personal & Household Products (Pprd)
			Pfd-Tobacco (Ptob)
		Pfd-Energy (Penr)	Pfd-Energy - Exploration & Production (Peap)
			Pfd-Gas Distribution (Ppip)
			Pfd-Integrated Energy (Peni)
			Pfd-Oil Field Equipment & Services (Posr)
			Pfd-Oil Refining & Marketing (Porm)
		Pfd-Healthcare (Phca)	Pfd-Health Facilities (Phfc)
			Pfd-Health Services (Phsr)
			Pfd-Managed Care (Pmca)
			Pfd-Medical Products (Pmpr)
			Pfd-Pharmaceuticals (Ppha)
		Pfd-Leisure (Plei)	Pfd-Gaming (Pgam)
			Pfd-Hotels (Phot)
			Pfd-Recreation & Travel (Prec)
			Pfd-Theaters & Entertainment (Pent)
		Pfd-Media (Pmed)	Pfd-Advertising (Padv)
			Pfd-Cable & Satellite TV (Pctv)
			Pfd-Media - Diversified (Pmdd)
			Pfd-Media Content (Pmco)
			Pfd-Printing & Publishing (Ppub)
		Pfd-Real Estate (Pres)	Pfd-Housing Association (Phou)
			Pfd-RealEstate Dev & Mgt (Pred)
			Pfd-REITs (Prei)
		Pfd-Retail (Prtl)	Pfd-Department Stores (Pdpt)
			Pfd-Discount Stores (Pdis)
			Pfd-Food & Drug Retailers (Pfre)
			Pfd-Restaurants (Prst)
			Pfd-Specialty Retail (Pspr)
		Pfd-Services (Psrv)	Pfd-Environmental (Penv)
			Pfd-Support-Services (Psup)
		Pfd-Technology & Electronics (Ptec)	Pfd-Electronics (Pele)
			Pfd-Software/Services (Pswa)
			Pfd-Tech Hardware & Equipment (Phwa)
		Pfd-Telecommunications (Ptco)	Pfd-Telecom - Satellite (Ptsa)
			Pfd-Telecom - Wireless (Ptwi)
			Pfd-Telecom - Wireline Integrated & Services (Ptin)

Table 7: ICE fixed income sector classification schema

Level 1 - Asset Class	Level 2 - Group	Level 3 - Category	Level 4 - Sub-category
		Pfd-Transportation (Ptra)	Pfd-Air Transportation (Pair)
			Pfd-Rail (Prai)
			Pfd-Transport Infrastructure/Services (Ptra)
			Pfd-Trucking & Delivery (Ptrk)
	Pfd-Quasi Government (PQGV)	Pfd-Agency (Pqgv)	Pfd-Agency (Pagy)
	Pfd-Utility (PUTI)	Pfd-Utility (Puti)	Pfd-Electric-Distr/Trans (Peld)
			Pfd-Electric-Generation (Pelg)
			Pfd-Electric-Integrated (Peli)
			Pfd-Non-Electric Utilities (Peln)
Convertible (CVT)	Cvt-Financial (CFNC)	Cvt-Banking (Cbnk)	Cvt-Banking (Cbnk)
		Cvt-Financial Services (Cfns)	Cvt-Brokerage (Cbrk)
			Cvt-Cons/Comm/Lease Financing (Cccl)
			Cvt-Investments & Misc Financial Services (Cinv)
		Cvt-Insurance (Cins)	Cvt-Insurance Brokerage (Cinb)
			Cvt-Life Insurance (Cinl)
			Cvt-Monoline Insurance (Cing)
			Cvt-Multi-Line Insurance (Cinm)
			Cvt-P&C (Cinp)
			Cvt-Reinsurance (Cinr)
	Cvt-Industrials (CIND)	Cvt-Automotive (Caut)	Cvt-Auto Loans (Caul)
			Cvt-Auto Parts & Equipment (Caup)
			Cvt-Automakers (Catm)
		Cvt-Basic Industry (Cbas)	Cvt-Building & Construction (Cbld)
			Cvt-Building Materials (Cblm)
			Cvt-Chemicals (Cchm)
			Cvt-Forestry/Paper (Cpap)
			Cvt-Metals/Mining Excluding Steel (Cmet)
			Cvt-Steel Producers/Products (Cstl)
		Cvt-Capital Goods (Ccap)	Cvt-Aerospace/Defense (Caer)
			Cvt-Diversified Capital Goods (Cdcp)
			Cvt-Machinery (Cmac)
			Cvt-Packaging (Cpac)
		Cvt-Consumer Goods (Ccon)	Cvt-Beverage (Cbev)
			Cvt-Food - Wholesale (Cfoo)
			Cvt-Personal & Household Products (Cprd)
			Cvt-Tobacco (Ctob)
		Cvt-Energy (Cenr)	Cvt-Energy - Exploration & Production (Ceap)
			Cvt-Gas Distribution (Cpip)
			Cvt-Integrated Energy (Ceni)
			Cvt-Oil Field Equipment & Services (Cosr)
			Cvt-Oil Refining & Marketing (Corm)
		Cvt-Healthcare (Chca)	Cvt-Health Facilities (Chfc)
			Cvt-Health Services (Chsr)
			Cvt-Managed Care (Cmca)
			Cvt-Medical Products (Cmpr)

Table 7: ICE fixed income sector classification schema

Level 1 - Asset Class	Level 2 - Group	Level 3 - Category	Level 4 - Sub-category
			Cvt-Pharmaceuticals (Cpha)
		Cvt-Leisure (Crnr)	Cvt-Gaming (Cgam)
			Cvt-Hotels (Chot)
			Cvt-Recreation & Travel (Crec)
			Cvt-Theaters & Entertainment (Cent)
		Cvt-Media (Cmed)	Cvt-Advertising (Cadv)
			Cvt-Cable & Satellite TV (Cctv)
			Cvt-Media - Diversified (Cmdd)
			Cvt-Media Content (Cmco)
			Cvt-Printing & Publishing (Cpub)
		Cvt-Real Estate (Cres)	Cvt-Housing Association (Chou)
			Cvt-RealEstate Dev & Mgt (Cred)
			Cvt-REITs (Crei)
		Cvt-Retail (Cret)	Cvt-Department Stores (Cdpt)
			Cvt-Discount Stores (Cdis)
			Cvt-Food & Drug Retailers (Cfre)
			Cvt-Restaurants (Crst)
			Cvt-Specialty Retail (Cspr)
		Cvt-Services (Csrv)	Cvt-Environmental (Cenv)
			Cvt-Support-Services (Csup)
		Cvt-Technology & Electronics (Ctec)	Cvt-Electronics (Cele)
			Cvt-Software/Services (Cswa)
			Cvt-Tech Hardware & Equipment (Chwa)
		Cvt-Telecommunications (Ctcm)	Cvt-Telecom - Satellite (Ctsa)
			Cvt-Telecom - Wireless (Ctwi)
			Cvt-Telecom - Wireline Integrated & Services (Ctin)
		Cvt-Transportation (Cmov)	Cvt-Air Transportation (Cair)
			Cvt-Rail (Crai)
			Cvt-Transport Infrastructure/Services (Ctra)
			Cvt-Trucking & Delivery (Ctrk)
	Cvt-Utility (CUTI)	Cvt-Utility (CUTI)	Cvt-Electric-Distr/Trans (Celd)
			Cvt-Electric-Generation (Celg)
			Cvt-Electric-Integrated (Celi)
			Cvt-Non-Electric Utilities (Celn)
Derivative (Drvt)	Swap (Swap)	Inflation Swap (Infs)	Inflation Swap (Infs)
		Interest rate Swap (Irsw)	Interest rate Swap (Irsw)
CASH (CASH)	CASH (CASH)	CASH (CASH)	CASH (CASH)

Price sources and timing

Table 8: Primary sources for ICE index constituent valuations[14]

Market	Price type	Price source	Price Timing
US and Canada:			
US agency, foreign government, corporate, ABS, CMBS, CMO, high yield	Evaluated bid	ICE[15]	4:00pm ET 4:00pm ET fair value for SIFMA early market close with NYSE regular close 1:00pm ET for SIFMA early close with NYSE early close
US Treasury	Evaluated bid	ICE	4:00pm ET 4:00pm ET fair value for SIFMA with market close and NYSE regular close 1:00pm ET for SIFMA early close with NYSE early close
US mortgages	Evaluated bid; weighted average of all pools comprising each generic cohort	ICE	4:00pm ET 4:00pm ET fair value for SIFMA early market close with NYSE regular close 1:00pm ET for SIFMA early close with NYSE early close
US preferred	Closing exchange price; evaluated bid if exchange price is unavailable; exchange-listed securities part of receivership are marked at zero	ICE	4:00pm ET 4:00pm ET fair value for SIFMA early market close with NYSE regular close 1:00pm ET for SIFMA early close with NYSE early close
US municipals (taxable and tax-exempt)	Evaluated bid	ICE	4:00pm ET 4:00pm ET fair value for SIFMA early market close with NYSE regular close 1:00pm ET for SIFMA early close with NYSE early close
Canada sovereign	Evaluated bid	Statpro	4:00pm ET
C$ non-sovereign high grade and high yield	Evaluated bid	Statpro	4:00pm ET
Europe:			
Euro high grade and high yield	Evaluated bid	ICE	4:15pm London
Sterling high grade and high yield non-Gilt	Evaluated bid	ICE	4:15pm London

[14] The price sources were selected and assessed based on the quality of the data, service and ability to produce the inputs needed to meet the objective of the index. Methodologies or processes employed by the data source may be requested directly from the provider.

[15] ICE Data Pricing & Reference Data, LLC

Table 8: Primary sources for ICE index constituent valuations[14]

Market	Price type	Price source	Price Timing
UK Gilts	Evaluated bid	ICE	4:15pm London
USD issues primarily or exclusively traded in Europe	Evaluated bid	ICE	4:15pm London
All other Europe	Evaluated bid	ICE	4:15pm London
Japan & Australia			
JGBs	Evaluated mid	JSDA	5:00pm local
Japan credit	Evaluated bid	ICE Data Services	3:00pm local
USD issues primarily or exclusively traded in Asia	Evaluated bid	ICE	4:00pm ET
All A$ Indices	Evaluated bid	ICE	5:00pm Sydney
Other debt markets:			
Brazil, Mexico, Peru	Evaluated bid	ICE	4:00pm ET
Israel, Nigeria, Romania	Evaluated bid	ICE	4:15pm London
Chile, Colombia, Egypt	Evaluated bid	ICE	3:00pm local
Morocco	Evaluated bid	ICE	4:00pm local
All other local debt markets	Evaluated bid	ICE	Local market close
External (USD and EUR) emerging market sovereign and credit	Evaluated bid	ICE	USD 4:00pm ET EUR 4:15pm London
Convertibles			
All Convertibles	Evaluated mid	ICE	Local market close; USD: 4pm ET
Swaps and FX:			
All nominal and IL swaps	Mid	ICE	USD 4:00pm ET; EUR/GBP 4:15pm London
Spot and forward FX rates	Mid	WM/Refinitiv	4:00pm London

Reference Rates for Deposit Indices

Currency	Description	Tenor	Reference Rate[16]
AUD	Australian Dollar	Overnight	RBA Cash Rate (AONIA)
AUD	Australian Dollar	1-month, 3-month	Bank Bills
CAD	Canadian Dollar	Overnight	Canadian Overnight Repo Rate Average (CORRA)
CAD	Canadian Dollar	1-month, 3-month, 6-month	Canadian Bankers' Acceptance rate curve
CHF	Swiss Franc	Overnight	SARON
CHF	Swiss Franc	1-month, 3-month	SARON + fallback spread
DKK	Danish Krone	Overnight	OIS
DKK	Danish Krone	1-month, 3-month	CIBOR

[16] For all bid side indices, the listed rate is used and a 12.5bp spread is subtracted.

Currency	Description	Tenor	Reference Rate[16]
EUR	Euro	Overnight	€str
EUR	Euro	1-week, 1-month, 3-month, 6-month, 12-month	Euribor
GBP	British Pound	Overnight	SONIA
GBP	British Pound	1-month, 3-month, 6-month, 12-month	ICE Term SONIA Reference Rates
HKD	Hong Kong Dollar	Overnight	HONIA
HKD	Hong Kong Dollar	1-month, 3-month	HIBOR
JPY	Japanese Yen	Overnight	TONAR
JPY	Japanese Yen	1-month, 3-month, 6-month, 12-month	TONAR + fallback spread
MYR	Malaysian Ringgit	Overnight	KLIBOR 1-Week
MYR	Malaysian Ringgit	1-month, 3-month	KLIBOR
NOK	Norwegian Krone	Overnight	NIBOR 1-Week
NOK	Norwegian Krone	1-month, 3-month	NIBOR
NZD	New Zealand Dollar	Overnight	OIS
NZD	New Zealand Dollar	1-month, 3-month	Bank Bills
SEK	Swedish Krona	Overnight	OIS
SEK	Swedish Krona	1-month, 3-month	STIBOR
USD	U.S. Dollar	Overnight	SOFR
USD	U.S. Dollar	1-month, 3-month, 6-month, 12-month	ICE Term SOFR Reference Rates

Benchmark Regulation ESG Disclosures - ICE ESG Bond Index Family

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY		
1	**Name of benchmark administrator**	ICE Data Indices, LLC
2	**Type of benchmark or family of benchmarks.** Choose the relevant underlying asset from the list provided in Annex II to Commission Delegated Regulation (EU)2020/1816.	Fixed Income Sovereign Debt
3	Name of the benchmark or family of benchmarks.	**ICE ESG Bond Index Family** See Index Finder on the ICE Index Platform for individual Indices in this family: **https://indices.ice.com/**
4	Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	x **Yes** □ **No**
5	Where the response to Item 4 is positive, please list below, for each family of benchmarks, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816. Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets. The ESG factors shall be disclosed at an aggregated weighted average value at the level of the family of benchmarks.	
	a) List of environmental factors considered: (Selection, weighting or exclusion:)	Please refer to the rule documents for each of the individual benchmarks within this family for more information on selection, weighting and exclusion. The **Corporate ESG Indices** consider the Sustainalytics overall ESG risk scores when determining constituent weights. The overall scores aggregate a comprehensive list of Environmental, Social and Governance factors. (Selection, Weighting, and/or Exclusion) The **Sovereign Carbon Reduction Indices** take account of the carbon footprint of constituent countries included in the Indices. (Weighting) The **Green, Social & Sustainable Bond Indices. Green Bond Indices** only include bonds whose use of proceeds are solely applied toward projects or activities that promote climate change mitigation or adaptation or other environmental sustainability purposes as outlined by the ICMA Green Bond Principles. **Sustainability Indices** only include bonds that have a clearly designated use of proceeds that is solely applied toward projects or activities that promote a combination of climate change mitigation, adaptation or other environmental sustainability purposes, and that directly aims to address and mitigate a specific social issue and/or seeks to achieve positive social outcomes as outlined by the ICMA Sustainability Bond Guidelines. (Selection)

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY		
		The **Catholic Principles ESG Index** is designed to achieve a carbon metric at least 30% below that of the parent index. (Weighting) The **HIP ESG US National Municipal Index** considers the HIP Sector-Normalized ESG Rating when determining constituent weights. The scores aggregate a comprehensive list of Environmental, Social and Governance factors or metrics on the five pillars associated with core human needs - Health, Wealth, Earth, Equality and Trust - and uses the standard deviation within a sector peer group to normalize the rating (Weighting) The **Paris-Aligned Benchmarks, Climate Transition Benchmarks and Net Zero 2050 Indices** exclude securities that meet the screening criteria based on Sustainalytics ESG ratings data, as outlined in the individual rule documents. These include several Environmental Factors, including exclusion of companies involved in coal, oil, gas or electricity production (Paris-Aligned). In addition, the debt of any issuer not covered by ESG ratings data, or where Carbon emissions data is not available, are excluded from the index (Exclusion) The Paris-Aligned Benchmarks are designed to achieve at least a 50% reduction in either absolute emissions or EVIC based carbon intensity compared to the parent index, and the Climate Transition Benchmarks are designed to achieve at least a 30% reduction. Both are designed to target a 7% annualized rate of reduction. To achieve the 7% decarbonization target, carbon tilt factors may be applied to the constituents at each rebalance. **Net Zero 2050 Indices** have similar reductions as the Paris-Aligned or Climate Transition Benchmarks. (weightings)
	b) List of social factors considered: (Selection, weighting or exclusion:)	Refer also to the rule documents for the individual benchmarks in this family for more information on selection, weighting and exclusion of securities. The **Corporate ESG Indices** exclude companies with significant or high involvement in controversial weapons based on Sustainalytics scores. (Exclusion) In addition, the Corporate ESG tilt, ESG tilt with duration match and ESG best-in-class Indices consider the Sustainalytics overall ESG risk scores when determining constituent weights. (Weighting) The overall scores aggregate a comprehensive list of Environmental, Social and Governance factors. The **Catholic Principles ESG Index** excludes securities if they meet specific screening criteria, as outlined in the Rules, based on Sustainalytics ESG ratings data. Among the predominantly social factors that the index is screened for include: Civil Liberty and Political Freedom. **Sovereign Carbon Reduction Indices**: N/A **Green, Social & Sustainable Bond Indices**: **Social Bond Indices** only include bonds that have a clearly designated use of proceeds that is solely applied toward projects or activities that directly aims to address or mitigate a specific social issue and/or seeks to achieve positive social outcomes as outlined by the ICMA Social Bond Principles. **Sustainability Indices** only include bonds that have a clearly designated use of proceeds that is solely applied toward projects or activities that promote a combination of climate change mitigation, adaptation or other environmental sustainability purposes, and that directly aims to address and

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY		
		mitigate a specific social issue and/or seeks to achieve positive social outcomes as outlined by the ICMA Sustainability Bond Guidelines. (Selection) The **HIP ESG US National Municipal Index** considers the overall HIP ESG Rating when determining constituent weights. The overall scores aggregate a comprehensive list of Environmental, Social and Governance factors or metrics on the five pillars associated with core human needs - Health, Wealth, Earth, Equality and Trust (Weighting) The **Paris-Aligned Benchmarks, Climate Transition Benchmarks** and **Net Zero 2050 Indices** exclude securities that meet the screening criteria based on Sustainalytics ESG ratings data, as outlined in the individual rule documents. (Exclusion) These include several social factors, including companies that are involved in activities related to controversial weapons and in the cultivation and production of tobacco.
	c) List of governance factors considered: (Selection, weighting or exclusion:)	Refer also to the rule documents for the individual benchmarks in this family for more information on selection, weighting and exclusion of securities. The **Corporate ESG Indices** consider the Sustainalytics overall ESG risk scores when determining constituent weights (Weighting). The overall scores aggregate a comprehensive list of Environmental, Social and Governance factors. The **Catholic Principles ESG Index** excludes securities if they meet specific screening criteria, as outlined in the Rules, based on Sustainalytics ESG ratings data. The predominantly governance-related factors that the index is screened for include: Control of Corruption; Rule of Law; Political Stability; Government Effectiveness. **Sovereign Carbon Reduction Indices**: N/A **Green, Social & Sustainable Bond Indices**: N/A The **HIP ESG US National Municipal Index** considers the overall HIP ESG Rating when determining constituent weights. The overall scores aggregate a comprehensive list of Environmental, Social and Governance factors or metrics on the five pillars associated with core human needs - Health, Wealth, Earth, Equality and Trust (Weighting) The **Paris-Aligned Benchmarks, Climate Transition Benchmarks** and **Net Zero 2050 Indices** exclude securities that meet the screening criteria based on Sustainalytics ESG ratings data, as outlined in the individual rule documents. (Exclusion) These include several Governance Factors.
6	Where the response to Item 4 is positive, please list below, for each benchmark, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816, depending on the relevant underlying asset concerned. Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets. The ESG factors shall not be disclosed for each constituent of the benchmark, but shall be disclosed at an aggregated weighted average value of the benchmark.	

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY		
	Alternatively, all of this information may be provided in the form of a hyperlink to a website of the benchmark administrator included in this explanation. The information on the website shall be easily available and accessible. Benchmark administrators shall ensure that information published on their website remains available for five years.	
	a) List of environmental factors considered: (Selection, weighting or exclusion:)	see the ESG disclosures section on **https://www.ice.com/fixed-income-data-services/index-solutions/regulation/benchmark-statements** for more information on the individual benchmarks
	b) List of social factors considered: (Selection, weighting or exclusion:)	see the ESG disclosures section on **https://www.ice.com/fixed-income-data-services/index-solutions/regulation/benchmark-statements** for more information on the individual benchmarks
	c) List of governance factors considered: (Selection, weighting or exclusion:)	see the ESG disclosures section on **https://www.ice.com/fixed-income-data-services/index-solutions/regulation/benchmark-statements** for more information on the individual benchmarks
7	Data and standards used	
	a) Data input. (i) Describe whether the data are reported, modelled or sourced internally or externally. (ii) Where the data are reported, modelled or sourced externally, please name the third party data provider.	The Indices use ESG related data from the following sources: - ESG risk scores, (EVIC and Revenue Based) Carbon Intensity values; absolute emissions data, Controversial Weapons and other ESG specific factors such as Rule of Law, Control of Corruption are obtained from Sustainalytics (**https://www.sustainalytics.com/**). For Scope 1 and Scope 2 emissions data, the coverage universe for Sustainalytics is approximately 14,000 companies, of which 3,000 is company-reported data and 11,000 is estimated. The vast majority of scope 3 data is estimated by Sustainalytics using a proprietary multi-factor regression model. Sustainalytics uses company-reported GHG emissions to generate estimates for non-reporting companies through statistical estimation. For more information on the source of carbon data - refer to Section 'ESG and Climate Related Methodologies' above. (Reported and Modelled) - HIP ESG Ratings used in the ICE HIP ESG US National Municipal Index are obtained from HIP Investor, Inc **https://HIPinvestor.com** (Reported). - CO2 per capita data for Sovereign Carbon Reduction and Catholics Principles Indices is sourced from Emissions Database for Global Atmospheric Research (EDGAR **https://edgar.jrc.ec.europa.eu/**) (Reported) - Use of proceeds data used to identify Green, Social & Sustainable Bonds is obtained from an affiliate ICE Data Pricing & Reference Data, LLC which is compiled in accordance with the ICMA Green Bond Principles. **https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/** **https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/social-bond-principles-sbp/** **https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-bond-guidelines-sbg/** (Reported)

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY		
		See notes in ESG disclosures document on **https://www.ice.com/marketdata/indices/regulation/benchmark-statements** for more information on the data source and on specific ESG factors In addition to ESG related data, the indices use non-ESG data, (e.g., evaluated prices, reference data, credit ratings, etc.) which are sourced from affiliated and nonaffiliated third parties who are disclosed in the Bond Index Methodology document **https://indices.ice.com/**
	b) Verification and quality of data. Describe how data are verified and how the quality of those data is ensured.	Refer to IDI's IOSCO Compliance Statement Principles 2 and 15 for information on oversight of third parties and input data controls **https://www.ice.com/market-data/indices/regulation/iosco-reports**
	c) Reference standards Describe the international standards used in the benchmark methodology.	The use of international standards are not generally incorporated as part of the design of these indices. The third party data sources however do apply standards to the derivation of the data that is provided to IDI for use in the indices. EDGAR provides independent emission estimates compared to what is reported by European Member States or by Parties under the United Nations Framework Convention on Climate Change (UNFCCC), using international statistics and a consistent IPCC methodology. Sustainalytics uses emissions data reported by companies in accordance with the GHG Protocol Standard.
Date on which information has been last updated and reason for the update:		**September 30, 2022 Launch of ICE HIP ESG US National Municipal Index**

Glossary

Table 9: Index glossary

Field name	Definition
BOND INDICES	
# of Issues	See Number of Issues.
$ Market value (USD terms)	The full market value of the Index constituent securities converted into USD terms. It does not include cash payments received during the month and retained by the Index. See Market Value ex Cash.
% Cheap	See Percent Cheap
% Excess Return vs. AAA Muni	The total return percentage of a bond minus the total return percentage of a risk-matched basket of Muni AAA GOs. The Muni AAA GO basket is comprised of synthetic securities derived from the fair value Muni AAA GO yield curve. The hedge basket is key rate duration-matched to the bond at six nodes: 6-month, 2-year, 5-year, 10-year, 20-year and 30-year. The excess return of an Index is equal to the average of its constituent security excess returns, weighted by their full market values as of the beginning of the period.
% Excess Return vs. Governments	See Excess Return % vs Govts.
% Excess Return vs. Muni	See % Excess Return vs. AAA Muni.
% Excess Return vs. Swap	See Excess Return % vs Swaps.
% Hedged	The percentage of the Index full market value at the beginning of the measurement period that is hedged into a given base currency using currency forwards, with 100% indicating fully hedged returns and 0% indicating unhedged returns. See Hedge Return Percentage.
% Market value	The sum of the full market values of all bonds within a given segment of the Index divided by the sum of the full market values of all bonds in the entire Index, including cash payments received during the period and retained by the Index. See % Weight.
% of	The full market value, including cash payments received and retained, of a selected Index divided by the full market value of another selected Index. (Note: if the first Index is a sub-Index whose constituents are completely contained within the second Index (i.e., its parent), then the "% of" field shows the sub-Index share of the parent Index. If some or all of the first Index's constituents are not constituents of the second Index, the "% of" calculation simply shows the relative size of the two Indices.)
% Price return	See Price Return Percentage.
% Total return	See Total Return Percentage.
% Weight	The full market value of a constituent bond (excluding any cash payments paid during the month) divided by the sum of the full market values of all constituent securities in an Index including all cash payments received during the month and retained by the Index.
Accrued Interest	For a bond, the accrued interest in percentage terms times the face value of the bond. For an Index, the sum of accrued interest values for all constituent securities.
Accrued Interest %	The interest earned on a bond, but not yet paid or received, through the settlement date stated as a percent of face value.
Accrued Interest Value	See Accrued Interest.
Announce Date	Stated settlement date from issuance
Asset Swap	An asset swap is a swap of a bond's fixed coupon for a floating rate coupon pegged to a short-term reference deposit rate. For a bond, asset swap spread is the spread over the forward swap curve that equates the present value of the floating rate instrument to the present value of the bond's cash flows where the cash flows of both

Table 9: Index glossary

Field name	Definition
	instruments are discounted using the swap. The price of a bond with embedded options, such as call or put features, is adjusted to strip away the option value. Asset swap spread is calculated in semi-annual terms, regardless of the bond coupon frequency, as the fixed cash flows are always swapped against semi-annual floating payments. The reference basis for the short-term deposit rate is defined by market convention, with a 3-month rate used for USD while 6-month is used for EUR, GBP, etc. In addition, the swap is calculated on a par basis, meaning that a cash position is added to (removed from) a discount (premium) bond to adjust its price to 100. For an Index, the average of its constituent security asset swap spreads, weighted by full market value. All bond spreads are limited to a 10,000bp/-1,000bp range.
Base currency	The base currency that is used for purposes of calculating returns (which may be hedged or unhedged) and for conversion of bond/Index valuations such as face value, full market value, etc.
Beginning Index Value	The total return Index value (stated in local, converted unhedged or converted hedged terms) at the beginning of the measurement period. See Total Return Index Value.
Bond Ticker	See Ticker.
Calculation [method]	The basis on which yield and risk measures have been calculated. Conventional uses the bond's actual cash flow frequency as the basis for calculations. Semi-annual yield calculations assume a semi-annual compounding frequency. Semi-annual risk calculations (duration, convexity, etc.) are calculated by discounting the bond's actual cash flows using the semi-annual yield.
Cash	For a bond, cash is the amount received during the month from coupon payments plus interest on coupon payments received at the applicable reinvestment rate, if any, stated as a percentage of face value. For an Index it is the sum of the cash position (cash percentage times face value) for all constituent securities converted into a given base currency. For convertible securities it is the sum of Interest Cash, Principal Cash and Redemption Cash. (Note: when determining the weight of a constituent in an Index, cash is not included as part of the constituent's full market value, but it is included in the Index full market value.)
Cash Value	See Cash.
Change in Govt OAS	The change in the Govt OAS during the period. For an Index, this includes the impact of rebalancing changes that occur during the period. See Govt OAS.
Change in Govt OAS (incl. rebalancing impact)	See change in Govt OAS.
Change in Swap OAS	The change in the Swap OAS during the period, inclusive of the impact of rebalancing changes that occur during the period. See Swap OAS.
Change in Swap OAS (incl. rebalancing impact)	See change in Swap OAS.
Change in Spread to Worst	The change in Spread to Worst during the period, inclusive of the impact of rebalancing changes that occur during the period. See Spread to Worst vs Govt.
Composite Rating	For a constituent bond, composite rating is the simple average of the Moody's, S&P and Fitch bond ratings. For an Index it is the average of its constituent security composite ratings, weighted by full market value.
Conduit Debt	A security issued in the name of a U.S. state or local government that is for the benefit of a third party primarily responsible for the repayment of the security. See Muni Conduit Obligor.
Conduit Obligor	See Muni Conduit Obligor.

Table 9: Index glossary

Field name	Definition
Contribution to Modified Duration	The modified duration to maturity of a bond, or group of bonds, times its weight in a given Index. See Mod Dur to Maturity.
Contribution to modified duration to worst	The modified duration to worst of a bond, or group of bonds, times its weight in a given Index. See Mod Dur to Worst.
Convexity to Maturity	The second derivative of a security's price with respect to its yield divided by the security's price, where it is assumed that the bond will be redeemed at its final maturity date without regard to any embedded options such as call or put features. When Convexity to Maturity is stated in conventional terms, the bond cash flows to its final maturity date are discounted using its conventional yield. When stated in semi-annual terms, the bond cash flows to its final maturity date are discounted using its semi-annual yield. For an Index it is the average of its constituent security convexities to maturity, weighted by full market value.
Convexity to Worst	The second derivative of a security's price with respect to its yield divided by the security's price. For bonds with embedded options, such as call or put features, Convexity to Worst is calculated to the redemption date that produces the lowest yield for bonds with call features or the highest yield for bonds with put features (the “workout date”). When Convexity to Worst is stated in conventional terms, the bond cash flows to the workout date are discounted using its conventional yield. When stated in semi-annual terms, the bond cash flows to the workout date are discounted using its semi-annual yield. For an Index it is the average of its constituent security convexities to worst, weighted by full market value.
Convexity to Worst (s.a.)	The Convexity to Worst for a bond or Index stated in semi-annual terms. See Convexity to Worst.
Convexity	The Convexity to maturity of a bond or Index stated in conventional terms. See Convexity to Maturity.
Convexity (s.a.)	The Convexity for a bond or Index stated in semi-annual terms. See Convexity.
Country of Risk	The International Organization for Standardization (ISO) country code of the issuer's country of risk. For corporate issuers the country of risk is based on the physical location of the issuer’s operating headquarters, with several exceptions (see “Country designation” for full description)
Country of Risk (Eurozone Grouped)	The Country of Risk where all Eurozone countries are combined in a single group under the EURC code. See Country of Risk.
Country of Risk (Eurozone itemized)	The Country of Risk where all Eurozone countries are shown individually. See Country of Risk.
Coupon	For a bond, its stated rate of interest; for an Index the average of its constituent security coupons, weighted by full market value.
CPR (paydown)	See MBS CPR / Sink %
Currency	The currency of denomination of the cash flows paid by a bond. Where used as a grouping category, Eurozone Grouped indicates that all euro legacy currencies are grouped under the EUR currency code while Eurozone Itemized indicates that euro legacy currencies are shown individually.
Currency of Denomination (Eurozone Grouped)	See Currency.
Currency of Denomination (Eurozone Itemized)	See Currency.
Currency Return	See Currency return percentage.
Currency return percentage	For an Index, currency return percentage in a given base currency is equal to the difference between the Index total return percentage in

Table 9: Index glossary

Field name	Definition
	local currency terms and its total return percentage in the selected base currency.
Current Yield	The annual coupon divided by the current price. For an index it is the average of the constituent security current yields, weighted by full market value.
CUSIP	The first eight characters of a unique identifier assigned by the Committee on Uniform Securities Identification Procedures (CUSIP) Service Bureau for U.S. and Canadian companies. Any securities without a CUSIP will be assigned an alternative eight-character unique identifier.
CUSIP9	A unique nine-character identifier assigned by the Committee on Uniform Securities Identification Procedures (CUSIP) Service Bureau for U.S. and Canadian companies. Any securities without a CUSIP will be assigned an alternative nine-character unique identifier.
Description	For a bond the issuer name; for an Index the official Index name.
Detail Composite Rating	See Composite Rating.
Effective Convexity	The second derivative of a security's price with respect to changes in the semi-annual par yield curve, divided by the security's price. For an Index it is the average of its constituent security effective convexities, weighted by full market value. See Effective Duration.
Effective Duration	Effective duration is the percentage change in the price of a bond given a parallel shift in the semi-annual par coupon government yield curve while keeping option-adjusted spread constant. A theoretical price is calculated by discounting the bond's cash flows using the shifted yield curve. An option pricing model is used to account for the impact of embedded options such as call or put features. For US mortgage-backed securities, prepayment and interest rate models are used to project security cash flows and the forward curve under multiple interest rate paths for the shifted yield curve scenario. For each interest rate path, the projected cash flows are discounted by the corresponding forward curve, plus the OAS derived from the base case, to arrive at a present value for the path. The average of the present values of all paths is the theoretical price for the scenario. For US ABS and CMBS securities, a single static set of cash flows are projected using an assumed pricing prepayment speed. For an Index, it is the average of its constituent security effective durations, weighted by full market value.
Effective Duration (OAD)	See Effective Duration.
Effective Yield	Effective yield is the yield of a hypothetical bullet bond created by stripping out the option value of a bond with embedded optionality such as a call or put features. For US ABS, CMBS and CMO securities, effective yields are based on a static set of cash flows generated using the assumed pricing prepayment speed. For US MBS, interest rate and prepayment models are used to project a set of future cash flows under a single interest rate scenario. The average life of the security is equal to the average time to each of the projected principal payments weighted by their future values. That average life is converted to a long-term equivalent PSA (i.e., the PSA that will generate cash flows having the same average life) and the cash flows generated by the long-term equivalent PSA are used to derive the yield. For an Index, it is the average of its constituent security effective yields, weighted by full market value. All bond yields are limited to a +100%/-10% range.
Effective Yield (OAY)	See Effective Yield.

Table 9: Index glossary

Field name	Definition
Ending Index Value	The total return Index value (stated in local, converted unhedged or converted hedged terms) at the end of the measurement period. See Total Return Index Value.
Excess Return % vs Govts	The total return percentage of a bond minus the total return percentage of a risk-matched basket of governments. The government basket is comprised of synthetic securities derived from the fair value government yield curve corresponding to the currency of denomination of the bond. The hedge basket is key rate duration-matched to the bond at six nodes: 6-month, 2-year, 5-year, 10-year, 20-year and 30-year. The excess return of an Index is equal to the average of its constituent security excess returns, weighted by their full market values as of the beginning of the period.
Excess Return % 1-day	The percentage one-day excess return. See Excess Return % vs Govts.
Excess Return % vs Swaps	The total return percentage of a bond minus the total return percentage of a risk-matched basket of interest rate swaps. The swap basket is comprised of synthetic securities derived from the fair value swap yield curve corresponding to the currency of denomination of the bond. The hedge basket is key rate duration-matched to the bond at six nodes: 6-month, 2-year, 5-year, 10-year, 20-year and 30-year. The excess return of an Index is equal to the average of its constituent security excess returns, weighted by their full market values as of the beginning of the period.
Excess Return vs. Govt	See Excess Return % vs Govts.
Excess Return vs. Swap	See Excess Return % vs Swaps.
Excess Rtn % MTD	The month-to-date total return percentage of a bond minus the month-to-date total return percentage of a risk-matched basket of governments. See Excess Return % vs Govts.
Excess SwapRtn % 1-day	The percentage one-day excess swap return. See Excess Return % vs Swaps.
Face Value	For a bond, the face value of the security held by the Index. For capitalization weighted Indices, the face value of a constituent is equal to the total amount outstanding of the bond issue. For Indices that use alternative weighting schemes, the face value of a constituent will differ from the total amount outstanding of the bond issue. The Face Value of an Index is equal to the sum of the face values of its constituent securities converted into a given base currency.
Factor	For inflation-linked securities where the market convention price does not include an inflation accrual, an adjustment amount that is multiplied by the security's nominal principal face amount to adjust for changes in each market's rate of inflation since issue. For securities whose price is quoted as a % of original face, a ratio representing the principal accrual. The indices account for the inflation factor on a T+1, next calendar day, basis to align with the calculation of accrued interest. For all other securities, including inflation-linked securities where the security prices include an inflation accrual, the Factor is 1. For collateralized securities, see Relative Factor
Full Market Value	Full market value in local currency terms. (Note 1: for bonds, full market value is equal to face value times price plus accrued interest; for Indices, full market value also includes cash payments received and retained by the Index during the period. Note 2: euro legacy bonds are converted into EUR terms.)

Table 9: Index glossary

Field name	Definition
Geo Region	Geographical Region associated with an issuer's Country of Risk. See Country of Risk. Also refer to the "Country status, region and code, assignments" section of this report.
Govt OAS	For a bond, the option-adjusted spread of the bond measured vs the underlying government yield curve corresponding to the bond's currency of denomination. For Municipal bonds, the option-adjust spread of the bond is measured vs the US Muni AAA GO curve. Option-adjusted spread is the number of basis points that the fair value government spot curve is shifted in order to match the present value of discounted cash flows to the bond's price. For securities with embedded options, such as call, sink or put features, a log normal short interest rate model is used to evaluate the present value of the securities potential cash flows. In this case, the OAS is equal to the number of basis points that the short interest rate tree must be shifted in order to match discounted cash flows to the bond's price. For US mortgage-backed and CMO securities, interest rate/prepayment models are used to generate forward curves and project cash flows. OAS is the number of basis points that is added to the semi-annually compounded forward one-month rate curves to discount the corresponding cash flows for each scenario to arrive at a present value for each scenario. OAS is calculated in order to match the average of present values of all scenarios to the bond's price. For ABS and CMBS, a single interest rate scenario is used and the cash flows are generated using the pricing speeds. For an index, the average of its constituent security government option-adjusted spreads, weighted by full market value. All bond spreads are limited to a 10,000bp/-1,000bp range.
Hedge Return	See Hedge return percentage.
Hedge Return Percentage	For a bond or an Index, hedge return percentage in a given base currency is equal to the difference between the Index total return percentage fully hedged into a given base currency minus its unhedged total return percentage in that same base currency, times the percentage of the bond/Index currency exposure that has been hedged.
Inception Date	The date that the Index history begins. It is typically earlier than the date the Index was first published, which is referred to as the Launch Date. See Launch Date.
Income Return %	The return of a bond or Index attributed to its coupon (including both received and/or accrued coupons, but not including amortization of premiums or accretion of discounts). Income return percentage is equal to total return percentage minus price return percentage. See Total Return Percentage, Price Return Percentage.
Income Return (Local)	See Income Return %.
Index Name	The official name of the Index.
Inflation Factor	See Factor.
ISIN	The International Securities Identification Number (ISIN).
ISO Country	See Country of Risk
ISO Currency	See Currency
Issue Year	The year the security was issued.
Issuer Country	See Country of Risk.
Issuer State (U.S. munis)	The State in which a US municipal securities issuer is domiciled.
Launch Date	The date the Index was first published (not available for all Indices). It is typically later than the date the Index history begins, which is referred to as the Index Inception Date. See Inception Date.

Table 9: Index glossary

Field name	Definition
Level 1 Asset Class	See Sector Level 1.
Level 2 Group	See Sector Level 2.
Level 3 Subgroup	See Sector Level 3.
Level 4 Detail	See Sector Level 4.
Swap OAS	For a bond, the option-adjusted spread of the bond measured vs the underlying swap curve corresponding to the bond's currency of denomination. For an Index, the average of its constituent security Swap OASs, weighted by full market value. All bond spreads are limited to a 10,000bp/-1,000bp range.
KDR - Swap - 6 Mos	The key rate duration of a security at the 6-month node of the fair value swap curve. For an index, it is the weighted average of constituent key rate durations at the 6-month node.
KDR - Swap - 2 Yrs	The key rate duration of a security at the 2-year node of the fair value swap curve. For an index, it is the weighted average of constituent key rate durations at the 2-year node.
KDR - Swap - 5 Yrs	The key rate duration of a security at the 5-year node of the fair value swap curve. For an index, it is the weighted average of constituent key rate durations at the 5-year node.
KDR - Swap - 10 Yrs	The key rate duration of a security at the 10-year node of the fair value swap curve. For an index, it is the weighted average of constituent key rate durations at the 10-year node.
KDR - Swap - 20 Yrs	The key rate duration of a security at the 20-year node of the fair value swap curve. For an index, it is the weighted average of constituent key rate durations at the 20-year node.
KDR - Swap - 30 Yrs	The key rate duration of a security at the 30-year node of the fair value swap curve. For an index, it is the weighted average of constituent key rate durations at the 30-year node.
KDR - TRSY - 6 Mos	The key rate duration of a security at the 6-month node of the fair value government yield curve. For an index, it is the weighted average of constituent key rate durations at the 6-month node.
KDR - TRSY - 2 Yrs	The key rate duration of a security at the 2-year node of the fair value government yield curve. For an index, it is the weighted average of constituent key rate durations at the 2-year node.
KDR - TRSY - 5 Yrs	The key rate duration of a security at the 5-year node of the fair value government yield curve. For an index, it is the weighted average of constituent key rate durations at the 5-year node.
KDR - TRSY - 10 Yrs	The key rate duration of a security at the 10-year node of the fair value government yield curve. For an index, it is the weighted average of constituent key rate durations at the 10-year node.
KDR - TRSY - 20 Yrs	The key rate duration of a security at the 20-year node of the fair value government yield curve. For an index, it is the weighted average of constituent key rate durations at the 20-year node.
KDR - TRSY - 30 Yrs	The key rate duration of a security at the 30-year node of the fair value government yield curve. For an index, it is the weighted average of constituent key rate durations at the 30-year node.
Mac Dur to Maturity	See Macaulay Duration.
Macaulay Duration	For a bond, the weighted average time to maturity of its cash flows without consideration given to embedded options such as call, put and/or sink feature. For an Index, it is the average of its constituent security Macaulay durations, weighted by full market value.
Mandatory Conversion Date	See Years to Maturity/Mand
Market Convention Price	The price of a security as it is conventionally quoted.

Table 9: Index glossary

Field name	Definition
Market Value Added %	The percentage increase in the weight of the security in the index compared to the pre-rebalancing weight of the security on the month end rebalancing date.
Market Value Ex Cash	The sum of the market values of the constituent securities of an Index converted into a given base currency. Constituent security market values are equal to price plus accrued interest times face value. Market Value ex Cash does not include any coupon payments received during the period and retained by the Index.
Market Weighted Coupon	See Coupon.
Maturity	Generally Maturity is the final stated maturity of a constituent security. For fixed to floating rate securities it is the last call date during the fixed rate coupon period. For perpetual preferred securities it is 12/31/2200. For callable perpetual corporate securities it is the first call date. For US mortgage pass-through securities it is a date derived from the security's average life.
Mkt Wgt Coupon	See Coupon.
Mkt % Index Wght	See % Weight
ML Industry Lvl 1	See Sector Level 1
ML Industry Lvl 2	See Sector Level 2
ML Industry Lvl 3	See Sector Level 3
ML Industry Lvl 4	See Sector Level 4
MLIndLvl1 code	The reference code associated with the Sector Level 1 categorization.
MLIndLvl2 code	The reference code associated with the Sector Level 2 categorization.
MLIndLvl3 code	The reference code associated with the Sector Level 3 categorization.
MLIndLvl4 code	The reference code associated with the Sector Level 4 categorization.
Mod Dur to Maturity	The percentage change in the price of a bond for a 100bp change in yield where it is assumed that the bond will be redeemed at its final maturity without regard to any embedded options such as call or put features. For an Index, it is the average of its constituent security modified durations to maturity, weighted by full market value. When duration to maturity is stated in conventional terms, the bond cash flows to maturity are discounted using its conventional yield. When stated in semi-annual terms, the bond cash flows to maturity are discounted using its semi-annual yield. For US ABS, CMBS and CMO securities, modified duration to maturity is based on a static set of cash flows generated using the assumed pricing prepayment speed. For US MBS, interest rate and prepayment models are used to project a set of future cash flows under a single interest rate scenario. The average life of the security is equal to the average time to each of the projected principal payments weighted by their future values. That average life is converted to a long-term equivalent PSA (ie, the PSA that will generate cash flows having the same average life) and the cash flows generated by the long-term equivalent PSA are used to derive the modified duration to maturity.
Mod Dur to Worst	The percentage change in the price of a bond for a 100bp change in yield where it is assumed that bonds with embedded options, such as call or put features, will be redeemed on the redemption date that produces the lowest yield for bonds with call features or the highest yield for bonds with put features (the “workout date”). For an Index, it is the average of its constituent security modified durations to worst, weighted by full market value. When duration to worst is stated in conventional terms, the bond cash flows to the workout date are discounted using its conventional yield. When stated in semi-annual terms, the bond cash flows to the workout date are discounted using its

Table 9: Index glossary

Field name	Definition
	semi-annual yield. For US ABS, CMBS and CMO securities, modified duration to worst is based on a static set of cash flows generated using the assumed pricing prepayment speed. For US MBS, interest rate and prepayment models are used to project a set of future cash flows under a single interest rate scenario. The average life of the security is equal to the average time to each of the projected principal payments weighted by their future values. That average life is converted to a long-term equivalent PSA (i.e., the PSA that will generate cash flows having the same average life) and the cash flows generated by the long-term equivalent PSA are used to derive the modified duration to worst.
Modified Duration	The modified duration to maturity of a bond or Index stated in conventional terms. See Mod Dur to Maturity.
Modified Duration to Maturity	The modified duration to maturity of a bond or Index stated in conventional terms. See Mod Dur to Maturity.
Modified Duration to Maturity (Conventional)	The modified duration to maturity of a bond or Index stated in conventional terms. See Mod Dur to Maturity.
Modified Duration to Maturity (Semi-Annual)	The modified duration to maturity of a bond or Index stated in semi-annual terms. See Mod Dur to Maturity.
Modified Duration to Worst	The modified duration to worst of a bond or Index stated in conventional terms. See Mod Dur to Worst.
Modified Duration to Worst (Conventional)	The modified duration to worst of a bond or Index stated in conventional terms. See Mod Dur to Worst.
Modified Duration to Worst (Semi-Annual)	The modified duration to worst of a bond or Index stated in semi-annual terms. See Mod Dur to Worst.
Mortgage WAC	The weighted average coupon of the underlying mortgages that comprise a generic US mortgage pass-through security, weighted by their outstanding pool balances.
Mortgage WALA	The weighted average age of the underlying mortgages that comprise a generic US mortgage pass-through security, weighted by their outstanding pool balances.
Mortgage WAM	The weighted average maturity of the underlying mortgages that comprise a generic US mortgage pass-through security, weighted by their outstanding pool balances.
Mty Type	See Redemption Type
Muni Conduit Obligor	The obligor associated with the issuance of a municipal security that is a third party to the issuer.
Nominal Amount	The denomination or face amount per security.
Number of Issues	The number of constituent securities in an Index or Index segment.
OAS vs Govt	See Govt OAS.
OAS vs Swap	See Swap OAS.
Option-adjusted spread (OAS)	See Govt OAS.
Par % Index Wght	The Face Value of a constituent security divided by the sum of the Face values of all constituent securities in an Index.
Par Amount	See Face Value.
Par Amount (USD terms)	See Face Value.
Par Weighted Coupon	The average of the Index constituent security coupons, weighted by face value.
Par Weighted Price	See Price.
Par Wgt Coupon	See Par Weighted Coupon.
Par Wgt Price	See Price.
Paydown Return	See Paydown Return %.

Table 9: Index glossary

Field name	Definition
Paydown Return %	For US MBS, ABS and CMBS securities, paydown return percentage represents the percentage change in value of the security attributed to the scheduled and prepaid principal received during the period. The portion of principal paid down will not participate in any price appreciation/depreciation during the period, but instead realizes a gain or loss equal to the difference between the end of period market price and par times the portion of face value that was paid down. For an Index, it is the average of its constituent security paydown return percentages, weighted by their full market values at the beginning of the measurement period.
Price	The clean price (ie, excluding accrued interest) of a bond stated as a percentage of face value. Securities traded on a share price, or dollar price, will have their prices converted to percentage of face (bond convention). For an Index it is the average of its constituent security prices, weighted by face value.
Price Return (Local)	The Price Return Percentage during the measurement period in local currency terms. See Price Return Percentage.
Price Return Index Hedged	A value that is set to an arbitrary level (typically 100) at the inception date of the Index and thereafter is incremented or decremented by the hedged price return percentage of the Index in a given base currency. See Inception Date, Price Return Percentage Hedged.
Price Return Index Value	A value that is set to an arbitrary level (typically 100) at the inception date of the Index and thereafter is incremented or decremented by the price return percentage of the Index. See Inception Date, Price Return Percentage.
Price Return Percentage	The price return percentage of a bond is equal to its change in price during the measurement period divided by its full market value at the beginning of the measurement period. If price return percentage is stated in a base currency other than the bond's currency of denomination, it also includes the impact of changes in spot currency rates during the period. For an Index, it is the average of its constituent security price return percentages, weighted by their full market values at the beginning of the period.
Price Return Percentage Hedged	The price return percentage of a bond or Index stated in a given base currency where the currency exposure of the bond/Index is hedged with currency forward contracts. See Price Return Percentage.
Rating	See Composite Rating.
Redemption type	A flag that indicates the presence of any features of a bond that could affect its redemption date, such as a call or put feature.
Relative factor	Amount to be adjusted/reduced for U.S. collateralized securities representing the face amount prepaid intra-month and contributing to prepay return. For inflation-linked securities, see Factor.
Sector Level 1	The first level of the four tier bond Index sector classification schema. Level 1 designates the sector asset class.
Sector Level 2	The second level of the four tier bond Index sector classification schema. Level 2 designates the sector group.
Sector Level 3	The third level of the four tier bond Index sector classification schema. Level 3 designates the sector category.
Sector Level 4	The fourth level of the four tier bond Index sector classification schema. Level 4 designates the sector sub-category.
Security Type	Indicates the basic market designation for a security: Government (Govt), U.S. Municipal (Muni), Corporate (Corp), Preferred (Pfd) or Collateralized/Securitized (Mtge) or Cash (CASH).
Semi Mod Duration	See Modified Duration(s.a.)

Table 9: Index glossary

Field name	Definition
Semi Mod Dur To Worst	See Mod. Dur to Worst (Semi-Annual)
Semi Convexity To Worst	See Convexity to Worst (s.a.)
Semi Convexity	See Convexity (s.a.)
Spread	See Govt OAS.
Spread Duration	For a bond, the percentage change in price for a 100bp change in option-adjusted spread (OAS). For an Index, it is the average of its constituent security spread durations, weighted by full market value.
Spread to Worst vs Govt	For a bond, its yield to worst minus the yield at a point on the fair value government yield curve that corresponds to the bond's expected redemption date, where it is assumed that a bond with embedded options will be redeemed on the date that produces the lowest yield for bonds with call features or the highest yield for bonds with put features (the “workout date”). For US MBS, ABS, CMBS and CMO securities the average life is used in place of the expected redemption date. For an Index, the average of its constituent security spreads to worst, weighted based on full market value. See Yield to Worst. All bond spreads are limited to a 10,000bp/-1,000bp range.
Subordination Type	The ranking of the bond with regard to claims on issuer assets or earnings in the event of default.
SubType	See Subordination Type.
Summary Composite Rating (AAA, AA, etc)	Generic composite rating categories that do not distinguish rating sub-categories. For example, the AA Summary Composite Rating category includes bonds with a composite rating equal to AA1, AA2 or AA3. See Composite Rating.
Synth Trsy Return % 1-day	The percentage one-day return of the risk-matched basket of underlying government securities. See Excess Return % vs Govts.
Swap Index	The total return index value of the risk-matched basket of underlying swap securities. See Excess Return % vs Govts.
Theoretical Discount	See Percent Cheap
Ticker	For bonds, this field shows the issuer ticker; for Indices it is the four character reference ticker assigned to the Index.
Total Return (Converted)	The total return percentage of an Index times the percentage changes in spot currency rates where all constituent securities are converted into a common base currency. See Total Return Percentage.
Total Return (Local)	The total return percentage during the measurement period in local currency terms. See Total Return Percentage
Total Return Index Hedged	A value that is set to an arbitrary level (typically 100) at the inception of the Index and thereafter is incremented or decremented by the hedged total rate of return percentage of the Index in a given base currency. See Inception Date, Total Return Percentage Hedged.
Total Return Index Value	A value that is set to an arbitrary level (typically 100) at the inception of the Index and thereafter is incremented or decremented by the total return percentage of the Index. See Total Return Percentage.
Total Return Percentage	The Total Return Percentage of a bond is equal to the sum of its change in price, change in accrued interest, and cash flow payments received during the measurement period divided by its full market value at the beginning of the measurement period. If total return percentage is stated in a base currency other than the bond's currency of denomination, it is multiplied by in the percentage change spot currency rates during the period. For an Index, it is the average of its constituent security total return percentages, weighted by their full market values at the beginning of the period.

Table 9: Index glossary

Field name	Definition
Total Return Percentage Hedged	The total return percentage of a bond or Index stated in a given base currency where the currency exposure of the bond/Index is hedged with currency forward contracts. See Total Return Percentage.
Total Return Value	See Total Return Index Value.
Transaction Cost %	For a bond, the difference in the bid-offer price of a security as a percentage of the security's price as of the month end rebalancing date. For an index, it's the sum of the bond level transaction cost %
TTR % MTD LOC	The month-to-date total return percentage in local currency terms. See Total Return Percentage.
Trsy Index	The total return index value of the risk-matched basket of underlying government securities. See Excess Return % vs Govts.
Type	See Subordination Type.
Weight	See % Weight.
WAC	See Mortgage WAC
WAM	See Mortgage WAM
WALA	See Mortgage WALA
Weighting Method	The basis for determining the weights of constituent securities within an Index.
Years to Final Maturity	See Years to Maturity.
Years to Maturity	For a bond, the time from the current settlement date to its final stated maturity measured in years. For an Index, the average of its constituent security years to final maturity, weighted by full market value. For US MBS, ABS and CMBS constituents, years to maturity is equal to the security's average life.
Years to Maturity Average Life	See Years to Maturity.
Years to Workout	For a bond, the time from the current settlement date to the expected redemption date. For bonds with embedded options, such as call or put features, the expected redemption date is the date that produces the lowest yield for bonds with call features or the highest yield for bonds with put features. For an Index, the average of the constituent security years to workout weighted based on full market value.
Yrs To Worst	For bonds with embedded options, years to worst is the time to the redemption date that produces the lowest yield result for bonds with call features.
Yield Ratio	The effective yield of a bond divided by the yield on the effective duration-matched point on the fair value government yield curve that corresponds to the currency of denomination of the bond. For an Index it is the average of its constituent security yield ratios, weight by full market value.
Yield to Maturity	For a bond, the percentage rate of return paid if the security is held to its maturity date without consideration given to any embedded options such as call or put features. When yield to maturity is stated in conventional terms, the bond cash flows to maturity are discounted using a yield based on the same coupon frequency of the bond. When stated in semi-annual terms, the bond cash flows to maturity are discounted using a semi-annual yield. For US MBS, ABS, CMBS and CMO securities, Yield to Maturity is equal to Effective Yield. For an Index, it is the average of its constituent security yields to maturity, weighted by full market value. All bond yields are limited to a +100%/-10% range.
Yield to Maturity (Conventional)	The yield to maturity of a bond or Index stated in conventional terms. See Yield to Maturity. All bond yields are limited to a +100%/-10% range.

Table 9: Index glossary

Field name	Definition
Yield to Maturity (Semi-Annual)	The yield to maturity of a bond or Index stated in semi-annual terms. See Yield to Maturity. All bond yields are limited to a +100%/-10% range.
Yield to Next Call	The yield to the next call date of a bond or Index. See Yield to Maturity. All bond yields are limited to a +100%/-10% range.
Yield to Worst	For bonds with embedded options, yield to worst is the yield to the redemption date that produces the lowest result for bonds with call features or the highest result for bonds with put features. If the initially calculated yield to worst ("YTW") is negative, the calculated workout date is within 30 days and the bond is continuously callable, the YTW is recalculated using a workout date 60 days from the current date. When yield to worst is stated in conventional terms, the bond cash flows to the workout date are discounted using a yield based on the same coupon frequency of the bond. When stated in semi-annual terms, the bond cash flows to the workout date are discounted using a semi-annual yield. For US MBS, ABS, CMBS and CMO securities, Yield to Worst is equal to Effective Yield. For an Index, it is the average of the Yield to Worst of its constituent securities weighted by full market value. See Effective Yield. All bond yields are limited to a +100%/-10% range.
Yield to Worst (Conventional)	The yield to worst of a bond or Index stated in conventional terms. See Yield to Worst. All bond yields are limited to a +100%/-10% range.
Yield to Worst (Semi-Annual)	The yield to worst of a bond or Index stated in semi-annual terms. See Yield to Worst. All bond yields are limited to a +100%/-10% range.
CONVERTIBLE INDICES	
Average Company Size	For convertible indices, the weighted average of the underlying equity market capitalizations for the constituent securities.
Average Market Value	For convertible indices, the market value of the underlying constituent securities divided by the total number of constituent securities.
Average Par Value	For convertible indices, the simple average of the Face Value for the index constituents
CashFlow Effect Value	For convertible indices, a value tracking the total return factor attributed to the cash flows received, holding all other inputs constant.
Conversion Premium	The excess of the convertible security's price above parity, expressed as a percentage. Conversion Premium = (Price - Parity) / Parity. For an index it is the harmonic mean of the constituent security conversion premiums, weighted by full market value.
Conversion Ratio	For convertible securities, the par amount divided by the share price of the underlying equity.
Credit Spread	For convertible securities, the credit spread input to the convertible risk model. For those convertible securities with an actual rating from the rating agencies the rating is used to reference an appropriate spread from the ICE Data Indices fair value credit curves. For unrated securities an implied rating is assigned.
Current Outstanding Face (LOC MM)	For convertible securities, the current face amount outstanding in local currency terms, in millions. This will be identical to the Face Value (see Face Value) in local currency terms, in millions, unless a redemption or conversion event has occurred.
Current Outstanding Face (USD MM)	For convertible securities, the current face amount outstanding in USD terms, in millions. This will be identical to the Face Value (see Face Value) in USD terms, in millions, unless a redemption or conversion event has occurred.

Table 9: Index glossary

Field name	Definition
Delta	For convertible securities the measure of equity sensitivity. Delta shows the relationship between a percentage change in the underlying equity and the corresponding expected percent change in convertible price. For an index, the average of each constituent security Delta, weighted by full market value.
Delta Effect Value	For convertible indices, a value tracking the total return factor attributed to the change in Delta, holding all other inputs constant.
Equity Dividend Yield	For convertible securities the 12-month historical dividend of the underlying equity or equity basket divided by the current Equity Price.
Equity ISIN	For convertible securities, the ISIN of the underlying equity as listed on its primary exchange.
Equity Market Cap ($MM)	For convertible securities, the current market capitalization of the company associated with the underlying equity, expressed in USD, in millions.
Equity Price	For convertible securities the price of the underlying equity or equity basket into which the security is exchangeable.
Equity Alternative %	For convertible indices, the percentage of the index with securities that have a delta value greater than or equal to 80.
Equity Total Return Index Value	For convertible securities, a value tracking the performance of the underlying equity. The value is set to an arbitrary level (typically 100) at the inception of the security's presence in the index and thereafter is incremented or decremented by the total return percentage of the index. See Equity Total Return % MTD.
Equity Total Return % MTD	For convertible securities, the month-to-date total return of the underlying equity. It is equal to the month-to-date change in price plus any dividends received, divided by the beginning-of-month price. For an index, it is the average of its constituent total return percentages, weighted by the convertible security's full market values at the beginning of the month.
Equity Ticker	For convertible securities, the ticker of the underlying equity as listed on its primary exchange. For securities convertible into a basket of equities this field is populated with BASKET
Equity Volatility	For convertible securities, the one-year historical volatility of the underlying equity. This is used as an input to the convertible risk model.
Gamma	Measures the rate of change of Delta with respect to the underlying equity for convertible securities. Gamma is a measure of convexity and is the second derivative with respect to the underlying asset. For an index, the average of each constituent security Gamma, weighted by full market value.
Gamma Effect Value	For convertible indices, a value tracking the total return factor attributed to the change in Gamma, holding all other inputs constant.
Implied Volatility	For convertible securities, the calculated equity volatility using the security's price. This is an output of the convertible risk model.
Implied Spread	For convertible securities, the calculated credit spread using the security's price. This is an output of the convertible risk model.
Interest Cash	For convertible securities, the value of any interest or dividend payments received.
Investment Grade %	For convertible indices, the percentage of the index rated investment grade.
Investment Value	Also known as the bond floor, for convertible securities the level at which a straight bond with the same maturity and credit risk would be valued. Investment value effectively provides a "floor" for the price of the convertible if it loses all its equity content and trades as a fixed

Table 9: Index glossary

Field name	Definition
	income instrument. For an index, the average of the constituent security investment values, weighted by face amount outstanding. Securities with mandatory conversion features are excluded from the index-level calculation.
Investment Value Premium	The premium of the convertible price above investment value, expressed as a percentage. For an index, the harmonic mean of constituent security investment value premiums, weighted by full market value. Securities with mandatory conversion features are excluded from the index-level calculation.
Is Mandatory	For convertible securities, the Is Mandatory field indicates whether the security has a mandatory conversion feature ("Y" or "N").
Leverage	Leverage for a convertible security is the ratio of the full value of the convertible bond to the value of a short position in the underlying equity, where the size of the short position is determined monthly based on the convertible security's delta. Leverage is also calculated for Delta-Hedged Indices based on the average of each constituent security Leverage, weighted by full market value.
Not Rated %	For convertible indices, the percentage of the index not rated.
Parity	Also known as conversion value parity for convertible securities. Parity is equal to the conversion ratio times the underlying equity Stock Price divided by Nominal Amount.
Parity Delta	Parity delta is a measure of equity sensitivity for convertible securities showing the relationship between a nominal change in Parity and the corresponding expected nominal change in the convertible Price. It is the slope of the curve that relates the convertible security Price to its Parity. For an index, the average of each constituent security Parity Delta, weighted by full market value.
Parity Gamma	Measures the rate of change of Parity Delta with respect to the underlying equity for convertible securities. Parity Gamma is a measure of convexity and is the second derivative with respect to the underlying asset. For an index, the average of each constituent security Parity Gamma, weighted by full market value.
Payback	For convertible securities the premium recovery period. The number of years it takes for the convertible security's income advantage to offset the premium paid calculated using the dollar-for-dollar method:
Percent Cheap	For a convertible index the discount to Theoretical Value of constituent securities, weighted by full market value.
Principal Cash	For convertible securities, the value of any principal reduction due to early redemption or conversions.
Redemption Cash	For a convertible security, the amount of accrued interest, if any, due from early redemption or conversion.
Residual Effect Value	For convertible indices, a value tracking the total return factor attributed to the residual after all other return effects are accounted for.
Rho	Also known as bond delta, for convertible securities the correlation of movement between the convertible security Price and interest rates. For an index, the average of each constituent security Rho, weighted by full market value.
Speculative Grade %	For convertible indices, the percentage of the index rated below investment grade.
Spread Effect Value	For convertible indices, a value tracking the total return factor attributed to the change in credit spread, holding all other inputs constant.
Theoretical Value	The result from a model which assesses a convertible security as a sum of its parts: the embedded options plus the income portion. Among the assumptions used is a volatility measure based on the

Table 9: Index glossary

Field name	Definition
	underlying equity and a credit spread, which we estimate based on implied or actual credit ratings. The credit spread used is option-adjusted spread (OAS) referenced from ICE Data Indices credit curves for the corresponding rating. For an index, the average of each constituent security Theoretical Value, weighted by face amount outstanding.
Time Effect Value	For convertible indices, a value tracking the total return factor attributed to the passage of time, holding all other inputs constant.
Total Return Alternative %	For convertible indices, the percentage of the index comprised securities having a delta greater than or equal to 40 but less than 80.
Vega	For convertible securities the expected percentage change in Price given a 1% change in the volatility of the underlying equity. For an index, it is the average of each constituent security Vega, weighted by full market value.
Volatility Effect Value	For convertible indices, a value tracking the total return factor attributed to the change in volatility, holding all other inputs constant.
Yield Alternative %	For convertible indices, the percentage of the index comprised securities having a delta less than 40.
Yield Effect Value	For convertible indices, a value tracking the total return factor attributed to the change in yield, holding all other inputs constant.
Years to Hard Call	For a convertible security with an issuer embedded call feature, the period of time in years to the next optional redemption. For an index, it is the average of each constituent security Years to Hard Call, weighted by full market value.
Years to Maturity/Mand	For a convertible security the period of time in years to maturity or mandatory conversion. For an index, it is the average of each constituent security Years to Maturity/Mand, weighted by full market value.
Yrs To Put	For a convertible security with an issuer embedded put feature, the period of time in years to the next optional put. For an index, it is the average of each constituent security Years to Put, weighted by full market value.
Yield Advantage	The difference between the convertible security's Current Yield and the underlying equity's Equity Dividend Yield.
Yield to Put	For convertible securities with a put feature, the yield to the next put date. For an index, it is the average of each constituent security Yield to Put, weighted by full market value, where only those convertible securities with a put feature are included in the average.

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