VettaFi

Fixed Income Indexes

Index Maintenance

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Introduction

VettaFi fixed income indices cover regional and country government and agency, corporate, investment grade, emerging, and high yield credit.

VettaFi acquired the Credit Suisse Fixed Income indices in February 2025 and rebranded them. VettaFi became their administrator in June 2025.

This document is intended as a reference guide to calculation policies and formulas that apply to VettaFi fixed income indices. Individual indices have different or additional policies, requirements, or formula. This document has fixed income policies and takes precedence for fixed income indices.

Indices are calculated each trading day using third party vendor pricing. Calculations of index returns and characteristics adhere to local market trading and settlement conventions. This ensures that investors will be able to replicate the returns and existing characteristics of the index.

Pricing and Analytics

Bond pricing and analytics are sourced from ICE Data Services (Intercontinental Exchange), Swiss bond pricing is provided by SIX Swiss Exchange, and Canadian bond pricing from Confluence.

Calculation

All measured characteristics for each index are calculated daily. Measures are also calculated at the sub-index and bond-level. Market capitalization weighting is used for all index characteristics, excluding average price and average coupon, which use principal outstanding. Market cap index weights are frozen at the end of the previous month or daily fluctuating for forward-looking measures.

Index formulas ignore transaction costs and tax consequences. Indicative bid prices are used for index calculations.

Updates to index composition are made on the first business day of each month.

Key Definitions

Index: For the purposes of this document, “the Index” refers to any VettaFi fixed income index which is determined in accordance with this methodology document.

Index Rules: In respect of an Index, the rules governing the calculation of such Index, comprising this methodology documents as supplemented by any Index-specific parameters.

Rebalance Date: The day on which an index is reconstituted for the next period.

Index Calculation Day: Days on which Index levels and measures will be calculated (includes all business days other than those designated as Index Holidays by a holiday calendar relevant to the specific index).

Denomination Currency: Currency in which bonds in the index are denominated.

Returns

Three basic equations are used for calculating index- and bond-level returns: total return, price return, and interest return. Unless otherwise noted, “returns” refers to daily returns. Total return is the sum of the price and interest return. If daily returns are known, users can calculate returns for any given period. All accrued values are accumulated based on the trading conventions of that security.

Formula Definitions

0 or date0: is the last business date of the previous month

T or t: is the current date, i.e., today

t-1: is one business date before today, also called “yesterday”

Pc_t : today’s clean price

Pc_0 : date0’s clean price

Pc_{t-1} : yesterday’s clean price

Pd_t : today’s dirty price

Pd_0 : date0’s dirty price

Pd_{t-1} : yesterday’s dirty price

PR_t: today’s price return

AI_t: Accrued interest, as a percentage of par, for today

AI_{t-1}: Accrued interest, as a percentage of par, for yesterday

$IC_{0,t}$: cash received between date0 and today

$IC_{0,t-1}$: cash received between date0 and yesterday

Total Return

The total return calculated on most performing bonds, from the last business date, for example, 0 to date t, is defined as:

$$TR_{0,t} = \left(\frac{\mathrm{Pc_t} - \mathrm{Pc_0} + \mathrm{AI_t} - \mathrm{AI_0} + \mathrm{IC_{0,t}}}{\mathrm{Pd_0}}\right)$$

The total return from the last business date 0 to the date before t (t-1) is defined as:

$$TR_{0,t-1} = \left(\frac{\mathrm{Pc_{t\_1}} - \mathrm{Pc_0} + \mathrm{AI_{t\_1}} - \mathrm{AI_0} + \mathrm{IC_{0,t\_1}}}{\mathrm{Pd_0}}\right)$$

While the above formula applies to most bonds, there are a few exceptions as follows:

Non-Performing Bonds -

Non-performing bonds are bonds that are flat-trading, defaulted, or otherwise no longer accruing interest. If a bond fails to make a coupon payment it is immediately set to non-performing, regardless of the grace period. The total return calculated on a non-performing bond from the last business date (0 to date t, for example) is defined as:

$$TR_{0,t} = \left(\frac{\mathrm{Pc_t} - \mathrm{Pc_0} - \mathrm{AI_0} + \mathrm{IC_{0,t}}}{\mathrm{Pd_0}}\right)$$

Where:

AI_0 is the calculated accrued interest based on whether or not the bond was performing at the start of the month.

If the bond was not performing at the beginning of the month, the value is 0. If the bond was performing at the beginning of the month, then AI_0 will contain the accrued interest as normally calculated on that date.

If a payment is made during the grace period, then the bond will no longer be considered non-performing as of the payment date. On the date of payment, returns will immediately begin calculating using the standard total returns formula:

$$TR_{0,t} = \left(\frac{\mathrm{Pc_t} - \mathrm{Pc_0} - \mathrm{AI_0} + \mathrm{IC_{0,t}}}{\mathrm{Pd_0}}\right)$$

Where: AI_0 is set to 0 if the bond was non-performing at the beginning of the month;

$IC_{0,t}$ contains cash in the amount of the coupon payment that was made before the grace period.

Amortizing Bonds -

For the calculation of total returns on performing bonds with sinking funds, the factor of the bond on day t as well as the factor of the bond on the last business day of the previous month is considered as follows:

$$TR_{0,t} = \left(\frac{\mathrm{Pc_t} \times F_0 + \mathrm{AI_t} \times F_t - (\mathrm{Pc_0} + \mathrm{AI_0}) \times F_0 + \mathrm{IC_{0,t}}}{(\mathrm{Pc_0} + \mathrm{AI_0}) \times F_0}\right)$$

Where:
F_0 is the factor on the last business day of the previous month; Ft is the factor on the current business day.

Price Return

The price return from the last business date of the previous month to the current date t is defined as:

$$PR_{0,t} = \left(\frac{\mathrm{Pc_t} - \mathrm{Pc_0}}{\mathrm{Pd_0}}\right)$$

The price return from the last business date 0 to the date before t (t-1) is defined as:

$$PR_{0,t-1} = \left(\frac{\mathrm{Pc_{t-1}} - \mathrm{Pc_0}}{\mathrm{Pd_0}}\right)$$

Interest Return

The interest return calculated on most performing bonds, from the last business date of the previous month to date t, is defined as:

$$IR_{0,t} = TR_{0,t} - PR_{0,t}$$

The interest return from the last business date 0 to the date before t (t-1) is defined as:

$$IR_{0,t-1} = TR_{0,t-1} - PR_{0,t-1}$$

Daily Returns (in percent)

Total Return

$$TR_{t-1,t} = \left(\frac{1 + TR_{0,t}}{1 + TR_{0,t-1}} - 1\right) * 100$$

Price Return

$$PR_{t-1,t} = \left(\frac{1 + PR_{0,t}}{1 + PR_{0,t-1}} - 1\right) * 100$$

Interest Return

$$IR_{t-1,t} = \left(\frac{1 + IR_{0,t}}{1 + IR_{0,t-1}} - 1\right) * 100$$

Excess Return

An excess benchmark return is calculated for each fixed bond (ExBench Return).

Return performance is measured against the benchmarked treasury bond for each corporate security. These returns are also available by the highest-level aggregate level and the individual industry, maturity, and ratings sectors. These measures are called excess return over benchmark and are market cap weighted.

Excess return period measures include 1Day (1D), Month to Date (MTD) Quarter to Date (QTD), and Year to Date (YTD) Excess Returns over benchmarks.

Daily price and total returns are calculated for excess returns over benchmarks. The formulas are as follows:

ExBench Price 1D return = fixed bond price 1D return - benchmark price 1D return
ExBench Total 1D return = fixed bond total 1D return - benchmark total 1D return

Daily returns are aggregated to determine MTD, QTD, and YTD returns

Period Returns

For one-day returns, horizontal returns are derived using the following formula. Assuming T_s and T_e are the start date and end date of the period, the 1Day return for date T_i is R_{Ti}, where $T_s <= T_i <= T_e$.

The period return **R** can be represented as:

$$\mathbf{R} = \prod_{T_i=T_s}^{T_i=T_e} (1 + \frac{R_{T_i}}{100}) - 1$$

Duration Adjusted Excess Returns

A duration adjustment is applied to the benchmark government bond in order to allow for a more accurate comparison of excess returns.

Excess Return = Total Return – ((Bench Total Return/Bench Duration) x Mod Duration)

FX Returns

Unhedged FX Returns

FX Unhedged Return is the return of a bond expressed in another currency:

$$(1 + MTDReturn) x \left(\frac{FXRate_t}{FXRate_0}\right) - 1$$

Hedged FX Returns

FX Hedged Return is the return of a bond expressed in another currency plus the gain or loss on a hedge of that currency entered into on Day 0 using an FX Forward Contract:

$$\left[(1 + MTDReturn)x\left(\frac{FXRate_t}{FXRate_0}\right) - 1\right] + \left[\frac{FXRate_0}{FFRate_0} - \frac{FXRate_0}{FXRate_t + \left(\frac{D-d}{D}x\,(FFRate_t - FXRate_t)\right)}\right]$$

Benchmark Bond Determination

Benchmark bonds are determined for nearly all bond indices with the primary exception being government bond indices denominated in G10 currencies.

The determination of the benchmark bond is based on the trading conventions in the relevant bond market. These conventions are not set in stone and may change over time.

As of the publication of this document, the following conventions apply for determining the benchmark bond:

Emerging Market Corporate Bonds –

Emerging Market Corporate Bond indices are all USD denominated. On 1 January, the benchmark level to use for each bond is determined.

If the bond has a term of less than 4 years on 1 January, then it will be benchmarked to the on-the-run 2yr US Treasury bond for the remainder of the year. If the bond has a term of more than 4 years, but less than 7 years on 1 January, then it will be benchmarked to the on-the-run 5-year US Treasury bond for the remainder of the year. If the bond has a term on 1 January of more than 7 years, but less than 14 years, then it will be benchmarked to the on-the-run 10-year US Treasury bond for the remainder of the year. If the bond has a term on 1 January of more than 14 years, but less than 25 years, then it will be benchmarked to the on-the-run 20-year US Treasury bond for the remainder of the year. If the bond has a term on 1 January of more than 25 years, then it will be benchmarked to the on-the-run 30-year US Treasury bond for the remainder of the year.

It is important to note that when new on-the-run bonds are issued, the respective Emerging Market Corporate bonds will be benchmarked to the new on-the-run bond on the dated date of the new benchmark US treasury bond.

European Corporate Bonds -

European Corporate bond indices are either denominated in Euro or in Sterling.

For Euro denominated bonds, the benchmark is determined on the last business date of the previous month by selecting the fixed-coupon German government bond that has begun accruing interest and

has the closest remaining term in absolute number of days. The benchmark bond remains fixed for the month.

For Sterling denominated bonds, the benchmark is determined on the last business date of the previous month by selecting the fixed-coupon UK government bond that has begun accruing interest and has the closest remaining term in absolute number of days to the respective corporate bond. The benchmark bond remains fixed for the month.

US dollar denominated corporate and Emerging Market sovereign bonds

US dollar denominated corporate bond indices and Emerging Market sovereign bonds all follow the same market conventions for determination of benchmark bonds. The benchmark level to use for each bond is determined each day.

If the bond has a current term of less than 2 years on 1 January, then it will be benchmarked to the on-the-run 2yr US Treasury bond. If the bond has a current term of more than 2 years, but less than 4 years, then it will be benchmarked to the on-the-run 3yr US Treasury bond. If the bond has a current term of more than 4 years, but less than 6 years, then it will be benchmarked to the on-the-run 5-year US Treasury bond. If the bond has a current term on 1 January of more than 6 years, but less than 14 years, then it will be benchmarked to the on-the-run 10-year US Treasury bond. If the bond has a current term on 1 January of more than 14 years, but less than 25 years, then it will be benchmarked to the on-the-run 20-year US Treasury bond. If the bond has a current term of more than 25 years, then it will be benchmarked to the on-the-run 30-year US Treasury bond.

It is important to note that when new on-the-run bonds are issued, the respective USD denominated corporate bonds will be benchmarked to the new on-the-run bond on the dated date of the new benchmark US treasury bond.

US Agency Bonds

US Agency bonds indices follow a similar convention to US corporates for determination of benchmark bond, with a few modifications. The benchmark level to use for each bond is determined each day.

If the bond has a current term of less than 2.5 years on 1 January, then it will be benchmarked to the on-the-run 2yr US Treasury bond. If the bond has a current term of more than 2.5 years, but less than 4 years, then it will be benchmarked to the on-the-run 3yr US Treasury bond. If the bond has a current term of more than 4 years, but less than 6 years, then it will be benchmarked to the on-the-run 5-year US Treasury bond. If the bond has a current term on 1 January of more than 6 years, but less than 8 years, then it will be benchmarked to the on-the-run 7-year US Treasury bond. If the bond has a current term on 1 January of more than 8 years, but less than 14 years, then it will be benchmarked to the on-the-run 10-year US Treasury bond. If the bond has a current term on 1 January of more than 14 years, but less than 25 years, then it will be benchmarked to the on-the-run 20-year US Treasury bond. If the bond has a current term of more than 25 years, then it will be benchmarked to the on-the-run 30-year US Treasury bond.

It is important to note that when new on-the-run bonds are issued, the respective USD denominated corporate bonds will be benchmarked to the new on-the-run bond on the dated date of the new benchmark US treasury bond.

Breakeven Bonds

For inflation protected government securities, the breakeven bond is the security used to measure the spread differential between the inflation security and its nominal equivalent.

The determination of the benchmark bond is based on the trading conventions in the relevant bond market. These conventions are not set in stone and may change over time.

As of the writing of this publication, the logic for determination of breakeven bond is consistent across all regions.
On the first date that the inflation bond is eligible for inclusion in the index (which is typically the first index rebalance date after the bond was issued), the breakeven bond is selected by choosing the closest maturity fixed-coupon treasury bond, in terms of absolute number of days, in the respective currency.
Callable government bonds are excluded from consideration as the breakeven bond.
For euro denominated bonds, only German government bonds are eligible for selection as the breakeven bond.

Yield Measures

The yield of a bond typically refers to the expected return of the bond when held to its maturity or call date. The methodology for calculating these yields is outlined below.

Please note that all forward-looking measures including yield are not calculated for non-performing bonds.

Yield

For indices that explicitly exclude bonds with optionality, one yield measure is calculated. This yield is equivalent to a yield to maturity.

For indices that do contain bonds with optionality, the yield is equivalent to the yield-to-worst. Some corporate bond indices, including the LUCI, LEI and LSI, for instance, explicitly exclude bonds with optionality but have an exception to permit the inclusion of bonds that are callable at par within 12 months of the final maturity date. The rationale for the exception is that the call feature is considered to be immaterial to the valuation of the bond. The call feature on the bonds in these indices and the yield measure shows a yield-to-maturity.

Yield-to-next

The yield-to-next (YTN) on bonds with optionality calculates the yield of the bond to the next option (call or put) date.

For bonds that do not have a call schedule or a put schedule, the yield-to-next calculation will be identical to the yield-to- maturity calculation.

For bonds that have less than 1 month remaining until the next call date, and no call has been announced, the next call is ignored for the purposes of yield-to-next calculations and the subsequent call date and call price are used.

Yield-to-maturity

The yield-to-maturity is calculated for non-perpetual bonds by using the final maturity date of the bond.

Annual Yield

The annual yield is a yield-to-maturity calculation assuming annual coupon payments.

Worst Date

The worst date is calculated by selecting the date that will result in the lowest yield, when calculating a yield for all call dates and to maturity, on each index calculation date.[1] The worst date will be set to the call effective date for intra-month calls.

Street Yield (yield-to-worst)

The street yield on any given date is determined by calculating a yield to the Worst Date, described above. In almost all circumstances, the street yield will be equal to the yield-to-worst date.

One notable difference between street yield and yield-to-worst occurs when a bond is trading in-the-money and it appears that a call will not be exercised by a company for tax, balance sheet or other reasons. In this instance, the next coupon period will be ignored. Street yield may differ from yield-to-worst if the market convention for a given market is to calculate to call date. In many corporate markets in non-Japan Asia, for example, there has been an implicit expectation that calls will be exercised.

The following rules apply for all yield calculations:

- All yield calculations follow local market conventions in terms of the treatment of accrued interest, calendars, ex- dividend periods, settlement conventions and cash flow assumptions.
- For fixed-to-float bonds and FLIRBs, a forward starting swap curve is used to approximate the cash flow schedule in the floating period. For fixed-to-float perpetuals, an assumed maturity is calculated. This assumed maturity is typically about 85 years from the present day.
- For fixed-to-variable bonds, which have a coupon payment frequency which differs from the coupon reset frequency, forward starting swap curves are also used to calculate future cash flow payments. For fixed-to-variable perpetuals, maturity dates are determined in an identical manner to fixed-to-float perpetuals.
    - For fixed-to-fixed perpetuals, yield-to-maturity calculations are not calculated beyond the first call date.
    - For bonds with sinking funds, the yield is calculated to average life.
- For hybrid bonds with the option to defer coupon payments, it is always assumed coupon payments will be made unless an announcement is made otherwise.
- Make whole call features are not considered in yield calculations unless a call has been announced. Similarly, event driven calls such as tax changes calls and other calls that are triggered on specific events are ignored for the purpose of this calculation until a call announcement is made.
- For bonds that have a trigger to convert to equity based on an event, the contingent convert feature is ignored for the purposes of yield calculations.
- If a call is announced, all yield calculations will be made to the exercise date. In practice, bonds typically trade at a small discount prior to their call date, which would typically result in extremely high yield calculations as the bond approaches exercise date. To minimize these superficial spikes in yield prior to call date, yields are calculated using the call price (rather than the market price)

upon its call announcement, which is about 30 calendar days prior to the call date.

- No yield measures are calculated for distressed and non-performing bonds.
- Limits may be applied to yield calculations on specific indices on an index-by-index basis. These caps are typically only applicable in extreme circumstances when prices drop precipitously over a very short period over time before the bond is marked as non-performing or dropped from the index. For example, a yield limit of 1000% may be applied to certain indices.

Please note that the above rules apply to current index calculations, and may not be applicable for all periods and for all indices, historically. An effort has been made over time to conform to market conventions. For example, prior to the credit crisis in 2008, many bank bonds traded to call date with the assumption that there was limited extension risk beyond the first call date. Even after the debt crisis, some markets, including the corporate bond market in non-Japan Asia, continued to assume bonds would always be called.

Duration Measures

Macaulay duration

Macaulay duration is defined as:

$$MacDur = \frac{1}{P_d} x \sum_{1}^{n} t_i \, CF_i \left(1 + {}^{y_d}/_{freq}\right)^{-t_i}$$

Where Pd is equal to the present value of the expected cash flows, yield (yd) and coupon frequencies (freq), equation with expected cash flows (CFi).

Macaulay duration divided by one plus the conventional yield is often referred to as modified duration. Modified duration can be used like continuously compounded duration to calculate the percentage change in bond price for small changes in yield.

Modified Duration

Modified duration is defined as:

$$ModDur = \frac{MacDur}{1 + {}^{y_d}/_{freq}} = \left(-\frac{1}{P_d}\right)\frac{\partial P_d}{\partial y_d}$$

Mathematically, modified duration represents the slope of the tangent line, at a particular yield level, to the price-yield curve of the bond. At different yield levels, the slope of this tangent line will vary. Modified duration can then be used to measure the price sensitivity of a bond since modified duration always assumes (1) instantaneous yield changes; (2) changes in yield which are small; and (3) parallel shifts in the yield curve. When moderate or large changes in interest rates are considered, a measure known as

convexity is sometimes important. Parallel shifts are a serious limitation. In practice, short- term rates are usually more volatile than, and not closely correlated with, long-term rates. From the above ModDur formula, flows the following statement:

Approximate dollar price change

$$\partial P_d = -(ModDur \times P_d)\partial y_d$$

DV01

Dollar duration is defined as:

$DolDur = (ModDur \times P_d)$

For example, AIG 5.1% 01/17/2007 on May 2, 2002 has ModDur = 4.065, dirty

price = 101.279. The DolDur = 4.065 * $101.279 = $411.699

Approximate dollar price change = - 411.699 * 0.0001= - 0.04117

The sign of dollar price change is not important as the price/yield relationship is well known. The magnitude of the dollar price change is the crucial variable. As mentioned in the duration assumptions, the estimation will be relevant only if the yield change is small.

For bonds with optionality, durations are calculated to worst date. If a call has been announced, durations are calculated to the exercise date.

Convexity

Convexity is a measure of the speed a bond's duration changes as its yield changes. Therefore, the duration of a bond with high convexity will increase as yields fall and decrease as yields rise. This means that for parallel yield shifts of equal size, the price gain on a downward move in yield is larger than the price loss on an upward move. Mathematically, it is the second derivative of price with respect to yield.

Spread over Swap Curve Measures

Asset Swap Spread

Depending on the yield of the bond and the Swap Curve the bond yields a certain premium in excess of the Relevant Rate, commonly referred to as the asset swap spread.

Spread to Swap Calculation

The swap-spread calculation is based on the following formula:

$$SwapSpread = \frac{PriceFromZero - MktPrice}{\sum dfc_i DCF_i}$$

Where the “PriceFromZero” is the price of the bond calculated using the swap-zero curve derived from the Swap Curve, “MktPrice” is the market price of the bond. The prices can be either both clean or dirty prices. DCF_i is the day count fraction for the coupon payment, as computed from the appropriate floating leg conventions (i.e., Act360 on the USD market).
dfc_i is the discount factor.

It is important to note that asset swap spread measures are computed to the same date as yield measures. For example, if yield to worst date is calculated for a bond, the asset swap spread is calculated to the worst date, as well. It is also important to note that the asset swap spread is not calculated on floating-rate bonds.

I-Spread

I-spread (to truncation date) is calculated by first generating a term rate (for that truncation date) by interpolating along the applicable Swap Curve. The I-spread is simply the spread between the bond's yield and this term rate based on the applicable Swap Curve. The truncation date for which I-spread is calculated can be the maturity of the bond, the next call date for the bond, or the date of the worst yield of the bond.

Z-Spread

The Z-Spread is calculated by generating an implied zero-coupon swap curve derived from the applicable Swap Curve, and then discounting all of the cash flows from a bond with these rates. If the bond trades at a price below the price calculated by discounting the cash flows, the zero-coupon swap curve is "bumped" higher (there is a parallel shift in this curve), and the bond price is calculated again. This trial-and-error process is continued until the calculated price equals the market price. The amount that the swap curve was "bumped" is the Z spread. Note that for sinking fund bonds, the Z-Spread is computed to maturity with amortizing legs.

Z-spread-to-worst, Z-spread-to-next, and Z-spread-to-maturity are calculated by discounting all of the cash flow from a bond with the rates from the implied zero-coupon swap curve until the worst date, next coupon date and maturity date, respectively.

G-Spread

The G-Spread measure is calculated for a given bond by first generating a yield curve of government bonds in the same currency as the bond, using the linear interpolation method, and then calculating the difference between the yield on the bond and the interpolated point along the generated yield curve on the worst date of the bond.

The only difference in methodology for calculating spread over YC measures for bonds in different indices is a slightly different approach to the construction of yield curves in each currency. All curves are constructed using linear interpolation between points, the difference in approach lies in the selection of bonds to be included in the yield curve. The methodology for determining which bonds are used for constructing yield curves is intended to match local market conventions and is subject to change due to modifications of the local government bond markets including, but not limited to, the debt issuance schedule and other changes in the local government bond markets.

As of the time of this writing, the yield curves are calculated as follows for each of the primary index base currencies:

- USD: The yield curve is generated by taking the on-the-run 3-month, 6-month, 2-year, 3-year, 5-year, 7-year, 10- year, 20-year and 30-year US Treasury bonds.
- JPY: The yield curve is generated by taking the on-the-run 2-year, 5-year, 7-year, 10-year, 20-year, 30-year and 40-year Japan Government bonds.
- EUR: The yield curve is generated by taking all fixed-coupon German government bonds with a balance of 1 billion EUR or greater that have not matured.
- GBP: The yield curve is generated by taking all fixed-coupon UK government bonds with a balance of 1 billion GBP or greater that have not matured.
- NOK: The yield curve is generated by taking all fixed-coupon Norwegian government bonds with a balance of 1 billion NOK or greater that have not matured.
- SEK: The yield curve is generated by taking all fixed-coupon Swedish government bonds with a balance of 1 billion SEK or greater that have not matured.
- DAK: The yield curve is generated by taking all fixed-coupon Danish government bonds with a balance of 1 billion DAK or greater that have not matured.
- CAD: The yield curve is generated by taking all fixed-coupon Canadian government bonds with a balance of 1 billion CAD or greater that have not matured.
- AUD: The yield curve is generated by taking all fixed-coupon Australian government bonds with a balance of 1 billion AUD or greater that have not matured.
- NZD: The yield curve is generated by taking all fixed-coupon New Zealand government bonds with a balance of 1 billion NZD or greater that have not matured.

OAS Spread

The OAS spread measures the spread between the rate of the bond and the risk-free rate of return. In considering both changing interest rates and prepayment risk, the OAS spread allows for comparison between a bond's cash flows and reference rates while valuing embedded options against market volatility.

Index Statistics

All index level (or portfolio level) statistics aggregate the bond level measures by constituent bond market weights. For return related statistics, bonds weights are fixed on the last business date of the previous month. For all other statistics, a bond's weight is defined as daily market weight with monthly fixed par amounts.

wi: market weight for the ith-bond in the index
For bond i, the market weight w_i= ($price_i$+ $AccruedInterest_i$) x par_amount_i
n: total number of bonds in the index
W: total weight for an index

Index's total weight W is calculated as

$$W = \sum_{i=1}^{n} w_i$$

Each bond i has weight of $w_i = w_i/\mathrm{W}$ for a given index.

For example, given a bond's modified duration, m_i, an index's modified duration, which can be represented as

$$D = \sum_{i=1}^{n} w_i * m_i$$

Note: Select measures are fixed for the month to simplify data interpretation. For example, a rating change will not take effect until the next month.

Amendment of Index Rules

The Index Sponsor, with the approval of the Index Committee, may supplement, amend (in whole or in part), revise, rebalance or withdraw index rules at any time if one of the following occurs:

(i) There is any event or circumstance that in the determination of Index Sponsor makes it impossible or impracticable to calculate the Index pursuant to the Index Rules;
(ii) a change to the Index Rules is required to address an error, ambiguity or omission; or
(iii) the Index Sponsor determines that an Extraordinary Event has occurred.

A supplement, amendment, revision, rebalancing or withdrawal may lead to a change in the way the Index is calculated or constructed. Such changes may include, without limitation, substitution of a bond or index rebalancing on a date other than a Rebalance Date. "Extraordinary Event" means any of the following events or circumstances:

a) change in either (i) the liquidity of any bond in the index, or (ii) the trading volume;
b) change in any applicable law or regulation, or any decision or promulgation of any change in the interpretation by any court, tribunal or regulatory authority of any applicable law or regulation;
c) any event or circumstance that means the value of a bond in the index is, in the determination of the Index Sponsor, unreliable;
d) any event that, in the determination of the Index Sponsor, has a material adverse effect on the ability of the Index Sponsor (or any of its affiliates) to establish, maintain, value, rebalance or unwind a hedge position in relation to an investment product linked to the Index; or
e) any other event which, in the sole determination of the Index Sponsor, either (i) has a material impact on the ability of the Index Calculation Agent or Index Sponsor to perform its duties, or (ii) in the sole determination of the Index Calculation Agent, serves to frustrate the purpose or aims of the Index Methodology or (iii) constitutes commercially reasonable grounds for the termination of the Index.

which, in the case of each of (a) – (e) above, has or will have a material effect on the Index as determined by the Index Sponsor, acting in good faith and a commercially reasonable manner.

Following any withdrawal of the Index as described above, the Index Sponsor may replace the Index with a successor index and/or replace the Index Strategy with a similar successor strategy or an entirely new strategy at any time, as it deems appropriate through consultation with the Index Committee.

Handling of Index Errors

VettaFi endeavors to provide the most accurate historical returns and statistics as possible. When errors are noted on the current Index Level, VettaFi will make a best effort to address and correct the levels within one Index Calculation Day of its publication. When historical errors are detected, the necessary change will be classified as either immaterial or material. How that classification is determined and the procedures that will be followed in the case of a restatement are detailed below.

Since all bond indices are calculated using month-to-date returns, errors in return calculations that occur only intra-month are self-correcting over time – i.e., the impact on compounded total, excess and price return levels are isolated to the affected dates and do not impact current index levels or index levels going forward. In this case, in which the error in returns calculations is limited in scope to intra-month dates, the change will generally be considered immaterial, and the Index Sponsor, in consultation with the Index Calculation Agent, will determine whether a restatement of only the impacted dates is warranted (intra-month restatements may be deemed necessary, for example, in cases in which errors in bond prices were found or incorrect reference data was used).

Errors that impact forward-looking measures (including yields, durations, spreads and all forward-looking measures outlined in this document) or bond index statistics but not index levels or returns calculations will also generally be considered immaterial. In the event that a sub-component, or breakdown, of the broader index is determined to be inaccurate due to a misclassification of a bond, the usage of the sub-indices will be considered by the Index Committee in their determination of materiality.

If an error impacts returns at month-end, and therefore impacts compounded total, price or excess returns, then the Index Committee will generally consider this to be a material change and will be brought to the Bond Index Approval Committee to determine if a re-statement is required. When the Committee concludes that a restatement is required and the change is material, then a restatement announcement will be disseminated via a publication prior to the restatement. Restatement announcements, once they are published, are final and are not open to commentary or discussion. It is the responsibility of all interested parties to subscribe to VettaFi's publications. Non-material index errors will not be brought to the Index Committee. Notification of non-material restatements may not be broadly disseminated.

Suspension of the Index

Index Disruption

Where, in the determination of the Index Calculation Agent, an Index Disruption Event has occurred or is existing and subsisting in respect to any Index Calculation Day (a "Disrupted Day"), the Index Calculation Agent may in respect of such Disrupted Day (i) suspend the calculation and publication of the Index Value and/or (ii) determine the Index Value on the basis of estimated or adjusted data and publish an estimated level of the Index Value and/or, the Index Calculation Agent may, following such Disrupted Day, take any action including but not limited to designation of alternative price sources or reconstitution of the Index.

Index Disruption Events

In the determination of the Index Sponsor, the following events are each an "Index Disruption Event":

a) a closure of the money markets relating to the currency in which the index is denominated or any other relevant currency as determined by the Index Calculation Agent other than for ordinary public holidays, or a restriction or suspension in trading in these markets that would materially impact any determination required in the construction or calculation of the Index and the Index Value;

b) the failure, suspension or postponement of any calculation within the Index Strategy in respect of any Index Calculation Day, any event resulting in a breakdown in any means of communication or a procedure normally used to enable the determination of the Index Value, any other event, in the determination of the Index Calculation Agent preventing the prompt or accurate determination of the Index Value, or the Index Calculation Agent concludes that as a consequence of any such event that the last reported Index Value should not be relied upon; and

c) the occurrence, in respect of any security, option, futures contract, derivative or foreign exchange contract or other instrument referenced in the calculation of the Index, of

(i) any suspension of or limitation imposed on trading by any relevant exchange or other trading facility, (ii) the closure of any relevant exchange or other trading facility before its scheduled closing time, or (iii) any other event that materially disrupts or impairs, as determined by the Index Sponsor acting in good faith and a commercially reasonable manner, the ability of market participants in general to effect transactions in, or obtain market values for, a bond in the index.

Categorization and Classification

The Index Calculation Agent makes every effort to use independent and reputable third-party data sources for the determination of categorizations for the inclusion of bonds in the various sub-indices wherever possible.

When a reliable external data source is available, for example for ratings, amount outstanding, maturity, term and subordination sub-indices, the Index Calculation Agent will use the external data sources as the primary source for determination of the classification of a bond. However, the Index Calculation Agent may choose to supplement the data with internal data sources to improve the quality of the data or to extend the granularity of the data.

In certain instances, the Index Calculation Agent maintains the right to override values provided by third-party data vendors if they are deemed to be inaccurate. For example, the Index Calculation Agent may determine that the country classification of a bond issuer provided by vendors is inconsistent with the primary country of risk for that particular issue.

Where a reliable external data source is not available, the Index Calculation Agent will determine the classification in its sole discretion, using the expert judgment of its strategists and the most accurate information available to them. An example of this would be the sector sub-indices or the categorization of bonds as quasi-sovereign rather than corporate or sovereign.

Terms and Conditions of Bond Index Constituents

The Index Calculation Agent uses third-party data sources for terms and conditions which are necessary inputs for the calculations of Index levels as well as related analytics including yields and spreads.

In the rare event that vendor data are deemed to be inaccurate or not representative of current market conditions, the Index Calculation Agent may use the expert judgment and knowledge of the markets of its strategists to override data that are provided by external vendors for individual securities for specific time periods. This includes, but is not limited to, assumptions on whether calls will be exercised, assumptions on whether coupon payments will be deferred, assumptions on cash flow schedules for hybrid and pay-in-kind securities, and assumptions on the likelihood of a bond coupon payment in the event that an issuer is in distress or about to default.

Modifications to the terms and conditions of bond index constituents can have a material impact on Index levels.

Methodology Updates and Changes

Date	Version	Previous	New
Jun 2025	1.0.0	Policies previously published by Credit Suisse in the April 2022 Credit Suisse Bond Index Methodology and Guidelines.	Initial Version of rebranded policies with VettaFi as the new owner and administrator.

Disclaimer