

Methodology

Small 30Yr US Treasury Yield Index

Description

The Small 30 Year US Treasury Yield Index is based on the U.S. 30-year yield to maturity of the on-the-run U.S. 30 Year Treasury Bond. The Index is expressed as the computed yield multiplied by 1,000.

As an example, a 30-year U.S. Treasury yield to maturity of 1.676% is equivalent to a Small 30 Year US Treasury Yield index of 16.76. This is $1.676\% = 0.01676 \times 1,000 = 16.76$.

Composition of the Index

The Index takes the auctioned 30-year Treasury Bond (which is considered “on-the-run”), and from this Bond’s coupon, time until maturity and currently traded midpoint, calculates a yield-until-maturity using a transparent closed-form solution.

Calculation of the Index is done in three steps: (1) **Selection**, (2) **Calculation**, and (3) **Indexing**.

- 1) **Selection.** For clarity, the “on-the-run” U.S. Treasury Bond is the most recently issued 30-year U.S. Treasury Bond; these are currently auctioned February, May, August, and November. Auctions are historically announced publicly the week before the auction detailing the issue date, maturity date, and coupon rate so participants can prepare their bids in advance.

Because of this auction format, there are four times per year that the 30-year on-the-run issue will roll to a new security with a new CUSIP number. When the 30-year on-the-run issue rolls to a new CUSIP, the bond has exactly 30 years to maturity. The day before the roll, the on-the-run has roughly 29.75 years to maturity (as two months, 29 days have passed since the last auction) and, the next day, the maturity will jump back to 30 years. CUSIP reissuances are not included in the calculation.

Bond specifics can be found on the U.S. Department of the Treasury Bureau of the Fiscal Service website: <https://www.treasurydirect.gov/>.

- 2) **Calculation.** The yield to maturity (YTM) is calculated using the following:

$$YTM = \frac{\text{Coupon} + \frac{\text{Face Value} - \text{Current Bond Price}}{t}}{\frac{\text{Face Value} + \text{Current Bond Price}}{2}}$$

Where:

Coupon = Coupon payment out of \$100.

Face Value = Face value of the bond. E.g. This is \$100 for the index.

Current Bond Price = Mid-price of the bond’s bid and offer

t = Years to maturity from the current day of the quote, to the maturity of the bond. Time is a precision of 4 decimal points, e.g., 0.0001.

Example

On Dec 21, 2020, the current on-the-run 30-Year U.S. Treasury Bond was CUSIP 912810SS8.

Bond's Full Maturity = 30 years, November 15, 2050

Coupon = 1.625%

On December 21, 2020 at 9:31 AM CT, the mid-price between the bid and ask is 98.789

Therefore:

C = 1.625, since 1.625% of 100 face value

F = 100

P = 98.789

t = 9.9918 years; the fraction of days left until maturity

$$YTM = \frac{C + \frac{F - P}{t}}{\frac{F + P}{2}} = \frac{1.625 + \frac{100 - 98.789}{29.9205}}{\frac{100 + 98.789}{2}} = 0.01676$$

The example calculated yield is therefore, 0.01676 = 1.676%.

- 3) **Indexing.** The index is current on-the-run U.S. Treasury 30-year Bond yield to maturity multiplied by 1,000.

Index price = 1000 × YTM as a decimal

Example

The on-the-run 30-Year Treasury has a calculated Yield of 0.01676=1.676%, the Index price would be 16.76.

Current 30-Year CUSIP

The auctioned, on-the-run, 30-Year U.S. Treasury CUSIP can be found on the U.S. Department of the Treasury Bureau of the Fiscal Service website <https://www.treasurydirect.gov/instit/instit.htm>. Reissuances are not included in the calculation.

Roll of the “On-the-Run” U.S. Treasury

The existing on-the-run U.S. Treasury Bond will be used for index publishing until 6:00 PM CT on the established quarterly auction date – even when the auction results are reported at noon of that day. After the end of the day of the auction, the new on-the-run CUSIP will be used for the published calculation until the next auction/roll.

In the case a quarterly auction does not occur on the expected date, the existing 30-Year U.S. Treasury is kept until a new 30-year U.S. Treasury Bond is auctioned.

Definitions

CUSIP. The identifier.

Maturity. Currently, 30-year U.S. Treasury bonds are auctioned quarterly.

Price. The price is defined as the mid-point of the bond's bid and offer.

Coupon. The coupon rate is taken from the U.S. Treasury Bond. For example, an annual 1.50% coupon rate on a \$100 face value is a \$1.50 annual coupon payment.