the SMALL exchange

Methodology

Small 2 Year US Treasury Yield Index

Description

The Small 2 Year US Treasury Yield Index ("Index") is based on the U.S. 2-year Treasury yield to maturity of the on-the-run U.S. 2 Year Treasury Note. The Index is expressed as the computed yield multiplied by 1,000.

As an example, a 2-year U.S. Treasury yield to maturity of 0.167% is equivalent to a Small 2 Year US Treasury Yield Index of 1.67. This is 0.167% = 0.0167 x 1,000 = 1.67.

Composition of the Index

The Index takes the auctioned 2-year U.S. Treasury Note (which is considered "on-the-run"), and from this Note'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" 2-year U.S. Treasury Note is the most recently issued 2-year U.S. Treasury Note; these are currently auctioned monthly. 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 twelve times per year that the 2-year on-the-run issue will roll to a new security with a new CUSIP number. When the 2-year on-the-run issue rolls to a new CUSIP, the note has exactly 2 years to maturity. The day before the roll, the on-the-run has roughly 1.92 years to maturity (29 days have passed since the last auction) and, the next day, the maturity will jump back to 2 years.

   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:

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

Where:

Coupon = Coupon payment out of $100.
Face Value = Face value of the note. E.g. This is $100 for the index.
Current Note Price = Mid-price of the note's bid and offer
t = Years to maturity from the current day of the quote, to the maturity of the note. Time is a precision of 4 decimal points, e.g., 0.0001.

Example
On Dec 21, 2020, the current on-the-run 2-year US Treasury Note was CUSIP 91282CAX9.
Note's Full Maturity = 2 years, November 30, 2022
Coupon = 0.125%
On December 21, 2020 at 9:31 AM CT, the mid-price between the bid and ask is 100.01

Therefore:
C = 0.125, since 0.125% of 100 face value
F = 100
P = 100.01
t = 1.9425 years; the fraction of days left until maturity

$$\text{YTM} = \frac{\text{C} + \frac{\text{F} - \text{P}}{\text{t}}}{\frac{\text{F} + \text{P}}{2}} = \frac{0.125 + \frac{100 - 100.01}{1.9425}}{\frac{100 + 100.01}{2}} = 0.00120$$

The example calculated yield is therefore, $0.00120 = 0.120\%$.

3) **Indexing.** The index is current on-the-run 2-year U.S. Treasury Note yield to maturity multiplied by 1,000.

Index price = 1000 × YTM as a decimal

Example
The on-the-run 2-year U.S. Treasury Note has a calculated Yield of 0.00120=0.120%, the Index price would be 1.20.

Current 2-Year CUSIP

The auctioned, on-the-run, 2-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 2-year U.S. Treasury Note will be used for index publishing until 6:00 PM CT on the established 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 an auction does not occur on the expected date, the existing 2-year U.S. Treasury Note is kept until a new 2-year U.S. Treasury Note is auctioned.

Definitions

CUSIP. The identifier.
Maturity. Currently, 2-year U.S. Treasury Notes are auctioned monthly.
Price. The price is defined as the mid-point of the note's bid and offer.
Coupon. The coupon rate is taken from the U.S. Treasury Note. For example, an annual 1.50% coupon rate on a $100 face value is a $1.50 annual coupon payment.