TRADEWEB ICE U.S. TREASURY CLOSING PRICES

CALCULATION METHODOLOGY

July 2022

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Overview

The "Tradeweb ICE U.S. Treasury Closing Prices" have been designed to represent the market mid-prices for U.S. Treasury Securities at specified times on days when the U.S. Treasury Securities market is open for trading in the United States (the "Underlying Interest").

Each Tradeweb ICE U.S. Treasury Closing Price for a U.S. Treasury Security is calculated in accordance with this Methodology document based upon bid and offer quotes for the relevant U.S. Treasury Security from liquidity providers on Tradeweb's Platforms (as defined below), subject to certain special cases, as described in this Methodology.

The "U.S. Treasury Securities" in respect of which the Tradeweb ICE U.S. Treasury Closing Prices are determined and published are: (i) securities issued by the U.S. Treasury; and (ii) separate trading of registered interest and principal securities (hereafter called "STRIPS") created from securities issued by the U.S. Treasury. The Introduction and Key Terms section contains details of the types of the U.S. Treasury Securities in respect of which the Tradeweb ICE U.S. Treasury Closing Prices are calculated.

The bid and offer quotes that are used to calculate and determine the Tradeweb ICE U.S. Treasury Closing Prices ("Input Data") are provided by liquidity providers on (i) Tradeweb's platform that offers trading of certain U.S. Treasury products included within the Tradeweb ICE U.S. Treasury Closing Prices benchmark via a central limit order-book ("CLOB") and a direct streaming protocol (the "Dealerweb Treasury Platform") and (ii) Tradeweb's platform that supports dealer-to-client (D2C) trading of all U.S. Treasury products included within the Tradeweb ICE U.S. Treasury Closing Prices benchmark (the "Institutional Platform and, together with the Dealerweb Treasury Platform, "Tradeweb's Platforms", as further described in the Introduction and Key Terms section), which, in each case, satisfy the detailed specifications and eligibility criteria regarding the different types and sources of, and the priority of use of the different types of, the Input Data (the "Input Data Specification", as set out in the Introduction and Key Terms section).

The bid and offer quotes that are used to calculate and determine the Tradeweb ICE U.S. Treasury Closing Prices ("Input Data") are provided by liquidity providers on two separate platforms:

(i) Tradeweb's platform that offers trading of on-the-run U.S. Treasury Notes and Bonds via a central limit order-book ("CLOB") and a direct streaming protocol (the "Dealerweb Treasury Platform")

(ii) Tradeweb's platform that supports dealer-to-client (D2C) trading of all U.S. Treasury products included within the Tradeweb ICE U.S. Treasury Closing Prices benchmark (the "Institutional Platform")

The Dealerweb Treasury Platform and the Institutional Platform, ("Tradeweb's Platforms", as further described in the Introduction and Key Terms section), in each case, satisfy the detailed specifications and eligibility criteria regarding the different types and sources of, and the priority of use of the different types of, the Input Data, as set out in the Introduction and Key Terms section).

Quotes sourced from the Dealerweb Treasury Platform are firm and executable quotes provided by liquidity providers to liquidity takers. Quotes sourced from the Institutional Platform are attributable to specific liquidity providers and are executable by the receiving liquidity takers, subject to the liquidity providers accepting the trade.

The times in respect of which the Tradeweb ICE U.S. Treasury Closing Prices are calculated ("Specified Times") are specified on the IBA website.

This document is the "Methodology" that sets out the methodology used to calculate and determine the published values for each Tradeweb ICE U.S. Treasury Closing Price, and is reviewed at least annually by the Oversight Committee for the Tradeweb ICE U.S. Treasury Closing Prices (the "Oversight Committee"), as documented in the Oversight Committee's Terms of Reference.

The Tradeweb ICE U.S. Treasury Closing Prices are administered by ICE Benchmark Administration Limited ("IBA"), which is authorised and regulated by the United Kingdom Financial Conduct Authority for the regulated activity of administering a benchmark.

IBA has outsourced the calculation, publication and licensing of the Tradeweb ICE U.S. Treasury Closing Prices to Tradeweb Markets LLC ("Tradeweb").

INTRODUCTION AND KEY TERMS

Key Features of the Methodology

- **Tailored Calculation Methodologies:** Prices for on-the-run U.S. Treasury Notes and Bonds are based upon "top-of-book" prices from the Dealerweb Treasury Platform. Prices for off-the-run U.S. Treasury Notes and Bonds are based upon the yield spread from the relevant on-the-run price, where the yield spread is determined using prices for the off-the-run security and a related on-the-run security from the Institutional Platform. Prices for all other U.S. Treasury Securities, including Bills, TIPS and STRIPS (and the above securities in certain cases), are determined based on dealer quotes on the Institutional Platform.

- **Multiple, Random Snapshots:** Multiple, randomized market snapshots of bid and offer quotes for a given U.S. Treasury Security from dealers on Tradeweb's Platforms, taken during a short window before calculation. This enhances the benchmark's robustness and reliability by protecting against attempted manipulation and temporary aberrations in the underlying market.

- **Outlier Exclusion:** To protect against unrepresentative dealer quotes within a market snapshot influencing the benchmark, dealer mid-prices and dealer yield spreads determined from the Institutional Platform that are more than one standard deviation from the mean may be excluded from the calculation.

- **Random Dealer Quote Removal:** To protect against the possibility of predicting the impact that a particular quote (or quotes) may have on the benchmark calculation, a number of dealer mid-prices and dealer yield spreads determined from the Institutional Platform may be randomly eliminated from the calculation.

- **Special Cases**: There are certain special cases where the published price for a U.S. Treasury Security is not derived using bid and offer quotes from Tradeweb's Platforms. For example, U.S. Treasury Securities that are close to maturity will be priced at par and illiquid STRIPS are priced using a zero-coupon curve.

U.S. Treasury Security Types, Methodology and Input Data, and Quoting Convention

The Tradeweb ICE U.S. Treasury Closing Prices are calculated and published in respect of the types of U.S. Treasury Security shown in the table below.

The particular calculation methodology and Input Data used to calculate the Tradeweb ICE U.S. Treasury Closing Price (whether "top-of-the-book" prices from the Dealerweb Treasury Platform, spreads from the price for the relevant on-the-run security against a related off-the-run security from the Institutional Platform, or prices from the Institutional Platform are used) and its quoting convention (whether the economic value of the Tradeweb ICE U.S. Treasury Closing Price for such security is expressed as a "Price", a "Rate" or a "Yield"), is dependent upon the security type.

<table>
<tr><th>U.S. Treasury Security Type</th><th>Description</th><th>On-the-run?</th><th>Input Data and Methodology</th><th>Quoting Convention for Tradeweb ICE U.S. Treasury Closing Price</th></tr>
<tr><td>WIANOTE</td><td>When Issued After Auction U.S. Treasury Note/Bond</td><td>Yes</td><td rowspan="2">"Top-of-book" prices from the Dealerweb Treasury Platform are used where available in accordance with the benchmark calculation methodology for on-the-run Notes and Bonds. Otherwise the methodology uses prices for the relevant security from the Institutional Platform</td><td rowspan="6">Mid-Price</td></tr>
<tr><td colspan="2" rowspan="2">REGNOTE
U.S. Treasury Note/Bond</td><td>Yes</td></tr>
<tr><td>No</td><td>Spreads from the price for the relevant on-the-run security against a related off-the-run security from the Institutional Platform are used where available in accordance with the benchmark calculation methodology for off-the-run REGNOTES and WIANOTES. Otherwise the methodology uses prices for the relevant security from the Institutional Platform</td></tr>
<tr><td>REGTIPS</td><td>U.S. Treasury Inflation Protected Note/Bond</td><td rowspan="5">N/A</td><td rowspan="5">The methodology uses prices for the relevant security from the Institutional Platform</td></tr>
<tr><td>WIATIPS</td><td>When Issued After Auction U.S. Treasury Inflation Protected Note/Bond</td></tr>
<tr><td>REGBILL</td><td>U.S. Treasury Bill</td><td rowspan="3">Mid-Rate</td></tr>
<tr><td>WIABILL</td><td>When Issued After Auction U.S. Treasury Bill</td></tr>
<tr><td>WIBBILL</td><td>When Issued</td></tr>
</table>

U.S. Treasury Security Type	Description	On-the-run?	Input Data and Methodology	Quoting Convention for Tradeweb ICE U.S. Treasury Closing Price
	Before Auction U.S. Treasury Bill			
STRIPINT	U.S. Treasury Interest Strip			Mid-Yield
STRIPPRIN	U.S. Treasury Principal Strip			
WIBNOTE	When Issued Before Auction U.S. Treasury Note/Bond			
WIBTIPS	When Issued Before Auction U.S. Treasury Inflation Protected Note/Bond			

The descriptions within this document use the generic term “mid-price” but the calculation and the Tradeweb ICE U.S. Treasury Closing Price will always use the correct convention (mid-price, mid-rate or mid-yield) for each U.S. Treasury Security Type.

For certain U.S. Treasury Security Types, a mid-price and/or mid-yield will be published as part of the Derived Prices and Associated Information (as defined below) alongside the mid-price, mid-rate or mid-yield that constitutes the Tradeweb ICE U.S. Treasury Closing Price.

Please see below and Appendix 2 for further information on the Derived Prices and Associated Information.

The Tradeweb Platforms

The Dealerweb Treasury Platform is operated by Dealerweb Inc. (“Dealerweb”), a subsidiary of Tradeweb, and offers trading in U.S. Treasury Securities via a central limit order-book (CLOB) and a direct streaming protocol.

For further details about the Dealerweb Treasury Platform, visit: https://www.tradeweb.com/our-markets/dealerweb-wholesale/.

The Institutional Platform is a global, institutional platform for trading U.S. Treasury Securities (as well as other fixed income asset types).

For further details about the Institutional Treasury Platform, visit: https://www.tradeweb.com/our-markets/institutional/

Tradeweb's Platforms are either regulated or exempt from regulation in the various jurisdictions where users can access the platform and trade U.S. Treasury Securities.

Input Data Specification

The Tradeweb ICE U.S. Treasury Closing Price for each U.S. Treasury Security is calculated based on Input Data that are:

- Bid and offer quotes expressed as a price, a rate or a yield (as applicable);
- For that U.S. Treasury Security;
- Sourced from dealers on either: (i) the Dealerweb Treasury Platform (for the purposes of calculating the Tradeweb ICE U.S. Treasury Closing Price in respect of on-the-run REGNOTES and WIANOTES only); or (ii) the Institutional Platform (for the purposes of calculating the Tradeweb ICE U.S. Treasury Closing Price for all other securities).
- During the relevant Collection Window,

subject to certain special cases, in accordance with this Methodology.

Quotes sourced from the Dealerweb Treasury Platform are firm and executable quotes provided by liquidity providers to liquidity takers. Quotes sourced from the Institutional Platform are attributable to specific liquidity providers and are executable by the receiving liquidity takers, subject to the liquidity providers accepting the trade.

The Input Data sourcing and collection process is subject to Tradeweb validation procedure to ensure that the Input Data Specification (the "Input Data Specification") is satisfied in respect of the Input Data used to calculate and determine each Tradeweb ICE U.S. Treasury Closing Price.

Publication Days, Early Closing Days and Holiday Schedules

The days when the U.S. Treasury Securities market is open for trading in the United States and on which the Tradeweb ICE U.S. Treasury Closing Prices will be published ("Publication Days") follow the U.S. holiday schedule recommended by SIFMA.

This can be found at the following link: https://www.sifma.org/resources/general/holiday-schedule/.

Tradeweb's Platforms will be closed on U.S. holidays, so the Tradeweb ICE U.S. Treasury Closing Prices will not be calculated and published on these days.

For certain U.S. holidays, as recommended by SIFMA, Tradeweb's Platforms close early on the preceding Publication Day ("Early Closing Days"). Users should check the holiday schedule listed above to confirm the Early Closing Days.

The publication time ("Publication Time") for the Tradeweb ICE U.S. Treasury Closing Prices for a Specified Time on a Publication Day (which may be earlier for an Early Closing Day) will be as soon as the prices are available for publication after such Specified Time and not later than 15 minutes after such time.

Errors and Republication

IBA has published an Error and Republication Policy which addresses situations where an error in Input Data or in the determination of a Tradeweb ICE U.S. Treasury Closing Price is identified after the publication of the relevant price, including when a re-publication of a corrected Tradeweb ICE U.S. Treasury Closing Price is required.

A record of all republications and errors in any quarter, and any complaint that results in a determination of a Tradeweb ICE U.S. Treasury Closing Price being changed in any quarter, will be published as part of a quarterly update by IBA at IBA Reports Center.

Insufficient Data

In the event there is insufficient eligible Input Data to calculate a Tradeweb ICE U.S. Treasury Closing Price for a U.S. Treasury Security in accordance with this Methodology, the Tradeweb ICE U.S. Treasury Closing Prices Insufficient Data Policy will apply to the determination of the Tradeweb ICE U.S. Treasury Closing Price for the relevant U.S. Treasury Security.

Derived Prices and Associated Information

Tradeweb will, alongside each Tradeweb ICE U.S. Treasury Closing Price, publish certain prices, yields and other information in respect of each U.S. Treasury Security that are derived from or related to the published Tradeweb ICE U.S. Treasury Closing Price for that U.S. Treasury Security (the "Derived Prices and Associated Information").

The list of such Derived Prices and Associated Information and a description of how certain of these are calculated from the relevant Tradeweb ICE U.S. Treasury Closing Price is included in Appendix 2.

Benchmark Rounding

The published Tradeweb ICE U.S. Treasury Closing Price is rounded to the nearest whole tick unit for the type of U.S. Treasury Security, as detailed in the table below.

U.S. Treasury Security Type	Tick Unit
REGNOTE REGTIPS WIANOTE WIATIPS	1/8 of 1/32 (1/256)
REGBILL WIABILL WIBBILL	0.0005
STRIPINT STRIPPRIN	0.0005
WIBNOTE WIBTIPS	0.0001

Calculation Steps

Calculation methodology for on-the-run REGNOTES and WIANOTES

- **Step 1** - For each applicable on-the-run REGNOTE and WIANOTE U.S. Treasury Security, "top-of-the-book" bid and offer quotes that satisfy the Input Data Specification are gathered on the Dealerweb Treasury Platform during a collection window (a "Collection Window") prior to the relevant Specified Time.

- **Step 2** - The Collection Window is broken into a number of equal time intervals and bid and offer prices are taken from a designated time point in each interval (the first being random and subsequent points being equally spaced after the first) (each a "Market Snapshot").

- **Step 3** - For each Market Snapshot, a "Market Snapshot Price" is calculated as the average of the best bid price and the best ask price.

- **Step 4 -** The price for each U.S Treasury Security is calculated as the arithmetic mean of the Market Snapshot Prices.

- **Verification** - If there are fewer than four dealers quoting in a majority of the Market Snapshots or the price for the relevant U.S. Treasury Security exceeds the maximum deviation against the Tradeweb Composite Price, then the price for the relevant U.S Treasury Security is calculated using prices from the Institutional Platform as set out below in "Calculation methodology for other securities".

Calculation methodology for off-the-run REGNOTES

- **Step 1** - For each applicable off-the-run REGNOTE U.S. Treasury Security, a related on-the-run security is identified based on one of two considerations:
    - The off-the-run REGNOTE is linked to an on-the-run security in a locked[1] swap box[2] on the Dealerweb Treasury Platform, or;
    - Upon the time to maturity of the off-the-run security.

- **Step 2** - Bid and offer quotes that satisfy the Input Data Specification are gathered from the Institutional Platform for the off-the-run and related on-the-run security during a Collection Window prior to the relevant Specified Time.

- **Step 3** - Market Snapshots of bid and offer prices for each off-the-run and related on-the-run security are taken from a designated time point in each interval during the Collection Window.

- **Step 4** - For each Market Snapshot for each off-the-run and related on-the-run security, a "Mid-Price" is calculated for each dealer for each "Tier" of clients to which it makes prices available as the volume-weighted mid-price of that dealer's bid prices and offer prices within that Tier. The volume weighting of the mid-price happens within each Tier. Then a simple average is applied across the tiers to get a Dealer Mid-Price.

[1]The term "locked" refers to a condition in which the bid price and ask price are identical, i.e, there is no spread between the bid and ask price

2 Swap Box Off-the-run securities are linked to on-the-run securities in such a manner that market makers can execute trades in these securities without assuming outright market risk. Off-the-run securities are quoted as a spread to the applicable on-the-run security.

- **Step 5** - For each off-the-run and on-the-run security, a "Dealer Mid-Price" is then calculated for each dealer as the average of the Mid-Prices for the Market Snapshots.

- **Step 6** - Both the on-the-run and off-the-run Dealer Mid-Prices for each off-the-run and related on-the-run security are converted to "Dealer Yields" and the "Dealer Yield Spread" is calculated as the difference between the two related Dealer Yields.

	On the Run				
	Bid		Ask		Mid-Price
	Volume	Price	Volume	Price	
Tier 1	300	102.1	250	102.2	102.150
Tier 2	200	102.11	220	102.18	102.145

	Off the Run				
	Bid		Ask		Mid-Price
	Volume	Price	Volume	Price	
Tier 1	200	103.1	180	103.21	103.155
Tier 2	180	103.13	170	103.19	103.160

In this case the spread for Tier 1 is 1.005 and for Tier 2 is 1.015.

- **Step 7** - Dealer Yield Spreads that are outliers (i.e. more than one standard deviation from the mean of all Dealer Yield Spreads) and a set of randomly selected Dealer Yield Spreads may be removed from the calculation.

- **Step 8** - The arithmetic mean of the remaining Dealer Yield Spreads is calculated for each Market Snapshot to produce a "Market Snapshot Yield Spread" for the related securities. The average of the Market Snapshot Yield Spreads provides the "Final Yield Spread".

- **Step 9** - The Tradeweb ICE U.S. Treasury Closing Price that was calculated for the relevant related on-the-run security is converted to a yield and added to the applicable Final Yield Spread to give an "Adjusted Yield".

- **Step 10** - This adjusted yield is then converted back to a price, which is the Tradeweb ICE U.S. Treasury Closing Price for the relevant off-the-run REGNOTE U.S. Treasury Security.

- **Verification** - If there is an insufficient number of dealers quoting on the Institutional platform for either the applicable on-the-run or the off-the-run security, or the price for the relevant U.S. Treasury Security exceeds the maximum deviation against the Tradeweb Composite Price, then an earlier, alternative Collection Window may be used. If neither alternative Collection Window has four or more dealers quoting the securities, then the price for the relevant U.S Treasury Security is calculated using prices from the Institutional Platform as set out below in "Calculation methodology for other securities".

Calculation methodology for other securities (subject to certain "Special Cases" as described below)

- **Step 1** - For each applicable U.S. Treasury Security, bid and offer quotes that satisfy the Input Data Specification are gathered from the Institutional Platform during a Collection Window prior to the relevant Specified Time.

- **Step 2** - Market Snapshots of bid and offer prices for each U.S. Treasury Security are taken from a designated time point in each interval during the Collection Window.

- **Step 3** - For each Market Snapshot for a security, a "Mid-Price" is calculated for each dealer for each "Tier" of clients to which it makes prices available as the volume-weighted mid-price of that dealer's bid prices and offer prices within that Tier.

- **Step 4** - A "Dealer Mid-Price" is then calculated for each dealer within a Market Snapshot as the average of the Mid-Prices for each security.

- **Step 5** - Dealer Mid-Prices that are outliers and a set of randomly selected Dealer Mid-Prices [are/may be] removed from the calculation.

- **Step 6** - The arithmetic mean of the remaining Dealer Mid-Prices is calculated for each Market Snapshot to produce a "Market Snapshot Price".

- **Step 4** - The Tradeweb ICE U.S. Treasury Closing Price for each U.S Treasury Security is calculated as the arithmetic mean of the Market Snapshot Prices.

- **Verification** - If there is an insufficient number of dealers quoting on the Institutional Platform for the applicable security, or any of the threshold tests designed to check for errors and exceptional circumstances are failed, then an earlier, alternative Collection Window may be used.

  If neither alternative Collection Window has sufficient dealers quoting or the price generated fails any other verification checks, then the Tradeweb ICE U.S. Treasury Closing Prices Insufficient Data Policy will apply to the determination of the Tradeweb ICE U.S. Treasury Closing Price for the relevant U.S. Treasury Security for the relevant Specified Time.

SPECIAL CASES

Special Case - U.S Treasury Securities Nearing Maturity

As U.S. Treasury Securities approach maturity, the yield calculations can be skewed due to the short period between the standard settlement date and the maturity date.

As a result, U.S. Treasury Securities that are close to maturity will be priced at par, rather than having a price derived from market snapshots of dealer quotes. The point at which a U.S. Treasury Security will default to being priced at par is determined by the number of days remaining to maturity. Any U.S. Treasury Security with fewer than a specified minimum number of days to maturity will be priced at par. This value may be subject to change and may be varied by U.S. Treasury Security Type.

In this special case, the par price will be the published Tradeweb ICE U.S. Treasury Closing Price in respect of such U.S. Treasury Security.

Special Case - Illiquid STRIPS

For STRIPS that have fewer than a specified minimum number of Market Snapshots with at least 4 dealers quoting the U.S. Treasury Security (Illiquid STRIPS), the price (yield) is derived from a zero-coupon curve rather than from the dealer quotes. The minimum number of snapshots may be subject to change.

Please refer to Appendix 1 for the calculation methodology used for Illiquid STRIPS.

In this special case, this calculated price will be the published Tradeweb ICE U.S. Treasury Closing Price in respect of such U.S. Treasury Security.

APPENDIX 1
CALCULATION METHODOLOGY FOR ILLIQUID STRIPS

Tradeweb derives Illiquid STRIPS yields from a zero-coupon yield curve calculated from the yields of liquid STRIPS (i.e. STRIPS that are not Illiquid STRIPS). STRIPS are deemed illiquid when there are fewer than a specified minimum number of Market Snapshots with at least 4 dealers quoting the U.S. Treasury Security. To handle inherent differences between Principal STRIPS and Interest STRIPS, a separate zero-coupon yield curve is derived for each.

The methodology uses cubic splines to model an instantaneous forward curve function $\mathbf{f_\beta(m)}$ where β is the vector of cubic spline parameters. The price of zero-coupon bonds with par 1 can be written as a function of the instantaneous forward curve:

$$\mathbf{B(\tau) = exp\left[-\int_0^{\tau} f_\beta(m)dm\right]}$$

where $\boldsymbol{\tau}$ is the maturity of the bond.

The price of STRIPS with par 100 can be written as:

$$P(\tau) = 100B(\tau)$$

By minimising the following objective function, the values of the cubic spline parameters β are found:

$$X_s = \sum_{i=1}^{N}\left[\frac{P_i - \prod_i(\beta)}{D_i}\right]^2 + \int_0^M \lambda(m)[f''_\beta(m)]^2 dm$$

where $P_i, D_i, \prod_i(\beta)$ are respectively the observed STRIP price, the modified duration, and the fitted price of bond i. $f''_\beta(m)$ is the second derivative of the fitted forward curve and M is the maturity of the longest dated STRIPS.

The objective function has two terms:

- The first is the sum of the squared STRIPS price differences, weighted by modified durations.
- The second is the Variable Roughness Penalty, being the integral of the forward curve curvature multiplied by a smoothing function $\lambda(m)$ which satisfies:

$$\log\lambda(m) = L - (L - S)\exp\left(\frac{-m}{\mu}\right)$$

where L, S, μ are roughness penalty parameters maximized over the sampling set of liquid STRIPS.

APPENDIX 2
DERIVED PRICES AND ASSOCIATED INFORMATION

Field	Description	Applicability
CUSIP	CUSIP Identifier for the U.S. Treasury Security. Can be repeated where security has WIA- or WIB- prefix.	All U.S Treasury Securities.
coupon	Annual coupon rate for the U.S. Treasury Security. 0 = not applicable.	REGNOTE, REGTIPS, WIANOTE AND WIATIPS
description	A description of the U.S. Treasury Security.	All U.S Treasury Securities.
securitytype	U.S. Treasury Security Type. See page 2 for the list of U.S Treasury Security Types.	All U.S Treasury Securities.
ontherun	On-the-run indicator. 1 = On-the-run (current). >1 = On-the-run (historic) up to 10 (beyond that = 0). -1 = WIBBILL, WIBTIPS or WIBNOTE. STRIPPRIN or STRIPINT = 0.	All U.S Treasury Securities.
whenissued	When Issued Indicator. -1 = WIA- or WIB- prefix. 0 = has been issued.	All U.S Treasury Securities.
maturitydate	Maturity date of the U.S. Treasury Security.	All U.S Treasury Securities.
datedated	First accrual date of the U.S. Treasury Security. 0 = not applicable.	All U.S Treasury Securities except STRIPS.
dateissued	Date the U.S. Treasury Security is issued. 0 = not applicable.	All U.S Treasury Securities except STRIPS.
auctiondate	Auction date of the U.S. Treasury Security. 0 = not applicable.	All U.S Treasury Securities except STRIPS.
firstcoupondate	First coupon payment date of the U.S. Treasury Security. 0 = not applicable.	All U.S Treasury Securities except STRIPS.
issuedas	Number of issue months of the U.S. Treasury Security. Blank = not applicable.	All U.S Treasury Securities except STRIPS and REGBILL, WIABILL, WIBBILL if has issuedays value.
Issuedays	Number of issue days of the U.S. Treasury Security. 0 = not applicable.	REGBILL, WIABILL, WIBBILL unless has issuedas value.
currency	Currency ISO Code (always USD).	All U.S Treasury Securities.
indexratio	Index Ratio, calculated in accordance with formulae below. Blank = not applicable.	REGTIPS and WIATIPS.
midprice	Mid Clean Price (for REGNOTE, REGTIPS, WIANOTE and WIATIPS as per methodology, for REGBILL, WIABILL, WIBBILL, STRIPINT and STRIPPRIN, as per formulae below). Blank = not applicable.	All U.S Treasury Securities except WIBTIPS and WIBNOTE.
middirtyprice	Mid Dirty Price, calculated in accordance with formulae below. Blank = not applicable.	REGTIPS and WIATIPS.
nominalprice	Mid Nominal Price, calculated in accordance with formulae below. Blank = not applicable.	REGTIPS and WIATIPS.
midyield	Mid Clean Yield (for STRIPINT, STRIPPRIN, WIBNOTE and WIBTIPS as per methodology, for REGBILL, WIABILL, WIBBILL and REGNOTE, REGTIPS, WIANOTE and WIATIPS in accordance with formulae below).	All U.S Treasury Securities.
nominalyield	Mid Nominal Yield, calculated in accordance with formulae below. Blank = not applicable.	REGTIPS and WIATIPS.

Field	Description	Applicability
bondyield	Mid Bond Yield (for REGBILL, WIABILL, WIBBILL, REGNOTE, WIANOTE, STRIPPRIN and STRIPINT in accordance with formulae below). 0 = REGTIPS and WIATIPS. Blank = WIBNOTE or WIBTIPS.	All U.S Treasury Securities.
midrate	Mid Discount Rate, calculated in accordance with the methodology. Blank = not applicable.	REGBILL, WIABILL and WIBBILL.
accrued	Accrued interest since preceding payment date or interest at maturity, calculated in accordance with formulae below. 0 = WIANOTE. Blank = not applicable.	REGNOTE, REGTIPS, WIANOTE, and WIATIPS.
mdur	Modified duration, calculated in accordance with formulae below). Blank = not applicable.	All U.S Treasury Securities except WIBTIPS, WIBNOTE.
effdur	Effective duration, calculated in accordance with formulae below. Blank = not applicable.	REGTIPS and WIATIPS.
amended	Amended flag. Defaults to 0. A value of 1 indicates U.S Treasury Security has been corrected in a republished file.	All U.S Treasury Securities.

See general formulae for the derived prices for the Tradeweb ICE U.S. Treasury Closing Prices below:

https://www.theice.com/publicdocs/Tradeweb_ICE_US_Treasury_Reference_Prices_Derived_Prices_Formulas.pdf

ANNEX

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY	
Item 1. Name of the benchmark administrator.	ICE Benchmark Administration Ltd
Item 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.	Sovereign Debt Benchmark
Item 3. Name of the benchmark or family of benchmarks.	Tradeweb ICE U.S. Treasury Closing Prices
Item 4. Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	☐ Yes ☒ No
Item 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:
(b) List of social factors considered:	Selection, weighting or exclusion:
(c) List of governance factors considered:	Selection, weighting or exclusion:
Item 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. 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:
(b) List of social factors considered:	Selection, weighting or exclusion:
(c) List of governance factors considered:	Selection, weighting or exclusion:
Hyperlink to the information on ESG factors for each benchmark:	Not applicable
Item 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.*	Not applicable
(b) Verification and quality of data. *Describe how data are verified and how the quality of those data is ensured.*	Not applicable
(c) Reference standards *Describe the international standards used in the benchmark methodology.*	Not applicable
Date on which information has been last updated and reason for the update:	16 February 2022 Date of first publication

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