# Alternative Reference Rates Committee

# Appendix to SOFR Floating Rate Notes Conventions Matrix

# November 2019

In August of 2019, the ARRC's Floating Rate Notes ("FRN") Working Group published a matrix identifying considerations for market participants interested in using SOFR in new issuances.[1] The materials herein are intended as an additional resource for market participants to consider and include the following:

- Term sheets with key provisions, to provide greater clarity on how to issue (or invest in) compounded SOFR-based floating rate notes, including the specific differences between certain conventions, and

- Recommended fallback language for SOFR-based floating rate notes.

This document is not intended in any way to mandate, prescribe, or limit the ways in which SOFR may be used in new issuances. Market participants, including those serving on the ARRC's FRN Working Group, will determine for themselves how SOFR can best be used in new issuances. Accordingly, nothing herein is intended to be binding on any market participant or give rise to any legal rights or obligations of the ARRC.

## Contents



[1] The Alternative Reference Rates Committee ("ARRC") is a group of private-market participants convened by the Federal Reserve Board and the Federal Reserve Bank of New York with a mandate to develop recommendations to help ensure a successful transition from U.S. dollar LIBOR. It is comprised of a diverse set of private-sector entities, including buyside, sellside, and intermediary participants in markets affected by U.S. dollar LIBOR, and a wide array of official-sector entities, including banking and financial sector regulators, as ex-officio members. After a multi-year process of market-wide consultation and deliberation to evaluate a range of potential alternatives to U.S. dollar LIBOR, the ARRC identified the Secured Overnight Financing Rate ("SOFR") as its recommended alternative rate. SOFR is a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. https://apps.newyorkfed.org/markets/autorates/SOFR.

# Key Provisions for Compounded SOFR FRN with Lookback[2]

**Interest Amount:** The amount of interest accrued and payable on the notes for each Interest Period will be equal to the product of (i) the outstanding principal amount of the notes multiplied by (ii) the product of (a) the Rate of Interest for the relevant Interest Period multiplied by (b) the quotient of the actual number of calendar days in such Interest Period divided by 360.

**Rate of Interest:** The Benchmark plus the Margin. In no event will the Rate of Interest for any Interest Period be less than the Minimum Rate of Interest.

**Benchmark:** Compounded SOFR, which is a compounded average of daily SOFR as determined for each [quarterly] Interest Period in accordance with the specific formula and other provisions set forth herein.

*[Daily SOFR rates will not be published in respect of any day that is not a U.S. Government Securities Business Day, such as a Saturday, Sunday or holiday. For this reason, in determining Compounded SOFR in accordance with the specific formula and other provisions set forth herein, the daily SOFR rate applied for any U.S. Government Securities Business Day that immediately precedes one or more days that are not U.S. Government Securities Business Days in the Interest Period will be multiplied by the number of calendar days from and including such U.S. Government Securities Business Day to, but excluding, the following U.S. Government Securities Business Day.[3]]*

*[If the [issuer or its designee][4] determines that a Benchmark Transition Event and its related Benchmark Replacement Date have occurred in respect of Compounded SOFR (or the daily SOFR used in the calculation thereof) prior to the relevant SOFR Determination Time, then the provisions under the heading "Effect of a Benchmark Transition Event" will apply.[5]]*

**Margin:** [Plus]/[Minus] __ basis points per annum.

**Interest Periods:** Each [quarterly][6] period from, and including, an Interest Payment Date (or, in the case of the first Interest Period, the Interest Commencement Date) to, but excluding, the next Interest Payment Date (or, in the case of the final Interest Period, the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date).

**Interest Payment Dates:** The [15th] day of each [March], [June], [September] and [December], commencing [December 2019] and ending on the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date.

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[2] These key provisions are for a compounded SOFR floating rate note structure. Fixed-to-floating rate structures would require further revisions. This structure could be used with a different number of days for the lookback and the number of five business days set forth in brackets is provided for illustrative purposes.

[3] With this convention, because of the ***lookback***, on each day of the Interest Period one would use the daily SOFR rate from five business days prior ("$SOFR_{i-5USBD}$"). The weighting of such rate in the compounding formula would be based on the day of application in the Interest Period. On most days, the weighting of a rate will be equal to "1", but a daily SOFR for a Friday during the Interest Period (that reflects the rate of a prior day because of the lookback) will generally be given the weight of "3" (to account for Saturday and Sunday) and a daily SOFR representing the day before a holiday during the Interest Period will also be given a weight greater than "1."

[4] Documents may specify which of the issuer or its designee will make various determinations in the fallback language.

[5] Fallback provisions to be included elsewhere in the document. See "SOFR FRN Fallback Provisions" herein.

[6] Quarterly interest periods and dates in brackets are included for illustrative purposes only.

**Interest Payment Determination Dates:** The date [five] U.S. Government Securities Business Days before each Interest Payment Date.

**Business Day Convention:** Modified Following; Adjusted. If any scheduled Interest Payment Date, other than the Maturity Date or redemption date, if applicable, falls on a day that is not a Business Day, such date will be postponed to the following Business Day, except that, if that Business Day would fall in the next calendar month, the Interest Payment Date will be the immediately preceding Business Day. If the scheduled final Interest Payment Date (i.e., the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date) falls on a day that is not a Business Day, the payment of principal and interest will be made on the next succeeding Business Day, but the final Interest Payment Date will not be postponed and interest on that payment will not accrue during the period from and after the scheduled final Interest Payment Date.[7]

**U.S. Government Securities Business Day:** Any day except for a Saturday, a Sunday or a day on which the Securities Industry and Financial Markets Association recommends that the fixed income departments of its members be closed for the entire day for purposes of trading in U.S. government securities.

**Business Day:** Any weekday that is a U.S. Government Securities Business Day and is not a legal holiday in New York [or Tokyo][8] and is not a date on which banking institutions in those cities are authorized or required by law or regulation to be closed.

**Day count convention:** Actual/360

**Minimum Rate of Interest:** 0% per Interest Period.[9]

**SOFR**: With respect to any U.S. Government Securities Business Day, means:

(1) the Secured Overnight Financing Rate published for such U.S. Government Securities Business Day as such rate appears on the SOFR Administrator's Website at 3:00 p.m. (New York time) on the immediately following U.S. Government Securities Business Day (the **"SOFR Determination Time"**);

(2) if the rate specified in (1) above does not so appear, the Secured Overnight Financing Rate as published in respect of the first preceding U.S. Government Securities Business Day for which the Secured Overnight Financing Rate was published on the SOFR Administrator's Website;

where:

**"SOFR Administrator"** means the Federal Reserve Bank of New York (or a successor administrator of the Secured Overnight Financing Rate); and

**"SOFR Administrator's Website"** means the website of the Federal Reserve Bank of New York, or any successor source.

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[7] It is general market practice to adjust each Interest Period other than the final Interest Period.
[8] Cities other than New York may be added to this definition.
[9] As the FRN Working Group observed, FRN coupons predominantly, if not uniformly, are currently floored at zero because, among other reasons, operational systems are not designed to accommodate investor payments to an issuer. The Minimum Interest Rate identified above for illustrative purposes only as part of these key provisions is based on the assumption that an FRN using SOFR likewise would not contemplate investors making coupon payments to an issuer.

**Compounded SOFR**[10]**:** With respect to any Interest Period, means the rate of return of a daily compound interest investment computed in accordance with the following formula (and the resulting percentage will be rounded, if necessary, to the nearest one hundred-thousandth of a percentage point, with 0.000005 being rounded upwards to 0.00001):

$$\left[\prod_{i=1}^{d_0}\left(1+\frac{SOFR_{i-5USBD}\ \times n_i}{360}\right)-1\right]\times\frac{360}{d}$$

where:

**"$d_0$,"** for any Interest Period, is the number of U.S. Government Securities Business Days in the relevant Interest Period;

**"i"** is a series of whole numbers from one to $d_0$, each representing the relevant U.S. Government Securities Business Day in chronological order from, and including, the first U.S. Government Securities Business Day in the relevant Interest Period;

**"$SOFR_{i\text{-}5USBD}$,"** for any U.S. Government Securities Business Day "i" in the relevant Interest Period, is equal to SOFR in respect of the U.S. Government Securities Business Day falling [five] U.S. Government Securities Business Days prior to that day "i";

**"$n_i$,"** for any U.S. Government Securities Business Day "i" in the relevant Interest Period, is the number of calendar days from, and including, such U.S. Government Securities Business Day "i" to, but excluding, the following U.S. Government Securities Business Day ("i+1"); and

**"d"** is the number of calendar days in the relevant Interest Period.

[10] The calculation of compounded SOFR will exclude the Margin.

# Key Provisions for Compounded SOFR FRN with Observation Period Shift[11]

**Interest Amount:** The amount of interest accrued and payable on the notes for each Interest Period will be equal to the product of (i) the outstanding principal amount of the notes multiplied by (ii) the product of (a) the Rate of Interest for the relevant Interest Period multiplied by (b) the quotient of the actual number of calendar days in such Interest Period divided by 360.[12]

**Rate of Interest:** The Benchmark plus the Margin. In no event will the Rate of Interest for any Interest Period be less than the Minimum Rate of Interest.

**Benchmark:** Compounded SOFR, which is a compounded average of daily SOFR, as determined for each [quarterly] Interest Period in accordance with the specific formula and other provisions set forth herein.

*[Daily SOFR rates will not be published in respect of any day that is not a U.S. Government Securities Business Day, such as a Saturday, Sunday or holiday. For this reason, in determining Compounded SOFR in accordance with the specific formula and other provisions set forth herein, the daily SOFR rate for any U.S. Government Securities Business Day that immediately precedes one or more days that are not U.S. Government Securities Business Days in the Observation Period will be multiplied by the number of calendar days from and including such U.S. Government Securities Business Day to, but excluding, the following U.S. Government Securities Business Day.[13]]*

*[If the [issuer or its designee][14] determines that a Benchmark Transition Event and its related Benchmark Replacement Date have occurred in respect of Compounded SOFR (or the daily SOFR used in the calculation thereof) prior to the relevant SOFR Determination Time, then the provisions under the heading "Effect of a Benchmark Transition Event" will apply.[15]]*

**Margin:** [Plus]/[Minus] __ basis points per annum.

**Interest Periods:** Each [quarterly][16] period from, and including, an Interest Payment Date (or, in the case of the first Interest Period, the Interest Commencement Date) to, but excluding, the next Interest Payment Date (or, in the case of the final Interest Period, the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date).

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[11] These key provisions are for a compounded SOFR floating rate note structure. Fixed-to-floating rate structures would require further revisions. This structure could be used with a different number of days for the observation period shift and the number of two business days set forth in brackets is provided for illustrative purposes.

[12] As an alternative, the Rate of Interest could be multiplied by the number of days in the relevant Observation Period divided by 360 (i.e. "(b) the quotient of the actual number of calendar days in such Observation Period divided by 360"). This would result in a calculation of interest payable for the Interest Period being equal to the value of a swap calculated over the Observation Period. Note that additional changes to the term sheet may be needed to accommodate this alternative.

[13] With this convention, because the period over which SOFR is observed is ***"backward-shifted"*** and this backward-shift includes both the rate ("$SOFR_i$") and the weighting of that rate ("$n_i$"), the rate and weighting are determined based on the day of the Observation Period rather than the day of the Interest Period. The weighting is intended to account for calendar days on which SOFR is not published and on most days, the weighting of a rate will be equal to "1", but a daily SOFR that represents a Friday during the Observation Period will generally be given the weight of "3" (to account for Saturday and Sunday) and a daily SOFR representing the day before a holiday during the Observation Period will also be given a weight greater than 1.

[14] Documents may specify which of the issuer or its designee will make various determinations in the fallback language.

[15] Fallback provisions to be included elsewhere in the document. See "SOFR FRN Fallback Provisions" herein.

[16] Quarterly interest periods and dates in brackets are included for illustrative purposes only.

**Interest Payment Dates:** The [15th] day of each [March], [June], [September] and [December], commencing [December 2019] and ending on the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date.

**Interest Payment Determination Dates:** The date [two] U.S. Government Securities Business Days before each Interest Payment Date.

**Business Day Convention:** Modified Following; Adjusted. If any scheduled Interest Payment Date, other than the Maturity Date or redemption date, if applicable, falls on a day that is not a Business Day, such date will be postponed to the following Business Day, except that, if that Business Day would fall in the next calendar month, the Interest Payment Date will be the immediately preceding Business Day. If the scheduled final Interest Payment Date (i.e., the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date) falls on a day that is not a Business Day, the payment of principal and interest will be made on the next succeeding Business Day, but the final Interest Payment Date will not be postponed and interest on that payment will not accrue during the period from and after the scheduled final Interest Payment Date. [17]

**U.S. Government Securities Business Day:** Any day except for a Saturday, a Sunday or a day on which the Securities Industry and Financial Markets Association recommends that the fixed income departments of its members be closed for the entire day for purposes of trading in U.S. government securities.

**Business Day:**[18] Any weekday that is [a U.S. Government Securities Business Day and is] not a legal holiday in New York [or Tokyo][19] and is not a date on which banking institutions in those cities are authorized or required by law or regulation to be closed.

**Day count convention:** Actual/360

**Minimum Rate of Interest:** 0% per Interest Period.[20]

**Observation Period**: In respect of each Interest Period, the period from, and including, the date [two] U.S. Government Securities Business Days preceding the first date in such Interest Period to, but excluding, the date [two] U.S. Government Securities Business Days preceding the Interest Payment Date for such Interest Period.

**SOFR**: With respect to any U.S. Government Securities Business Day, means:

(1) the Secured Overnight Financing Rate published for such U.S. Government Securities Business Day as such rate appears on the SOFR Administrator's Website at 3:00 p.m. (New York time) on the immediately following U.S. Government Securities Business Day (the **"SOFR Determination Time"**);

(2) if the rate specified in (1) above does not so appear, the Secured Overnight Financing Rate as published in respect of the first preceding U.S. Government Securities Business Day for which the Secured Overnight Financing Rate was published on the SOFR Administrator's Website;

[17] It is general market practice to adjust each Interest Period other than the final Interest Period.

[18] For the Observation Period shift convention, note that the definition of "Business Day" does not need to include U.S. Government Securities Business Days so long as the Observation Period definition references U.S. Government Securities Business Days.

[19] Cities other than New York may be added to this definition.

[20] As the FRN Working Group observed, FRN coupons predominantly, if not uniformly, are currently floored at zero because, among other reasons, operational systems are not designed to accommodate investor payments to an issuer. The Minimum Interest Rate identified above for illustrative purposes only as part of these key provisions is based on the assumption that an FRN using SOFR likewise would not contemplate investors making coupon payments to an issuer.

where:

**"SOFR Administrator"** means the Federal Reserve Bank of New York (or a successor administrator of the Secured Overnight Financing Rate); and

**"SOFR Administrator's Website"** means the website of the Federal Reserve Bank of New York, or any successor source.

**Compounded SOFR[21]:** With respect to any Interest Period, means the rate of return of a daily compound interest investment computed in accordance with the following formula (and the resulting percentage will be rounded, if necessary, to the nearest one hundred-thousandth of a percentage point, with 0.000005 being rounded upwards to 0.00001):

$$\left[\prod_{i=1}^{d_o}\left(1+\frac{SOFR_i \times n_i}{360}\right)-1\right] \times \frac{360}{d}$$

where:

**"$d_0$,"** for any Observation Period, is the number of U.S. Government Securities Business Days in the relevant Observation Period;

**"i"** is a series of whole numbers from one to $d_0$, each representing the relevant U.S. Government Securities Business Day in chronological order from, and including, the first U.S. Government Securities Business Day in the relevant Observation Period;

**"SOFRi,"** for any U.S. Government Securities Business Day "i" in the relevant Observation Period, is equal to SOFR in respect of that day "i";

**"$n_i$,"** for any U.S. Government Securities Business Day "i" in the relevant Observation Period, is the number of calendar days from, and including, such U.S. Government Securities Business Day "i" to, but excluding, the following U.S. Government Securities Business Day ("i+1"); and

**"d"** is the number of calendar days in the relevant Observation Period.

[21] The calculation of compounded SOFR will exclude the Margin.

# Key Provisions for Compounded SOFR FRN with Payment Delay[22] [23]

**Interest Amount:** The amount of interest accrued and payable on the notes for each Interest Accrual Period will be equal to the product of (i) the outstanding principal amount of the notes multiplied by (ii) the product of (a) the Rate of Interest for the relevant Interest Accrual Period multiplied by (b) the quotient of the actual number of calendar days in such Interest Accrual Period divided by 360.

**Rate of Interest:** The Benchmark plus the Margin. In no event will the Rate of Interest for any Interest Accrual Period be less than the Minimum Rate of Interest.

**Benchmark:** Compounded SOFR, which is a compounded average of daily SOFR, as determined for each [quarterly] Interest Accrual Period in accordance with the specific formula and other provisions set forth herein.

*[Daily SOFR rates will not be published in respect of any day that is not a U.S. Government Securities Business Day, such as a Saturday, Sunday or holiday. For this reason, in determining Compounded SOFR in accordance with the specific formula and other provisions set forth herein, the daily SOFR rate for any U.S. Government Securities Business Day that immediately precedes one or more days that are not U.S. Government Securities Business Days will be multiplied by the number of calendar days from and including such U.S. Government Securities Business Day to, but excluding, the following U.S. Government Securities Business Day.]*

*[If the [issuer or its designee][24] determines that a Benchmark Transition Event and its related Benchmark Replacement Date have occurred in respect of Compounded SOFR (or the daily SOFR used in the calculation thereof) prior to the relevant SOFR Determination Time, then the provisions under the heading "Effect of a Benchmark Transition Event" will apply.[25]]*

**Margin:** [Plus]/[Minus] __ basis points per annum.

**Interest Accrual Periods:** Each [quarterly][26] period from, and including, an Interest Accrual Period End Date (or, in the case of the first Interest Accrual Period, the Interest Commencement Date) to, but excluding, the next Interest Accrual Period End Date (or, in the case of the final Interest Accrual Period, the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date).

**Interest Accrual Period End Dates:** The [15th] day of each [March], [June], [September] and [December], commencing [December 2019] and ending on the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date.

**Interest Payment Dates:** The [second] Business Day following each Interest Accrual Period End Date; provided that the Interest Payment Date with respect to the final Interest Accrual Period will be the Maturity Date or, if the issuer elects to redeem the notes on the redemption date, the redemption date.

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[22] These key provisions are for a compounded SOFR floating rate note structure. Fixed-to-floating rate structures would require further revisions. This structure could be used with a different number of days for the payment delay and the number of two business days set forth in brackets is provided for illustrative purposes.

[23] Issuers should confirm that the Depository Trust Company (DTC) will support the payment delay structure on the platform applicable to their securities. As of October 10, 2019, DTC indicated that it will not be able to support the payment delay structure on DTC's Money Market Instrument (MMI) program.

[24] Documents may specify which of the issuer or its designee will make various determinations in the fallback language.

[25] Fallback provisions to be included elsewhere in the document. See "SOFR FRN Fallback Provisions" herein.

[26] Quarterly interest accrual periods and dates in brackets are included for illustrative purposes only.

**Interest Payment Determination Dates:** The Interest Accrual Period End Date at the end of each Interest Accrual Period; provided that the Interest Payment Determination Date with respect to the final Interest Accrual Period will be the Rate Cut-off Date.

**Business Day Convention:** Modified Following; Adjusted. If any scheduled Interest Accrual Period End Date falls on a day that is not a Business Day, such date will be postponed to the following Business Day, except that, if that Business Day would fall in the next calendar month, the Interest Accrual Period End Date will be the immediately preceding Business Day.[27]

**U.S. Government Securities Business Day:** Any day except for a Saturday, a Sunday or a day on which the Securities Industry and Financial Markets Association recommends that the fixed income departments of its members be closed for the entire day for purposes of trading in U.S. government securities.

**Business Day:**[28] Any weekday that is [a U.S. Government Securities Business Day and is] not a legal holiday in New York [or Tokyo][29] and is not a date on which banking institutions in those cities are authorized or required by law or regulation to be closed.

**Day count convention:** Actual/360

**Maturity Date:** [_______][30]

**Minimum Rate of Interest:** 0% per Interest Accrual Period.[31]

**Rate Cut-Off Date**: The [second][32] U.S. Government Securities Business Day prior to the Maturity Date or redemption date, as applicable. For purposes of calculating Compounded SOFR with respect to the final Interest Accrual Period, the level of SOFR for each U.S. Government Securities Business Day in the period from and including the Rate Cut-Off Date to but excluding the Maturity Date or redemption date, as applicable, shall be the level of SOFR in respect of such Rate Cut-Off Date.

**SOFR**: With respect to any U.S. Government Securities Business Day, means:

(1) the Secured Overnight Financing Rate published for such U.S. Government Securities Business Day as such rate appears on the SOFR Administrator's Website at 3:00 p.m. (New York time) on the immediately following U.S. Government Securities Business Day (the **"SOFR Determination Time"**);

(2) if the rate specified in (1) above does not so appear, the Secured Overnight Financing Rate as

[27] It is important to note that all Interest Accrual Period End Dates should be adjusted to a good U.S. Government Securities Business Day. This is because if the final Interest Accrual Period is not adjusted, the SOFR compounding formula weighting ($n_i$) must be modified (e.g. Friday's rate would not always be multiplied by three). It's easier to adjust the final Interest Accrual Period to end on a U.S. Government Securities Business Day than to modify the compounding formula. Note that if the Maturity Date is adjusted, the Interest Accrual Period would also be adjusted accordingly.

[28] "Business Days" need not include "U.S. Government Securities Business Days" so long as Interest Accrual Period End Dates and Rate Cut-off Dates are always adjusted to be good U.S. Government Securities Business Days.

[29] Cities other than New York may be added to this definition.

[30] The Maturity Date matches the final Interest Accrual Period End Date.

[31] As the FRN Working Group observed, FRN coupons predominantly, if not uniformly, are currently floored at zero because, among other reasons, operational systems are not designed to accommodate investor payments to an issuer. The Minimum Interest Rate identified above for illustrative purposes only as part of these key provisions is based on the assumption that an FRN using SOFR likewise would not contemplate investors making coupon payments to an issuer.

[32] Some calculation agents may prefer an additional day in the lockout period to calculate interest before payment is due.

published in respect of the first preceding U.S. Government Securities Business Day for which the Secured Overnight Financing Rate was published on the SOFR Administrator's Website;

where:

**"SOFR Administrator"** means the Federal Reserve Bank of New York (or a successor administrator of the Secured Overnight Financing Rate); and

**"SOFR Administrator's Website"** means the website of the Federal Reserve Bank of New York, or any successor source.

**Compounded SOFR**[33]**:** With respect to any Interest Accrual Period, means the rate of return of a daily compound interest investment computed in accordance with the following formula (and the resulting percentage will be rounded, if necessary, to the nearest one hundred-thousandth of a percentage point, with 0.000005 being rounded upwards to 0.00001):

$$\left[\prod_{i=1}^{d_o}\left(1+\frac{\mathrm{SOFR}_i \times \mathrm{n}_i}{360}\right)-1\right]\times\frac{360}{\mathrm{d}}$$

where:

**"$d_0$,"** for any Interest Accrual Period, is the number of U.S. Government Securities Business Days in the relevant Interest Accrual Period;

**"i"** is a series of whole numbers from one to $d_0$, each representing the relevant U.S. Government Securities Business Day in chronological order from, and including, the first U.S. Government Securities Business Day in the relevant Interest Accrual Period;

**"$SOFR_i$,"** for any U.S. Government Securities Business Day "i" in the relevant Interest Accrual Period, is equal to SOFR in respect of that day "i";

**"$n_i$,"** for any U.S. Government Securities Business Day "i" in the relevant Interest Accrual Period, is the number of calendar days from, and including, such U.S. Government Securities Business Day "i" to, but excluding, the following U.S. Government Securities Business Day ("i+1"); and

**"d"** is the number of calendar days in the relevant Interest Accrual Period.

[33] The calculation of compounded SOFR will exclude the Margin.

## Comparison of Key Provisions for Three Compounded SOFR FRNs

For illustrative purposes, the following sets forth a comparison of three compounded SOFR Floating Rate Notes.[34]

| SOFR Structure: | Lookback | Observation Period Shift | Payment Delay |
|---|---|---|---|
| **Interest Amount:** | The amount of interest accrued and payable on the notes on each Interest Payment Date will be equal to the product of (i) the outstanding principal amount of the notes multiplied by (ii) the product of (a) the Rate of Interest multiplied by (b) the quotient of the actual number of calendar days in the Interest Period divided by 360. | | |
| **Rate of Interest:** | The Benchmark [plus][minus] the Margin ([] basis points per annum).<br>In no event will the Rate of Interest for any Interest Period be less than the Minimum Rate of Interest. | | |
| **Benchmark:** | Compounded SOFR, which is the compounded average of daily SOFR determined in accordance with a formula over the specified time period. | | |
| **Rate Cut-Off Date:** | N/A | N/A | The [second] U.S. Government Securities Business Day prior to the Maturity Date or redemption date, as applicable.<br><br>SOFR for each day in the period from and including the Rate Cut-Off Date to but excluding the Maturity Date or redemption date, as applicable, shall be SOFR in respect of the Rate Cut-Off Date. |
| **Period during which daily SOFR rates are compounded:** | The period from, and including, the date [five] U.S. Government Securities Business Days preceding the prior Interest Payment Date (or Issue Date), to, but excluding, the date [five] U.S. Government Securities Business Days preceding the Interest Payment Date for which interest is being calculated. | The period from, and including, the date [two] U.S. Government Securities Business Days preceding the prior Interest Payment Date (or Issue Date), to, but excluding, the date [two] U.S. Government Securities Business Days preceding the Interest Payment Date for which interest is being calculated. | The period from and including the prior Interest Accrual Period End Date (or Issue Date) to but excluding the applicable Interest Accrual Period End Date (which is [two] U.S. Government Securities Business Days prior to the Interest Payment Date, except at Maturity or redemption, if applicable). |

[34] This comparison chart assumes the notes will be floating rate notes. Fixed-to-floating rate structures would require further revisions. The number of days for the lookback, observation period shift or payment delay as well as dates are included for illustrative purposes only.

<table>
<tr><th>SOFR Structure:</th><th>Lookback</th><th>Observation Period Shift</th><th>Payment Delay</th></tr>
<tr><td>Weighting[35] of SOFR Observations:</td><td>Rates are weighted based on the day in the Interest Period.[36]</td><td>Rates are weighted based on the day in the Observation Period.[37]</td><td>Rates are weighted based on the day in the Interest Accrual Period.</td></tr>
<tr><td>Interest Payment Dates:</td><td colspan="2">[March 15], [June 15], [September 15], and [December 15] commencing ________ and ending on the Maturity Date or, if applicable, the redemption date.</td><td>The [second] Business Day following each Interest Accrual Period End Date; provided that the Interest Payment Date with respect to the final Interest Period will be the Maturity Date or, if applicable, the redemption date.<br><br>Interest Accrual Period End Dates are [March 15], [June 15], [September 15], and [December 15] commencing ________ and ending on the Maturity Date or, if applicable, the redemption date.</td></tr>
<tr><td>Interest Periods:</td><td colspan="2">Interest Period: From and including the prior Interest Payment Date (or Issue Date) to but excluding the applicable Interest Payment Date.</td><td>Interest Period = Interest Accrual Period: From and including the prior Interest Accrual Period End Date (or Issue Date) to but excluding the applicable Interest Accrual Period End Date (which is two Business Days prior to the Interest Payment Date, except at Maturity or redemption, if applicable).</td></tr>
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[35] The weighting in the compounding formula (“$n_i$”) is intended to account for calendar days on which SOFR is not published.

[36] With this convention, because of the ***lookback***, on each day of the Interest Period one would use the daily SOFR rate from five business days prior (“$SOFR_{i\text{-}5USBD}$”). The weighting of such rate in the compounding formula, however, would be based on the day of application in the Interest Period. On most days, the weighting of a rate will be equal to “1”, but a daily SOFR for a Friday during the Interest Period (that reflects the rate of a prior day because of the lookback) will generally be given the weight of “3” (to account for Saturday and Sunday) and a daily SOFR representing the day before a holiday during the Interest Period will also be given a weight greater than “1.”

[37] With this convention, because the period over which SOFR is observed is ***“backward-shifted”*** and this backward-shift includes both the rate (“$SOFR_i$”) and the weighting of that rate (“$n_i$”), the rate and weighting of such rate in the compounding formula are determined based on the day SOFR represents in the Observation Period rather than the day of the Interest Period. On most days, the weighting of a rate will be equal to “1”, but a daily SOFR that represents a Friday during the Observation Period will generally be given the weight of “3” (to account for Saturday and Sunday) and a daily SOFR representing the day before a holiday during the Observation Period will also be given a weight greater than 1.

| SOFR Structure: | Lookback | Observation Period Shift | Payment Delay |
|---|---|---|---|
| **Business Day Convention:** | Modified Following, Adjusted; provided that the Maturity Date or redemption date, if applicable, would not be adjusted | | Modified Following, Adjusted, including for Maturity Date or redemption date, if any |
| **Business Days:** [38] | Any weekday that is [a U.S. Government Securities Business Day and is] not a legal holiday in New York or [] and is not a date on which banking institutions in those cities are authorized or required by law or regulation to be closed. | | |
| **U.S. Government Securities Business Day:** | Any day except for a Saturday, a Sunday or a day on which the Securities Industry and Financial Markets Association recommends that the fixed income departments of its members be closed for the entire day for purposes of trading in U.S. government securities. | | |
| **Day count convention:** | Actual/360 | | |
| **SOFR:** | With respect to any U.S. Government Securities Business Day, means:<br><br>(1) the Secured Overnight Financing Rate published for such U.S. Government Securities Business Day as such rate appears on the SOFR Administrator's Website at 3:00 p.m. (New York time) on the immediately following U.S. Government Securities Business Day (the **"SOFR Determination Time"**);<br><br>(2) if the rate specified in (1) above does not so appear, the Secured Overnight Financing Rate as published in respect of the first preceding U.S. Government Securities Business Day for which the Secured Overnight Financing Rate was published on the SOFR Administrator's Website;<br><br>where:<br><br>**"SOFR Administrator"** means the Federal Reserve Bank of New York (or a successor administrator of the Secured Overnight Financing Rate); and<br><br>**"SOFR Administrator's Website"** means the website of the Federal Reserve Bank of New York, or any successor source. | | |

[38] For the Observation Period Shift and Payment Delay structures, the definition of "Business Day" does not need to include U.S. Government Securities Business Days so long as the period over which daily SOFR rates are compounded begins and ends on good U.S. Government Securities Business Days (e.g. the "Observation Period" or "Interest Accrual Period").

| SOFR Structure: | Lookback | Observation Period Shift | Payment Delay |
| --- | --- | --- | --- |
| **Compounded SOFR:** | The rate of return of a daily compound interest investment computed in accordance with the following formula (and the resulting percentage will be rounded, if necessary, to the nearest one hundred-thousandth of a percentage point, with 0.000005 being rounded upwards to 0.00001): | | |
| | $\left[\prod_{i=1}^{d_0}\left(1+\frac{SOFR_{i-5USBD}\times n_i}{360}\right)-1\right]\times\frac{360}{d}$<br><br>where:<br><br>“**$d_0$**,” for any Interest Period, is the number of U.S. Government Securities Business Days in the relevant Interest Period;<br><br>“**i**” is a series of whole numbers from one to $d_0$, each representing the relevant U.S. Government Securities Business Days in chronological order from, and including, the first U.S. Government Securities Business Day in the relevant Interest Period;<br><br>“**$SOFR_{i-5USBD}$**,” for any U.S. Government Securities Business Day “i” in the relevant Interest Period, is a reference rate equal to SOFR in respect of the U.S. Government Securities Business Day falling five U.S. Government Securities Business Days prior to that day “i”;<br><br>“**$n_i$**,” for any U.S. Government Securities Business Day “i” in the relevant Interest Period, is the number of calendar days from, and including, such U.S. Government Securities Business Day “i” to, but excluding, the following U.S. Government Securities Business Day (“i + 1”); and<br><br>“**d**” is the number of calendar days in the relevant Interest Period. | $\left[\prod_{i=1}^{d_0}\left(1+\frac{SOFR_i\times n_i}{360}\right)-1\right]\times\frac{360}{d}$<br><br>where:<br><br>“**$d_0$**,” for any Observation Period, is the number of U.S. Government Securities Business Days in the relevant Observation Period;<br><br>“**i**” is a series of whole numbers from one to $d_0$, each representing the relevant U.S. Government Securities Business Days in chronological order from, and including, the first U.S. Government Securities Business Day in the relevant Observation Period;<br><br>“**$SOFR_i$**,” for any U.S. Government Securities Business Day] “i” in the relevant Observation Period, is a reference rate equal to SOFR in respect of that day “i”;<br><br>“**$n_i$**,” for any U.S. Government Securities Business Day “i” in the relevant Observation Period, is the number of calendar days from, and including, such U.S. Government Securities Business Day “i” to, but excluding, the following U.S. Government Securities Business Day (“i + 1”); and<br><br>“**d**” is the number of calendar days in the relevant Observation Period. | $\left[\prod_{i=1}^{d_0}\left(1+\frac{SOFR_i\times n_i}{360}\right)-1\right]\times\frac{360}{d}$<br><br>where:<br><br>“**$d_0$**,” for any Interest Accrual Period, is the number of U.S. Government Securities Business Days in the relevant Interest Accrual Period;<br><br>“**i**” is a series of whole numbers from one to $d_0$, each representing the relevant U.S. Government Securities Business Days in chronological order from, and including, the first U.S. Government Securities Business Day in the relevant Interest Accrual Period;<br><br>“**$SOFR_i$**,” for any U.S. Government Securities Business Day “i” in the relevant Interest Accrual Period, is a reference rate equal to SOFR in respect of that day “i”;<br><br>“**$n_i$**,” for any U.S. Government Securities Business Day “i” in the relevant Interest Accrual Period, is the number of calendar days from, and including, such U.S. Government Securities Business Day “i” to, but excluding, the following U.S. Government Securities Business Day (“i + 1”); and<br><br>“**d**” is the number of calendar days in the relevant Interest Accrual Period. |

## SOFR FRN Fallback Provisions

**Effect of a Benchmark Transition Event:**

If [the issuer, or its designee,][39] determines on or prior to the relevant Reference Time that a Benchmark Transition Event and its related Benchmark Replacement Date have occurred with respect to the then-current Benchmark, the Benchmark Replacement will replace the then-current Benchmark for all purposes relating to the notes in respect of all determinations on such date and for all determinations on all subsequent dates.

In connection with the implementation of a Benchmark Replacement, the issuer or its designee will have the right to make Benchmark Replacement Conforming Changes from time to time.

Any determination, decision or election that may be made by the issuer or the issuer's designee pursuant to this section, including any determination with respect to a tenor, rate or adjustment or of the occurrence or non-occurrence of an event, circumstance or date and any decision to take or refrain from taking any action or any selection:

(1) will be conclusive and binding absent manifest error;

(2) will be made in the sole discretion of the issuer or its designee, as applicable; and

(3) notwithstanding anything to the contrary in the documentation relating to the notes, shall become effective without consent from the holders of the notes or any other party.

**"Benchmark"** means, initially, Compounded SOFR, as such terms are defined above; provided that if the issuer or its designee determines on or prior to the Reference Time that a Benchmark Transition Event and its related Benchmark Replacement Date have occurred with respect to Compounded SOFR (or the published daily SOFR used in the calculation thereof) or the then-current Benchmark, then "Benchmark" means the applicable Benchmark Replacement.

**"Benchmark Replacement"** means [40]the first alternative set forth in the order below that can be determined by the issuer or its designee as of the Benchmark Replacement Date.

(1) the sum of: (a) the alternate rate of interest that has been selected or recommended by the Relevant Governmental Body as the replacement for the then-current Benchmark and (b) the Benchmark Replacement Adjustment;

(2) the sum of: (a) the ISDA Fallback Rate and (b) the Benchmark Replacement Adjustment; or

(3) the sum of: (a) the alternate rate of interest that has been selected by the issuer or its designee as the replacement for the then-current Benchmark giving due consideration to any industry-

[39] Documents may specify which of the issuer or its designee will make various determinations in the fallback language.
[40] Market participants may choose to future-proof fallback language for a Benchmark Replacement that has a term structure. Such changes could also be considered conforming changes (e.g. if Compounded SOFR were to be replaced by a forward-looking term rate, the issuer or its designee would revise the fallback language to include an interpolation step and relevant definitions as well as appropriate references to "Corresponding Tenor.")

accepted rate of interest as a replacement for the then-current Benchmark for U.S. dollar-denominated floating rate notes at such time and (b) the Benchmark Replacement Adjustment.

**"Benchmark Replacement Adjustment"** means the first alternative set forth in the order below that can be determined by the issuer or its designee as of the Benchmark Replacement Date:

(1) the spread adjustment, or method for calculating or determining such spread adjustment, (which may be a positive or negative value or zero) that has been selected or recommended by the Relevant Governmental Body for the applicable Unadjusted Benchmark Replacement;

(2) [if the applicable Unadjusted Benchmark Replacement is equivalent to the ISDA Fallback Rate] the ISDA Fallback Adjustment; or

(3) the spread adjustment (which may be a positive or negative value or zero) that has been selected by the issuer or its designee giving due consideration to any industry-accepted spread adjustment, or method for calculating or determining such spread adjustment, for the replacement of the then-current Benchmark with the applicable Unadjusted Benchmark Replacement for U.S. dollar-denominated floating rate notes at such time.

**"Benchmark Replacement Conforming Changes"** means, with respect to any Benchmark Replacement, any technical, administrative or operational changes (including changes to the timing and frequency of determining rates and making payments of interest, rounding of amounts or tenors, and other administrative matters) that the issuer or its designee decides may be appropriate to reflect the adoption of such Benchmark Replacement in a manner substantially consistent with market practice (or, if the issuer or its designee decides that adoption of any portion of such market practice is not administratively feasible or if the issuer or its designee determine that no market practice for use of the Benchmark Replacement exists, in such other manner as the issuer or its designee determines is reasonably necessary).

**"Benchmark Replacement Date"** means the earliest to occur of the following events with respect to the then-current Benchmark (including the daily published component used in the calculation thereof):

(1) in the case of clause (1) or (2) of the definition of "Benchmark Transition Event," the later of (a) the date of the public statement or publication of information referenced therein and (b) the date on which the administrator of the Benchmark permanently or indefinitely ceases to provide the Benchmark (or such component); or

(2) in the case of clause (3) of the definition of "Benchmark Transition Event," the date of the public statement or publication of information referenced therein.

For the avoidance of doubt, if the event that gives rise to the Benchmark Replacement Date occurs on the same day as, but earlier than, the Reference Time in respect of any determination, the Benchmark Replacement Date will be deemed to have occurred prior to the Reference Time for such determination.

**"Benchmark Transition Event"** means the occurrence of one or more of the following events with respect to the then-current Benchmark (including the daily published component used in the calculation thereof):

(1) a public statement or publication of information by or on behalf of the administrator of the

Benchmark (or such component) announcing that such administrator has ceased or will cease to provide the Benchmark (or such component), permanently or indefinitely, provided that, at the time of such statement or publication, there is no successor administrator that will continue to provide the Benchmark (or such component); or

(2) a public statement or publication of information by the regulatory supervisor for the administrator of the Benchmark (or such component), the central bank for the currency of the Benchmark (or such component), an insolvency official with jurisdiction over the administrator for the Benchmark (or such component), a resolution authority with jurisdiction over the administrator for the Benchmark (or such component) or a court or an entity with similar insolvency or resolution authority over the administrator for the Benchmark, which states that the administrator of the Benchmark (or such component) has ceased or will cease to provide the Benchmark (or such component) permanently or indefinitely, provided that, at the time of such statement or publication, there is no successor administrator that will continue to provide the Benchmark (or such component); or

(3) a public statement or publication of information by the regulatory supervisor forthe administrator of the Benchmark announcing that the Benchmark is no longer representative.

**"ISDA Definitions"** means the 2006 ISDA Definitions published by the International Swaps and Derivatives Association, Inc. or any successor thereto, as amended or supplemented from time to time, or any successor definitional booklet for interest rate derivatives published from time to time.

**"ISDA Fallback Adjustment"** means the spread adjustment (which may be a positive or negative value or zero) that would apply for derivatives transactions referencing the ISDA Definitions to be determined upon the occurrence of an index cessation event with respect to the Benchmark.

**"ISDA Fallback Rate"** means the rate that would apply for derivatives transactions referencing the ISDA Definitions to be effective upon the occurrence of an index cessation date with respect to the Benchmark for the applicable tenor excluding the applicable ISDA Fallback Adjustment.

**"Reference Time"** with respect to any determination of the Benchmark means (1) if the Benchmark is Compounded SOFR, the SOFR Determination Time, and (2) if the Benchmark is not Compounded SOFR, the time determined by the issuer or its designee after giving effect to the Benchmark Replacement Conforming Changes.

**"Relevant Governmental Body"** means the Federal Reserve Board and/or the Federal Reserve Bank of New York, or a committee officially endorsed or convened by the Federal Reserve Board and/or the Federal Reserve Bank of New York or any successor thereto.

**"Unadjusted Benchmark Replacement"** means the Benchmark Replacement excluding the Benchmark Replacement Adjustment.