



Which types of investors would be the primary buyers of Treasury SOFR-indexed FRNs? Would Treasury SOFR-indexed FRNs attract new investor types or additional demand from existing Treasury investors? Assuming the possibility of a 1-year or 2-year maturity, how would the tenor of a Treasury SOFR-indexed FRN affect demand?

Primary buyers would be Treasury and Government/Agency Money Market Funds. Treasury-only funds would potentially be most interested given the fact that Agency funds access to cheaper GSE SOFR FRNs. While there is likely to be some additional demand from current Money Fund treasury investors, this is only to the extent that their WALs can support the longer tenors. We do not expect significant participation from Securities Lenders or Prime Funds given expected pricing levels. Money Funds are likely to have more appetite for the 1yr structure as a result of WAL constraints. Shorter structures might also be attractive, but this would be price dependent.

Please estimate annual demand for Treasury SOFR-indexed FRNs. Would demand be greater for a shorter tenor? How would potential growth in issuance of SOFR-indexed FRNs by other issuers affect long-term demand for Treasury SOFR-indexed FRNs?

Money Funds surveyed identified the 1yr tenor as the most practical maturity of issuance. While there would likely be demand for 2yr, it will be limited by potential WAL constraints. They would also look at shorter tenors, but this would be price dependent. The broader acceptance and growth of issuance in SOFR FRNs is likely to encourage further investor participation. This is especially true with managing any operational nuance associated with the SOFR-indexed calculation. We estimate potential annual demand of \$150-250bn for a 1-year SOFR-linked FRN

Would introducing a Treasury SOFR-indexed FRN help Treasury finance the government at the lowest cost over time? Why or why not?

FRNs allow the US Treasury to diversify its investor base by accessing alternative sources of demand and diversify some of its interest rate exposure (to a secured overnight floating rate). The cost of SOFR-linked FRN debt vs. existing 13-week T-bill FRN security will depend on T-bill/SOFR spreads over time. At the time of writing, 3m implied SOFR is trading approximately 10bp below 3m T-bills implying a potential cost-saving for the US government (not adjusting for liquidity premium). For longer-term debt optimization, we reference the excellent TBAC work where their models highlights a "favorable risk/return tradeoff from reducing the allocation to variable rate debt (bills and FRNs) and increasing the allocation to short/intermediate fixed rate debt". This said, the rise in term premia and record deficit increase since Covid-19 could impact their optimal debt issuance outcomes.

How would you expect a Treasury SOFR-indexed security to price relative to a comparable maturity 13-week T-bill FRN security? How would this pricing vary across the economic cycle and interest rate environments? Please provide pricing estimates.

Using a two-tiered pricing framework similar to TBAC's approach in May 2019, we find (i) Breakeven Rate: Discount Margin on 1-year SOFR Floater around 11bp more than 3-month Bill Floater (using SOFR futures), (ii) Current TF 07/21 (1-year) DM mid around 3bp. Current breakeven for Treasury 1y SOFR FRN: 8 DM (3-11). Note, SOFR-linked valuations are likely to be at the rich end of the range given current crisis conditions of excess liquidity capping repo rates and record T-bill supply weighing on T-bill rates. During a tightening cycle, it is likely cost-effective to issue SOFR Floaters with the auction discount margin likely to be lower than breakeven discount margin (and opposite during easing cycle).

SOFR has risen significantly for certain short time periods, such as around some ends of months, quarters, and years. To what extent would such patterns, if they continue, affect the interest cost for Treasury on a SOFR-indexed FRN, the interest payments of which would be based on a SOFR averaged or compounded rate over a longer interest accrual period? To what extent would investors be willing



<p>to bid lower discount margins at auctions for Treasury SOFR-indexed FRNs in expectation of such patterns continuing? Please elaborate.</p>
<p>Calendar sensitive dealer balance sheet reduction pressures is observable in overnight repo rates at month-end, quarter-end and year-end (with reporting dates used for leverage ratio and GSIB calculations). On average over the past 5 years, SOFR has been higher on the average of the 5 days before and after by 5bp for month-ends, 13bp for quarter-end and 16bp for year-ends. However, averaged across the course of the year this is only worth 0.25-0.5bp of interest cost (TBAC May 2019). Furthermore, banks will shift to daily averaging from 2022 reducing the impact of monthly reporting dates on repo rates, but potentially taking the average level of secured rates higher.</p>
<p>During the global financial crisis, repurchase agreement rates were persistently higher than Treasury bill rates. More recently, during the COVID-19 outbreak, liquidity in Treasury and other markets (including repurchase agreement markets) exhibited signs of stress. How would potential future periods of market stress affect SOFR? In a potential future period of market stress, how might interest costs for Treasury differ between a Treasury SOFR-indexed FRN and the 13-week T-bill FRN? Please elaborate.</p>
<p>Demand for the most liquid risk-free asset such as T-bills spikes during financial crisis and this is unlikely to change. However, this tends to prove temporary subject to the depth of the crisis and ensuing monetary and fiscal response. Furthermore, risk aversion benefits Government bonds (with money market funds benefiting from huge inflows in March and April this year). Any repo stress during the Covid-19 crisis was very limited with a large and rapid Fed reaction including liquidity easing (CB swap lines, OMO), quantitative easing (with mass reserves expansion) and most recently widespread credit easing. The ability and desire of the Federal Reserve to ensure liquidity and police repo rates (SOFR) is critical and has proven to be the case in Q4 19 following September's repo tension and most recently in late March's Covid-19 crisis. Indeed, with low volumes underlying overnight fed funds and the importance of secured rates (repo) to Treasury market functioning and soon cash and derivative market (SOFR swaps), we expect the Fed could ultimately shift its benchmark policy rate from unsecured fed funds to an economically more significant (secured) SOFR rate.</p>
<p>How liquid would Treasury SOFR-indexed FRNs be in secondary markets? Please compare the expected liquidity of Treasury SOFR-indexed FRNs to Treasury bills, the existing 13-week T-bill FRN, and off-the-run short-dated coupons.</p>
<p>We suspect the liquidity in SOFR-linked FRNs would be similar to that of existing 13-week T-bill FRNs. This is much, much lower than either T-bills and coupons bonds, even adjusted for a smaller outstanding amounts, with lower turnover as FRNs more commonly held to maturity to maturity (for tax reasons) and potentially elevated dealer inventory.</p>
<p>What are the primary considerations Treasury should evaluate when structuring a Treasury SOFR-indexed FRN? How would different potential security structures affect investment decisions by market participants, including with respect to activity in derivatives markets?</p>
<p>Maturity, indexation, compounding, interest frequency and payment. We believe best practice in the design of SOFR-linked cash products should facilitate hedging (and asset swap) transactions with derivative market especially as Treasury's SOFR-linked FRN is likely to become a benchmark for other issuers.</p>
<p>Some previously gathered feedback has suggested a 1-year final maturity for original issuance of a Treasury SOFR-indexed FRN. Is this maturity or another maturity preferable for a Treasury SOFR-indexed FRN? Please elaborate.</p>



1y maturity should be favored to capture demand from Government/Agency Money Market funds and reduce risk of cannibalizing existing 2y FRN program. It is worth considering retiring 52 week bill program after current deficit needs are fulfilled (potentially in 2021 or 2022).

Is a quarterly issuance frequency with two reopenings appropriate for a Treasury SOFR-indexed FRN, similar to the existing 13-week T-bill FRN? What factors should Treasury consider in making this decision?

Similar auction structure to existing 2y FRN should be favored: Quarterly issuance with monthly reopenings. Balancing the goal of building liquidity with regular issuance subject to end user demand and dealer appetite to support auctions and facilitate risk transfer in less liquid secondary markets.

When during the month should Treasury auction SOFR-indexed FRNs? When should auctions settle?

Ideally, in the second half of the month (same week as TIPS auction and 20y UST auctions) with end of month settlement date.

Should interest on Treasury SOFR-indexed FRNs be calculated based on a simple average or a compounded average of SOFR? Should Treasury consider indexing the security to an average rate based on SOFR, such as those recently published by FRBNY as administrator for SOFR? If so, what would be the optimal averaging period for a SOFR-indexed FRN?

In the absence of an official 3m term rate, a compounded overnight SOFR rate over 3 Months, in arrears should be favored. This is similar to derivative markets (ISDA fallback outcome) facilitating hedging and liquidity.

What coupon frequency should be used for a Treasury SOFR-indexed FRN? Note that the existing 13-week T-bill FRN pays coupons quarterly. Would a semi-annual, or other coupon frequency be preferred? When during the month should coupon and principal payments be made?

We would suggest quarterly coupon, similar to current FRN (to maximize any possible substitution demand)

Should a Treasury SOFR-indexed FRN incorporate a lockout (i.e., last k rates for an interest period set at SOFR k days before the period ends), a lookback or “lag” (i.e., for every day in the interest period, use SOFR from k days earlier), or a payment delay (i.e., coupon and principal payments made k days after the end of the interest period) in its structure? If so, what values would be appropriate for each attribute?

Please explain relevant considerations for these features.

The ARRC FRN Working Group notes the following considerations regarding a lookback:

- In the previously mentioned survey by The Credit Roundtable, 75% of respondents, who were mostly buy-side FRN market participants, expressed a strong preference for the “lookback with observation period shift” (as described below) over a “payment delay” structure.
- A lookback allows parties additional time to calculate accrued amounts based on the SOFR rate published for a prior day, which is especially beneficial in the event that SOFR is temporarily unavailable or must be revised.
- A structure with a lookback avoids the need for a lockout and therefore avoids the risk of locking the rate on a date when the SOFR rate is unusually volatile.
- The use of a lookback also allows parties to calculate accrued interest for secondary market trades a number of days before settlement (i.e., the day that accrued interest can be calculated depends upon the length of the lookback period)
- Using a lookback that also shifts the SOFR observation period has a number of benefits. With this structure, the period over which SOFR is observed is “backward-shifted” (e.g., with a two-business day shift, the observation period would start and end two U.S. business days prior to interest period start and end dates). The backward-shift applies to both the daily SOFR rates and the weighting of those rates, so the SOFR rate and weighting are determined based on the day of the observation



period rather than the day of the interest period. This ensures the appropriate weighting is assigned to each rate depending on its calendar day.

- Because a lookback with an observation shift uses all SOFR resets (i.e., it is not combined with any lockouts), parties can align FRN interest accruals with uncleared hedges that have established the same SOFR observation period.
- A lookback with a shifted observation period also ensures that the SOFR applied for weekends and holidays is consistent with the repo and swap market.
- In order to utilize the FRBNY published SOFR Index with an FRN that has a lookback, the lookback must be applied with an observation period shift. A lookback without an observation shift cannot use the SOFR Index.
- The ARRC FRN Working Group published sample key terms for an FRN that utilizes the two-business day lookback with observation shift structure within its publication in support of the SOFR Index.[3]

The ARRC FRN Working Group notes the following considerations about a payment delay:

- The standard convention for derivatives referencing SOFR (the OIS convention) is a two-day payment delay, therefore an FRN with a payment day could align with cleared derivatives referencing SOFR, although parties could execute an over-the-counter swap with another convention.
- Accrued interest for secondary market trades with a payment delay cannot be determined prior to settlement. This could be addressed by implementing a separate convention (e.g., a lockout), for secondary trading, however, this would mean that there is a different approach for accrued interest when trading compared to actual accrued interest earned by holding the notes.
- While it could be possible to use the SOFR Index with a payment delay structure, implementation is less straightforward because the last coupon period generally includes a lockout. Interest calculated for a period including a lockout cannot be calculated using the SOFR Index, but instead requires the long-form formula.

In light of FRBNY’s data contingency procedures for the publication of SOFR, what contingency measures should Treasury consider incorporating into the terms of a SOFR-indexed FRN if SOFR, or an average rate based on SOFR, is temporarily unavailable or revised?

The ARRC FRN Working Group notes that generally FRNs provide that if the daily SOFR rate specified does not appear on a temporary basis, the SOFR published in respect of the first preceding day for which the rate was published should be applied. If the SOFR Index is not published on a temporary basis but the daily SOFR overnight rates continue to be published, the ARRC FRN Working Group suggests that the compounding formula be used to calculate the compounded rate over the relevant observation period. The ARRC FRN Working Group also notes the importance of including robust fallback provisions in the event that SOFR is permanently discontinued. An example of such permanent transition fallback provisions for SOFR are set forth in the ARRC FRN Working Group’s publication titled, “Statement on Use of the SOFR Index

If Treasury decides to issue SOFR-indexed FRNs, what, if any, changes should Treasury make to the existing 13-week T-bill FRN issuance program?

We would suggest keeping the existing 2y FRN, with new 1y SOFR linked FRN in order to see the largest increase in monthly issuance.

Should Treasury issue FRNs indexed to both indices, or should Treasury consolidate FRN issuance on a single index?

We would suggest Favor keeping both indices with different maturities to maximize demand (and meet funding needs) at least for the next few years,

If there is not sufficient demand for both Treasury FRNs to coexist, which index would generate the greater long-term demand and better meet Treasury's issuance objectives? Please elaborate.



In the longer-term, a shift towards a shorter SOFR-linked FRN (1y) should benefit from strong demand (money market funds) and potentially lower costs assuming a well behaved secured market (repo) and improved SOFR liquidity over time. In the short-term, achieving required sizes of floating rate debt financing and liquidity levels will be challenging via SOFR-linked FRNs alone.

Should Treasury consider issuing 13-week T-bill FRNs with a 1-year final maturity? How should the decision regarding issuance of Treasury SOFR-indexed FRNs affect this possibility?

We do not believe the Treasury issuing a 13-week T-bill FRNs with a 1-year final maturity is optimal. Diversification of funding (investors, maturity and index) and developing the cash SOFR-linked bond market (with a sovereign reference) have stronger merits in our view. We do not think the market has the capacity or desire for 1y maturity FRNs with different floating rate index references.

What proportion of likely investors is currently operationally ready to purchase Treasury SOFR-indexed FRNs? For those investors that are not ready, what are the main impediments? How much lead time and investment would be required for additional investors to become operationally ready to purchase Treasury SOFR-indexed FRNs? Would any of the security structure choices mentioned in Section 3 above affect the operational readiness of likely investors

The majority of Money Fund investors are already purchasing GSE backed SOFR-indexed FRNs and have the operational plumbing in place. These have mostly been issued paying simple interest.

There may be some system adaptations required by investors if they were to move to a compounded interest calculation. This would be mitigated by appropriate advance notification by the US Treasury, of the compounding calculation convention that will be adopted, to allow for proper IT developments to be made.

To what extent would Treasury's issuance of SOFR-indexed FRNs advance the overall market transition away from U.S. dollar LIBOR? How would different market segments (e.g., FRNs, derivatives, business loans, consumer products) be affected by Treasury's decision to issue SOFR-indexed FRNs? What effect would Treasury's issuance of SOFR-indexed FRNs have on the overall market transition away from LIBOR beyond that caused by current issuance of SOFR-indexed FRNs by other issuers? Please provide specific details of the cause and effect relationships you expect.

A Treasury SOFR-indexed FRN could set a positive example for others to follow suit and reinforce the message that LIBOR is ending. Market participants have expressed a desire for standard structures to support a deeper market and to avoid multiple system enhancements. The FRN market may look to this Treasury issuance as an example, and it could therefore help create consensus around the appropriate structure that should be used for future SOFR FRN issuance. Nevertheless, even if the Treasury does not begin issuing SOFR linked notes at this time, we believe that the market for SOFR-linked FRNs will continue to develop as we move closer to the cessation of LIBOR and as market participants develop the necessary system enhancements.

A Treasury SOFR-linked FRN is an opportunity to fertilize the SOFR ecosystem with additional liquidity, advancing the development of a market convention.