SOFR

4-Letter Word with an “F”?

Originally pinned with the acronym, “BTFR”, but the Fed changed it, in fear that it would be nicknamed “ButtFur” – or, worse… (hint: Broad Treasury Funding Rate)

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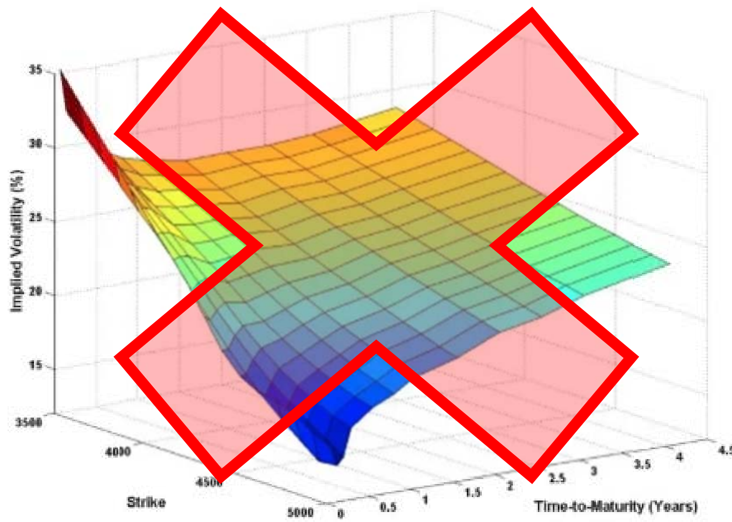
John Coleman - The Fixed Income Group at R.J. O’Brien

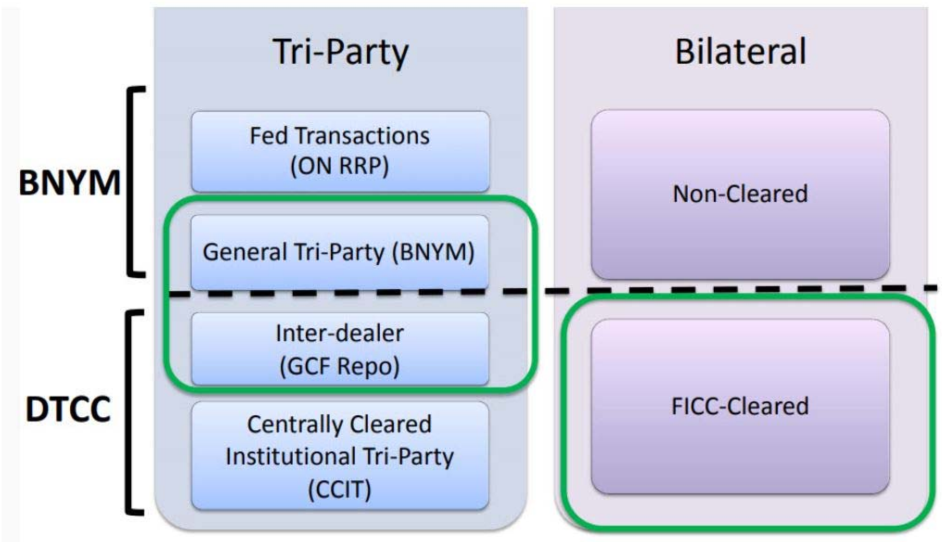
February 2020

<700 Days til LIBOR is HISTORY:
“I Trade Mortgages! Why Do I Care?”

- OAS– no idea. Can’t be calculated with no SOFR Option Vol Surface
- Overtly Impacted: Resi ARMs, CLOs, Spread Levels for DUS, Freddie K, GPLs, etc. etc. etc.
- “Waste No Crisis!” Opportunity for those who are ready



“Dude, You Showed Us This Slide Last Year!” Uh, Yeah, SOFR is Still Just Treasury G/C Repo Repackaged



Source: FRBNY

A Hybrid of ‘G/C’ ‘O/N’ Rates

- Overnight Treasury G/C Rate

- BoNY Triparty Repo
- GCF/DTCC Repo
- FICC-Cleared Bilateral Repo

“All transactions with rates below the 25th volume-weighted percentile rate within this data set will be removed, to reduce the impact of specials …” FRBNY

SOFR pub time: (approx.): 8:30 a.m. ET based on the PRIOR day’s trading activity

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SOFR Is NOT Going Away– LIBOR Is: SOFR Term Rates (EDSF<Go>) & Futures Execution (EMSX)

Bloomberg's EDSF Screen

3-Month SOFR Future | Export To Excel | Settings

Delayed 02/03/2020 | Adjust | Mean Rev. 0.030 | Rate

	Start Date	Days	Ticker	Last		Rate	6 Mo	1 Yr	2 Yr
10)	02/05/2020	42	SFRZ9	98.4350	y	1.5650	1.480	1.354	1.209
11)	03/18/2020	91	SFRH0	98.5000		1.5000	1.433	1.301	1.177
12)	06/17/2020	91	SFRM0	98.6400		1.3600	1.292	1.188	1.116
13)	09/16/2020	91	SFRU0	98.7800	y	1.2200	1.162	1.103	1.075
14)	12/16/2020	91	SFRZ0	98.9000	y	1.1000	1.076	1.049	1.054
15)	03/17/2021	91	SFRH1	98.9500	y	1.0500	1.039	1.025	1.050
16)	06/16/2021	91	SFRM1	98.9750	y	1.0250	1.016	1.018	1.053
17)	09/15/2021	91	SFRU1	98.9950	y	1.0050	1.006	1.022	1.060
18)	12/15/2021	91	SFRZ1	98.9950	y	1.0050	1.014	1.034	1.070

SOFR Futures Now Exceed $1 Trillion

SOFR FUTURES

1mo SOFR: $855 Billion Open

Description	Bid	Ask	Open Int
1) Spot	1.580	1.580	
2) Feb20	98.412	98.415	59997
3) Mar20	98.440	98.445	38407
4) Apr20	98.465	98.475	25720
5) May20	98.525	98.535	28590
6) Jun20	98.570	98.580	15339
7) Jul20	98.605	98.620	2970
8) Aug20	98.660	98.675	779
9) Sep20	98.685	98.725	
10) Oct20	98.740	98.765	100

3mo SOFR: $153 Billion Open

Description	Bid	Ask	Open Int
1) Spot	1.5800	1.5800	
2) Dec19	98.4325	98.4500	59523
3) Mar20	98.5050	98.5100	34880
4) Jun20	98.6350	98.6450	22313
5) Sep20	98.7700	98.7800	12699
6) Dec20	98.8900	98.9000	14849
7) Mar21	98.9350	98.9400	3140
8) Jun21	98.9600	98.9700	3428
9) Sep21	98.9800	98.9900	1686
10) Dec21	98.9750	98.9900	1151

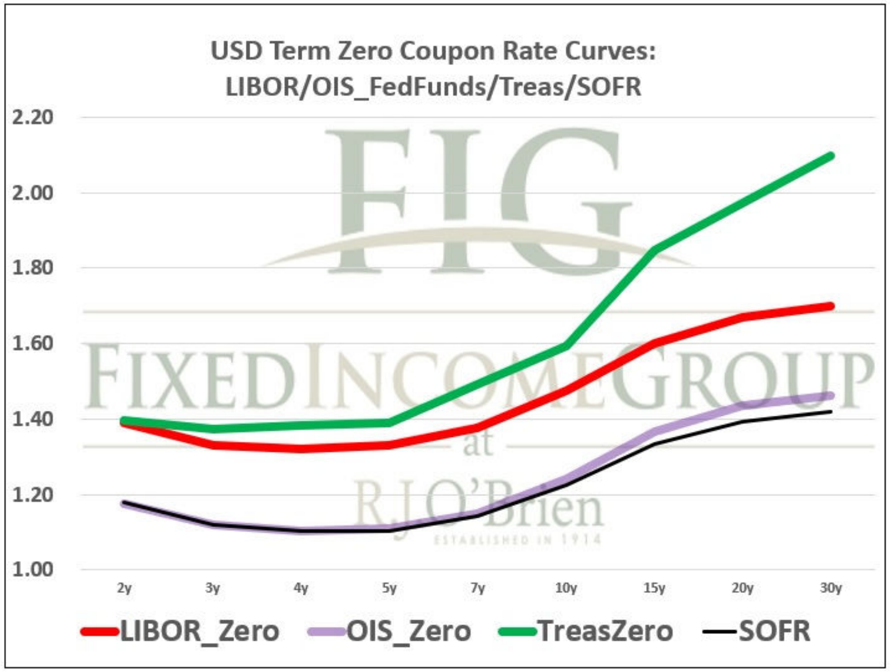
To SEE the SOFR Curve: Annualize LIBOR Swaps, Convert Via OIS Basis Swap, & Then Convert Via OIS:SOFR Basis Swap

Nobody is watching SOFR yet
(cuz it's a nightmare to calc):

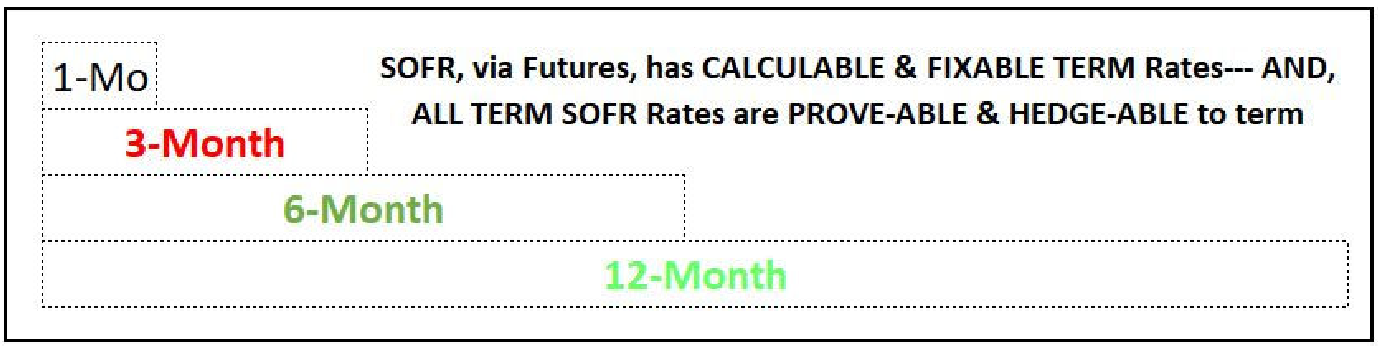
100*(100*(-LIswap/100+(((1+((1+((((1+LIswap/100*(360/365)/2)^(2/4)-1)*4)-LI_OISbasis/10000)/4)^4-1)/360)^90-1)*4)))-OIS_SOFRbasis

<u>Things to know (probably):</u>

- Rather SHORT SOFR than Treas
  - Less Curve Roll Up for SOFR
  - Less Carry (more neg carry) for SOFR
- Rather be LONG Treas than SOFR
  - For hedging IO or MSR



LIBOR (TERM: Visible but Questionable) vs. SOFR (TERM: Calculable & Prove-able)



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The Next Birthplace of Scandals & Frustration: LIBOR's Un-Hedge-Able TERM RATE Accuracy

3mo SOFR TERM Rate (Jun'19 IMM) Settled 4.83 basis points BELOW REALIZED 3mo Rate (HEDGE-able)	
SOFR Futures ANTICIPATED 3mo TERM RATE	
SRLM9 3mo Futures Price (6/18/19):	97.72
SRLM9 Anticipated 3mo SOFR Rate:	2.28000%
REALIZED 3mo TERM SOFR RATE:	
SRLM9 3mo Futures Final Settle (9/18/20):	97.67175
Annualized Rate Equiv:	2.32825%
Product of 91 indiv SOFR 1d Rets:	1.0058853

3mo LIBOR TERM Rate (Jun'19 IMM) Settled 19.38 basis points ABOVE REALIZED 3mo Rate (unhedge-able)	
LIBOR Futures ANTICIPATED 3mo TERM RATE	
EDM9 3mo Futures Price (6/18/19):	97.5815
EDM9 Anticipated 3mo LIBOR Rate:	2.41850%
REALIZED 3mo TERM LIBOR RATE:	
3mo LIBOR Future Settles/no accrual	n/a
Annualized Rate Equiv:	2.22471%
Product of 91 indiv LIBOR 1d Rets:	1.0056236

Day		Date	SOFRrate	1day Return	O/N LIBOR	1day Ret
1	Weds	6/19/2019	0.0236	1.0000656	0.0234088	1.000065
2	Thurs	6/20/2019	0.0236	1.0000656	0.023415	1.000065
3	Fri	6/21/2019	0.0237	1.0000658	0.023475	1.0000652
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
87	Fri	9/13/2019	0.022	1.0000611	0.0209475	1.0000582
88	Sat	9/14/2019	0.022	1.0000611	0.0209475	1.0000582
89	Sun	9/15/2019	0.022	1.0000611	0.0209475	1.0000582
90	Mon	9/16/2019	0.0243	1.0000675	0.0211163	1.0000587
91	Tues	9/17/2019	0.0525	1.0001458	0.0215488	1.0000599

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Does SOFR "Work"? Swap Short-Maturity Fannie Mae Floaters to Fixed – OR – Fixed into Floaters (FNMA Descrip: Bloomberg)

FNMA Float 10/30/20 $↑100.017 +.001 100.012 / 100.022 1.599 / 1.586
At 0:00 --x-- Source BVAL
FNMA Float 10/30/20 Corp | Settings | Actions | Page 1/12 Security Description: Bond
94) Notes | 95) Buy | 96) Sell
25) Bond Description | 26) Issuer Description

Pages	Issuer Information				Identifiers	
11) Bond Info	Name	FANNIE MAE			ID Number	ZS4078946
12) Addtl Info	Industry	Government Owned, No Guarantee (BCL/			CUSIP	3135G0V67
13) Reg/Tax	Security Information				ISIN	US3135G0V670
14) Covenants	Mkt Iss	Global			Bond Ratings	
15) Guarantors	Country	US	Currency	USD	Moody's	Aaa
16) Bond Ratings	Rank	Unsecured	Series		S&P	AA+
17) Identifiers	Coupon		Type	Floating	Fitch	AAA
18) Exchanges	Formula	O/N SOFR +7.5000			Composite	AA+
19) Inv Parties						
20) Fees, Restrict						

BUY SOFR FUTURES to FIX the Rate on Fannie Floater

Term SOFR from 1-day Futures Returns

1.57757%	**1.58435%**	**1.55959%**	**1.51941%**	**1.48271%**	**1.42060%**	**1.38625%**
1.0013585	1.0040049	1.00788457	1.011902043	1.0150742	1.0215853	1.0281486
1mo	3mo	6mo	**FNMA Maturty**	12mo	18mo	24mo
1/23/2020	1/23/2020	1/23/2020	**1/23/2020**	1/23/2020	1/23/2020	1/23/2020
2/22/2020	4/22/2020	7/22/2020	**10/30/2020**	1/22/2021	7/22/2021	1/22/2022
31	91	182	282	366	547	731

FNMA 2 7/8 10/30/20 $↓100.958 -.012 100.935 / 100.980 1.641 / 1.582
At 0:00 --x-- Source BVAL
FNMA 2 7/8 10/30/20 Corp | Settings | Actions | Page 1/12 Security Description: Bor
94) Notes | 95) Buy | 96) Sell
25) Bond Description | 26) Issuer Description

Pages	Issuer Information				Identifiers	
11) Bond Info	Name	FANNIE MAE			ID Number	AV3342087
12) Addtl Info	Industry	Government Owned, No Guarantee (BCLA			CUSIP	3135G0U84
13) Reg/Tax	Security Information				ISIN	US3135G0U847
14) Covenants	Mkt Iss	Global			Bond Ratings	
15) Guarantors	Country	US	Currency	USD	Moody's	Aaa
16) Bond Ratings	Rank	Unsecured	Series		S&P	AA+
17) Identifiers	Coupon	2.875000	Type	Fixed	Fitch	AAA
18) Exchanges	Cpn Freq	S/A			Composite	AA+
19) Inv Parties						
20) Fees, Restrict						

SELL SOFR FUTURES to Swap FN Fixed Rate to Floating

Term SOFR from 1-day Futures Returns

1.57757%	**1.58435%**	**1.55959%**	**1.51941%**	**1.48271%**	**1.42060%**	**1.38625%**
1.0013585	1.0040049	1.00788457	1.011902043	1.0150742	1.0215853	1.0281486
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1/23/2020	1/23/2020	1/23/2020	**1/23/2020**	1/23/2020	1/23/2020	1/23/2020
2/22/2020	4/22/2020	7/22/2020	**10/30/2020**	1/22/2021	7/22/2021	1/22/2022
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EITHER WAY, FANNIE trades +7.5 bps to SOFR out to 10/30/20– No Arbitrage (unlike last year)!

Bloomberg BVAL STILL Doesn't Calculate SOFR Correctly Past About a Year. FHLB Float 3/12/21

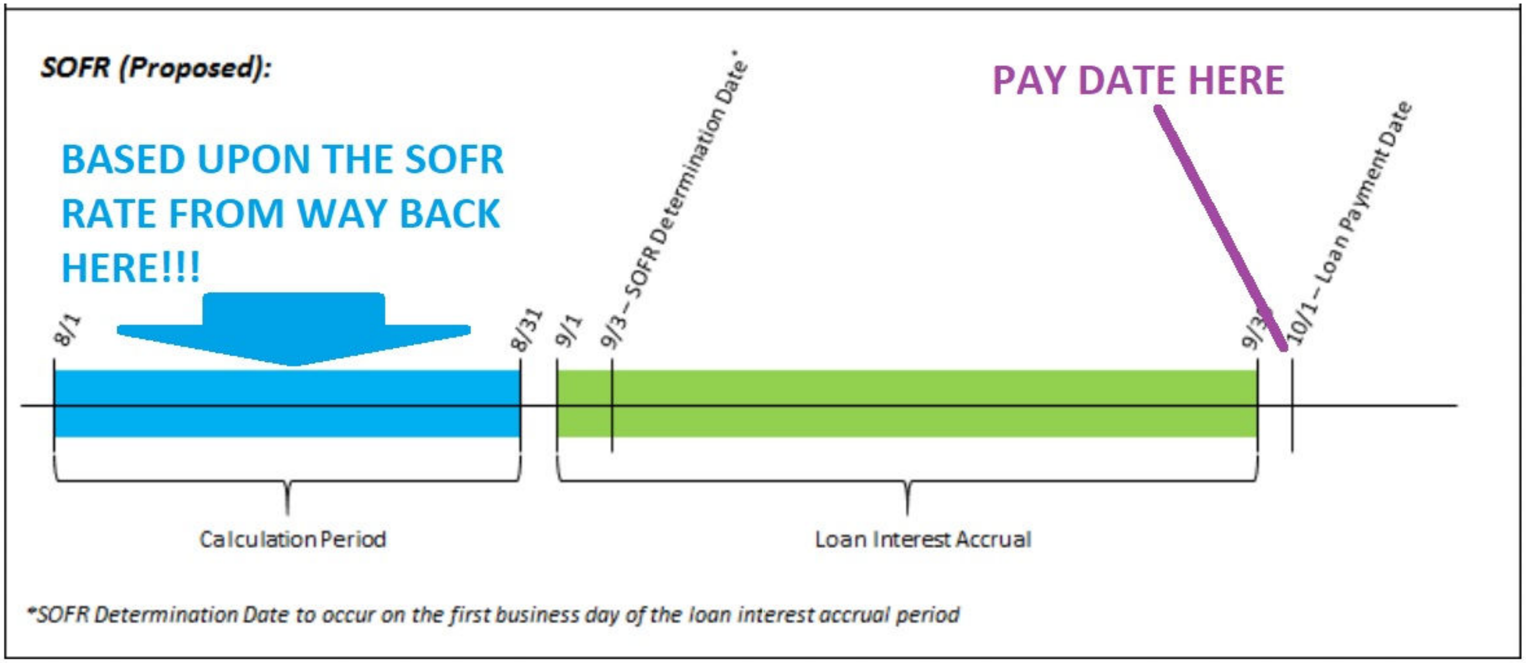
Term SOFR from 1-day Returns

1.59046%	1.57557%	1.51966%	1.46345%	1.40388%	1.38207%	[illegible]
1.0012812	1.0039389	1.00768271	1.011138501	1.0142727	1.0155099	1.0255129
1mo	3mo	6mo	9mo	12mo	FHLB	24mo
2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020
3/2/2020	5/2/2020	8/2/2020	11/2/2020	2/2/2021	3/12/2021	2/2/2022
29	90	182	274	366	404	731

SOFR Fixed to 3/12/21 @ 1.382%
Floater Coupon SOFR + 11.5
→ Yield 1.497%
→ Eh, not 1.67% ~ish

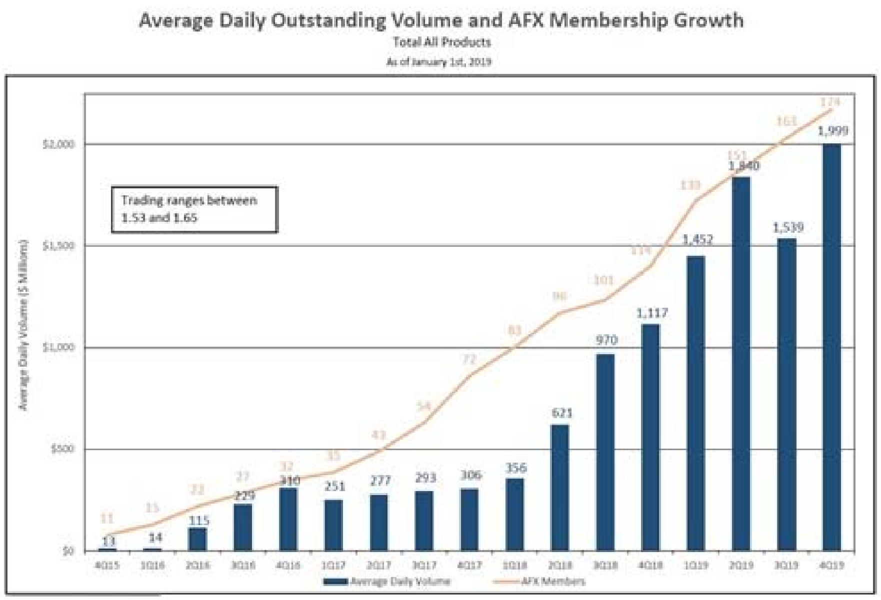
FHLB Identical-Maturity FIXED Security @ 1.423%
→ Fixed a bit RICH to Swapped SOFR Floater

Freddie K-F73 – SOFR FLOATER–
Goofy Structure Indicative of Challenges

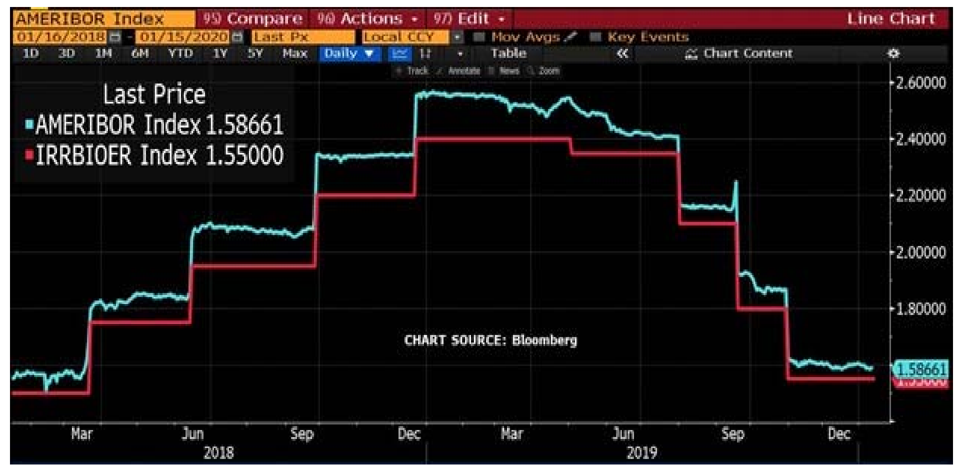


Will Trade Like a 1mo-Fixed into Forward Floater (adds price vol)

Growing AMERIBOR: Trades $2bb per Day. Shrinking LIBOR: Trades $500mm per Day.



AMERIBOR (Green) versus IOER (Red)



Transaction Records
Daily: $3.04 bln
Weekly: $13.02 bln
Monthly: $46.70 bln

*In addition to the 174 AFX Members, there are more than 1,000 downstream banks through AFX's correspondent bank lending program.

The American Financial Exchange opened on December 11, 2015

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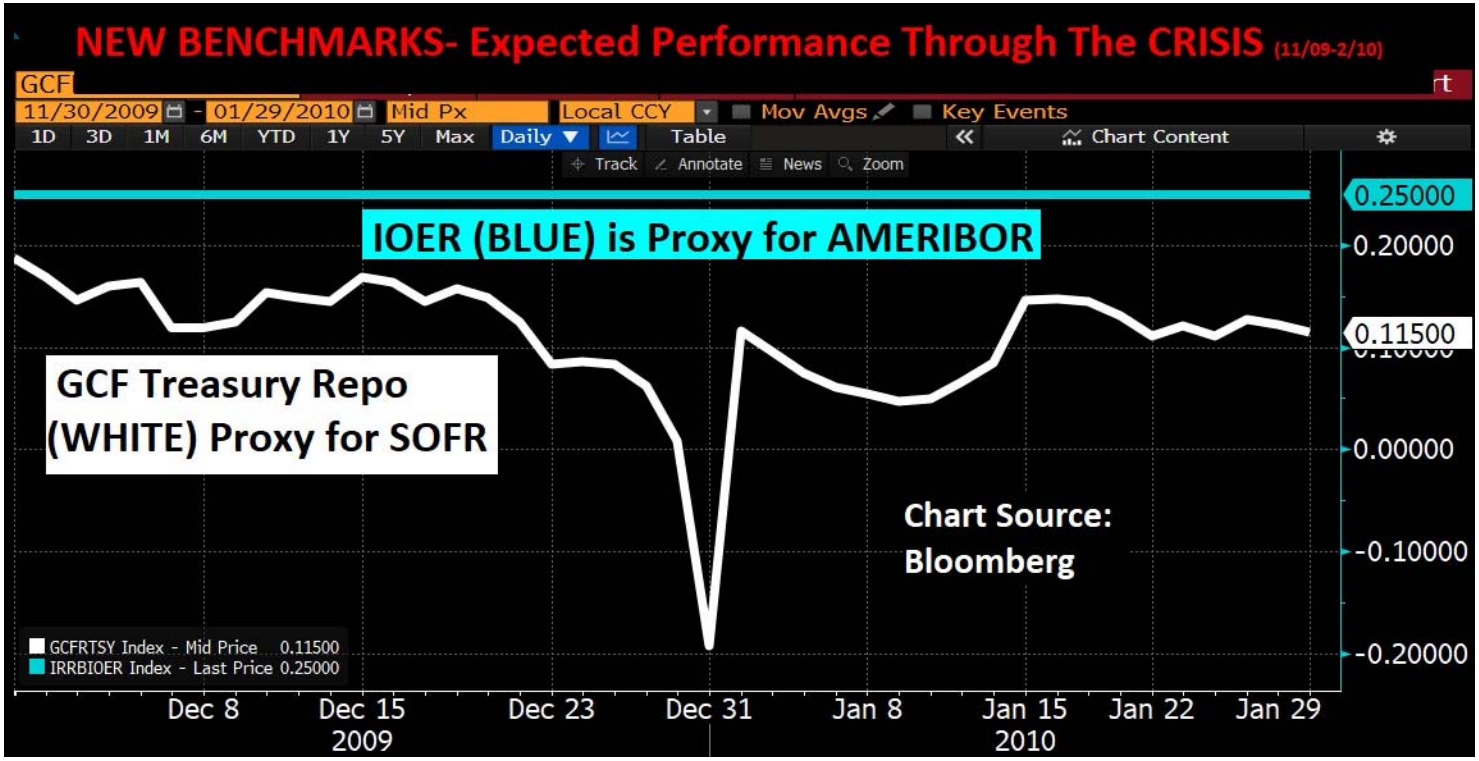
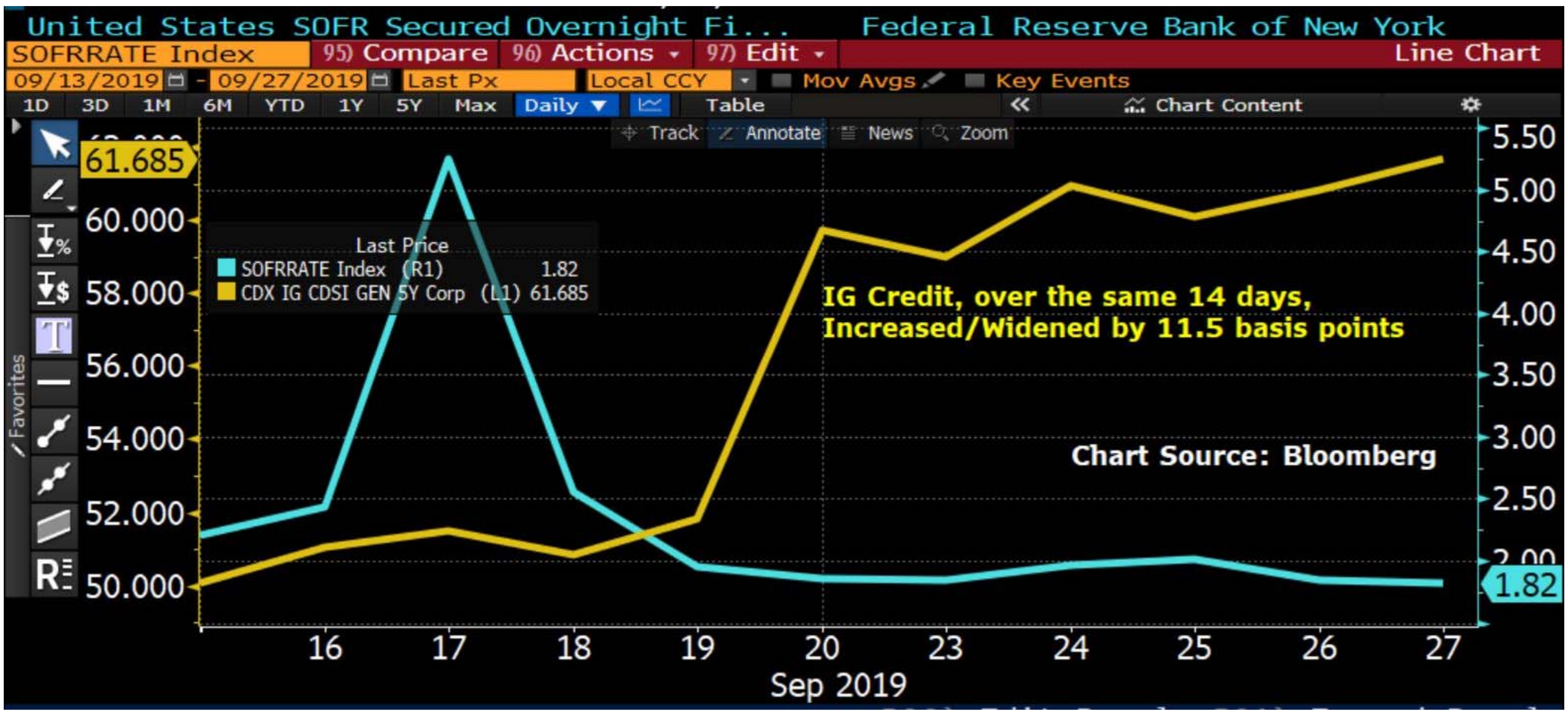
AMERIBOR May Be Best Choice For CLO Benchmark Replacement

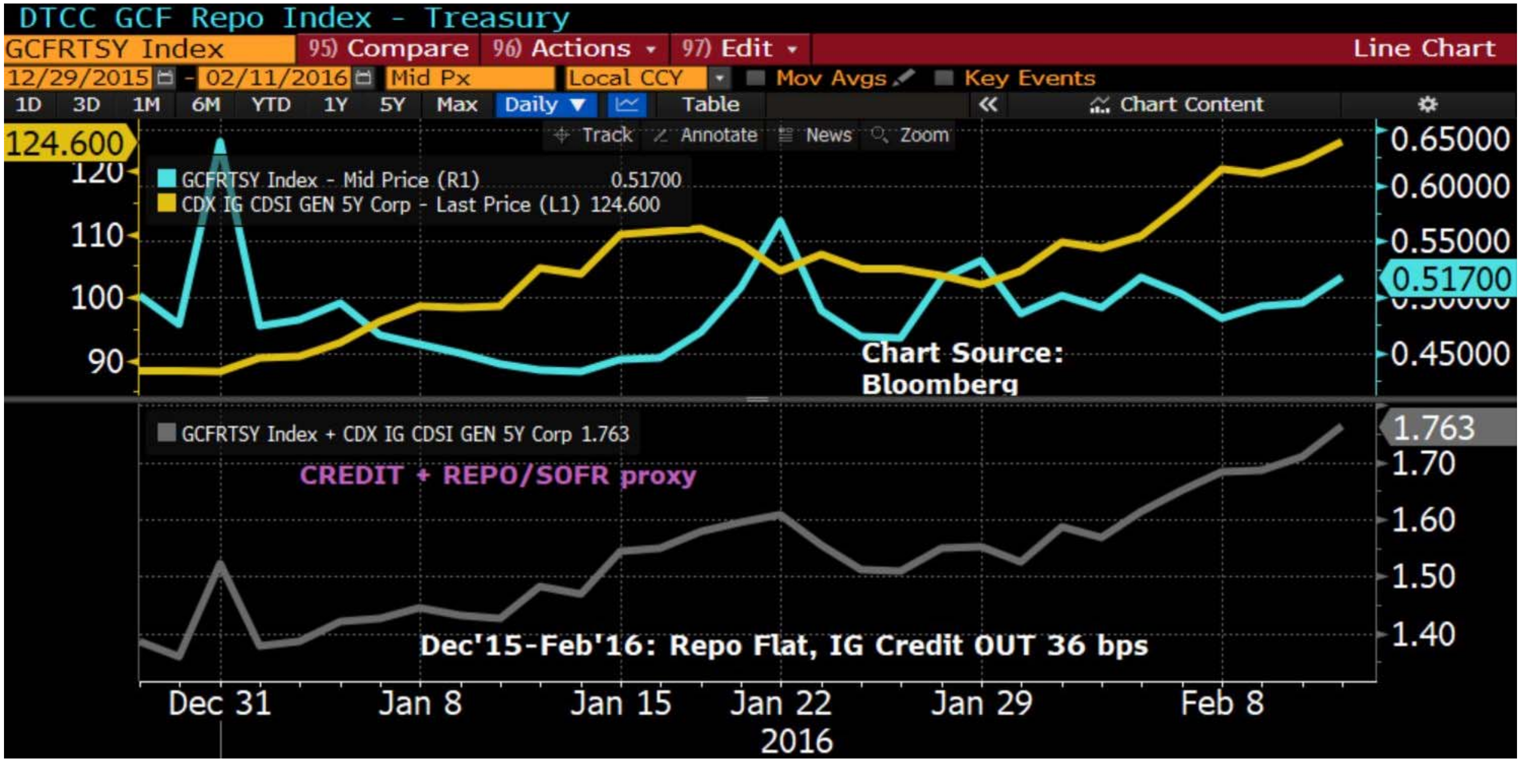


SOFR is U.S Govt Credit. In Stress, **SOFR Rates *DECLINE*** While **Rates & Risk** to Lenders/Security-Holders *INCREASE*

(Bogus scaling due to SOFR spike on 9/17/19)



In Extreme Duress, CREDIT often Eclipses Rate



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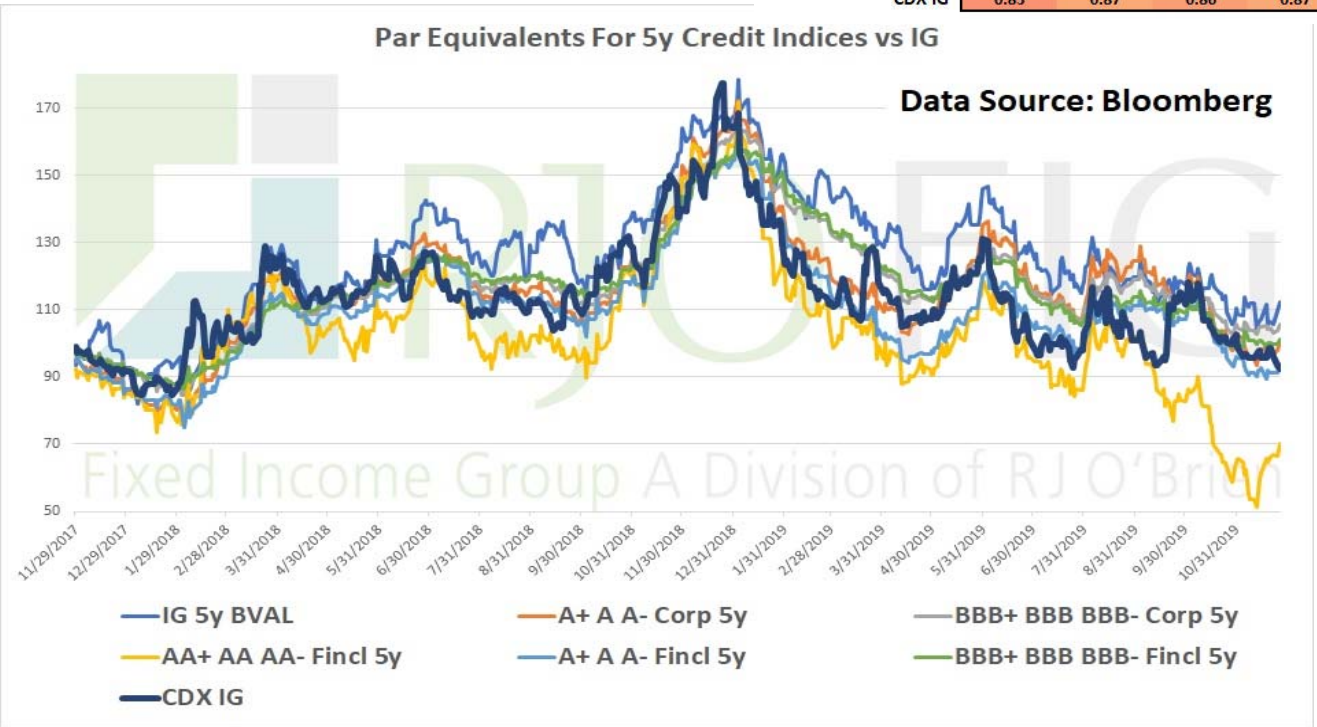
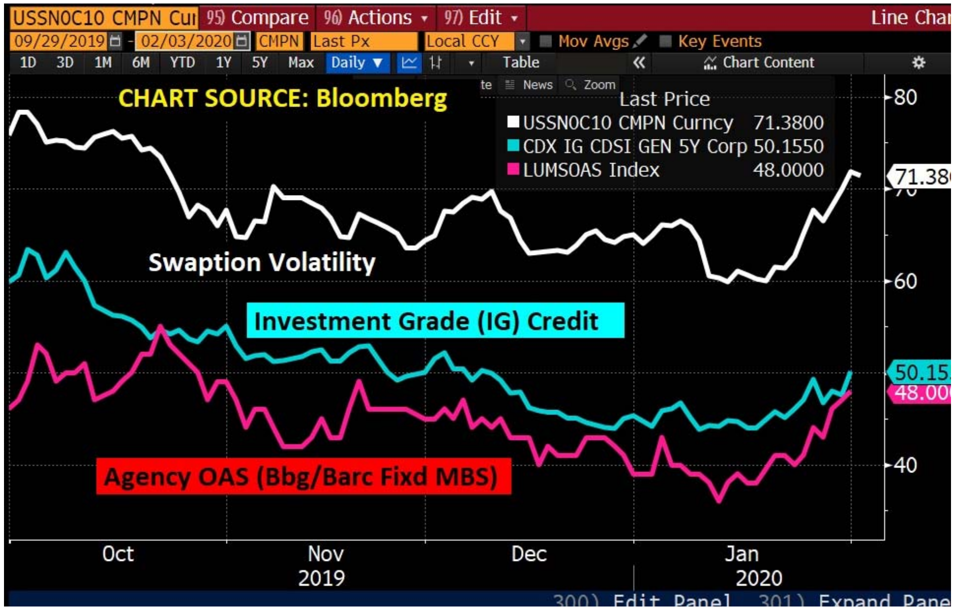
IG Credit, Across Credit Slices, Is HIGHLY Correlated

Correlations between ALL selected credit indices are meaningful.

	IG 5y BVAL	A+ A A- Corp 5y	BBB+ BBB BBB- Corp	AA+ AA AA- Fincl	A+ A A- Fincl 5y	BBB+ BBB BBB- Fincl	CDX IG
IG 5y BVAL	1.00	0.93	0.97	0.81	0.92	0.96	0.85
A+ A A- Corp 5y	0.93	1.00	0.96	0.86	0.98	0.93	0.87
BBB+ BBB BBB- Corp 5y	0.97	0.96	1.00	0.81	0.96	0.99	0.86
AA+ AA AA- Fincl 5y	0.81	0.86	0.81	1.00	0.88	0.81	0.87
A+ A A- Fincl 5y	0.92	0.98	0.96	0.88	1.00	0.94	0.89
BBB+ BBB BBB- Fincl 5y	0.96	0.93	0.99	0.81	0.94	1.00	0.85
CDX IG	0.85	0.87	0.86	0.87	0.89	0.85	1.00



WHY IG Credit Vs Mortgage Risk?
Think: “Credit-Less Benchmark” Needs It Added



- Resi Mortgage OAS Influencers:
  - Credit
  - Volatility
- Since SOFR is Treasury Credit and Ameribor is Fed-Wrapped Bank Credit, non-bank warehouse lines will adjust to:

  {Benchmark} + {Credit} + X
- Any Institution Can TRADE IG Credit as a Futures Contract

Whether SOFR, AMERIBOR or Treasury— CREDIT Must Be Monitored & Traded A La Carte

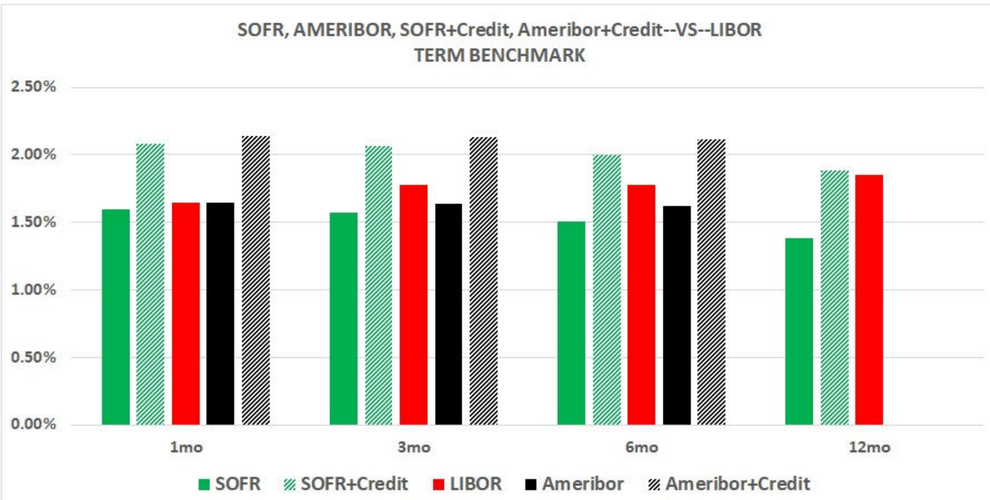
SPOT TERM Rates Forward

	1mo	3mo	6mo	12mo
SOFR	1.5916%	1.5737%	1.5054%	1.3850%
SOFR+Credit	2.0817%	2.0662%	2.0000%	1.8832%
LIBOR	1.6453%	1.7771%	1.7793%	1.8471%
Ameribor	1.6445%	1.6364%	1.6192%	
Ameribor+Credit	2.1352%	2.1287%	2.1137%	

Funding Spread Equivalents to LIBOR+100bps:

	1mo	3mo	6mo	12mo
LIBOR+100	2.64525%	2.77713%	2.77925%	2.84713%
SOFR+Credit	+0.56357%	+0.71095%	+0.77921%	+0.96397%
Ameribor+Credit	+0.51004%	+0.64844%	+0.6655%	

2/3/2020 15:48



Term SOFR from 1-day Returns

1.59164%	1.57373%	1.50543%	1.44546%	1.38497%	1.36303%	1.23592%
1.0012822	1.0039343	1.00761081	1.01100153	1.014081	1.015296	1.025096
1mo	3mo	6mo	9mo	12mo	FHLB	24mo
2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020
3/2/2020	5/2/2020	8/2/2020	11/2/2020	2/2/2021	########	2/2/2022
29	90	182	274	366	404	731

Term SOFR+Credit from 1-day Returns

2.08168%	2.06618%	2.00004%	1.94192%	1.88316%	1.79506%	1.74061%
1.0016769	1.0051655	1.01011129	1.0147802	1.019145	1.027275	1.035344
1mo	3mo	6mo	9mo	12mo	18mo	24mo
2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020
3/2/2020	5/2/2020	8/2/2020	11/2/2020	2/2/2021	8/2/2021	2/2/2022
29	90	182	274	366	547	731

Term AMERIBOR from 1-day Returns

1.64451%	1.63644%	1.61918%	1.58258%			
1.0013247	1.0040911	1.00818587	1.0120452			
1mo	3mo	6mo	9mo			
1/31/2020	1/31/2020	1/31/2020	1/31/2020			
2/28/2020	4/29/2020	7/30/2020	10/30/2020			
29	90	182	274			

Term AMERIBOR+Credit from 1-day Returns

2.13521%	2.12869%	2.11375%	2.07935%			
1.00172	1.0053217	1.01068616	1.01582614			
1mo	3mo	6mo	9mo			
1/31/2020	1/31/2020	1/31/2020	1/31/2020			
2/28/2020	4/29/2020	7/30/2020	10/30/2020			
29	90	182	274			

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