

US Interest Rate Derivatives Analytics Package

For Business: September 16, 2024

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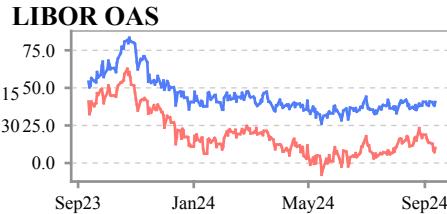
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Derivatives Strategy

Cross Market Asset Swap Report

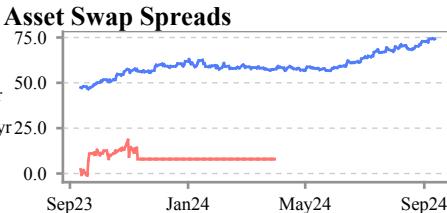
MBS Passthroughs

Mat	Lib OAS	High	Low	Avg	Z
FN 30	40.6	83.3	26.3	44.2	-0.3
GN 30	78.1	165.0	56.3	79.3	-0.1
FN 15	10.0	62.6	-7.7	18.3	-0.6
GN 10	46.5	85.0	18.7	47.3	-0.1



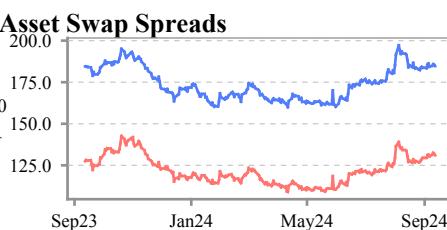
Agency Bullet Benchmarks

Mat	ASP	High	Low	Avg	Z
2.0	-16.5	-16.2	-24.1	-19.5	-0.3
5.0	7.9	18.5	7.9	12.2	0.4
10.0	49.6	49.7	35.4	40.9	2.8
30.0	74.2	74.4	50.0	60.4	2.6



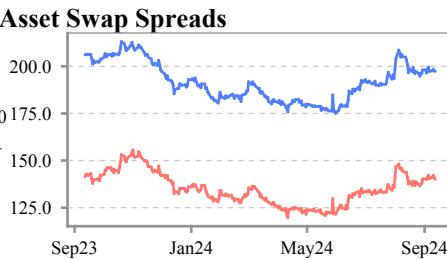
Industrial A

Mat	ASP	High	Low	Avg	Z
1-3	67.6	73.6	43.4	58.4	1.2
3-5	95.0	105.8	71.3	86.6	0.9
5-7	109.4	131.0	90.9	105.2	0.4
7-10	131.0	142.7	109.0	121.7	1.1
10+	184.7	197.2	160.0	173.6	1.1



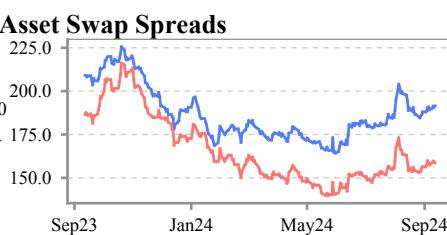
Utilities

Mat	ASP	High	Low	Avg	Z
1-3	74.8	84.7	54.2	69.9	0.6
3-5	97.5	115.3	80.1	95.3	0.2
5-7	118.3	146.9	102.5	118.8	0.0
7-10	140.1	155.5	119.8	134.8	0.6
10+	197.4	213.0	175.1	191.0	0.6



Financials

Mat	ASP	High	Low	Avg	Z
1-3	94.4	139.7	73.5	97.3	-0.2
3-5	123.2	181.4	103.3	129.5	-0.3
5-7	143.7	198.8	124.6	149.5	-0.3
7-10	158.6	216.1	139.7	165.0	-0.3
10+	191.6	225.6	164.3	185.8	0.4



1.The High, Low, Average and Z-Scores are based on 1 Year history of historical data.

2.ASP on Agencies refers to the matched-maturity swap spreads of benchmarks.

3.Libor OAS refers to OAS to Libor Curve. ASP refers to Asset Swap Spread

4.We use the interpolated swap spreads and last valid data for corporates.

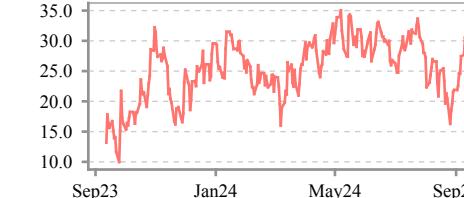
Industrials BBB (ex-auto)

Mat	ASP	High	Low	Avg	Z
1-3	88.9	125.5	71.8	90.6	-0.1
3-5	107.3	149.9	89.6	109.9	-0.2
5-7	118.4	169.5	104.3	124.0	-0.3
7-10	133.2	180.7	117.4	136.7	-0.2
10+	149.2	175.2	131.3	145.2	0.3

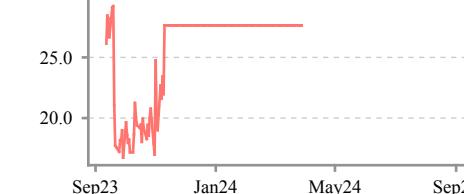
Asset Swap Spread



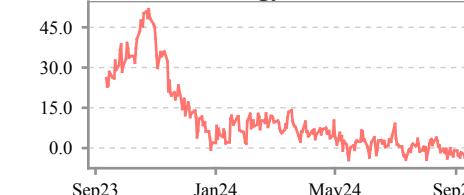
MBS: 30Yr - 15Yr



Agency: 10Yr - 5Yr



30Yr MBS - 10Yr Agy



7-10Yr A Ind - 7-10Yr A Fin



Industrial 7-10Yr: BBB - A (ex-auto)



7-10Yr A Industrial - 30Yr MBS



7-10Yr A Fin - 10Yr Agy



Derivatives Strategy

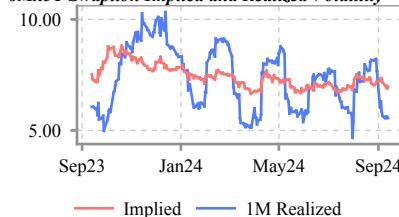
Cross Market Volatility Report

Short Dated Swaptions

Implied (bps/day)

Mat/Und	Current	6M					Realized Vol	
		Chg	Min	Avg	Max	1M	3M	
3Mx1Y	7.87	1.49	4.79	6.01	8.48	7.68	7.85	
3Mx2Y	8.09	0.75	6.38	7.23	8.72	7.23	7.41	
6Mx1Y	7.72	0.62	6.31	6.89	8.20	8.10	8.23	
6Mx2Y	7.70	0.21	6.88	7.41	8.19	7.24	7.49	
6Mx5Y	6.97	-0.18	6.66	7.07	7.69	5.56	6.29	
6Mx7Y	6.69	-0.17	6.41	6.82	7.40	5.09	6.01	
6Mx10Y	6.29	-0.17	6.06	6.47	7.01	4.71	5.78	
6Mx30Y	5.68	0.01	5.37	5.80	6.28	4.14	5.41	

6Mx5Y Swaption Implied and Realized Volatility

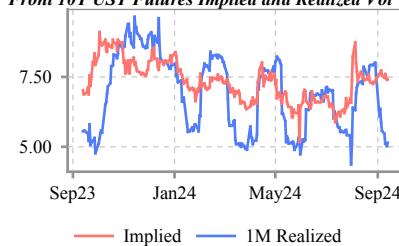


Exchange Traded Options

Implied (bps/day)

Mat/Und	Current	6M					Realized Vol	
		Chg	Min	Avg	Max	1M	3M	
Front TU	8.8	1.4	6.0	7.4	11.4	6.4	7.0	
Front FV	7.00	-0.50	6.35	7.52	9.92	5.70	6.41	
Front TY	7.41	0.51	5.17	6.91	8.73	5.14	6.06	
Front TN	6.4	0.0	5.5	6.3	7.9	4.8	5.8	
Front US	6.74	0.68	5.45	6.36	7.83	4.47	5.77	
Front WN	5.99		4.82	5.61	6.82	4.10	5.55	

Front 10Y UST Futures Implied and Realized Vol

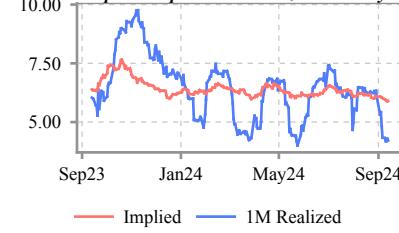


Long Dated Swaptions

Implied (bps/day)

Mat/Und	Current	6M					Realized Vol	
		Chg	Min	Avg	Max	1M	3M	
2Yx2Y	6.85	-0.76	6.82	7.27	7.81	5.28	6.18	
2Yx5Y	6.43	-0.62	6.40	6.82	7.33	4.63	5.86	
5Yx5Y	5.93	-0.44	5.93	6.28	6.60	4.23	5.67	
1Yx10Y	6.19	-0.51	6.14	6.49	7.02	4.56	5.76	
2Yx10Y	6.04	-0.54	6.02	6.38	6.85	4.31	5.66	
3Yx10Y	5.90	-0.47	5.88	6.23	6.65	4.21	5.63	
5Yx10Y	5.68	-0.30	5.68	5.96	6.27	4.14	5.60	
10Yx10Y	5.08	-0.01	4.96	5.22	5.38	4.05	5.49	

3Yx10Y Swaption Implied and Realized Volatility

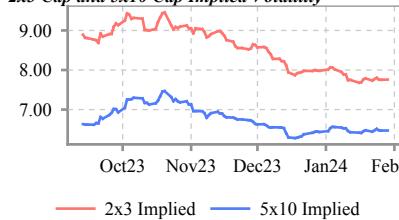


SOFR Cap Volatility

Implied (bps/day)

Mat/Und	Current	6M					Realized Vol	
		Chg	Min	Avg	Max	1M	3M	
1x2	7.55	-0.66	7.41	7.67	8.19			
2x3	7.15	-0.89	7.11	7.53	8.11			
3x5	6.74	-0.79	6.74	7.21	7.66			
5x7	6.43	-0.56	6.43	6.79	7.10			
5x10	6.23	-0.41	6.23	6.51	6.77			
7x10	6.11	-0.31	6.11	6.34	6.58			
10x20	5.31	0.01	5.14	5.38	5.53			

2x3 Cap and 5x10 Cap Implied Volatility



EUR Swaption Volatility

Implied (bps/day)

Mat/Und	Current	6M					Realized Vol	
		Chg	Min	Avg	Max	1M	3M	
6Mx2Y	5.06	-0.59	4.71	5.15	5.96	11.27	26.77	
6Mx5Y	4.74	-0.67	4.70	5.10	5.58	7.14	18.67	
2Yx2Y	5.17	-0.68	5.17	5.64	5.97	6.04	16.25	
2Yx10Y	4.70	-0.75	4.70	5.22	5.66	3.73	11.25	

6mx5Y and 2Yx10Y Euro Swaption Implied Volatility



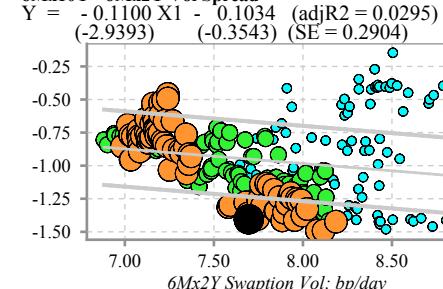
Note:

1. All regressions use a 1 year historical window.

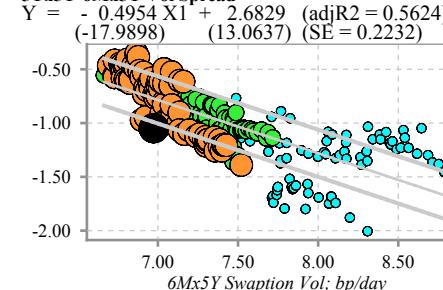
Other Vols (% per year)

Mat/Und	Current	6M				
		Chg	Min	Avg	Max	
VIX	16.6	2.1	11.9	15.4	38.6	
3M Gold vol	15.6	3.7	11.2	14.4	16.9	
3M EUR/USD vol	6.2	0.8	5.2	5.9	7.3	
3M USD/JPY vol	11.8	3.7	7.7	9.6	12.6	

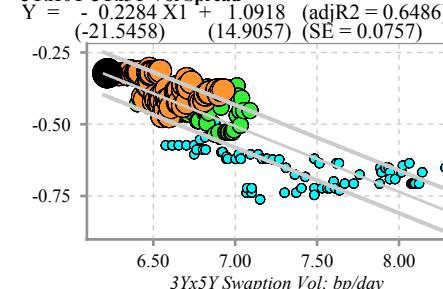
6Mx10Y - 6Mx2Y Vol Spread



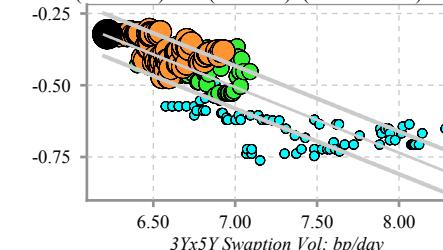
5Yx5Y-6Mx5Y Vol Spread



1x3 cap - 1Yx2Y Swaption Vol Spread



2Yx2Y EUR - 2Yx2Y US Vol Spread



Derivatives Strategy

jpmorganmarkets.com

CC MBS/Swap Basis Model

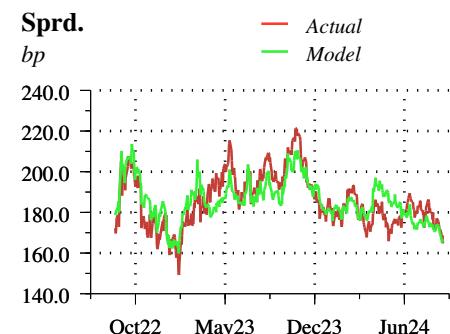
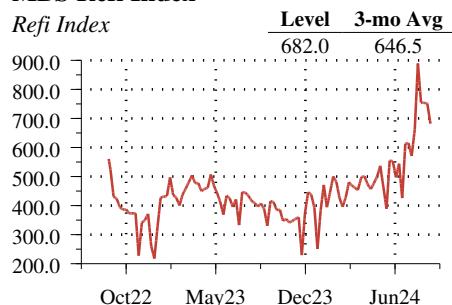
Level	1-day	1-wk	3-mo	1-yr
	Chg	Chg	Avg	Avg
CC MBS/7y swaps	164.7	-3.93	-7.18	179.5
CC MBS/10y swaps	159.5	-4.35	-7.41	178.8
CC SOFR-OAS	63.9	-2.99	-3.25	64.1
2yx5y swap ylds	3.03	-0.01	-0.06	3.38
3yx10y (bp/day)	5.90	0.02	-0.12	6.21
6mx5y (bp/day)	6.97	0.08	-0.19	7.08

	Coeff	T-stat
Intercept	51.77	8.69
2yx5y swap ylds	27.27	18.15
3yx10y (bp/day)	-12.49	-6.92
6mx5y (bp/day)	15.21	19.20

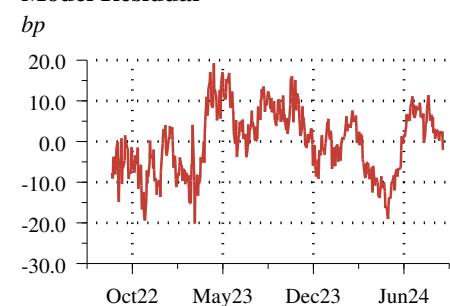
Observations	500
Adjusted R2	62.2%
Std Error	7.94
Residual	-2.06
Z-Score	-0.26

Other Drivers of MBS/Swap Basis

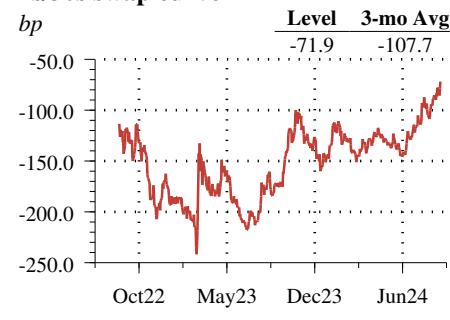
MBS Refi Index



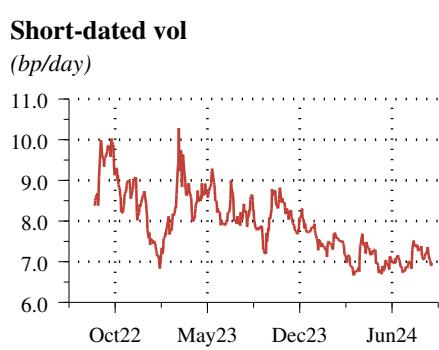
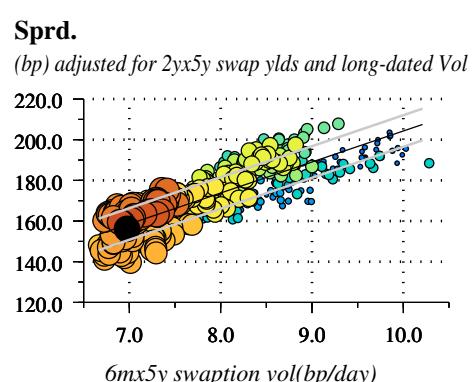
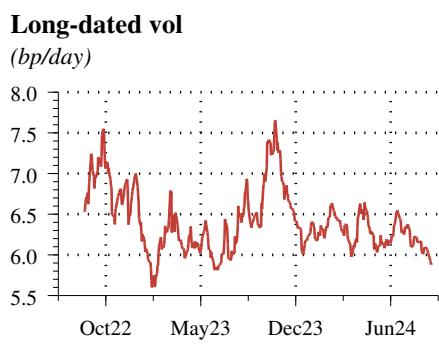
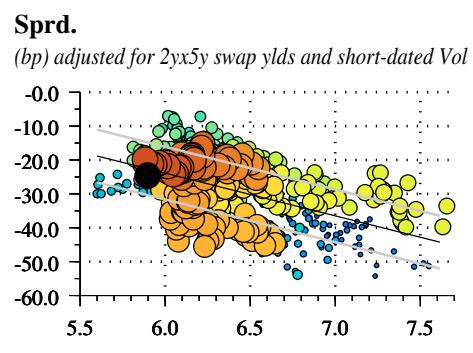
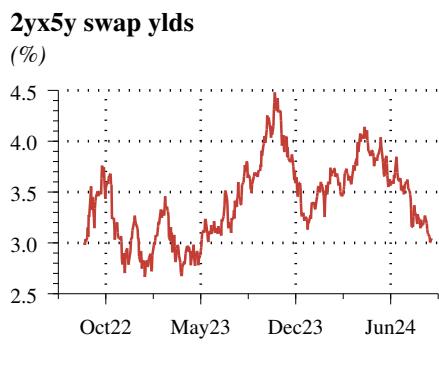
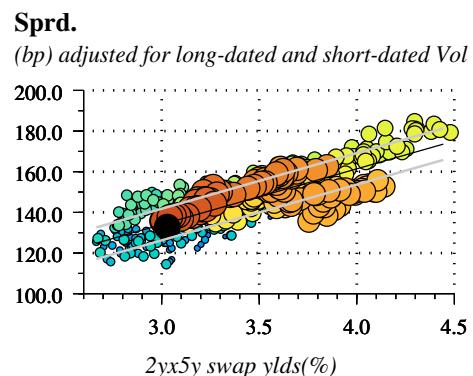
Model Residual



1s/30s swap curve



Model Independent Variables



1.CC MBS refers to current coupon 30-year pass-through securities.

2.The Sprd. is computed as the difference between the CC MBS and 7-year swap yields.

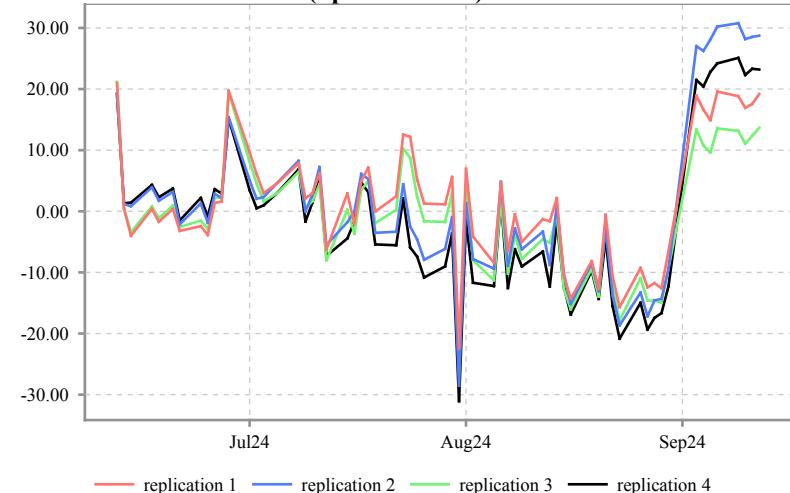
3.The model is based on 2-years of history.

Derivatives Strategy

Benchmark and Bond Index Replication with Futures

Hedge Ratio (# of contracts)						
// shock	FV	TU	TY	TN	US	WN
Replication 1	145	173	180	na	226	na
Replication 2	145	173	180	na	na	148
Replication 3	145	173	91	65	226	na
Replication 4	145	173	91	65	na	148
Beta-adjusted						
	TU	FV	TY	TN	US	WN
Replication 1	145	174	174	na	205	na
Replication 2	145	174	174	na	na	146
Replication 3	145	174	88	65	205	na
Replication 4	145	174	88	65	na	146

Cumulative outperformance of replication strategies over the index (bp of notional)



Tenor	Hedge Ratio (// shock, # of contracts)			Hedge Ratio (Beta-adj, # of contracts)		
	1 contract	2 contracts(L)	2 contracts(R)	1 contract	2 contracts(L)	2 contracts(R)
2Y	45	na	na	45	na	na
3Y(TU)	68	na	na	68	na	na
3Y(FV)	62	14	53	63	14	53
5Y	101	55	28	102	56	24
7Y	88	na	na	85	na	na
10Y(TY)	119	53	27	116	51	24
10Y(TN)	87	na	na	87	na	na
30Y(US)	119	na	na	108	na	na
30Y(WN)	78	na	na	77	na	na

December 2024 Futures

Contract	Price	BPV (\$/contract)		BNOC	Repo rate (bp)
		// shock	beta-adj (32nds)		
TU	104.30	41.6	41.5	0.1	518
FV	110.50	45.2	44.7	0.0	519
TY	115.19	69.7	72.1	-0.1	520
TN	119.59	95.3	95.3	-0.2	521
US	126.34	150.5	166.3	0.4	513
WN	136.34	230.1	233.0	1.2	504

Note: For replication of the J.P. Morgan Government Bond Index (GBI) we consider 4 replication strategies: We assume the 1- to 3-year bucket is hedged with TU and 3- to 5-year with FV for all. Replications 1 and 3 hedge the 10+ year bucket with US, and Replications 2 and 4 do the same with WN. For replications without TN (replications 1 and 2), we assume the entire 5- to 10-year bucket is hedged with TY, and for those with TN (replication 2 and 3) we use TY for 5- to 7-year maturities and TN for 7- to 10-year maturities. We assume monthly rebalancing of bpv-based hedge ratios (either using parallel or beta-adjusted shocks to the curve). The GBI index is also assumed to be unlevered--i.e., no repo funding cost.

For benchmarks, we assume hot-run returns, rolled on the first day of the month and financed in term repo through the next roll (accounting for specialness as well) versus a either one future contract (specified in parenthesis if necessary) or, a TU/FV, FV/TY or TY/US blend for 3Y, 5Y and 10Y OTRs, respectively. When using a single contract we assume pbpb-neutral hedge ratios matching the pbpb of the current note to the futures DV01 (based on parallel or beta-adjusted shocks to the curve), rebalanced monthly and rolling the contracts on the first delivery date. When using 2 contract blends, we use empirical hedge ratios calculated as the 3-month beta of daily changes in the hot-run yield versus the 2 underlying CTD yields, again with monthly rebalancing.

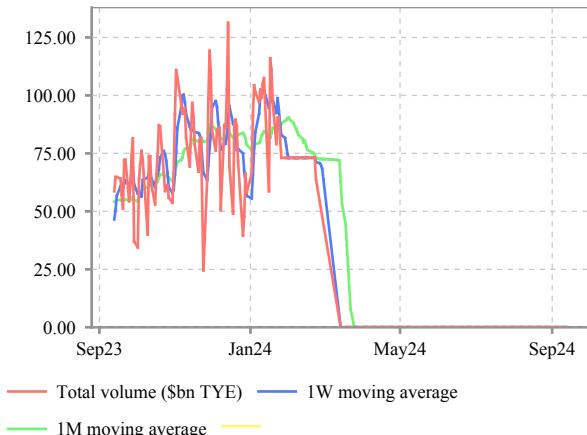
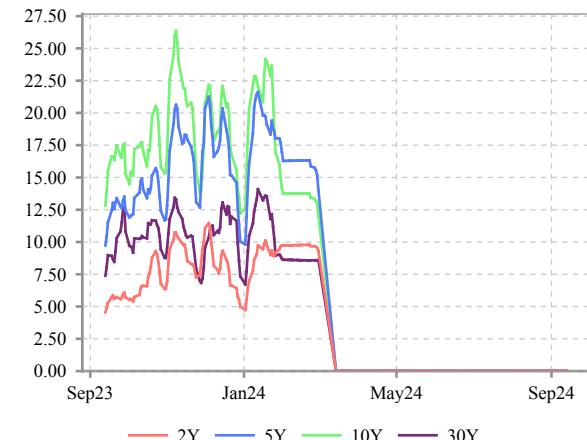
USD Swap Trading Volume

		1-yr	2-yr	2-5-yr	5-yr	5-10-yr	10-yr	10-20yr	20-yr	20-30-yr	30-yr	50-yr	Total**
spot	notional	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one week avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one month avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6m-1Y	notional	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one week avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one month avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1Y-2Y	notional	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one week avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one month avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2Y-5Y	notional	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one week avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one month avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-10Y	notional	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one week avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one month avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
total	notional	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one week avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	one month avg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

*Notional amount in \$bn

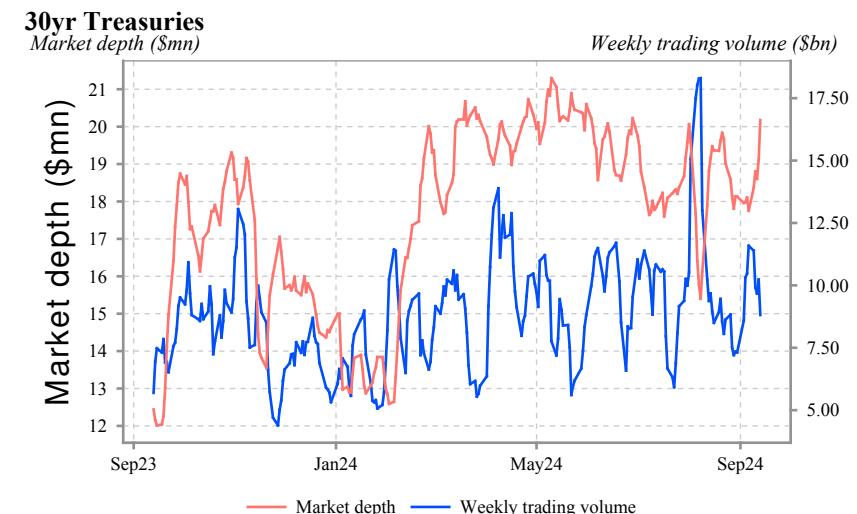
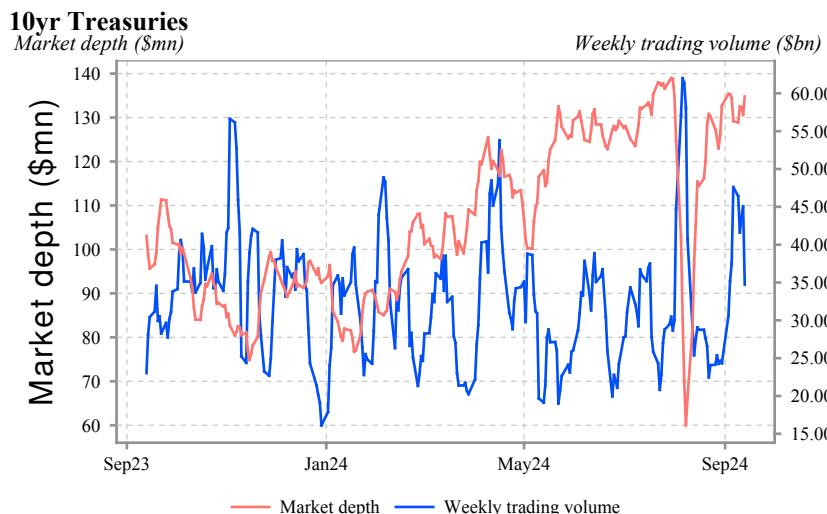
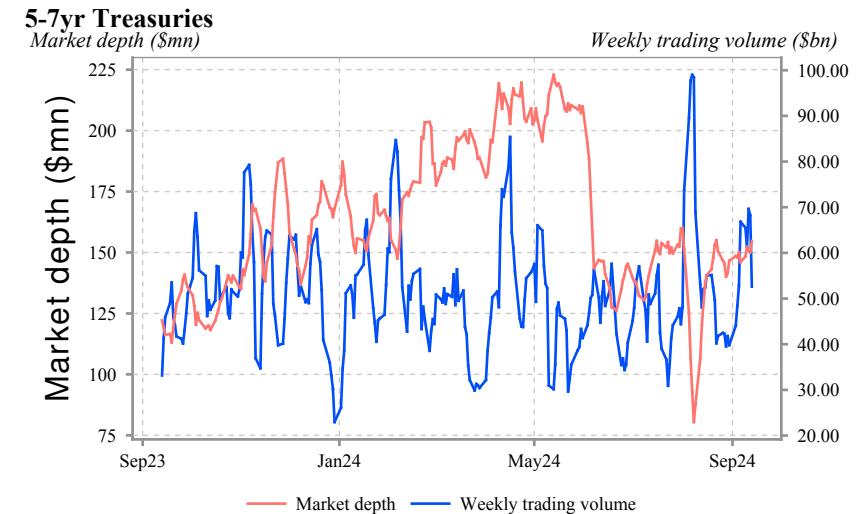
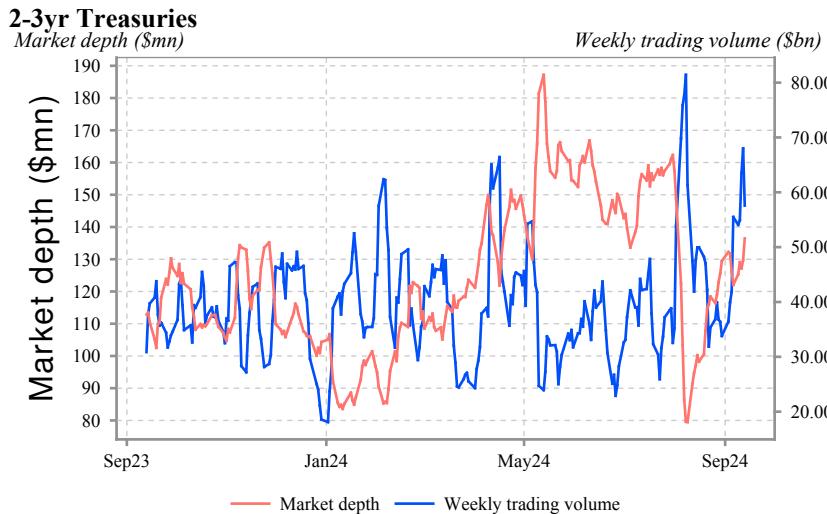
** 10-yr equivalents

Source: J.P. Morgan, DTCC



Fixed Income Strategy

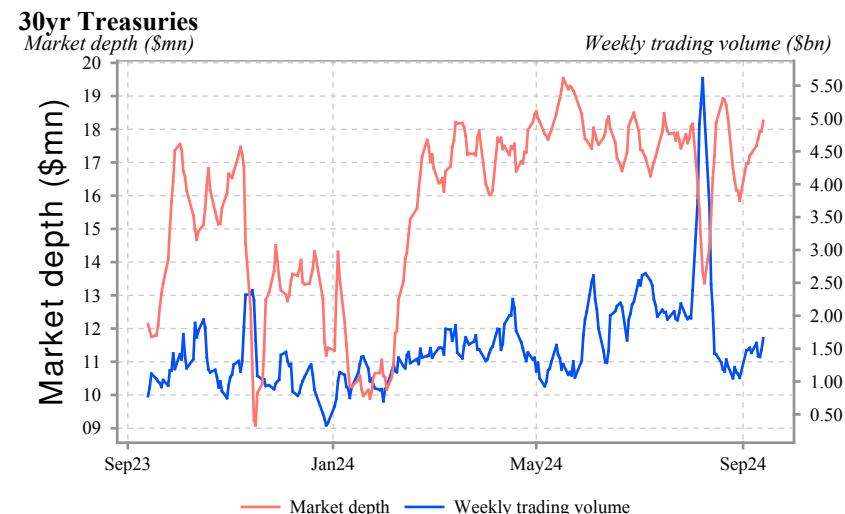
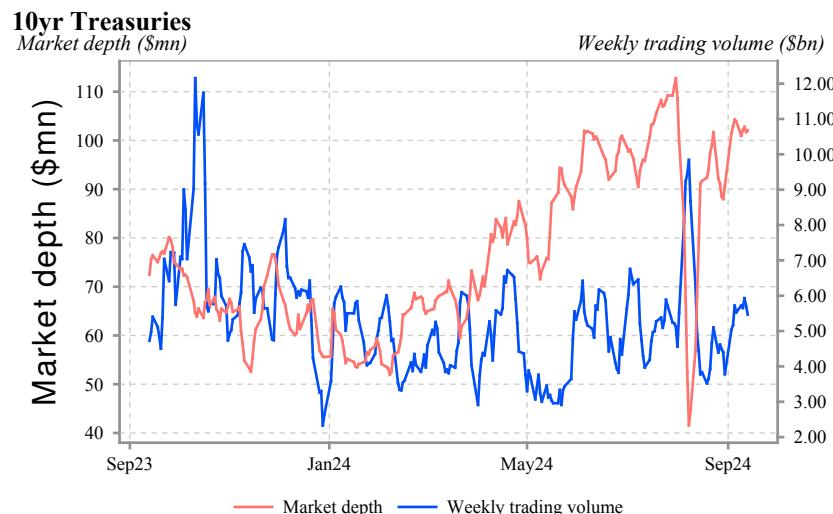
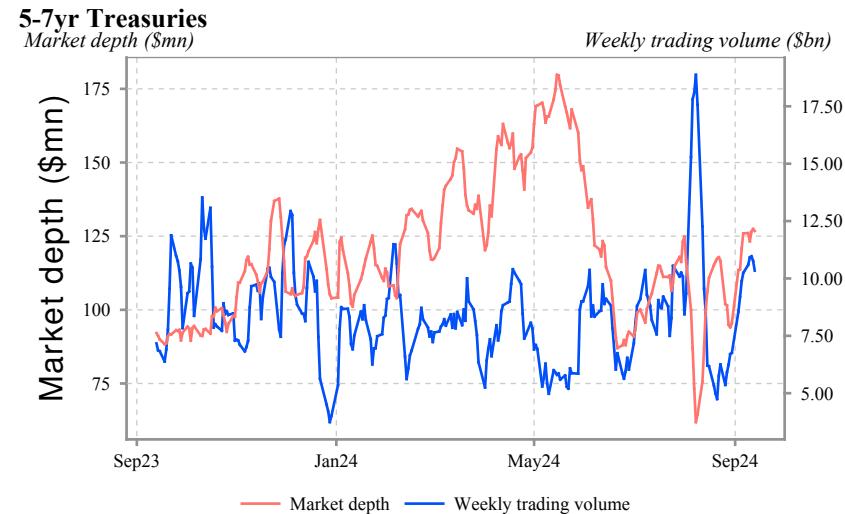
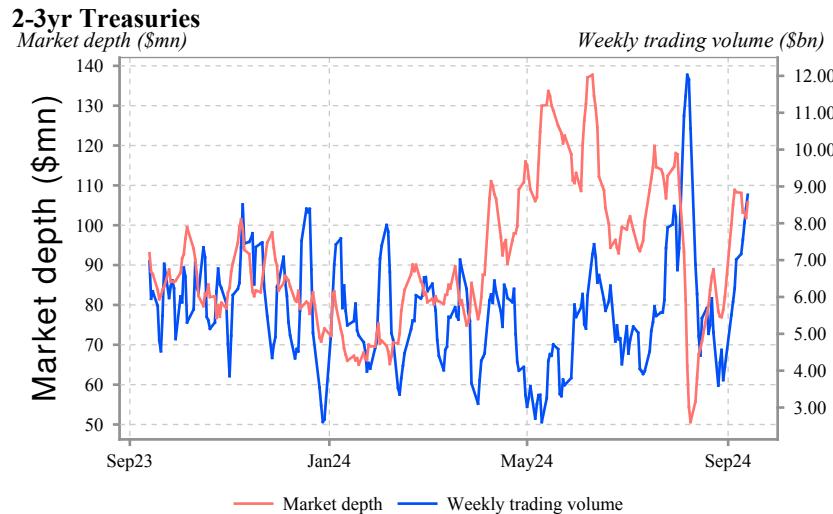
Cash Treasury Market Liquidity Summary



Market depth is defined as the weekly moving average of the top 3 bid/ask sizes in OTR Treasuries, averaged between 8:30am and 10:30am daily. Both market depth and volume data are taken from BrokerTec, an interdealer electronic trading platform

Fixed Income Strategy

Cash Treasury Market Liquidity Summary - London time



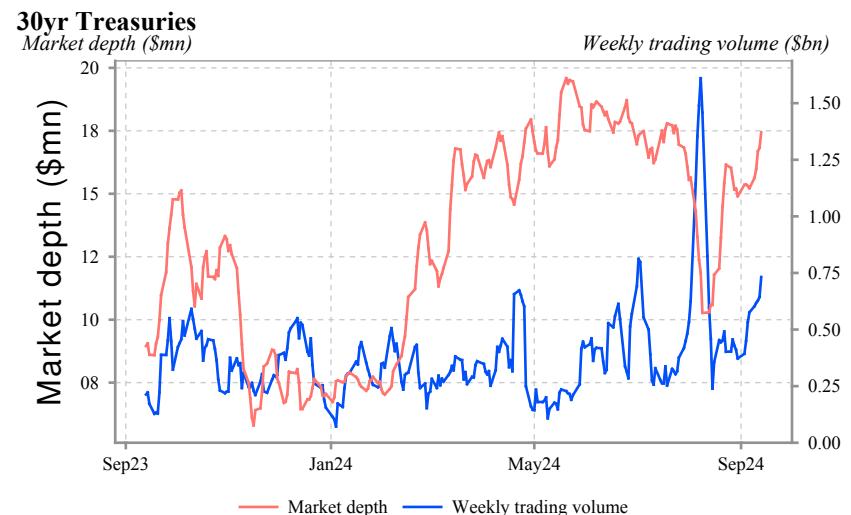
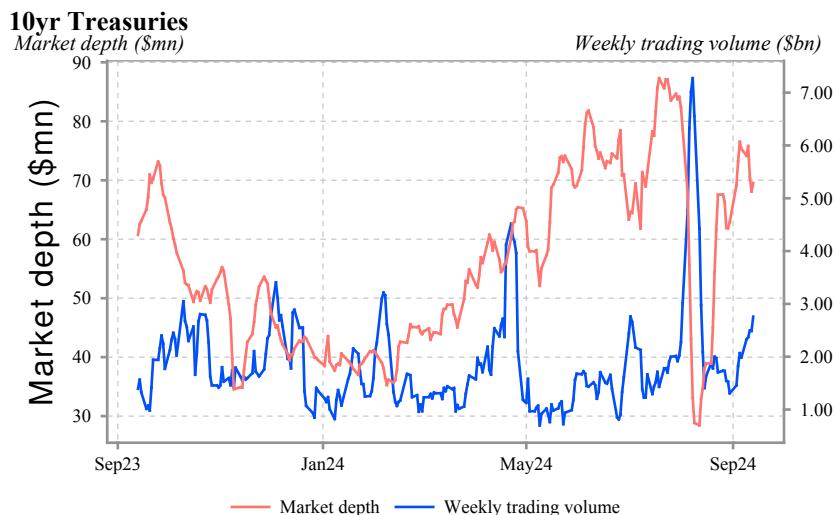
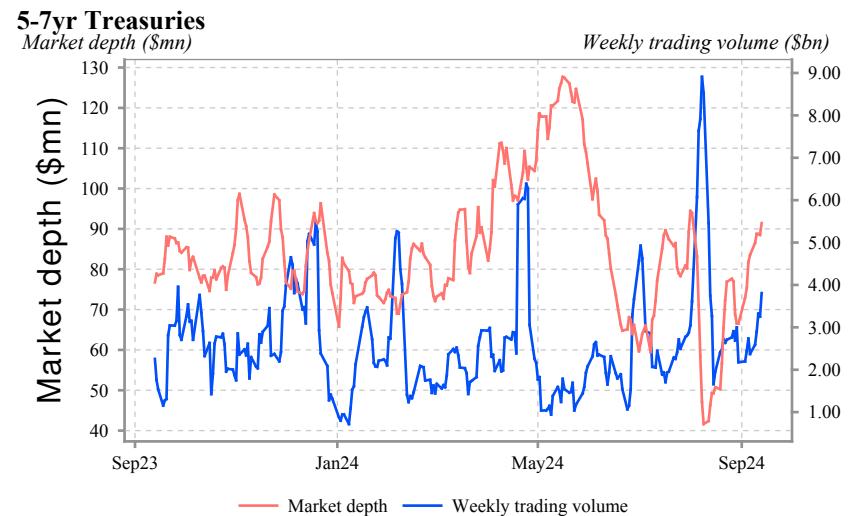
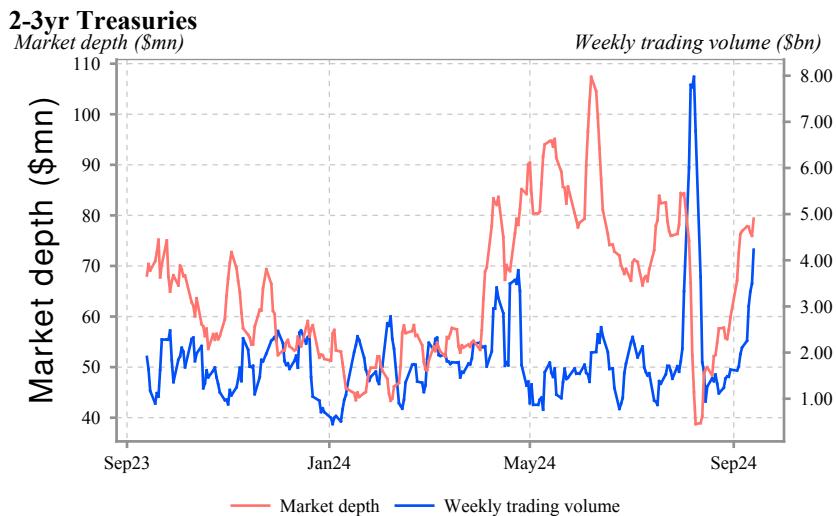
Market depth is defined as the weekly moving average of the top 3 bid/ask sizes in OTR Treasuries, averaged between 8:30am and 10:30am daily. Both market depth and volume data are taken from BrokerTec, an interdealer electronic trading platform.

Source: J.P. Morgan, BrokerTec

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Fixed Income Strategy

Cash Treasury Market Liquidity Summary - Tokyo time



Market depth is defined as the weekly moving average of the top 3 bid/ask sizes in OTR Treasuries, averaged between 8:30am and 10:30am daily. Both market depth and volume data are taken from BrokerTec, an interdealer electronic trading platform.

Source: J.P. Morgan, BrokerTec

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Fixed Income Strategy

Treasury Futures Liquidity Report

2-year note (TU) current open interest ('000s)



5-year note (FV) current open interest ('000s)



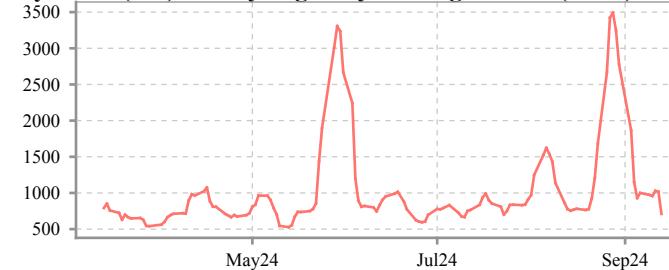
10-year note (TY) current open interest ('000s)



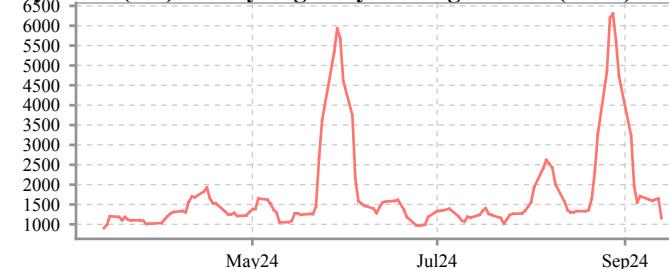
Classic Bond (US) current open interest ('000s)



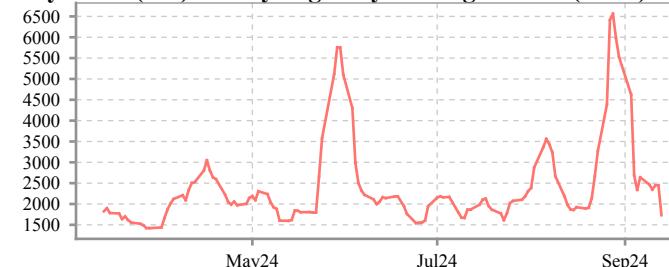
2-yr note (TU) weekly avg daily trading volume ('000s)



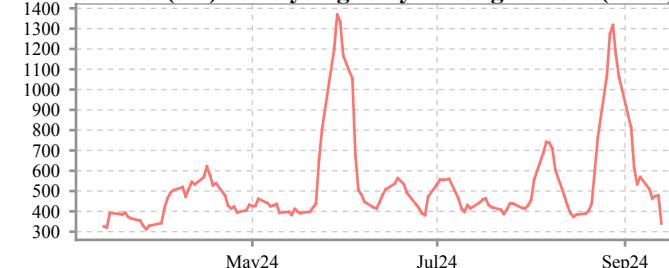
5-yr note (FV) weekly avg daily trading volume ('000s)



10-yr note (TY) weekly avg daily trading volume ('000s)



Classic Bond (US) weekly avg daily trading volume ('000s)



2-year note (TU) market depth ('000s)



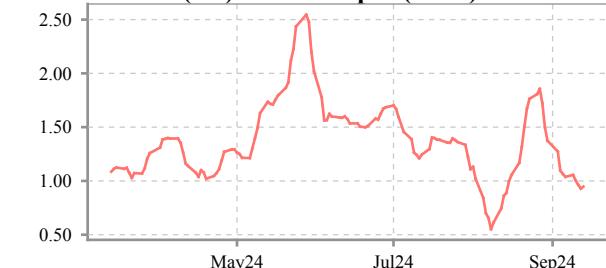
5-year note (FV) market depth ('000s)



10-year note (TY) market depth ('000s)



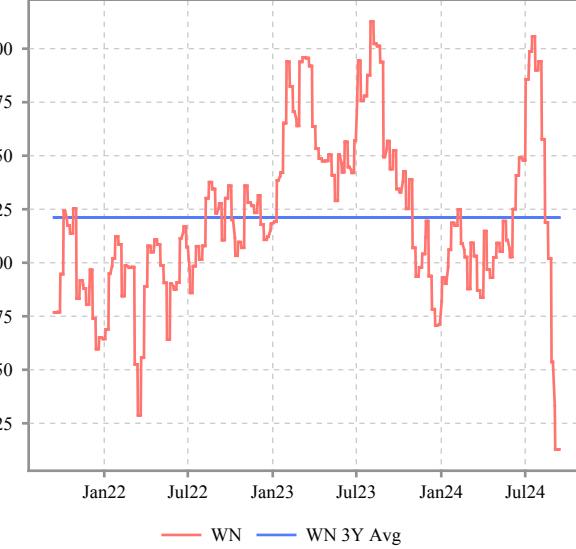
Classic Bond (US) market depth ('000s)



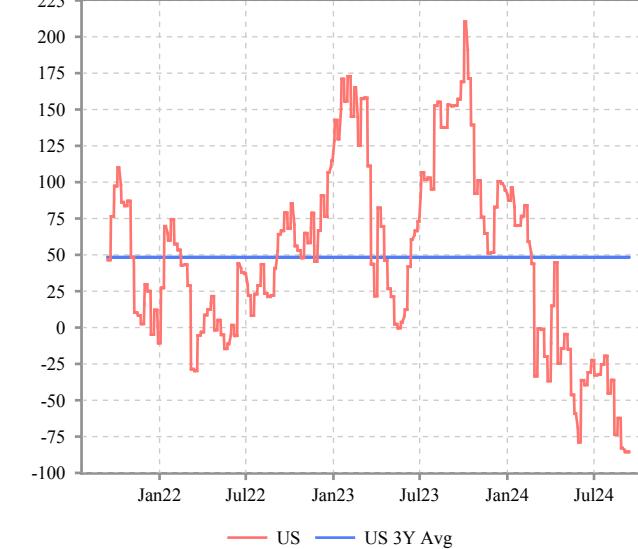
Derivatives Strategy

Treasury Future Net Commercial Longs Report

Net Commercial Longs - WN



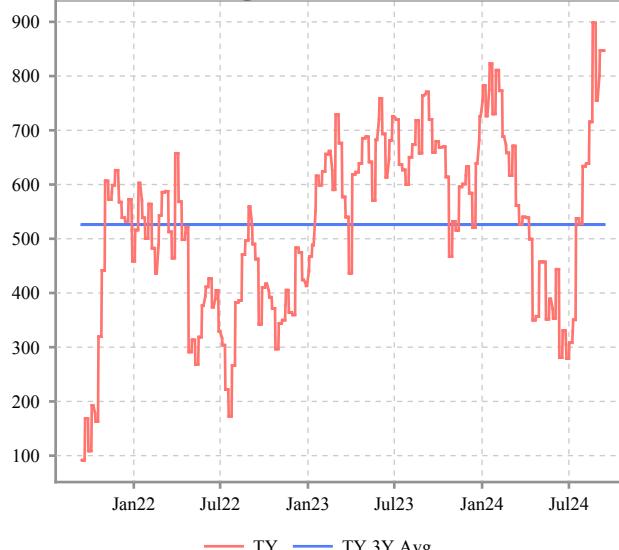
Net Commercial Longs - US



Net Commercial Longs - UXY



Net Commercial Longs - TY



Net Commercial Longs - FV



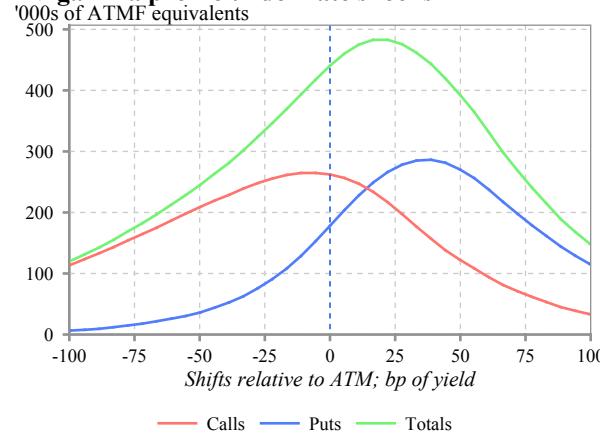
Net Commercial Longs - TU



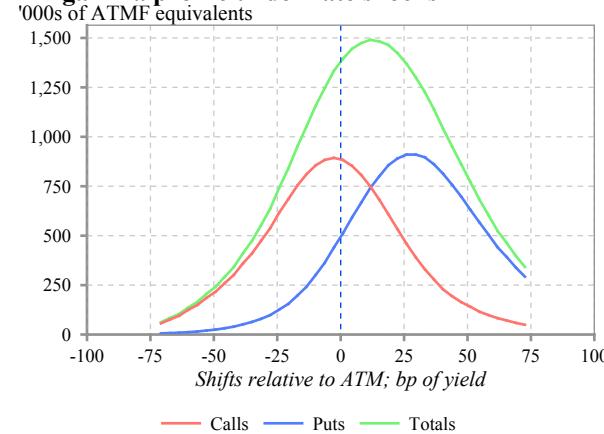
* Net commercial longs minus shorts in various contracts; '000s of contracts, 3Y history and 3Y average. Source: CFTC, J.P. Morgan

Options on Treasury Futures Strike Concentration Report

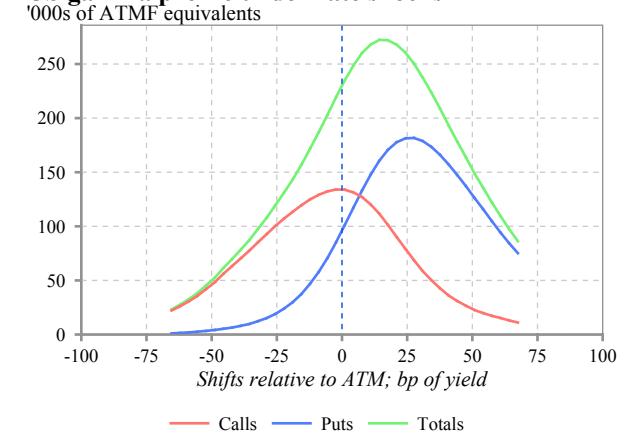
FV gamma profile under rate shocks



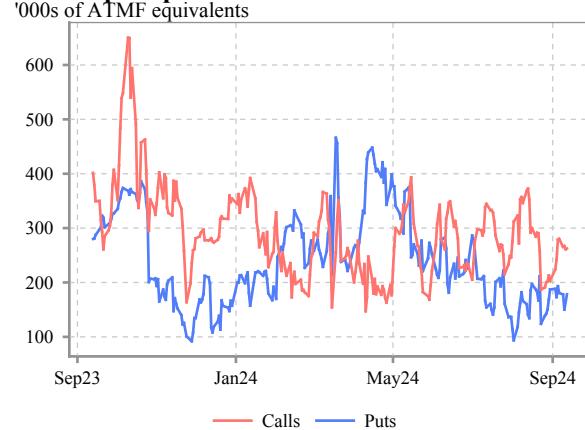
TY gamma profile under rate shocks



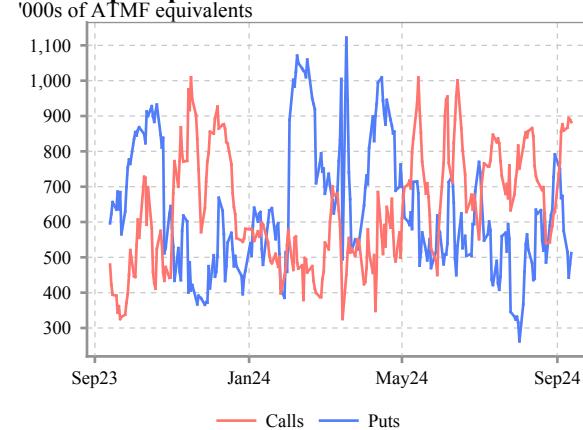
US gamma profile under rate shocks



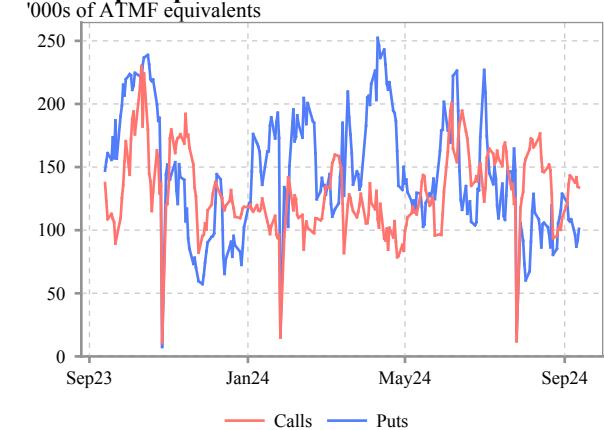
FV call/put open interest



TY call/put open interest



US call/put open interest

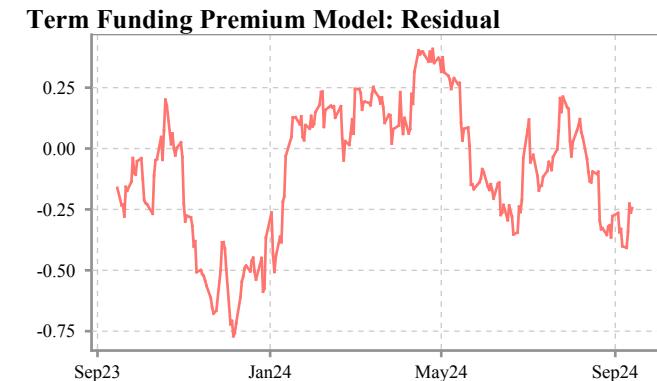
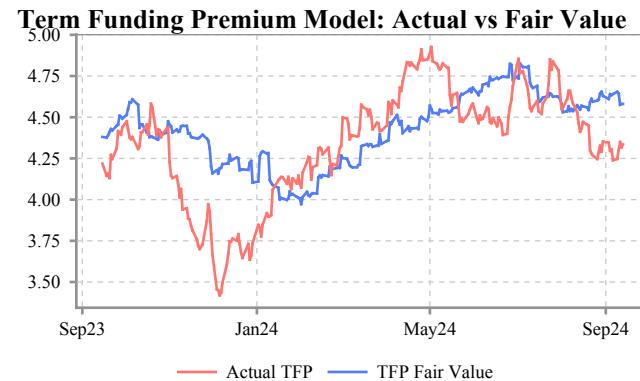


Derivatives Strategy

Swap Spread Fair Value Model Report – Term Funding Premium and Zero Duration Swap Spreads

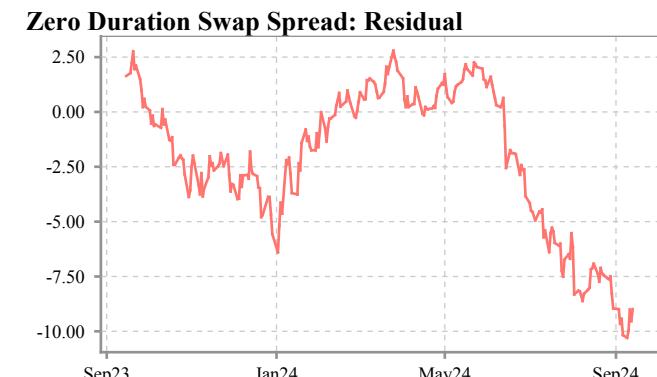
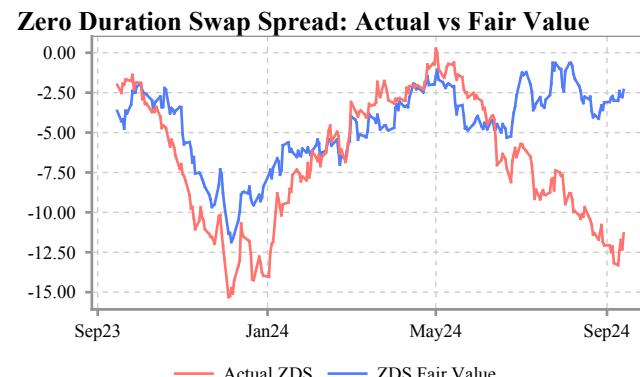
Term Funding Premium Model

	Coeff	T-Stat	Current Value
Fed balance sheet size (\$Tn)	-1.4	-21.18	7.17
AUM at top 20 core bond funds (\$bn)	-0.01	-19.93	443.31
Monthly UST supply (\$bn 10s)	0.01	7.75	234.76
RRP (\$Tn)	0.82	16.01	0.71
Intercept	18.74	58.11	
R-squared	0.89		
Std. error	0.3		
Actual TFP	4.34		
TFP Fair value	4.58		

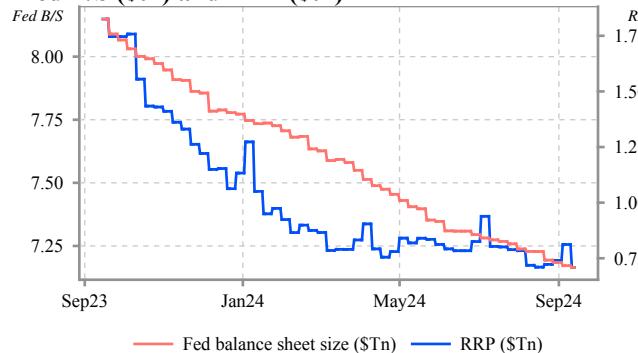


Zero Duration Swap Spread Model

	Coeff	T-Stat	Current Value
TFP (bp/yr)	8.2	39.49	4.34
RRP (\$Tn)	4.1	33.27	0.71
3Mx3M OIS rate (%)	-3.36	-37.77	4.00
Intercept	-27.34	-47.56	
R-squared	0.72		
Std. error	2.17		
Actual ZDS	-11.32		
ZDS Fair value	-2.33		



Fed B/S (\$tn) and RRP (\$tn)



AUM at top 20 core bond funds



3Mx3M OIS rate (%)



* Term Funding Premium is defined as the negative of the slope of a regression of maturity matched swap spreads versus modified duration in benchmark sectors (2Y, 3Y, 5Y, 7Y, 10Y, 20Y and 30Y) on any given day

** Zero-duration swap spread is defined as the intercept from a regression of maturity matched swap spreads versus modified duration in benchmark sectors (2Y, 3Y, 5Y, 7Y, 10Y, 20Y and 30Y) on any given day

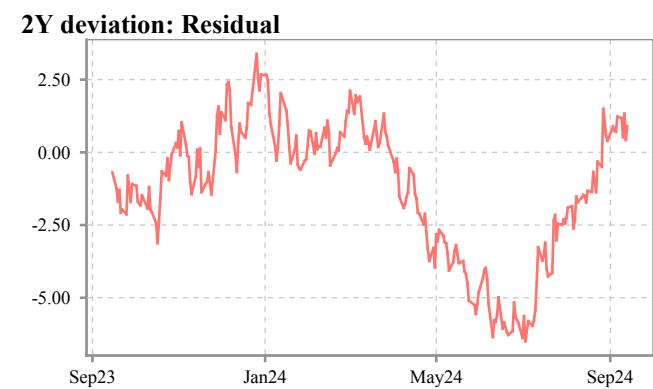
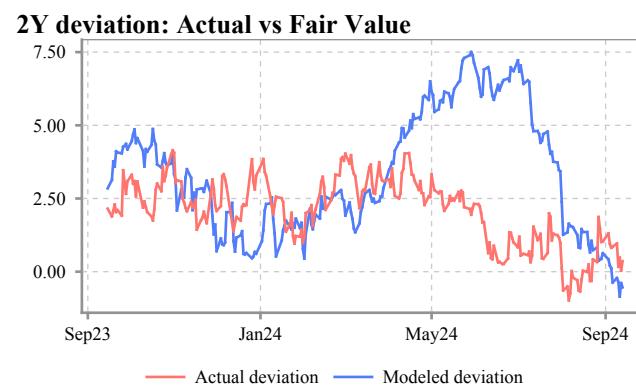
*** Regression from Apr 2021 – Jun 2024.

Derivatives Strategy

Swap Spread Fair Value Model Report – Swap Spread Deviation from Term Structure

2Y modeled deviation from term structure

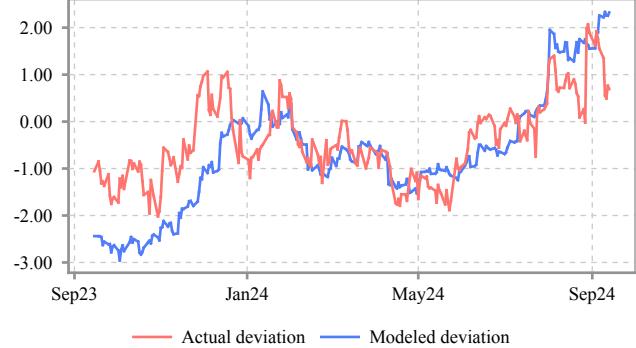
	Coeff	T-Stat	Current Value
RRP (\$Tn)	4.1	19.88	0.71
1Yx1Y imp. Vol (bp/day)	-0.74	-7.17	7.76
T-bill stock 3M pct chg	-0.31	-19.73	3.98
2Y UST yield (%)	3.09	15.82	3.58
1st/5th 3M SOFR futures curve %	2.78	15.62	-1.23
Intercept	-4.1	-13.09	
R-squared	0.67		
Std. error	2.53		
2Y Swap spread actual deviation	0.36		
2Y Swap spread modeled deviation	-0.54		



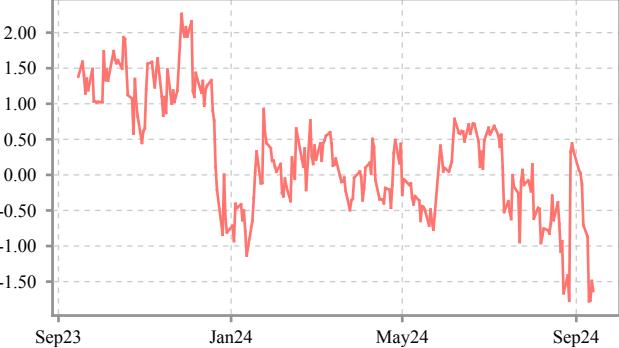
5Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
2Yx2Y implied vol (bp/day)	-0.55	-17.0	6.85
6Mx1M - 1M OIS rate (%)	-2.57	-32.64	-1.51
Intercept	2.21	9.44	
R-squared	0.7		
Std. error	1.48		
5Y Swap spread actual deviation	0.69		
5Y Swap spread modeled deviation	2.32		

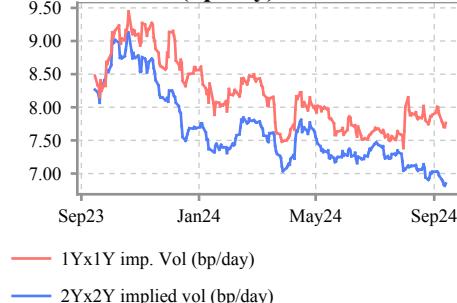
5Y deviation: Actual vs Fair Value



5Y deviation: Residual



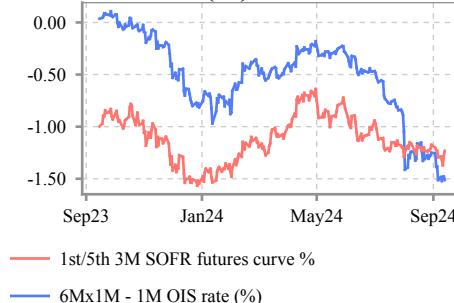
1Yx1Y and 2Yx2Y implied volatility (bp/day)



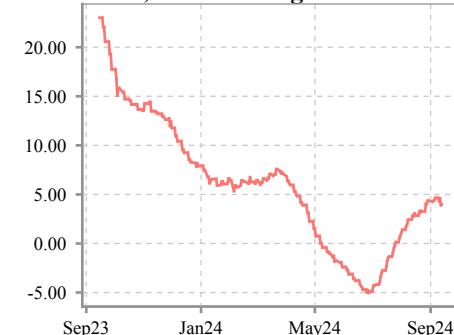
2Y UST yield (%)



Fed expectations and 6m1m-1m OIS (%)



T-bill stock, 3M % change



* 2Y/5Y swap spread deviation relative to the term structure of swap spreads is calculated for any given day as the actual 2Y/5Y maturity matched swap spread minus the fitted value as of that day. The fitted value is calculated from a cross sectional regression of maturity matched swap spreads at benchmark tenors (2s, 3s, 5s, 7s, 10s, 20s, 30s) versus their modified durations, and evaluated at the OTR 2Y/5Y note's modified duration.

** 2Y/5Y swap spread deviation relative to term structure of swap spreads is calculated for every day in this historical period, using the above definition

*** Regression period from Apr 2021 - Apr 2024

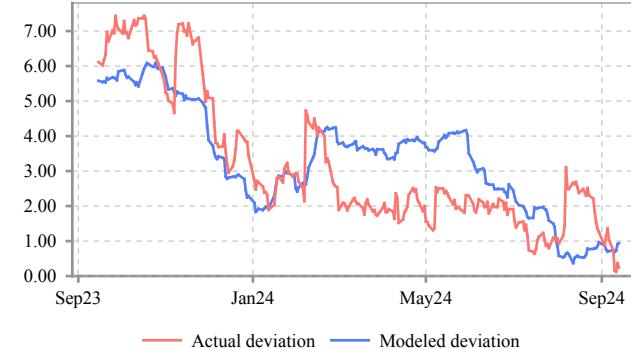
Derivatives Strategy

Swap Spread Fair Value Model Report – Swap Spread Deviation from Term Structure

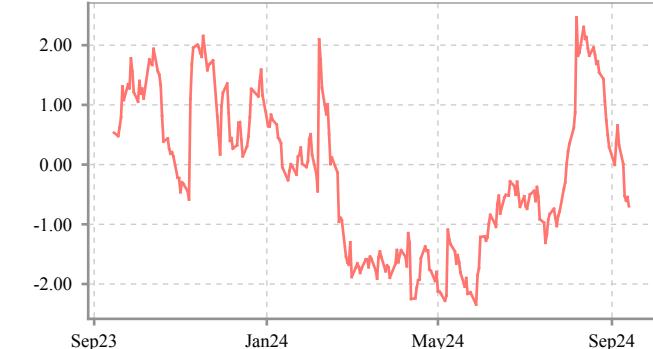
10Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
Monthly UST supply	-0.04	-8.72	234.76
10Y yields	0.91	7.51	3.65
sofr-ioer (6w avg)	-0.98	-17.81	-6.66
Intercept	-0.37	-0.23	
R-squared	0.62		
Std. error	2.03		
10Y Swap spread actual deviation	0.24		
10Y Swap spread modeled deviation	0.94		

10Y deviation: Actual vs Fair Value



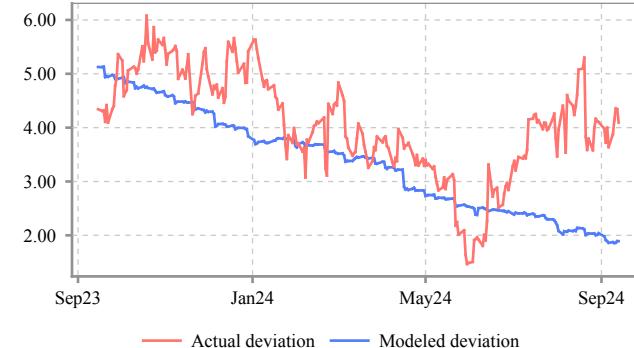
10Y deviation: Residual



30Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
Fed balance sheet size (\$tn)	2.93	34.44	7.17
VA hedging needs (\$bn 20s)	-0.02	-16.06	73.62
Intercept	-17.36	-21.73	
R-squared	0.82		
Std. error	1.26		
30Y Swap spread actual deviation	4.09		
30Y Swap spread modeled deviation	1.89		

30Y deviation: Actual vs Fair Value



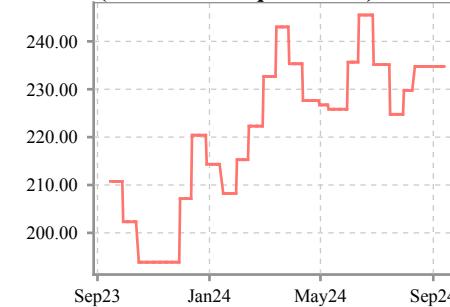
30Y deviation: Residual



10Y UST yield (%)



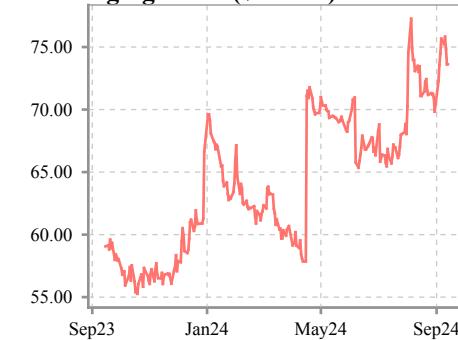
Monthly UST supply – 6w moving avg (\$bn of 10Y equivalents)



SOFR-IOER – 6w moving avg (%)



VA hedging needs (\$bn 20s)



* 10Y/30Y swap spread deviation relative to the term structure of swap spreads is calculated for any given day as the actual 10Y/30Y maturity matched swap spread minus the fitted value as of that day. The fitted value is calculated from a cross sectional regression of maturity matched swap spreads at benchmark tenors (2s, 3s, 5s, 7s, 10s, 20s, 30s) versus their modified durations, and evaluated at the OTR 10Y/30Y note's modified duration.

** 10Y/30Y swap spread deviation relative to term structure of swap spreads is calculated for every day in this historical period, using the above definition

*** Regression period from Apr 2021 - Apr 2024 (10Y deviation model) and Apr 2020 - Apr 2024 (30Y deviation model)

* We use 6-week moving averages of Monthly UST duration supply as well as the SOFR-IOER differential for smoothing purposes

† Aggregate Variable Annuity duration, in \$bn 20s, is estimated using an approach developed and described in a separate JPMorgan Research Note - Interest Rate Risk in Variable Annuities, Sep 2011. Available upon request.

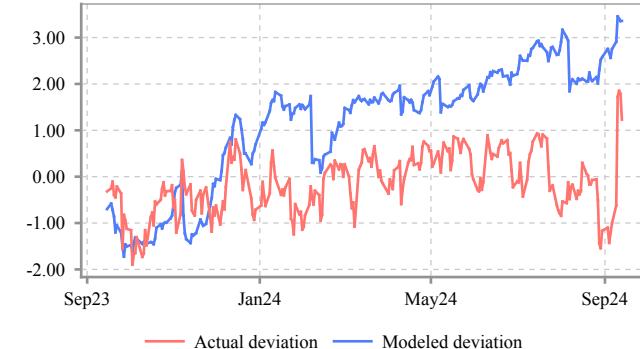
Derivatives Strategy

Swap Spread Fair Value Model Report – Swap Spread Deviation from Term Structure

3Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
2-year spreads deviation from fitted structure	-0.23	-19.2	0.36
10-year spreads deviation from fitted structure	-0.62	-38.24	0.24
Intercept	3.59	35.97	
R-squared	0.76		
Std. error	1.41		
3Y Swap spread actual deviation	1.23		
3Y Swap spread modeled deviation	3.36		

3Y deviation: Actual vs Fair Value



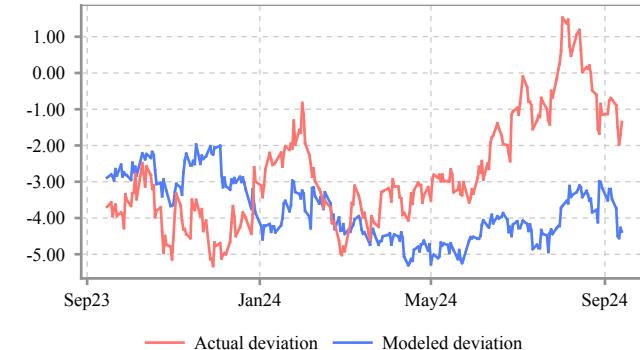
3Y deviation: Residual



7Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
5-year spreads deviation from fitted structure	0.63	40.26	0.69
10-year spreads deviation from fitted structure	0.44	33.89	0.24
Intercept	-4.92	-74.03	
R-squared	0.72		
Std. error	1.05		
7Y Swap spread actual deviation	-1.35		
7Y Swap spread modeled deviation	-4.37		

7Y deviation: Actual vs Fair Value



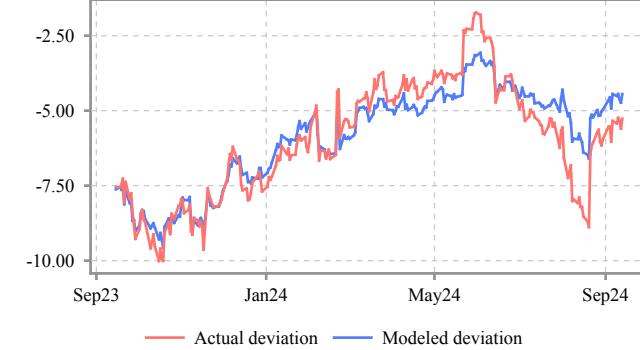
7Y deviation: Residual



20Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
30-year spreads deviation from fitted structure	-0.89	-43.28	4.09
10-year spreads deviation from fitted structure	-0.5	-51.16	0.24
Intercept	-0.69	-5.67	
R-squared	0.87		
Std. error	0.87		
20Y Swap spread actual deviation	-5.27		
20Y Swap spread modeled deviation	-4.45		

20Y deviation: Actual vs Fair Value



20Y deviation: Residual



* 3Y, 7Y, and 20Y swap spread deviation relative to the term structure of swap spreads is calculated for any given day as the actual 3Y, 7Y, and 20Y maturity matched swap spread minus the fitted value as of that day. The fitted value is calculated from a cross sectional regression of maturity matched swap spreads at benchmark tenors (2s, 3s, 5s, 7s, 10s, 20s, 30s) versus their modified durations, and evaluated at the OTR 3Y, 7Y, and 20Y note's modified duration.

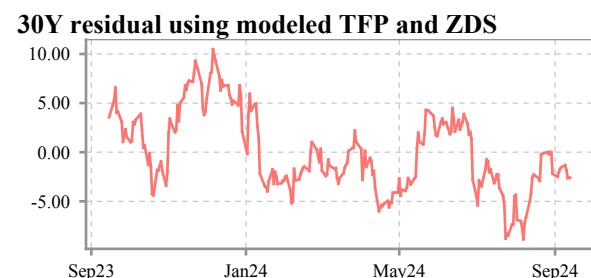
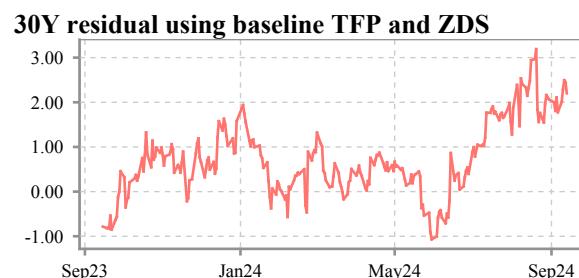
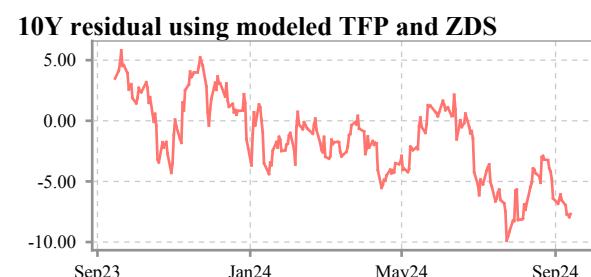
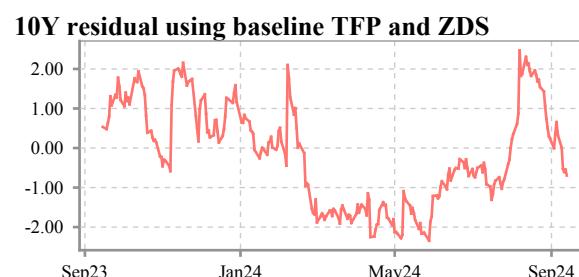
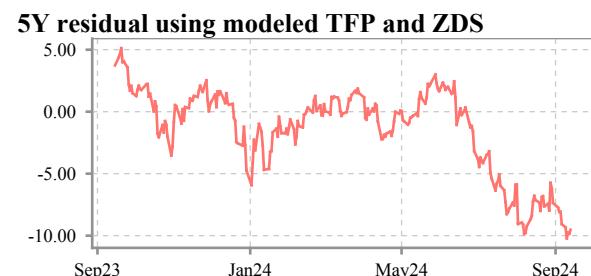
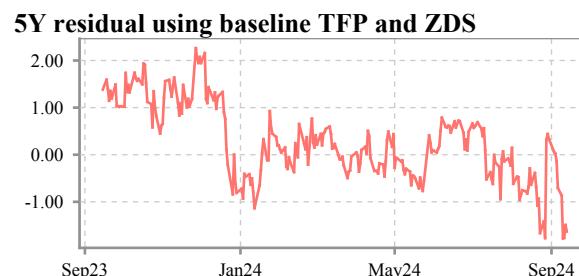
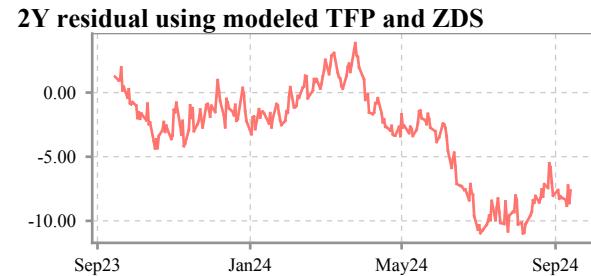
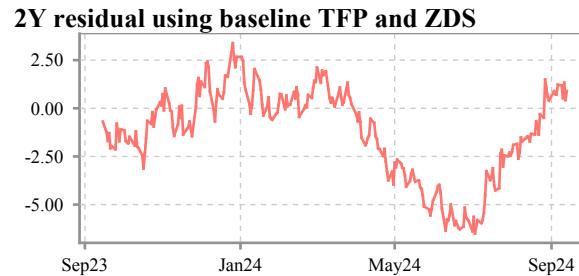
** 3Y, 7Y, and 20Y swap spread deviation relative to term structure of swap spreads is calculated for every day in this historical period, using the above definition

*** Regression period from Apr 2021 - Apr 2024

Derivatives Strategy

Swap Spread Fair Value Model Report – Swap Spread Fair Value Summary

Sector	Actual spread level	FV using baseline TFP and ZDS	FV using modeled TFP and ZDS	Residual using baseline TFP and ZDS	Residual using modeled TFP and ZDS
2Y	-19.1	-20.0	-11.4	0.9	-7.6
3Y	-22.3	-20.2	-11.9	-2.1	-10.4
5Y	-30.1	-28.5	-20.6	-1.6	-9.5
7Y	-39.0	-42.0	-34.5	3.0	-4.5
10Y	-46.5	-45.8	-38.8	-0.7	-7.7
20Y	-75.1	-74.2	-68.6	-0.8	-6.5
30Y	-81.4	-83.6	-78.8	2.2	-2.6



* Swap spread fair value is calculated as Term funding premium times modified duration of OTR bond + zero duration swap spread + modeled deviation

** Baseline TFP is defined as the negative of the slope of a regression of maturity matched swap spreads versus modified duration in benchmark sectors (2Y, 3Y, 5Y, 7Y, 10Y, 20Y and 30Y) on any given day

** Baseline ZDS is defined as the intercept from a regression of maturity matched swap spreads versus modified duration in benchmark sectors (2Y, 3Y, 5Y, 7Y, 10Y, 20Y and 30Y) on any given day

*** Modeled TFP is defined as the current Term funding premium fair value as defined on the page titled "Swap spread fair value model report – Term funding premium and Zero duration swap spreads"

*** Modeled ZDS is defined as the current Zero duration swap spread fair value as defined on the page titled "Swap spread fair value model report – Term funding premium and Zero duration swap spreads"

* Residual is calculated as Actual swap spread minus swap spread fair value.

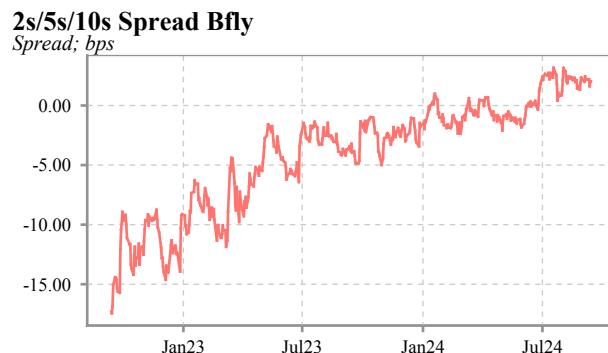
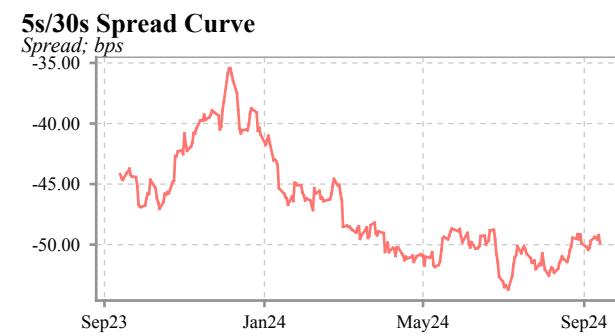
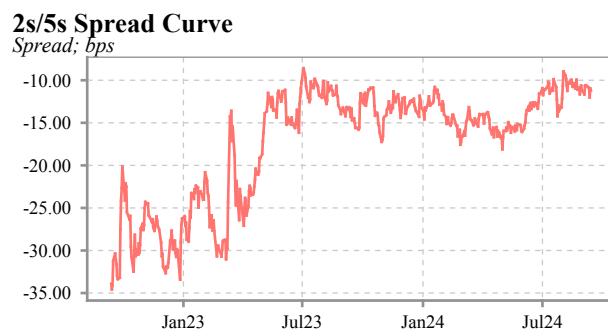
Derivatives Strategy

Off-the-run SOFR Swap Spread

Spreads	1-day	1-wk	1-mo	3-month				Total	6M Avg
	Spot	Chg	Chg	Chg	Repo	Carry	Slide		
1 Year	-9.8	0.5	1.3	-1.6	5.13	8.9	3.3	12.2	1.4
2 Year	-20.0	1.3	1.5	-1.3	5.07	1.2	-1.4	-0.3	-2.3
3 Year	-23.5	0.9	1.9	-2.1	5.07	0.3	-1.2	-0.8	-2.0
5 Year	-31.3	1.1	1.0	-1.8	5.07	-0.1	-1.0	-1.1	-2.0
7 Year	-38.8	1.3	0.8	-2.6	5.07	-0.3	-0.4	-0.8	-1.2
10 Year	-46.5	0.9	0.7	-2.0	5.07	-0.4	-0.3	-0.7	-1.1
20 Year	-75.2	0.8	1.2	0.5	5.13	-0.5	-1.0	-1.5	-1.8
30 Year	-81.1	0.4	0.8	-0.5	5.07	-0.5	-0.4	-0.9	-1.0

Curves	1-day	1-wk	1-mo	2-Year				Z
	Spot	Chg	Chg	Chg	High	Low	Avg	
2s/3s	-3.5	-0.4	0.4	-0.7	-0.1	-23.2	-7.8	0.9
2s/5s	-11.2	-0.2	-0.6	-0.4	-8.6	-33.4	-16.8	0.9
2s/10s	-26.5	-0.4	-0.8	-0.7	-12.7	-39.2	-26.3	0.0
2s/30s	-61.1	-0.9	-0.8	0.8	-47.9	-86.0	-63.9	0.4
3s/5s	-7.7	0.2	-0.9	0.3	-2.3	-18.1	-9.0	0.5
3s/10s	-23.0	0.0	-1.2	0.1	-6.9	-26.6	-18.4	-1.1
5s/10s	-15.3	-0.2	-0.3	-0.2	-1.5	-16.5	-9.5	-1.5
5s/20s	-44.0	-0.3	0.2	2.3	-36.0	-53.1	-42.7	-0.5
5s/30s	-49.9	-0.7	-0.2	1.3	-35.4	-57.0	-47.1	-0.7
7s/10s	-7.7	-0.4	-0.1	0.6	4.9	-9.3	-1.2	-1.9
10s/30s	-34.6	-0.5	0.1	1.5	-27.4	-50.9	-37.6	0.7
20s/30s	-5.9	-0.4	-0.4	-1.1	3.0	-10.3	-4.4	-0.5

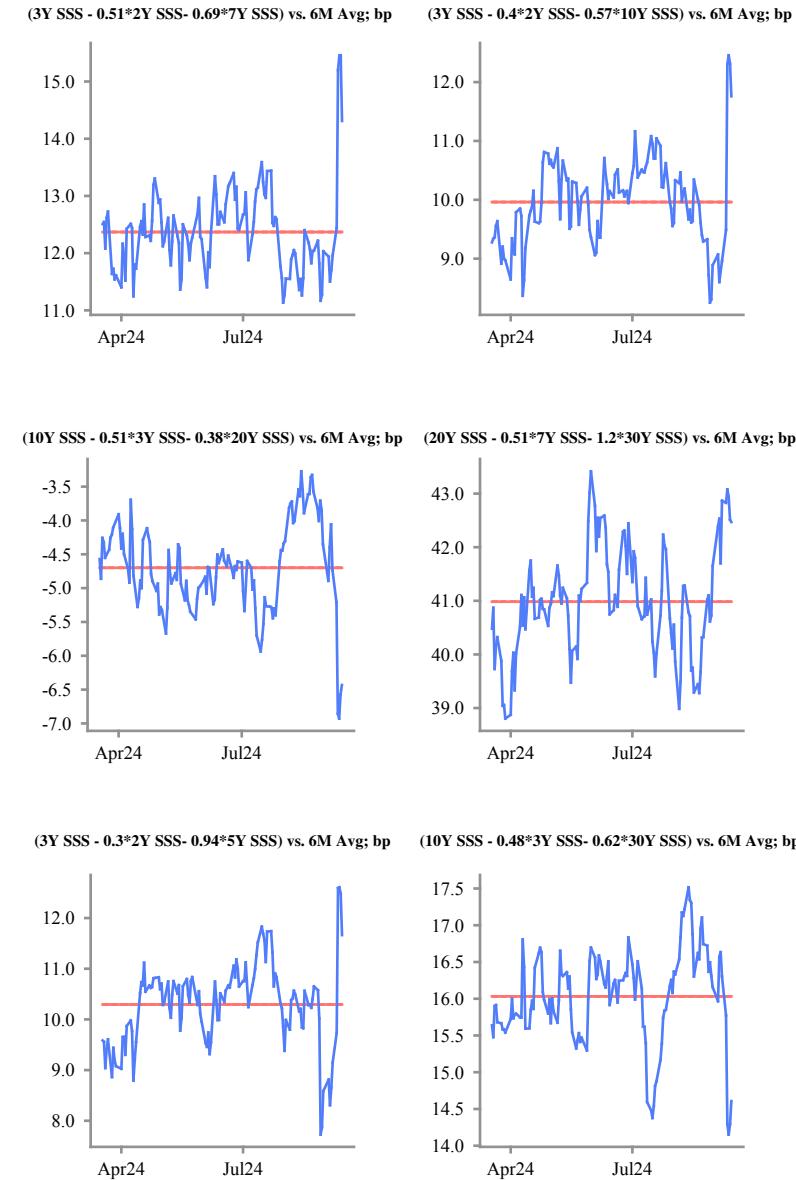
Butterflies	1-day	1-wk	1-mo	2-Year				Z
	Spot	Chg	Chg	Chg	High	Low	Avg	
2s/3s/5s	2.1	-0.3	0.6	-0.5	5.1	-8.6	0.6	0.6
2s/5s/10s	2.0	0.0	-0.2	-0.1	3.2	-14.6	-3.7	1.3
2s/5s/30s	19.3	0.2	-0.2	-0.9	21.6	3.5	15.1	1.2
2s/10s/30s	4.1	0.0	-0.5	-1.1	14.5	-0.9	5.7	-0.5
3s/5s/10s	3.8	0.2	-0.3	0.3	5.4	-5.9	0.2	1.4
5s/7s/10s	0.1	0.3	0.0	-0.7	1.8	-7.7	-3.5	1.9
5s/10s/20s	6.7	-0.1	-0.4	-1.4	22.4	6.0	11.9	-1.3
5s/10s/30s	9.7	0.1	-0.2	-0.9	23.9	8.8	14.1	-1.3
10s/20s/30s	-11.4	0.2	0.5	1.8	-8.3	-23.6	-14.4	1.0
10s/25s/30s	-23.0	-0.1	0.6	2.4	-18.1	-35.2	-23.9	0.3
20s/25s/30s	-8.7	0.0	0.3	1.1	-2.6	-12.5	-7.3	-0.9



Derivatives Strategy

SOFR Swap Spread Butterfly Report

Fly	3M Left Wt	3M Right Wt	6M Left Wt	6M Right Wt	9M Left Wt	9M Right Wt	1Y Left Wt	1Y Right Wt	Wtd Fly Cur.	Wtd Fly 6M Avg	6M Residual	6M Rsq	Ann. Rlzd Vol
2Ys3Ys5Ys	0.55	1.00	0.30	0.94	0.35	0.88	0.38	0.83	11.7	10.3	1.4	21%	4.4
2Ys3Ys7Ys	0.77	0.56	0.51	0.69	0.53	0.68	0.54	0.60	14.3	12.4	1.9	36%	5.5
2Ys3Ys10Ys	0.66	0.53	0.40	0.57	0.86	0.02	0.92	-0.07	11.8	10.0	1.8	9%	5.7
2Ys3Ys20Ys	0.79	0.30	0.59	0.25	0.84	0.03	0.84	0.07	7.8	6.8	1.0	41%	4.7
2Ys3Ys30Ys	0.75	0.54	0.58	0.41	0.88	-0.05	0.89	-0.06	22.2	20.9	1.2	4%	5.6
2Ys5Ys7Ys	0.29	0.59	0.26	0.69	0.27	0.71	0.27	0.66	1.8	1.1	0.7	63%	3.0
2Ys5Ys10Ys	0.12	0.61	0.07	0.67	0.46	0.27	0.57	0.14	2.4	1.8	0.6	86%	4.0
2Ys5Ys20Ys	0.46	0.25	0.31	0.29	0.49	0.18	0.53	0.21	-2.2	-1.9	-0.2	76%	5.3
2Ys5Ys30Ys	0.37	0.51	0.28	0.50	0.61	0.09	0.65	0.08	15.9	16.0	0.0	61%	6.5
2Ys7Ys10Ys	-0.06	0.99	-0.23	0.96	0.33	0.42	0.61	0.16	1.0	0.9	0.1	79%	5.5
2Ys7Ys20Ys	0.97	0.15	0.24	0.32	0.43	0.23	0.59	0.21	-10.5	-9.7	-0.8	48%	8.0
2Ys7Ys30Ys	0.48	0.90	0.07	0.75	0.57	0.15	0.71	0.08	23.7	24.3	-0.6	46%	10.2
2Ys10Ys20Ys	0.49	0.49	0.33	0.47	0.08	0.78	0.47	1.01	-4.8	-3.6	-1.3	55%	9.1
2Ys10Ys30Ys	0.42	0.84	0.31	0.74	0.46	0.54	0.54	0.68	20.1	21.0	-0.9	23%	8.7
2Ys20Ys30Ys	0.34	1.24	0.12	1.39	0.61	0.63	0.69	0.55	39.9	39.0	0.9	77%	8.6
3Ys5Ys7Ys	0.25	0.63	0.32	0.69	0.33	0.71	0.35	0.62	4.0	3.7	0.3	20%	2.7
3Ys5Ys10Ys	0.06	0.67	0.09	0.66	0.56	0.25	0.64	0.17	2.7	2.3	0.5	74%	3.9
3Ys5Ys20Ys	0.48	0.23	0.47	0.22	0.59	0.17	0.64	0.18	-3.3	-2.6	-0.7	69%	4.6
3Ys5Ys30Ys	0.35	0.54	0.40	0.42	0.70	0.13	0.74	0.13	13.1	13.5	-0.4	37%	5.7
3Ys7Ys10Ys	0.00	0.94	-0.01	0.68	0.54	0.21	0.71	0.12	-7.5	-7.4	-0.1	57%	4.3
3Ys7Ys20Ys	1.07	-0.05	0.60	0.05	0.61	0.09	0.76	0.07	-21.9	-20.6	-1.3	56%	7.2
3Ys7Ys30Ys	0.54	0.73	0.36	0.38	0.66	0.10	0.79	0.08	0.4	1.4	-1.0	27%	7.8
3Ys10Ys20Ys	0.55	0.42	0.51	0.38	0.07	0.81	0.59	1.06	-6.4	-4.7	-1.7	30%	8.7
3Ys10Ys30Ys	0.45	0.77	0.48	0.62	0.54	0.59	0.64	0.74	14.6	16.0	-1.4	20%	8.1
3Ys20Ys30Ys	0.36	1.19	0.31	1.18	0.72	0.67	0.82	0.57	28.0	27.4	0.6	84%	6.9
5Ys7Ys10Ys	1.45	-0.02	1.17	-0.19	1.00	-0.06	1.14	-0.08	-12.9	-12.1	-0.8	45%	4.9
5Ys7Ys20Ys	1.87	-0.33	1.33	-0.26	1.07	-0.11	1.20	-0.15	-18.6	-18.2	-0.4	79%	3.9
5Ys7Ys30Ys	1.55	-0.14	1.05	-0.14	0.95	-0.03	1.07	-0.06	-18.6	-18.0	-0.6	42%	4.2
5Ys10Ys20Ys	1.23	0.19	1.05	0.18	0.34	0.67	1.51	0.49	-1.3	-0.4	-0.9	54%	6.0
5Ys10Ys30Ys	1.14	0.37	1.01	0.31	0.80	0.51	0.92	0.64	9.2	10.0	-0.8	83%	5.2
5Ys20Ys30Ys	0.69	1.12	0.66	0.98	1.06	0.58	1.20	0.45	24.7	23.7	1.1	91%	6.4
7Ys10Ys20Ys	0.71	0.42	0.81	0.40	0.36	0.70	1.31	0.77	15.7	16.1	-0.4	38%	5.2
7Ys10Ys30Ys	0.74	0.62	0.82	0.62	0.88	0.58	0.92	0.72	35.5	35.7	-0.1	86%	4.9
7Ys20Ys30Ys	0.24	1.45	0.51	1.20	1.18	0.68	1.24	0.60	42.5	41.0	1.5	93%	8.3
10Ys20Ys30Ys	0.40	1.16	0.49	0.98	1.27	-0.01	1.00	0.21	27.5	26.1	1.4	84%	8.4



Note: SOFR swap spreads are calculated as the maturity matched swap spread for the current on the run security. To calculate the weights, a 6M empirical regression is used of the 50/50 weighted spread fly regressed against the belly spread and the difference in the wing spreads. Weights on the butterfly are calculated similar to swap curve butterfly trades, i.e. they are structured to be "level" and "curve" neutral with respect to the maturity matched swap spread curve: left weight = $(0.5 \cdot \text{beta_curve}) / (1 - \text{beta_level})$ and right weight = $(0.5 + \text{beta_curve}) / (1 - \text{beta_level})$, where beta_level and beta_curve are calculated from the 6M regression described previously. The weighted spread is plotted and the 6M average of the weight spread is compared to the current weighted spread value to compute the residual. The weighted butterfly spreads trades with the greatest absolute residual are shown. SSS stands for SOFR swap spread.

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Derivatives Strategy

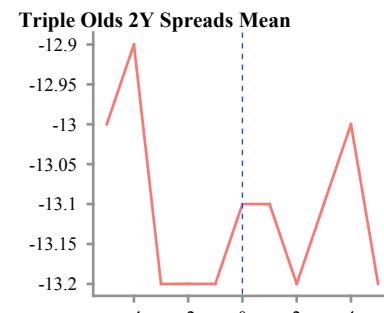
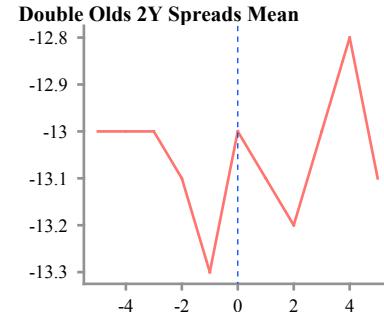
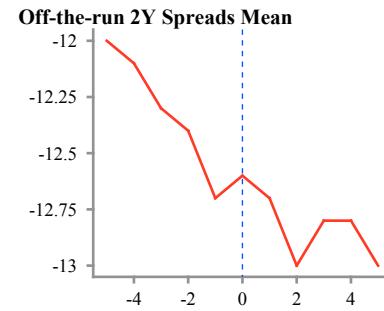
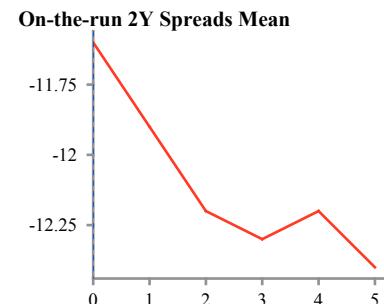
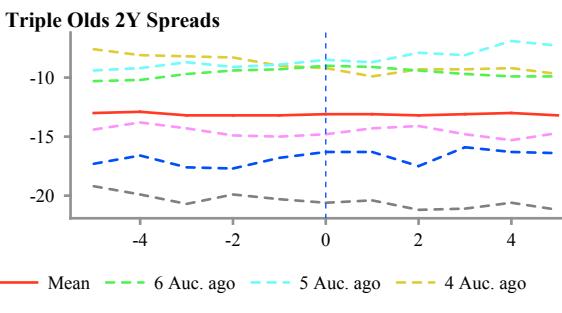
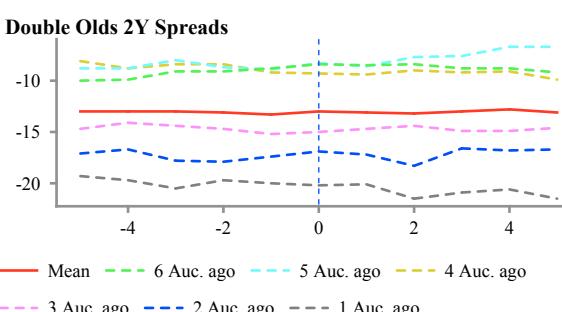
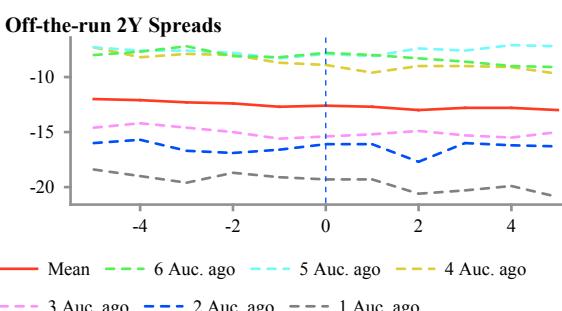
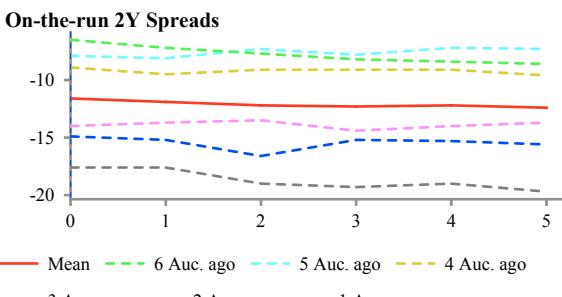
SOFR Swap Spreads Auction Cycle Report

On-the-run 2Y Spreads	0	1	2	3	4	5
Mean	-11.6	-11.9	-12.2	-12.3	-12.2	-12.4
6. Auc Day 2024-03-25: T 4.5% Mar 31 2026	-6.5	-7.2	-7.7	-8.2	-8.4	-8.6
5. Auc Day 2024-04-23: T 4.875% Apr 30 2026	-7.9	-8.1	-7.3	-7.8	-7.2	-7.3
4. Auc Day 2024-05-28: T 4.875% May 31 2026	-8.9	-9.5	-9.1	-9.1	-9.1	-9.6
3. Auc Day 2024-06-25: T 4.625% Jun 30 2026	-14.0	-13.7	-13.5	-14.4	-14.0	-13.7
2. Auc Day 2024-07-23: T 4.375% Jul 31 2026	-14.9	-15.2	-16.6	-15.2	-15.3	-15.6
1. Auc Day 2024-08-27: T 3.75% Aug 31 2026	-17.6	-17.6	-19.0	-19.3	-19.0	-19.7

Off-the-run 2Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-12.0	-12.1	-12.3	-12.4	-12.7	-12.6	-12.7	-13.0	-12.8	-12.8	-13.0
6. Auc Day 2024-03-25: T 4.625% Feb 28 2026	-8.0	-7.7	-7.2	-8.1	-8.2	-7.8	-8.0	-8.3	-8.6	-9.0	-9.1
5. Auc Day 2024-04-23: T 4.5% Mar 31 2026	-7.3	-7.6	-7.6	-7.8	-8.3	-7.9	-8.1	-7.4	-7.6	-7.1	-7.2
4. Auc Day 2024-05-28: T 4.875% Apr 30 2026	-7.3	-8.2	-7.9	-8.0	-8.7	-8.9	-9.6	-9.0	-9.0	-9.1	-9.7
3. Auc Day 2024-06-25: T 4.875% May 31 2026	-14.6	-14.2	-14.6	-15.0	-15.6	-15.4	-15.2	-14.9	-15.3	-15.5	-15.0
2. Auc Day 2024-07-23: T 4.625% Jun 30 2026	-16.0	-15.7	-16.7	-16.9	-16.6	-16.1	-16.1	-17.7	-16.0	-16.2	-16.3
1. Auc Day 2024-08-27: T 4.375% Jul 31 2026	-18.4	-19.0	-19.6	-18.7	-19.1	-19.3	-19.3	-20.6	-20.3	-19.9	-20.9

Double Olds 2Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-13.0	-13.0	-13.0	-13.1	-13.3	-13.0	-13.1	-13.2	-13.0	-12.8	-13.1
6. Auc Day 2024-03-25: T 4.25% Jan 31 2026	-10.0	-9.9	-9.1	-9.1	-8.8	-8.4	-8.5	-8.4	-8.8	-8.8	-9.2
5. Auc Day 2024-04-23: T 4.625% Feb 28 2026	-8.8	-8.8	-8.0	-8.7	-8.9	-8.3	-8.6	-7.7	-7.6	-6.7	-6.7
4. Auc Day 2024-05-28: T 4.5% Mar 31 2026	-8.1	-8.8	-8.4	-8.4	-9.2	-9.3	-9.4	-9.0	-9.2	-9.1	-9.9
3. Auc Day 2024-06-25: T 4.875% Apr 30 2026	-14.7	-14.1	-14.4	-14.7	-15.2	-15.0	-14.7	-14.4	-14.9	-14.9	-14.6
2. Auc Day 2024-07-23: T 4.875% May 31 2026	-17.1	-16.7	-17.8	-17.9	-17.4	-16.9	-17.2	-18.3	-16.6	-16.8	-16.7
1. Auc Day 2024-08-27: T 4.625% Jun 30 2026	-19.3	-19.7	-20.5	-19.7	-20.0	-20.2	-20.1	-21.5	-20.9	-20.6	-21.5

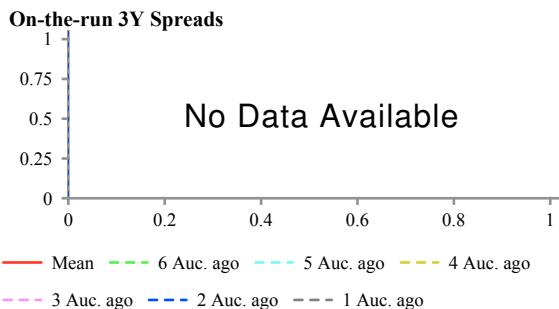
Triple Olds 2Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-13.0	-12.9	-13.2	-13.2	-13.2	-13.1	-13.1	-13.2	-13.1	-13.0	-13.2
6. Auc Day 2024-03-25: T 4.25% Dec 31 2025	-10.3	-10.2	-9.7	-9.4	-9.3	-9.0	-9.1	-9.4	-9.7	-9.9	-9.9
5. Auc Day 2024-04-23: T 4.25% Jan 31 2026	-9.4	-9.2	-8.7	-9.1	-8.9	-8.5	-8.7	-7.9	-8.1	-6.9	-7.3
4. Auc Day 2024-05-28: T 4.625% Feb 28 2026	-7.6	-8.1	-8.2	-8.3	-9.0	-9.2	-9.9	-9.3	-9.3	-9.2	-9.7
3. Auc Day 2024-06-25: T 4.5% Mar 31 2026	-14.4	-13.8	-14.3	-14.9	-15.0	-14.8	-14.3	-14.1	-14.8	-15.3	-14.7
2. Auc Day 2024-07-23: T 4.875% Apr 30 2026	-17.3	-16.6	-17.6	-17.7	-16.8	-16.3	-16.3	-17.5	-15.9	-16.3	-16.4
1. Auc Day 2024-08-27: T 4.875% May 31 2026	-19.2	-19.9	-20.7	-19.9	-20.3	-20.6	-20.4	-21.2	-21.1	-20.6	-21.2



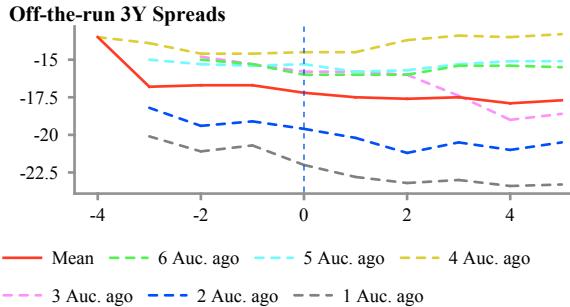
Derivatives Strategy

SOFR Swap Spreads Auction Cycle Report

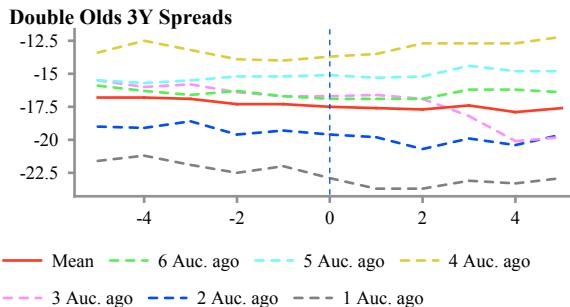
On-the-run 3Y Spreads	0	1	2	3	4	5
Mean						
6. Auc Day 2024-03-11: T 4.5% Apr 15 2027						
5. Auc Day 2024-04-09: T 4.5% May 15 2027	-16.8	-16.7	-16.7	-17.2	-17.5	-17.6
4. Auc Day 2024-05-07: T 4.625% Jun 15 2027	-15.0	-15.3	-16.0	-16.0	-16.0	-15.4
3. Auc Day 2024-06-10: T 4.375% Jul 15 2027	-15.0	-15.3	-15.4	-15.3	-15.7	-15.3
2. Auc Day 2024-07-09: T 3.75% Aug 15 2027	-14.8	-15.3	-15.8	-15.8	-16.0	-17.4
1. Auc Day 2024-08-06: T 3.375% Sep 15 2027	-20.1	-21.1	-20.7	-22.0	-22.8	-23.2



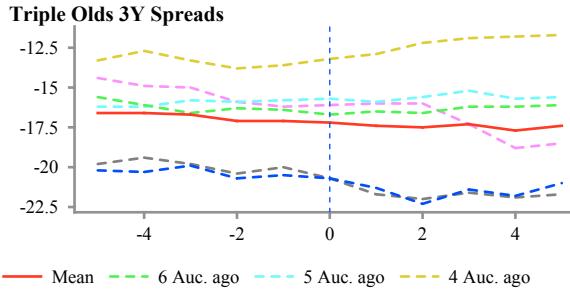
Off-the-run 3Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean											
6. Auc Day 2024-03-11: T 4.25% Mar 15 2027	-13.5	-16.8	-16.7	-16.7	-17.2	-17.5	-17.6	-17.5	-17.9	-17.7	-17.7
5. Auc Day 2024-04-09: T 4.5% Apr 15 2027	-15.0	-15.3	-16.0	-16.0	-16.0	-16.0	-16.0	-15.4	-15.4	-15.5	-15.5
4. Auc Day 2024-05-07: T 4.5% May 15 2027	-13.5	-13.9	-14.6	-14.6	-14.5	-14.5	-13.7	-13.4	-13.5	-13.3	-13.3
3. Auc Day 2024-06-10: T 4.625% Jun 15 2027	-14.8	-15.3	-15.8	-15.8	-16.0	-17.4	-19.0	-18.6	-18.6	-18.6	-18.6
2. Auc Day 2024-07-09: T 4.375% Jul 15 2027	-18.2	-19.4	-19.1	-19.6	-20.2	-21.2	-20.5	-21.0	-21.0	-20.5	-20.5
1. Auc Day 2024-08-06: T 3.75% Aug 15 2027	-20.1	-21.1	-20.7	-22.0	-22.8	-23.2	-23.0	-23.4	-23.4	-23.3	-23.3



Double Olds 3Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean											
6. Auc Day 2024-03-11: T 4.125% Feb 15 2027	-16.8	-16.8	-16.9	-17.3	-17.3	-17.5	-17.6	-17.7	-17.4	-17.9	-17.6
5. Auc Day 2024-04-09: T 4.25% Mar 15 2027	-15.9	-16.3	-16.6	-16.3	-16.7	-16.9	-16.9	-16.9	-16.2	-16.2	-16.4
4. Auc Day 2024-05-07: T 4.5% Apr 15 2027	-15.5	-15.7	-15.5	-15.2	-15.2	-15.1	-15.3	-15.2	-14.4	-14.8	-14.8
3. Auc Day 2024-06-10: T 4.5% May 15 2027	-13.4	-12.5	-13.2	-13.9	-14.0	-13.7	-13.5	-12.7	-12.7	-12.7	-12.2
2. Auc Day 2024-07-09: T 4.625% Jun 15 2027	-15.5	-16.0	-15.8	-16.4	-16.7	-16.7	-16.6	-16.9	-18.2	-20.1	-19.8
1. Auc Day 2024-08-06: T 3.75% Jul 15 2027	-19.0	-19.1	-18.6	-19.6	-19.3	-19.6	-19.8	-20.7	-19.9	-20.4	-19.6



Triple Olds 3Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean											
6. Auc Day 2024-03-11: T 4.0% Jan 15 2027	-16.6	-16.6	-16.7	-17.1	-17.1	-17.2	-17.4	-17.5	-17.3	-17.7	-17.4
5. Auc Day 2024-04-09: T 4.125% Feb 15 2027	-15.6	-16.1	-16.6	-16.3	-16.4	-16.7	-16.5	-16.6	-16.2	-16.2	-16.1
4. Auc Day 2024-05-07: T 4.25% Mar 15 2027	-16.2	-16.2	-15.8	-15.9	-15.8	-15.7	-15.9	-15.6	-15.2	-15.7	-15.6
3. Auc Day 2024-06-10: T 4.5% Apr 15 2027	-13.3	-12.7	-13.3	-13.8	-13.6	-13.2	-12.9	-12.2	-11.9	-11.8	-11.7
2. Auc Day 2024-07-09: T 4.5% May 15 2027	-14.4	-14.9	-15.0	-15.9	-16.2	-16.1	-16.0	-16.0	-17.3	-18.8	-18.5
1. Auc Day 2024-08-06: T 4.625% Jun 15 2027	-20.2	-20.3	-19.9	-20.7	-20.5	-20.7	-21.3	-22.3	-21.4	-21.8	-21.0



Derivatives Strategy

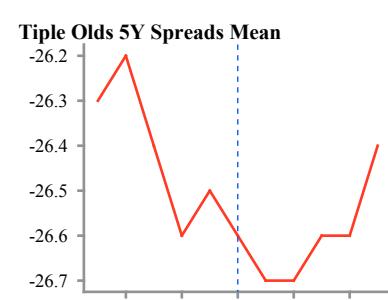
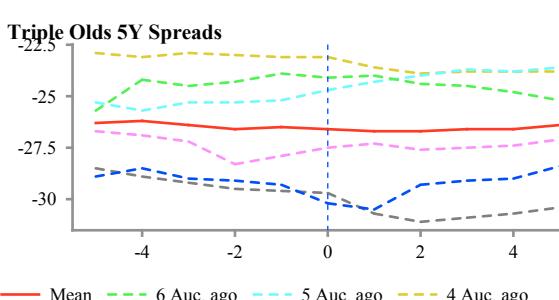
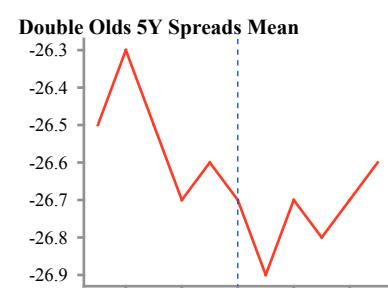
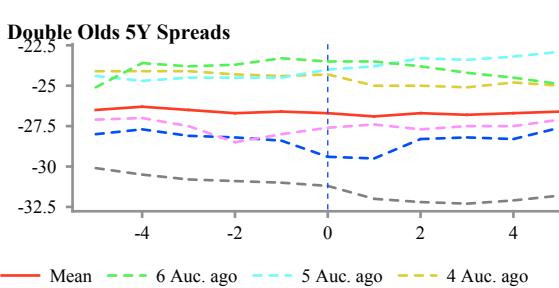
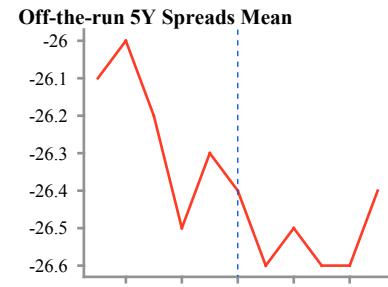
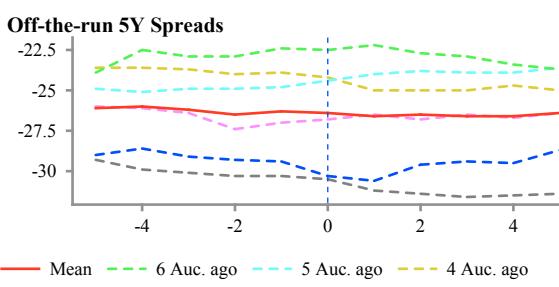
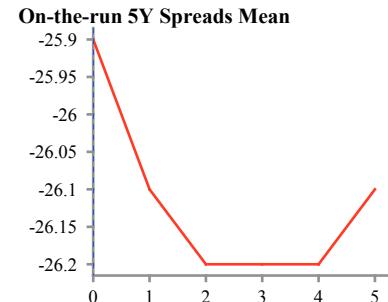
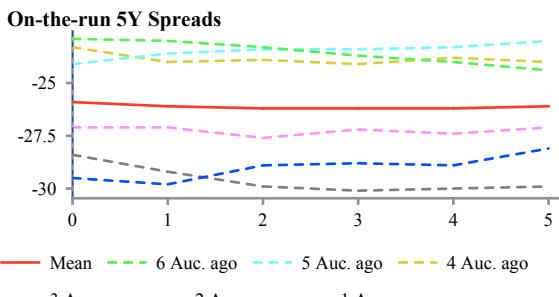
SOFR Swap Spreads Auction Cycle Report

On-the-run 5Y Spreads	0	1	2	3	4	5
Mean	-25.9	-26.1	-26.2	-26.2	-26.2	-26.1
6. Auc Day 2024-03-26: T 4.125% Mar 31 2029	-22.9	-23.0	-23.3	-23.7	-24.0	-24.4
5. Auc Day 2024-04-24: T 4.625% Apr 30 2029	-24.1	-23.6	-23.4	-23.4	-23.3	-23.0
4. Auc Day 2024-05-28: T 4.5% May 31 2029	-23.3	-24.0	-23.9	-24.1	-23.8	-24.0
3. Auc Day 2024-06-26: T 4.25% Jun 30 2029	-27.1	-27.1	-27.6	-27.2	-27.4	-27.1
2. Auc Day 2024-07-24: T 4.0% Jul 31 2029	-29.5	-29.8	-28.9	-28.8	-28.9	-28.1
1. Auc Day 2024-08-28: T 3.625% Aug 31 2029	-28.4	-29.2	-29.9	-30.1	-30.0	-29.9

Off-the-run 5Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-26.1	-26.0	-26.2	-26.5	-26.3	-26.4	-26.6	-26.5	-26.6	-26.6	-26.4
6. Auc Day 2024-03-26: T 4.25% Feb 28 2029	-23.9	-22.5	-22.9	-22.9	-22.4	-22.5	-22.2	-22.7	-22.9	-23.4	-23.7
5. Auc Day 2024-04-24: T 4.125% Mar 31 2029	-24.9	-25.1	-24.9	-24.9	-24.8	-24.4	-24.0	-23.8	-23.9	-23.9	-23.6
4. Auc Day 2024-05-28: T 4.625% Apr 30 2029	-23.6	-23.6	-23.7	-24.0	-23.9	-24.2	-25.0	-25.0	-25.0	-24.7	-25.0
3. Auc Day 2024-06-26: T 4.5% May 31 2029	-26.0	-26.1	-26.4	-27.4	-27.0	-26.8	-26.5	-26.8	-26.5	-26.7	-26.4
2. Auc Day 2024-07-24: T 4.25% Jun 30 2029	-29.0	-28.6	-29.1	-29.3	-29.4	-30.3	-30.6	-29.6	-29.4	-29.5	-28.7
1. Auc Day 2024-08-28: T 4.0% Jul 31 2029	-29.3	-29.9	-30.1	-30.3	-30.3	-30.5	-31.2	-31.4	-31.6	-31.5	-31.4

Double Olds 5Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-26.5	-26.3	-26.5	-26.7	-26.6	-26.7	-26.9	-26.7	-26.8	-26.7	-26.6
6. Auc Day 2024-03-26: T 4.0% Jan 31 2029	-25.1	-23.6	-23.8	-23.7	-23.3	-23.5	-23.5	-23.8	-24.2	-24.5	-24.9
5. Auc Day 2024-04-24: T 4.25% Feb 28 2029	-24.4	-24.7	-24.5	-24.5	-24.5	-24.0	-23.8	-23.3	-23.4	-23.2	-22.9
4. Auc Day 2024-05-28: T 4.125% Mar 31 2029	-24.1	-24.1	-24.1	-24.3	-24.4	-24.3	-25.0	-25.0	-25.1	-24.8	-25.0
3. Auc Day 2024-06-26: T 4.625% Apr 30 2029	-27.1	-27.0	-27.5	-28.5	-28.0	-27.6	-27.4	-27.7	-27.5	-27.5	-27.1
2. Auc Day 2024-07-24: T 4.5% May 31 2029	-28.0	-27.7	-28.1	-28.2	-28.4	-29.4	-29.5	-28.3	-28.2	-28.3	-27.6
1. Auc Day 2024-08-28: T 4.25% Jun 30 2029	-30.1	-30.5	-30.8	-30.9	-31.0	-31.2	-32.0	-32.2	-32.3	-32.1	-31.8

Triple Olds 5Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-26.3	-26.2	-26.4	-26.6	-26.5	-26.6	-26.7	-26.7	-26.6	-26.6	-26.4
6. Auc Day 2024-03-26: T 3.75% Dec 31 2028	-25.7	-24.2	-24.5	-24.3	-23.9	-24.1	-24.0	-24.4	-24.5	-24.8	-25.2
5. Auc Day 2024-04-24: T 4.0% Jan 31 2029	-25.3	-25.7	-25.3	-25.3	-25.2	-24.7	-24.3	-24.0	-23.7	-23.8	-23.6
4. Auc Day 2024-05-28: T 4.25% Feb 28 2029	-22.9	-23.1	-22.9	-23.0	-23.1	-23.1	-23.6	-23.9	-23.8	-23.8	-23.8
3. Auc Day 2024-06-26: T 4.125% Mar 31 2029	-26.7	-26.9	-27.2	-28.3	-27.9	-27.5	-27.3	-27.6	-27.5	-27.4	-27.1
2. Auc Day 2024-07-24: T 4.625% Apr 30 2029	-28.9	-28.5	-29.0	-29.1	-29.3	-30.2	-30.5	-29.3	-29.1	-29.0	-28.4
1. Auc Day 2024-08-28: T 4.5% May 31 2029	-28.5	-28.9	-29.2	-29.5	-29.6	-29.7	-30.7	-31.1	-30.9	-30.7	-30.4

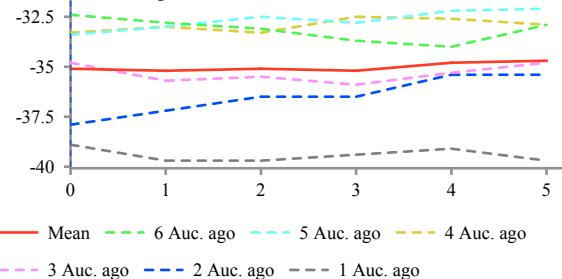


Derivatives Strategy

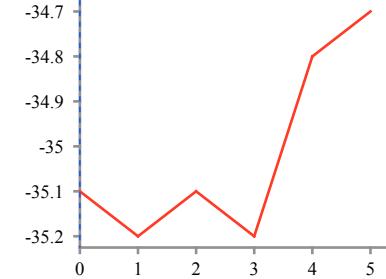
SOFR Swap Spreads Auction Cycle Report

On-the-run 7Y Spreads	0	1	2	3	4	5
Mean	-35.1	-35.2	-35.1	-35.2	-34.8	-34.7
6. Auc Day 2024-03-27: T 4.125% Mar 31 2031	-32.4	-32.8	-33.1	-33.7	-34.0	-32.9
5. Auc Day 2024-04-25: T 4.625% Apr 30 2031	-33.4	-33.0	-32.5	-32.8	-32.2	-32.1
4. Auc Day 2024-05-29: T 4.625% May 31 2031	-33.3	-33.0	-33.3	-32.5	-32.6	-32.9
3. Auc Day 2024-06-27: T 4.25% Jun 30 2031	-34.8	-35.7	-35.5	-35.9	-35.3	-34.8
2. Auc Day 2024-07-25: T 4.125% Jul 31 2031	-37.9	-37.2	-36.5	-36.5	-35.4	-35.4
1. Auc Day 2024-08-29: T 3.75% Aug 31 2031	-38.9	-39.7	-39.7	-39.4	-39.1	-39.7

On-the-run 7Y Spreads

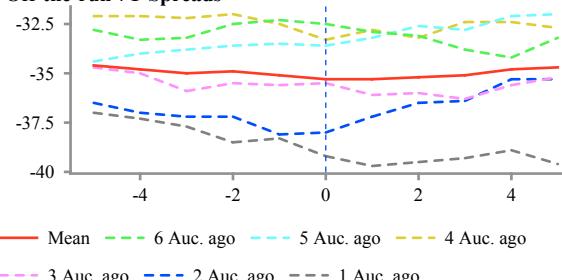


On-the-run 7Y Spreads Mean

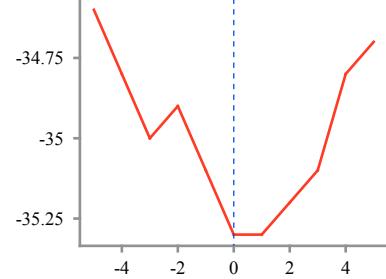


Off-the-run 7Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-34.6	-34.8	-35.0	-34.9	-35.1	-35.3	-35.3	-35.2	-35.1	-34.8	-34.7
6. Auc Day 2024-03-27: T 4.25% Feb 28 2031	-32.8	-33.3	-33.2	-32.5	-32.3	-32.5	-32.9	-33.1	-33.8	-34.2	-33.2
5. Auc Day 2024-04-25: T 4.125% Mar 31 2031	-34.4	-34.0	-33.8	-33.6	-33.5	-33.6	-33.2	-32.6	-32.8	-32.1	-32.0
4. Auc Day 2024-05-29: T 4.625% Apr 30 2031	-32.1	-32.1	-32.2	-32.0	-32.5	-33.3	-32.8	-33.2	-32.4	-32.4	-32.7
3. Auc Day 2024-06-27: T 4.625% May 31 2031	-34.7	-35.0	-35.9	-35.5	-35.6	-35.5	-36.1	-36.0	-36.3	-35.6	-35.2
2. Auc Day 2024-07-25: T 4.25% Jun 30 2031	-36.5	-37.0	-37.2	-37.2	-38.1	-38.0	-37.2	-36.5	-36.4	-35.3	-35.3
1. Auc Day 2024-08-29: T 4.125% Jul 31 2031	-37.0	-37.3	-37.7	-38.5	-38.3	-39.2	-39.7	-39.5	-39.3	-38.9	-39.6

Off-the-run 7Y Spreads

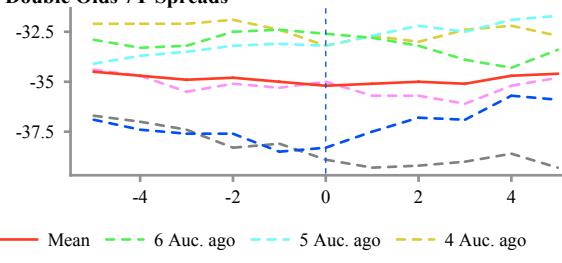


Off-the-run 7Y Spreads Mean

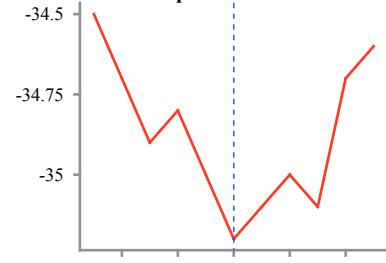


Double Olds 7Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-34.5	-34.7	-34.9	-34.8	-35.0	-35.2	-35.1	-35.0	-35.1	-34.7	-34.6
6. Auc Day 2024-03-27: T 4.0% Jan 31 2031	-32.9	-33.3	-33.2	-32.5	-32.4	-32.6	-32.8	-33.2	-33.9	-34.3	-33.4
5. Auc Day 2024-04-25: T 4.25% Feb 28 2031	-34.1	-33.7	-33.5	-33.2	-33.1	-33.2	-32.7	-32.2	-32.5	-31.9	-31.7
4. Auc Day 2024-05-29: T 4.125% Mar 31 2031	-32.1	-32.1	-32.1	-31.9	-32.4	-33.2	-32.7	-33.0	-32.4	-32.2	-32.7
3. Auc Day 2024-06-27: T 4.625% Apr 30 2031	-34.4	-34.7	-35.5	-35.1	-35.3	-35.0	-35.7	-35.7	-36.1	-35.2	-34.8
2. Auc Day 2024-07-25: T 4.625% May 31 2031	-36.9	-37.4	-37.6	-37.6	-38.5	-38.3	-37.5	-36.8	-36.9	-35.7	-35.9
1. Auc Day 2024-08-29: T 4.25% Jun 30 2031	-36.7	-37.0	-37.4	-38.3	-38.1	-38.9	-39.3	-39.2	-39.0	-38.6	-39.3

Double Olds 7Y Spreads

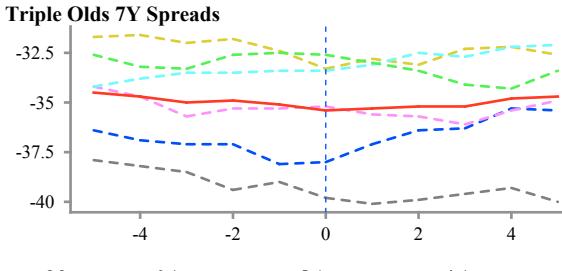


Double Olds 7Y Spreads Mean

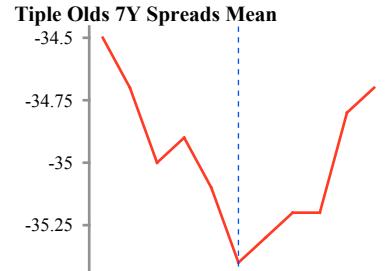


Triple Olds 7Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-34.5	-34.7	-35.0	-34.9	-35.1	-35.4	-35.3	-35.2	-35.2	-34.8	-34.7
6. Auc Day 2024-03-27: T 3.75% Dec 31 2030	-32.6	-33.2	-33.3	-32.6	-32.5	-32.6	-33.0	-33.4	-34.1	-34.3	-33.4
5. Auc Day 2024-04-25: T 4.0% Jan 31 2031	-34.2	-33.8	-33.5	-33.5	-33.4	-33.4	-33.1	-32.5	-32.7	-32.2	-32.1
4. Auc Day 2024-05-29: T 4.25% Feb 28 2031	-31.7	-31.6	-32.0	-31.8	-32.4	-33.3	-32.8	-33.1	-32.3	-32.2	-32.6
3. Auc Day 2024-06-27: T 4.125% Mar 31 2031	-34.2	-34.7	-35.7	-35.3	-35.3	-35.2	-35.6	-35.7	-36.1	-35.4	-34.9
2. Auc Day 2024-07-25: T 4.625% Apr 30 2031	-36.4	-36.9	-37.1	-37.1	-38.1	-38.0	-37.1	-36.4	-36.3	-35.3	-35.4
1. Auc Day 2024-08-29: T 4.625% May 31 2031	-37.9	-38.2	-38.5	-39.4	-39.0	-39.8	-40.1	-39.9	-39.6	-39.3	-40.0

Triple Olds 7Y Spreads



Triple Olds 7Y Spreads Mean

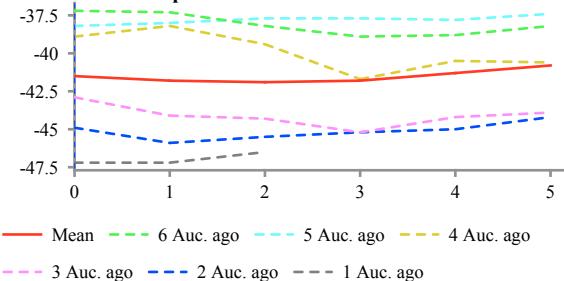


Derivatives Strategy

SOFR Swap Spreads Auction Cycle Report

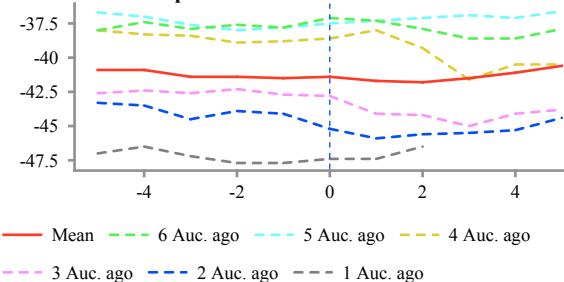
On-the-run 10Y Spreads	0	1	2	3	4	5
Mean	-41.5	-41.8	-41.9	-41.8	-41.3	-40.8
6. Auc Day 2024-04-10: T 3.375% May 15 2033	-37.2	-37.3	-38.2	-38.9	-38.8	-38.2
5. Auc Day 2024-05-08: T 3.875% Aug 15 2033	-38.2	-38.0	-37.7	-37.7	-37.8	-37.4
4. Auc Day 2024-06-11: T 4.5% Nov 15 2033	-38.9	-38.2	-39.4	-41.7	-40.5	-40.6
3. Auc Day 2024-07-10: T 4.0% Feb 15 2034	-42.9	-44.1	-44.3	-45.2	-44.2	-43.9
2. Auc Day 2024-08-07: T 4.375% May 15 2034	-44.9	-45.9	-45.5	-45.2	-45.0	-44.2
1. Auc Day 2024-09-11: T 3.875% Aug 15 2034	-47.2	-47.2	-46.5			

On-the-run 10Y Spreads



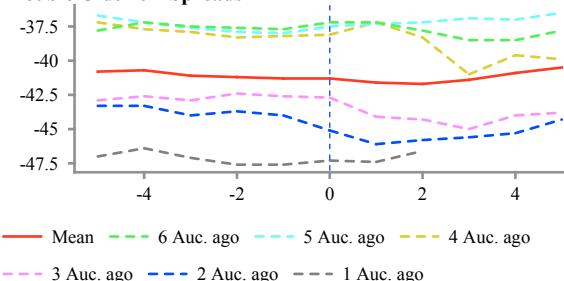
Off-the-run 10Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-40.9	-40.9	-41.4	-41.4	-41.5	-41.4	-41.7	-41.8	-41.5	-41.1	-40.6
6. Auc Day 2024-04-10: T 3.5% Feb 15 2033	-38.0	-37.4	-37.9	-37.6	-37.8	-37.1	-37.3	-37.9	-38.6	-38.6	-37.9
5. Auc Day 2024-05-08: T 3.375% May 15 2033	-36.7	-37.0	-37.6	-38.0	-37.8	-37.5	-37.3	-37.1	-36.9	-37.1	-36.6
4. Auc Day 2024-06-11: T 3.875% Aug 15 2033	-38.0	-38.3	-38.4	-38.9	-38.8	-38.6	-38.0	-39.3	-41.6	-40.5	-40.5
3. Auc Day 2024-07-10: T 4.5% Nov 15 2033	-42.6	-42.4	-42.6	-42.3	-42.7	-42.8	-44.1	-44.2	-45.0	-44.1	-43.8
2. Auc Day 2024-08-07: T 4.0% Feb 15 2034	-43.3	-43.5	-44.5	-43.9	-44.1	-45.2	-45.9	-45.6	-45.5	-45.3	-44.4
1. Auc Day 2024-09-11: T 4.375% May 15 2034	-47.0	-46.5	-47.2	-47.7	-47.7	-47.4	-47.4	-46.5			

Off-the-run 10Y Spreads



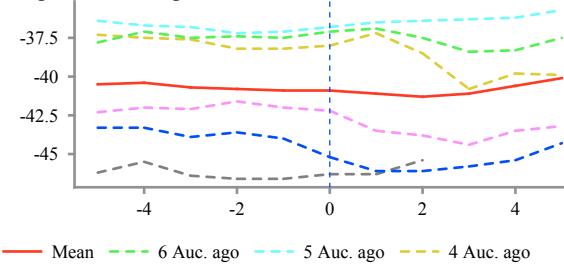
Double Olds 10Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-40.8	-40.7	-41.1	-41.2	-41.3	-41.3	-41.6	-41.7	-41.4	-40.9	-40.5
6. Auc Day 2024-04-10: T 4.125% Nov 15 2032	-37.8	-37.2	-37.5	-37.6	-37.7	-37.2	-37.2	-37.8	-38.5	-38.5	-37.8
5. Auc Day 2024-05-08: T 3.5% Feb 15 2033	-36.7	-37.2	-37.6	-37.9	-38.0	-37.5	-37.3	-37.2	-36.9	-37.0	-36.5
4. Auc Day 2024-06-11: T 3.375% May 15 2033	-37.2	-37.7	-37.9	-38.3	-38.2	-38.1	-37.2	-38.3	-41.0	-39.6	-39.9
3. Auc Day 2024-07-10: T 3.875% Aug 15 2033	-42.9	-42.6	-42.9	-42.4	-42.6	-42.7	-44.1	-44.3	-45.0	-44.0	-43.8
2. Auc Day 2024-08-07: T 4.5% Nov 15 2033	-43.3	-43.3	-44.0	-43.7	-44.0	-45.1	-46.1	-45.8	-45.6	-45.3	-44.3
1. Auc Day 2024-09-11: T 4.0% Feb 15 2034	-47.0	-46.4	-47.1	-47.6	-47.6	-47.3	-47.4	-46.6			

Double Olds 10Y Spreads

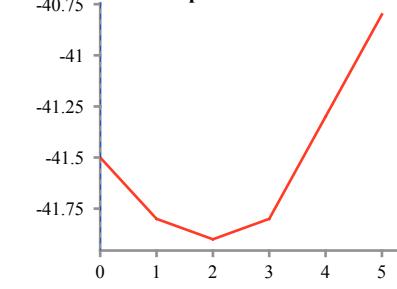


Triple Olds 10Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-40.5	-40.4	-40.7	-40.8	-40.9	-40.9	-41.1	-41.3	-41.1	-40.6	-40.1
6. Auc Day 2024-04-10: T 2.75% Aug 15 2032	-37.8	-37.1	-37.5	-37.4	-37.5	-37.1	-36.9	-37.5	-38.4	-38.3	-37.5
5. Auc Day 2024-05-08: T 4.125% Nov 15 2032	-36.4	-36.7	-36.8	-37.2	-37.1	-36.8	-36.5	-36.4	-36.3	-36.2	-35.7
4. Auc Day 2024-06-11: T 3.5% Feb 15 2033	-37.3	-37.5	-37.6	-38.2	-38.2	-38.0	-37.2	-38.5	-40.8	-39.8	-39.9
3. Auc Day 2024-07-10: T 3.375% May 15 2033	-42.3	-42.0	-42.1	-41.6	-42.0	-42.2	-43.5	-43.8	-44.4	-43.5	-43.2
2. Auc Day 2024-08-07: T 3.875% Aug 15 2033	-43.3	-43.3	-43.9	-43.6	-44.0	-45.2	-46.1	-46.1	-45.8	-45.4	-44.3
1. Auc Day 2024-09-11: T 4.5% Nov 15 2033	-46.2	-45.5	-46.4	-46.6	-46.6	-46.3	-46.3	-45.4			

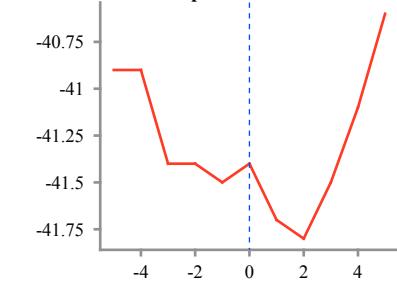
Triple Olds 10Y Spreads



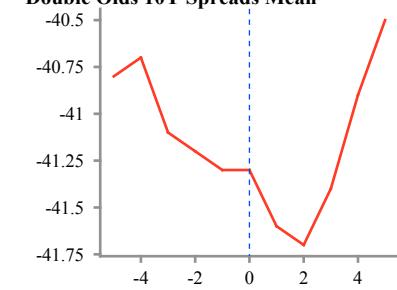
On-the-run 10Y Spreads Mean



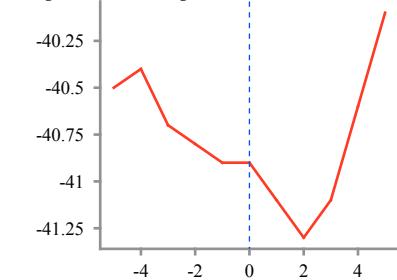
Off-the-run 10Y Spreads Mean



Double Olds 10Y Spreads Mean



Triple Olds 10Y Spreads Mean



Derivatives Strategy

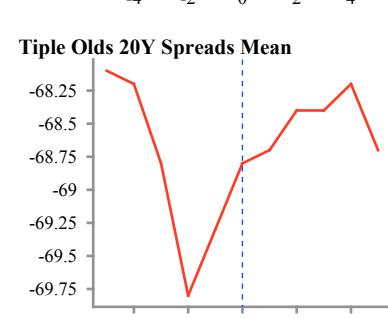
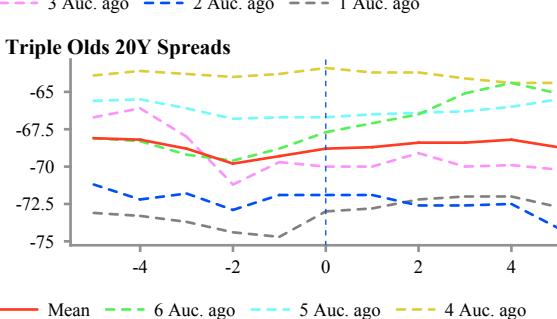
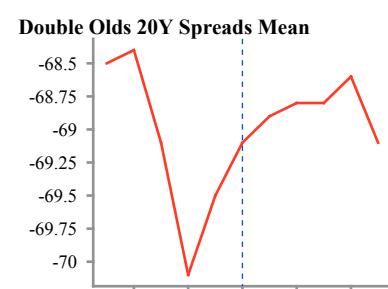
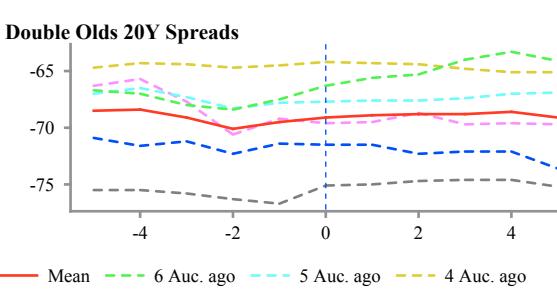
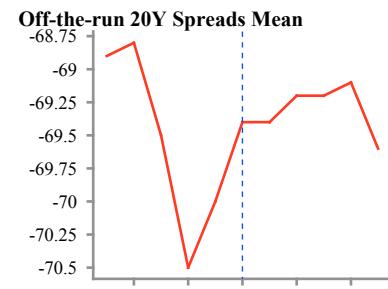
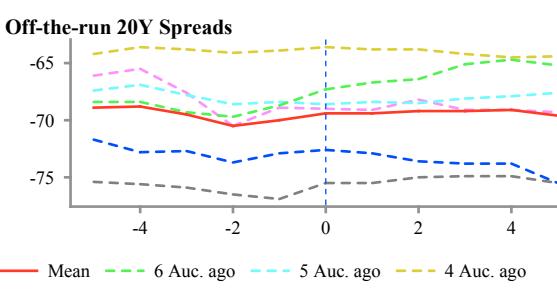
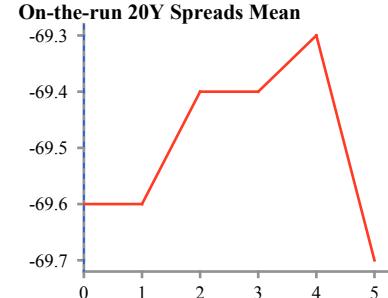
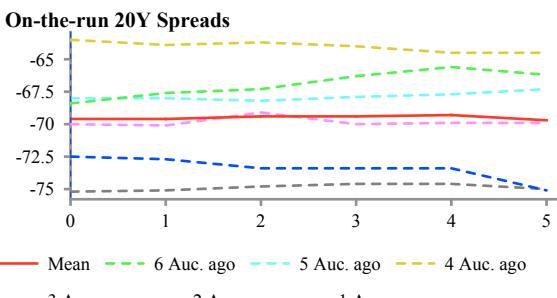
SOFR Swap Spreads Auction Cycle Report

On-the-run 20Y Spreads	0	1	2	3	4	5
Mean	-69.6	-69.6	-69.4	-69.4	-69.3	-69.7
6. Auc Day 2024-03-19: T 3.875% May 15 2043	-68.4	-67.6	-67.3	-66.3	-65.6	-66.2
5. Auc Day 2024-04-17: T 4.375% Aug 15 2043	-68.0	-68.0	-68.2	-67.9	-67.7	-67.3
4. Auc Day 2024-05-22: T 4.75% Nov 15 2043	-63.5	-63.9	-63.7	-64.0	-64.5	-64.5
3. Auc Day 2024-06-18: T 4.5% Feb 15 2044	-70.0	-70.1	-69.1	-70.0	-69.9	-69.9
2. Auc Day 2024-07-17: T 4.625% May 15 2044	-72.5	-72.7	-73.4	-73.4	-73.4	-75.1
1. Auc Day 2024-08-21: T 4.125% Aug 15 2044	-75.2	-75.1	-74.8	-74.6	-74.6	-75.0

Off-the-run 20Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-68.9	-68.8	-69.5	-70.5	-70.0	-69.4	-69.4	-69.2	-69.2	-69.1	-69.6
6. Auc Day 2024-03-19: T 3.875% Feb 15 2043	-68.4	-68.4	-69.3	-69.7	-68.7	-67.3	-66.7	-66.4	-65.1	-64.7	-65.2
5. Auc Day 2024-04-17: T 3.875% May 15 2043	-67.4	-66.9	-67.8	-68.6	-68.4	-68.6	-68.4	-68.5	-68.1	-67.9	-67.6
4. Auc Day 2024-05-22: T 4.375% Aug 15 2043	-64.2	-63.6	-63.8	-64.1	-63.9	-63.6	-63.8	-63.8	-64.2	-64.5	-64.4
3. Auc Day 2024-06-18: T 4.75% Nov 15 2043	-66.1	-65.5	-67.6	-70.5	-68.9	-69.0	-69.1	-68.2	-69.1	-69.1	-69.3
2. Auc Day 2024-07-17: T 4.5% Feb 15 2044	-71.7	-72.8	-72.7	-73.7	-72.9	-72.6	-72.9	-73.6	-73.8	-73.8	-75.5
1. Auc Day 2024-08-21: T 4.625% May 15 2044	-75.4	-75.6	-75.9	-76.5	-76.9	-75.5	-75.5	-75.0	-74.9	-74.9	-75.5

Double Olds 20Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-68.5	-68.4	-69.1	-70.1	-69.5	-69.1	-68.9	-68.8	-68.8	-68.6	-69.1
6. Auc Day 2024-03-19: T 4.0% Nov 15 2042	-66.7	-67.0	-68.0	-68.4	-67.5	-66.3	-65.6	-65.3	-64.0	-63.3	-64.1
5. Auc Day 2024-04-17: T 3.875% Feb 15 2043	-67.0	-66.5	-67.3	-68.3	-67.8	-67.7	-67.6	-67.6	-67.4	-67.0	-66.9
4. Auc Day 2024-05-22: T 3.875% May 15 2043	-64.7	-64.3	-64.4	-64.7	-64.5	-64.2	-64.3	-64.4	-64.8	-65.1	-65.1
3. Auc Day 2024-06-18: T 4.375% Aug 15 2043	-66.3	-65.7	-67.7	-70.6	-69.2	-69.6	-69.5	-68.7	-69.7	-69.6	-69.7
2. Auc Day 2024-07-17: T 4.75% Nov 15 2043	-70.9	-71.6	-71.2	-72.3	-71.4	-71.5	-71.5	-72.3	-72.1	-72.1	-73.6
1. Auc Day 2024-08-21: T 4.5% Feb 15 2044	-75.5	-75.5	-75.8	-76.3	-76.7	-75.1	-75.0	-74.7	-74.6	-74.6	-75.2

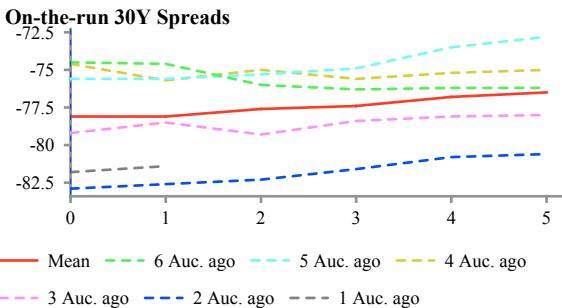
Triple Olds 20Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-68.1	-68.2	-68.8	-69.8	-69.3	-68.8	-68.7	-68.4	-68.4	-68.2	-68.7
6. Auc Day 2024-03-19: T 3.375% Aug 15 2042	-68.1	-68.3	-69.2	-69.6	-68.8	-67.7	-67.1	-66.5	-65.1	-64.4	-65.1
5. Auc Day 2024-04-17: T 4.0% Nov 15 2042	-65.6	-65.5	-66.1	-66.8	-66.7	-66.7	-66.5	-66.4	-66.3	-66.0	-65.5
4. Auc Day 2024-05-22: T 3.875% Feb 15 2043	-63.9	-63.6	-63.8	-64.0	-63.8	-63.4	-63.7	-63.7	-64.1	-64.4	-64.4
3. Auc Day 2024-06-18: T 3.875% May 15 2043	-66.7	-66.1	-68.0	-71.2	-69.7	-70.0	-70.0	-69.1	-70.0	-69.9	-70.2
2. Auc Day 2024-07-17: T 4.375% Aug 15 2043	-71.2	-72.2	-71.8	-72.9	-71.9	-71.9	-71.9	-72.6	-72.6	-72.5	-74.1
1. Auc Day 2024-08-21: T 4.75% Nov 15 2043	-73.1	-73.3	-73.7	-74.4	-74.7	-73.0	-72.8	-72.2	-72.0	-72.0	-72.7



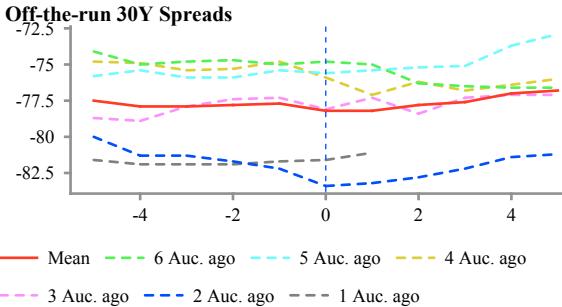
Derivatives Strategy

SOFR Swap Spreads Auction Cycle Report

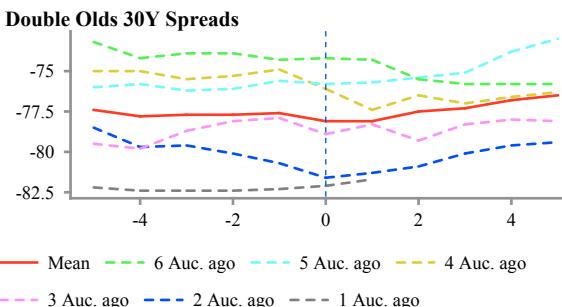
On-the-run 30Y Spreads	0	1	2	3	4	5
Mean	-78.1	-78.1	-77.6	-77.4	-76.8	-76.5
6. Auc Day 2024-04-11: T 3.625% May 15 2053	-74.5	-74.6	-76.0	-76.3	-76.2	-76.2
5. Auc Day 2024-05-09: T 4.125% Aug 15 2053	-75.6	-75.6	-75.3	-74.9	-73.5	-72.8
4. Auc Day 2024-06-13: T 4.75% Nov 15 2053	-74.6	-75.7	-75.0	-75.6	-75.2	-75.0
3. Auc Day 2024-07-11: T 4.25% Feb 15 2054	-79.2	-78.5	-79.3	-78.4	-78.1	-78.0
2. Auc Day 2024-08-08: T 4.625% May 15 2054	-82.9	-82.6	-82.3	-81.6	-80.8	-80.6
1. Auc Day 2024-09-12: T 4.25% Aug 15 2054	-81.8	-81.4				



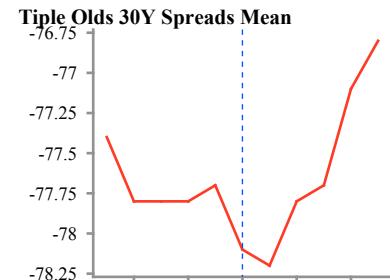
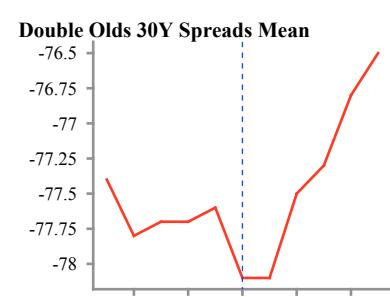
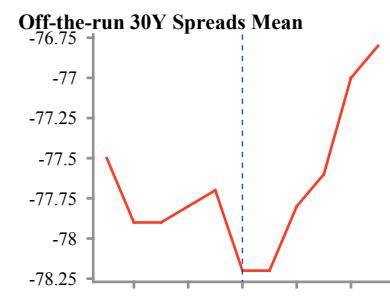
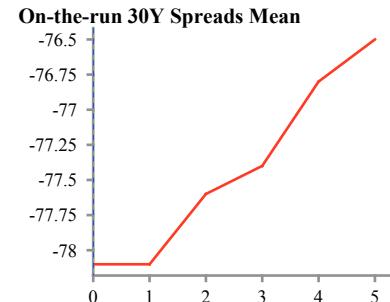
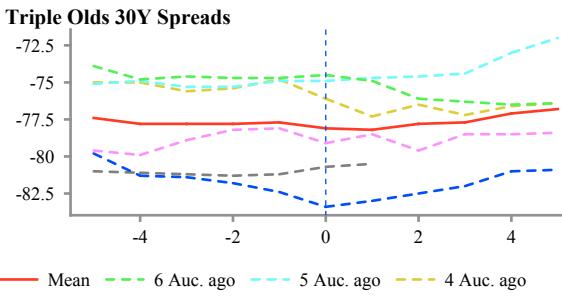
Off-the-run 30Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-77.5	-77.9	-77.9	-77.8	-77.7	-78.2	-78.2	-77.8	-77.6	-77.0	-76.8
6. Auc Day 2024-04-11: T 3.625% Feb 15 2053	-74.1	-75.0	-74.8	-74.7	-75.0	-74.8	-75.0	-76.3	-76.5	-76.6	-76.6
5. Auc Day 2024-05-09: T 3.625% May 15 2053	-75.8	-75.4	-75.9	-75.9	-75.4	-75.6	-75.4	-75.2	-75.1	-73.7	-72.9
4. Auc Day 2024-06-13: T 4.125% Aug 15 2053	-74.8	-74.9	-75.4	-75.3	-74.8	-75.9	-77.1	-76.2	-76.8	-76.4	-76.0
3. Auc Day 2024-07-11: T 4.75% Nov 15 2053	-78.7	-78.9	-77.9	-77.4	-77.3	-78.1	-77.3	-78.4	-77.3	-77.1	-77.1
2. Auc Day 2024-08-08: T 4.25% Feb 15 2054	-80.0	-81.3	-81.3	-81.7	-82.2	-83.4	-83.2	-82.8	-82.2	-81.4	-81.2
1. Auc Day 2024-09-12: T 4.625% May 15 2054	-81.6	-81.9	-81.9	-81.7	-81.6	-81.1					



Double Olds 30Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-77.4	-77.8	-77.7	-77.7	-77.6	-78.1	-78.1	-77.5	-77.3	-76.8	-76.5
6. Auc Day 2024-04-11: T 4.0% Nov 15 2052	-73.2	-74.2	-73.9	-73.9	-74.3	-74.2	-74.3	-75.5	-75.8	-75.8	-75.8
5. Auc Day 2024-05-09: T 3.625% Feb 15 2053	-76.0	-75.8	-76.2	-76.1	-75.6	-75.8	-75.7	-75.4	-75.1	-73.8	-73.0
4. Auc Day 2024-06-13: T 3.625% May 15 2053	-75.0	-75.0	-75.5	-75.3	-74.9	-76.1	-77.4	-76.5	-77.0	-76.6	-76.3
3. Auc Day 2024-07-11: T 4.125% Aug 15 2053	-79.5	-79.8	-78.7	-78.1	-77.9	-78.9	-78.3	-79.3	-78.3	-78.0	-78.1
2. Auc Day 2024-08-08: T 4.75% Nov 15 2053	-78.5	-79.7	-79.6	-80.1	-80.7	-81.6	-81.3	-80.9	-80.1	-79.6	-79.4
1. Auc Day 2024-09-12: T 4.25% Feb 15 2054	-82.2	-82.4	-82.4	-82.3	-82.1	-81.7					



Triple Olds 30Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-77.4	-77.8	-77.8	-77.8	-77.7	-78.1	-78.2	-77.8	-77.7	-77.1	-76.8
6. Auc Day 2024-04-11: T 3.0% Aug 15 2052	-73.9	-74.8	-74.6	-74.7	-74.7	-74.5	-74.9	-76.1	-76.3	-76.5	-76.4
5. Auc Day 2024-05-09: T 4.0% Nov 15 2052	-75.1	-74.9	-75.3	-75.3	-74.9	-74.9	-74.7	-74.6	-74.4	-73.0	-72.0
4. Auc Day 2024-06-13: T 3.625% Feb 15 2053	-75.0	-75.0	-75.6	-75.4	-74.8	-76.1	-77.3	-76.5	-77.2	-76.6	-76.4
3. Auc Day 2024-07-11: T 3.625% May 15 2053	-79.6	-79.9	-78.9	-78.2	-78.1	-79.1	-78.5	-79.6	-78.5	-78.5	-78.4
2. Auc Day 2024-08-08: T 4.125% Aug 15 2053	-79.8	-81.3	-81.4	-81.8	-82.4	-83.4	-83.0	-82.5	-82.0	-81.0	-80.9
1. Auc Day 2024-09-12: T 4.75% Nov 15 2053	-81.0	-81.1	-81.2	-81.3	-81.2	-80.7	-80.5				



Derivatives Strategy

Issue Specific SOFR Swap Spread Detailed Report

Cpn	Mat	Orig Issue Size *	Yield	Interpolated Swap Yield		Matched Maturity Swap Spread				Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %		
			Spot	3m Fwd	Spot	3m Fwd	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	1m	3m	1m	3m		
1.750	Mar 15 2025	3	56.1	4.440	3.657	4.480	4.057	4.0	40.0	36.0	32.7	9.9	50.1	40.2	-47.5	-0.1	35.4	35.5	31.5	5.27	5.13	2.10	10.10	14.4
2.625	Mar 31 2025	7	34.1	4.427	3.723	4.419	3.993	-0.9	27.1	27.9	26.7	2.9	31.1	28.2	-29.1	-4.9	22.6	27.5	25.9	5.27	5.13	1.92	8.63	54.0
3.875	Mar 31 2025	2	42.0	4.481	3.822	4.419	3.992	-6.2	17.1	23.3	22.0	-1.7	21.3	23.0	-31.1	-10.3	12.6	22.9	21.2	5.27	5.13	1.93	8.64	0.0
0.500	Mar 31 2025	5	46.5	4.491	3.842	4.419	3.992	-7.3	15.0	22.3	21.1	-4.5	19.2	23.7	-32.3	-11.3	10.5	21.8	20.2	5.27	5.13	1.91	8.61	14.8
2.625	Apr 15 2025	3	57.0	4.392	3.746	4.357	3.933	-3.5	18.7	22.2	23.0	0.2	22.8	22.6	-26.4	-7.5	14.3	21.9	22.5	5.27	5.13	1.77	7.57	19.3
2.875	Apr 30 2025	7	32.7	4.434	3.886	4.304	3.886	-12.9	-0.1	12.9	14.9	-10.6	2.1	12.6	-27.5	-16.9	-4.3	12.6	14.7	5.27	5.13	1.63	6.72	25.1
3.875	Apr 30 2025	2	46.1	4.402	3.833	4.304	3.886	-9.8	5.3	15.1	17.1	-6.9	7.4	14.3	-25.5	-13.8	1.0	14.8	16.9	5.27	5.13	1.64	6.73	8.9
0.375	Apr 30 2025	5	46.7	4.408	3.847	4.304	3.886	-10.3	3.9	14.2	16.5	-9.4	6.0	15.4	-30.6	-14.3	-0.3	14.0	16.3	5.27	5.13	1.61	6.67	10.4
2.125	May 15 2025	10	66.5	4.350	3.803	4.251	3.838	-10.0	3.5	13.4	21.6	-7.9	5.6	13.5	-25.2	-13.8	-0.6	13.3	21.6	5.27	5.13	1.51	6.05	23.8
2.750	May 15 2025	3	76.5	4.346	3.795	4.251	3.838	-9.5	4.3	13.8	21.9	-7.2	6.4	13.6	-24.4	-13.4	0.2	13.6	21.9	5.27	5.13	1.52	6.06	41.4
2.875	May 31 2025	7	35.2	4.297	3.772	4.195	3.785	-10.2	1.4	11.5	22.5	-8.4	3.2	11.7	-18.9	-13.9	-2.4	11.5	22.7	5.27	5.13	1.41	5.52	36.1
0.250	May 31 2025	5	49.7	4.315	3.805	4.195	3.785	-12.0	-2.0	10.0	21.2	-11.7	-0.1	11.5	-20.4	-15.7	-5.8	9.9	21.5	5.27	5.13	1.40	5.47	17.3
4.250	May 31 2025	2	49.9	4.293	3.764	4.195	3.785	-9.8	2.2	12.0	22.8	-7.4	4.0	11.4	-17.6	-13.6	-1.6	11.9	23.0	5.27	5.13	1.42	5.55	15.8
2.875	Jun 15 2025	3	46.6	4.251	3.747	4.140	3.737	-11.2	-1.0	10.2	24.2	-6.4	5.2	11.6	-27.5	-14.8	-4.5	10.2	24.7	5.27	5.13	1.32	5.08	5.6
2.750	Jun 30 2025	7	33.7	4.145	3.622	4.093	3.696	-5.2	7.4	12.6	21.7	-2.9	9.5	12.4	-18.2	-8.7	3.9	12.6	22.2	5.27	5.13	1.24	4.66	48.5
4.625	Jun 30 2025	2	42.0	4.200	3.698	4.093	3.696	-10.6	-0.2	10.5	19.3	-7.4	2.1	9.5	-15.1	-14.2	-3.7	10.5	19.8	5.27	5.13	1.25	4.70	0.0
0.250	Jun 30 2025	5	53.4	4.206	3.716	4.093	3.696	-11.2	-2.0	9.2	18.6	-10.2	0.2	10.4	-16.0	-14.8	-5.5	9.2	19.1	5.27	5.13	1.23	4.61	18.7
3.000	Jul 15 2025	3	48.5	4.158	3.677	4.047	3.655	-11.1	-2.3	8.9	15.2	-8.8	0.2	9.0	-17.8	-14.7	-5.8	8.9	15.7	5.27	5.13	1.17	4.34	11.3
2.875	Jul 31 2025	7	31.6	4.097	3.625	4.002	3.617	-9.5	-0.8	8.7	12.1	-7.3	1.8	9.0	-5.8	-13.0	-4.3	8.7	12.6	5.27	5.13	1.11	4.03	32.9
4.750	Jul 31 2025	2	41.9	4.100	3.627	4.002	3.617	-9.8	-1.0	8.9	12.2	-6.7	1.7	8.4	-8.2	-13.3	-4.4	8.9	12.7	5.27	5.13	1.11	4.06	0.0
0.250	Jul 31 2025	5	54.6	4.108	3.647	4.002	3.617	-10.7	-3.0	7.7	11.4	-9.8	-0.6	9.2	-9.6	-14.2	-6.5	7.7	11.9	5.27	5.13	1.10	3.99	17.4
6.875	Aug 15 2025	30	12.6	3.430	2.731	3.960	3.585	53.0	85.4	32.4	34.2	56.2	85.9	29.8	-56.0	49.3	81.8	32.4	34.5	5.27	5.13	1.06	3.81	70.0
2.000	Aug 15 2025	10	66.5	4.072	3.622	3.960	3.581	-11.2	-4.1	7.1	9.0	-9.5	-1.4	8.0	-9.5	-14.8	-7.7	7.1	9.3	5.27	5.13	1.05	3.76	16.9
3.125	Aug 15 2025	3	68.6	4.069	3.616	3.960	3.581	-10.9	-3.5	7.4	9.2	-8.6	-0.8	7.9	-8.5	-14.5	-7.1	7.4	9.5	5.27	5.13	1.05	3.78	38.7
2.750	Aug 31 2025	7	33.2	4.057	3.650	3.924	3.551	-13.3	-10.0	3.4	7.4	-13.5	-7.5	5.9	-10.9	-17.0	-13.6	3.4	7.4	5.27	5.13	1.00	3.57	34.0
5.000	Aug 31 2025	2	49.7	4.049	3.636	3.924	3.551	-12.5	-8.5	4.0	7.8	-11.6	-5.9	5.7	-9.8	-16.2	-12.2	4.0	7.9	5.27	5.13	1.01	3.59	9.4
0.250	Aug 31 2025	5	55.4	4.054	3.649	3.924	3.551	-13.0	-9.8	3.2	7.3	-14.3	-7.7	6.7	-9.3	-16.7	-13.5	3.1	7.3	5.27	5.13	1.00	3.53	18.1
3.500	Sep 15 2025	3	41.0	4.016	3.617	3.885	3.519	-13.2	-9.8	3.4	6.6	-11.1	-5.0	6.1	-6.1	-17.0	-13.6	3.4	6.4	5.27	5.13	0.96	3.37	0.0
3.000	Sep 30 2025	7	31.0	3.992	3.598	3.845	3.491	-14.7	-10.7	4.0	4.8	-12.3	-6.9	5.4	-14.6	-18.5	-14.5	3.9	4.4	5.27	5.13	0.92	3.19	28.6
5.000	Sep 30 2025	2	48.0	3.988	3.590	3.845	3.492	-14.3	-9.9	4.4	5.1	-10.9	-5.9	5.0	-8.5	-18.1	-13.7	4.4	4.8	5.27	5.13	0.93	3.21	0.0
0.250	Sep 30 2025	5	60.3	3.988	3.598	3.845	3.491	-14.3	-10.6	3.7	4.6	-13.4	-7.2	6.2	-9.3	-18.1	-14.5	3.6	4.3	5.27	5.13	0.91	3.16	13.3
4.250	Oct 15 2025	3	40.0	3.956	3.567	3.808	3.466	-14.8	-10.1	4.7	4.3	-11.5	-6.6	4.9	-7.5	-18.7	-14.0	4.6	3.9	5.27	5.13	0.90	3.05	0.0
3.000	Oct 31 2025	7	31.0	3.919	3.539	3.772	3.441	-14.7	-9.7	5.0	3.8	-11.5	-6.4	5.1	-9.2	-18.6	-13.7	4.9	3.3	5.27	5.13	0.85	2.89	37.6
5.000	Oct 31 2025	2	51.0	3.929	3.548	3.772	3.441	-15.7	-10.7	5.1	3.7	-11.5	-7.1	4.3	-9.0	-19.6	-14.6	5.0	3.3	5.27	5.13	0.86	2.92	0.0
0.250	Oct 31 2025	5	60.8	3.921	3.546	3.772	3.441	-14.9	-10.5	4.4	3.4	-13.2	-7.5	5.7	-9.0	-18.7	-14.5	4.3	2.9	5.27	5.13	0.83	2.85	12.0
4.500	Nov 15 2025	3	54.0	3.891	3.513	3.736	3.416	-15.5	-9.7	5.8	3.3	-9.5	-4.6	4.9	-5.7	-19.4	-13.7	5.7	3.0	5.27	5.13	0.83	2.79	26.0
2.250	Nov 15 2025	10	66.1	3.895	3.523	3.736	3.415	-16.0	-10.8	5.2	2.9	-11.1	-5.9	5.2	-6.8	-19.9	-14.8	5.1	2.5	5.27	5.13	0.81	2.75	11.7

* in \$ billions

Note:

1. Carry and slide calculated for swap spread receiving positions

2. A bp change in carry for a 10 bp change in repo rate

Derivatives Strategy

Issue Specific SOFR Swap Spread Detailed Report

Cpn	Mat	Orig Issue Size *	Yield	Interpolated Swap Yield		Matched Maturity Swap Spread			Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %			
			Spot	3m Fwd	Spot	3m Fwd	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	1m	3m	1m	3m		
2.875	Nov 30 2025	7	34.8	3.872	3.509	3.713	3.400	-15.9	-10.9	5.0	2.8	-14.4	-10.5	4.0	-4.9	-19.8	-14.9	4.9	2.5	5.27	5.13	0.79	2.65	32.3
4.875	Nov 30 2025	2	54.6	3.877	3.511	3.713	3.400	-16.4	-11.1	5.4	3.0	-13.8	-10.4	3.4	-5.7	-20.3	-15.1	5.3	2.6	5.27	5.13	0.80	2.68	1.1
0.375	Nov 30 2025	5	64.9	3.877	3.521	3.713	3.400	-16.4	-12.1	4.3	2.3	-16.3	-12.0	4.3	-6.3	-20.3	-16.1	4.2	1.9	5.27	5.13	0.77	2.60	21.2
4.000	Dec 15 2025	3	40.0	3.844	3.484	3.680	3.378	-16.4	-10.6	5.8	3.0	-12.2	-8.3	4.0	-5.1	-20.3	-14.6	5.7	2.7	5.27	5.13	0.76	2.56	0.0
2.625	Dec 31 2025	7	32.0	3.826	3.475	3.652	3.355	-17.3	-12.1	5.3	2.2	-13.5	-9.5	4.0	-5.3	-21.3	-16.1	5.1	1.9	5.27	5.13	0.73	2.43	32.6
4.250	Dec 31 2025	2	57.0	3.830	3.477	3.652	3.355	-17.8	-12.3	5.5	2.3	-13.1	-9.4	3.7	-4.6	-21.7	-16.3	5.4	2.1	5.27	5.13	0.74	2.46	0.0
0.375	Dec 31 2025	5	68.0	3.824	3.478	3.652	3.355	-17.1	-12.4	4.7	1.8	-14.6	-10.2	4.4	-5.6	-21.1	-16.4	4.6	1.5	5.27	5.13	0.72	2.39	19.1
3.875	Jan 15 2026	3	40.0	3.787	3.438	3.628	3.334	-15.9	-10.4	5.5	2.7	-11.4	-7.3	4.1	-4.0	-19.9	-14.5	5.4	2.4	5.27	5.13	0.71	2.36	0.0
2.625	Jan 31 2026	7	32.0	3.765	3.428	3.605	3.315	-16.1	-11.4	4.7	2.4	-13.0	-9.1	3.9	-5.3	-20.1	-15.5	4.6	2.1	5.27	5.13	0.68	2.24	19.7
4.250	Jan 31 2026	2	60.0	3.777	3.439	3.605	3.315	-17.2	-12.4	4.8	2.4	-13.2	-9.8	3.4	-5.2	-21.2	-16.5	4.7	2.1	5.27	5.13	0.69	2.27	0.0
0.375	Jan 31 2026	5	69.2	3.790	3.464	3.605	3.315	-18.6	-14.9	3.7	1.4	-16.7	-13.1	3.7	-7.1	-22.6	-19.0	3.6	1.1	5.27	5.13	0.67	2.21	13.9
6.000	Feb 15 2026	30	12.9	3.522	3.138	3.578	3.293	5.5	15.6	10.0	8.0	12.0	20.1	8.1	13.0	1.5	11.4	9.9	7.7	5.27	5.13	0.67	2.21	51.7
4.000	Feb 15 2026	3	55.6	3.740	3.407	3.578	3.293	-16.3	-11.4	4.8	2.8	-10.2	-6.2	4.0	-4.7	-20.3	-15.6	4.7	2.5	5.27	5.13	0.67	2.18	28.1
1.625	Feb 15 2026	10	64.9	3.763	3.439	3.578	3.293	-18.5	-14.6	3.8	1.9	-13.6	-9.8	3.8	-6.3	-22.5	-18.8	3.7	1.6	5.27	5.13	0.66	2.15	20.2
2.500	Feb 28 2026	7	33.5	3.747	3.442	3.564	3.282	-18.3	-16.0	2.2	1.3	-17.1	-14.3	2.9	-5.6	-22.3	-20.2	2.1	1.0	5.27	5.13	0.64	2.09	21.8
4.625	Feb 28 2026	2	65.7	3.745	3.435	3.564	3.282	-18.0	-15.3	2.7	1.7	-15.8	-13.1	2.6	-4.6	-22.1	-19.5	2.6	1.4	5.27	5.13	0.65	2.12	4.1
0.500	Feb 28 2026	5	74.2	3.742	3.440	3.564	3.282	-17.8	-15.8	2.0	1.0	-17.8	-14.5	3.2	-4.7	-21.9	-20.0	1.9	0.8	5.27	5.13	0.63	2.07	19.1
4.625	Mar 15 2026	3	40.0	3.721	3.417	3.542	3.264	-17.9	-15.3	2.6	2.0	-14.3	-11.5	2.8	-4.9	-22.0	-19.5	2.5	1.7	5.27	5.13	0.63	2.05	0.1
2.250	Mar 31 2026	7	32.0	3.711	3.415	3.524	3.250	-18.7	-16.4	2.3	1.5	-16.3	-13.6	2.7	-5.5	-22.9	-20.7	2.2	1.2	5.27	5.13	0.60	1.95	19.9
4.500	Mar 31 2026	2	66.0	3.715	3.415	3.524	3.250	-19.1	-16.4	2.6	1.8	-15.4	-13.1	2.2	-4.4	-23.2	-20.7	2.5	1.5	5.27	5.13	0.61	1.98	0.0
0.750	Mar 31 2026	5	72.0	3.703	3.408	3.524	3.250	-17.9	-15.8	2.2	1.4	-16.5	-13.4	3.1	-5.0	-22.1	-20.0	2.1	1.1	5.27	5.13	0.60	1.93	22.0
3.750	Apr 15 2026	3	42.5	3.680	3.383	3.506	3.237	-17.4	-14.6	2.8	1.9	-14.1	-11.5	2.6	-5.3	-21.6	-18.9	2.7	1.6	5.27	5.13	0.60	1.92	6.1
2.375	Apr 30 2026	7	32.4	3.676	3.389	3.490	3.224	-18.6	-16.5	2.1	1.2	-16.7	-14.2	2.4	-6.2	-22.8	-20.8	2.0	0.9	5.27	5.13	0.58	1.84	40.5
4.875	Apr 30 2026	2	69.3	3.687	3.397	3.490	3.224	-19.7	-17.3	2.5	1.4	-16.3	-14.4	1.8	-4.9	-23.9	-21.5	2.4	1.1	5.27	5.13	0.59	1.88	0.5
0.750	Apr 30 2026	5	72.6	3.674	3.390	3.490	3.224	-18.4	-16.6	1.8	0.9	-17.5	-14.7	2.8	-3.6	-22.6	-20.8	1.7	0.6	5.27	5.13	0.57	1.82	22.6
3.625	May 15 2026	3	50.9	3.670	3.385	3.474	3.212	-19.6	-17.3	2.3	1.6	-16.9	-14.9	2.0	-8.8	-23.8	-21.6	2.2	1.4	5.27	5.13	0.57	1.81	21.6
1.625	May 15 2026	10	69.5	3.670	3.389	3.474	3.212	-19.6	-17.7	1.8	1.3	-18.1	-15.7	2.4	-6.9	-23.8	-22.0	1.7	1.0	5.27	5.13	0.56	1.78	27.0
2.125	May 31 2026	7	35.4	3.651	3.374	3.460	3.202	-19.0	-17.2	1.8	0.7	-18.1	-15.9	2.2	-3.1	-23.3	-21.5	1.7	0.5	5.27	5.13	0.54	1.74	31.9
0.750	May 31 2026	5	72.8	3.652	3.379	3.460	3.202	-19.2	-17.7	1.5	0.4	-19.2	-16.8	2.4	-3.8	-23.4	-22.1	1.4	0.2	5.27	5.13	0.54	1.71	19.4
4.875	May 31 2026	2	73.1	3.663	3.382	3.460	3.202	-20.3	-18.0	2.3	1.1	-17.6	-16.1	1.5	-3.4	-24.5	-22.3	2.2	0.8	5.27	5.13	0.56	1.78	5.6
4.125	Jun 15 2026	3	40.0	3.639	3.362	3.444	3.190	-19.5	-17.2	2.3	1.2	-16.2	-14.2	1.9	-3.7	-23.7	-21.5	2.2	1.0	5.27	5.13	0.54	1.72	0.0
1.875	Jun 30 2026	7	33.8	3.631	3.363	3.431	3.181	-20.0	-18.2	1.8	0.4	-18.5	-16.2	2.2	-4.3	-24.3	-22.6	1.7	0.2	5.27	5.13	0.52	1.64	30.0
0.875	Jun 30 2026	5	70.3	3.621	3.354	3.431	3.181	-19.1	-17.4	1.7	0.4	-18.2	-15.7	2.5	-4.3	-23.3	-21.7	1.6	0.1	5.27	5.13	0.51	1.62	26.2
4.625	Jun 30 2026	2	71.4	3.630	3.364	3.431	3.181	-19.9	-18.3	1.6	0.1	-16.6	-15.5	1.1	-2.4	-24.1	-22.7	1.5	-0.2	5.18	5.07	0.53	1.68	3.4
4.500	Jul 15 2026	3	40.0	3.613	3.343	3.418	3.172	-19.5	-17.2	2.4	1.0	-16.4	-14.4	2.1	-4.3	-23.8	-21.6	2.3	0.7	5.27	5.13	0.51	1.63	0.0
1.875	Jul 31 2026	7	33.3	3.608	3.350	3.405	3.163	-20.2	-18.7	1.5	0.1	-18.8	-16.7	2.1	-4.1	-24.5	-23.2	1.4	-0.1	5.27	5.13	0.49	1.55	28.3
0.625	Jul 31 2026	5	66.8	3.601	3.345	3.405	3.163	-19.5	-18.2	1.3	-0.1	-18.9	-16.6	2.3	-3.7	-23.8	-22.7	1.2	-0.3	5.27	5.13	0.49	1.53	16.8

* in \$ billions

Note:

1. Carry and slide calculated for swap spread receiving positions
2. A bp change in carry for a 10 bp change in repo rate

Derivatives Strategy

Issue Specific SOFR Swap Spread Detailed Report

Cpn	Mat	Orig Issue Size *	Yield	Interpolated Swap Yield		Matched Maturity Swap Spread			Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %			
			Spot	3m Fwd	Spot	3m Fwd	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	1m	3m	1m	3m		
4.375	Jul 31 2026	2	72.8	3.606	3.351	3.405	3.162	-20.0	-18.9	1.2	-0.3	-17.1	-16.0	1.0	-1.8	-24.4	-23.3	1.1	-0.5	5.18	5.07	0.50	1.58	5.2
6.750	Aug 15 2026	30	10.9	3.414	3.123	3.392	3.154	-2.2	3.2	5.3	3.8	2.6	6.8	4.2	-9.0	-6.5	-1.3	5.2	3.6	5.27	5.13	0.50	1.57	58.3
4.375	Aug 15 2026	3	57.7	3.584	3.324	3.392	3.154	-19.1	-17.0	2.2	0.7	-15.2	-13.1	2.1	-0.5	-23.5	-21.4	2.1	0.4	5.27	5.13	0.49	1.55	27.2
1.500	Aug 15 2026	10	65.4	3.591	3.338	3.392	3.154	-19.9	-18.5	1.4	-0.1	-17.7	-15.4	2.3	-1.9	-24.2	-22.9	1.3	-0.3	5.27	5.13	0.48	1.51	16.5
1.375	Aug 31 2026	7	36.2	3.572	3.331	3.385	3.148	-18.7	-18.3	0.4	0.1	-17.8	-15.6	2.2	-2.0	-23.3	-22.9	0.4	-0.3	5.27	5.13	0.47	1.47	35.4
0.750	Aug 31 2026	5	68.7	3.578	3.340	3.385	3.148	-19.4	-19.2	0.2	-0.1	-18.9	-16.7	2.2	-2.9	-23.9	-23.8	0.2	-0.5	5.27	5.13	0.46	1.46	12.2
3.750	Aug 31 2026	2	74.5	3.575	3.338	3.385	3.148	-19.1	-19.0	0.0	-0.3	-16.8	-15.6	1.1	-0.3	-23.6	-23.7	0.0	-0.7	5.18	5.07	0.48	1.50	7.4
4.625	Sep 15 2026	3	44.0	3.573	3.332	3.372	3.140	-20.1	-19.3	0.9	0.5	-17.3	-15.5	1.7	-2.8	-24.5	-23.8	0.8	0.3	5.27	5.13	0.47	1.47	0.0
1.625	Sep 30 2026	7	35.3	3.556	3.321	3.360	3.133	-19.6	-18.7	0.9	-0.1	-18.3	-16.4	1.9	-1.7	-24.0	-23.3	0.8	-0.3	5.27	5.13	0.45	1.41	49.5
0.875	Sep 30 2026	5	68.3	3.548	3.312	3.360	3.133	-18.7	-17.9	0.8	-0.1	-17.9	-15.8	2.1	-1.6	-23.2	-22.4	0.7	-0.4	5.27	5.13	0.45	1.40	16.8
4.625	Oct 15 2026	3	46.0	3.559	3.322	3.349	3.127	-21.0	-19.5	1.6	0.3	-17.5	-16.3	1.2	-2.3	-25.5	-24.0	1.5	0.0	5.27	5.13	0.46	1.41	0.0
1.625	Oct 31 2026	7	35.3	3.555	3.329	3.338	3.122	-21.8	-20.7	1.0	-0.4	-20.5	-19.0	1.5	-3.2	-26.3	-25.3	0.9	-0.7	5.27	5.13	0.43	1.35	34.1
1.125	Oct 31 2026	5	67.2	3.553	3.327	3.338	3.122	-21.5	-20.6	0.9	-0.5	-20.6	-19.0	1.6	-3.4	-26.0	-25.2	0.8	-0.7	5.27	5.13	0.43	1.34	14.8
6.500	Nov 15 2026	30	11.5	3.203	2.920	3.326	3.116	12.4	19.6	7.3	5.5	16.2	22.2	6.0	7.4	7.8	15.0	7.2	5.2	5.27	5.13	0.45	1.38	60.7
4.625	Nov 15 2026	3	48.9	3.544	3.313	3.326	3.116	-21.8	-19.7	2.1	0.4	-17.5	-16.3	1.2	-3.4	-26.3	-24.3	2.0	0.1	5.27	5.13	0.44	1.36	1.9
2.000	Nov 15 2026	10	69.1	3.545	3.319	3.326	3.116	-21.8	-20.4	1.5	-0.2	-19.3	-17.8	1.5	-3.0	-26.3	-25.0	1.3	-0.5	5.27	5.13	0.43	1.32	25.9
1.625	Nov 30 2026	7	34.5	3.538	3.318	3.317	3.111	-22.1	-20.6	1.4	-0.6	-20.3	-18.9	1.4	-3.9	-26.6	-25.3	1.3	-0.7	5.27	5.13	0.42	1.29	37.6
1.250	Nov 30 2026	5	63.9	3.526	3.305	3.317	3.111	-20.9	-19.4	1.5	-0.6	-19.4	-17.7	1.6	-3.2	-25.4	-24.0	1.3	-0.7	5.27	5.13	0.41	1.29	7.8
4.375	Dec 15 2026	3	50.0	3.520	3.294	3.308	3.107	-21.2	-18.7	2.5	0.3	-17.4	-16.3	1.2	-1.3	-25.8	-23.4	2.4	0.0	5.27	5.13	0.42	1.31	0.0
1.750	Dec 31 2026	7	35.0	3.509	3.291	3.299	3.100	-21.0	-19.1	1.9	-0.3	-18.8	-17.1	1.7	-2.2	-25.6	-23.8	1.8	-0.6	5.27	5.13	0.40	1.24	34.2
1.250	Dec 31 2026	5	64.7	3.498	3.279	3.299	3.100	-19.8	-17.9	1.9	-0.3	-18.0	-16.1	1.9	-1.6	-24.4	-22.6	1.8	-0.6	5.27	5.13	0.40	1.23	12.0
4.000	Jan 15 2027	3	52.0	3.516	3.298	3.291	3.095	-22.5	-20.3	2.2	0.1	-18.7	-17.3	1.4	-2.6	-27.1	-25.1	2.0	-0.2	5.27	5.13	0.40	1.25	0.0
1.500	Jan 31 2027	7	98.5	3.508	3.299	3.284	3.089	-22.3	-20.9	1.4	-0.5	-21.1	-19.6	1.4	-2.0	-27.0	-25.7	1.3	-0.8	5.27	5.13	0.38	1.19	22.4
6.625	Feb 15 2027	30	10.5	3.285	3.042	3.276	3.084	-1.0	4.2	5.1	3.5	4.1	7.5	3.5	-15.4	-5.7	-0.7	5.0	3.1	5.27	5.13	0.40	1.23	70.0
4.125	Feb 15 2027	3	58.0	3.507	3.296	3.276	3.083	-23.1	-21.3	1.9	0.2	-18.8	-17.5	1.3	-2.6	-27.8	-26.1	1.7	-0.1	5.27	5.13	0.39	1.20	6.9
2.250	Feb 15 2027	10	65.8	3.504	3.297	3.276	3.083	-22.8	-21.4	1.5	-0.2	-19.8	-18.3	1.4	-1.9	-27.5	-26.2	1.3	-0.5	5.27	5.13	0.38	1.17	30.9
1.125	Feb 28 2027	7	36.8	3.494	3.299	3.271	3.080	-22.3	-21.8	0.4	-0.5	-22.3	-21.0	1.3	-3.3	-27.0	-26.7	0.3	-0.8	5.27	5.13	0.37	1.14	62.9
1.875	Feb 28 2027	5	62.1	3.488	3.290	3.271	3.080	-21.7	-21.0	0.7	-0.3	-21.2	-19.8	1.3	-2.2	-26.4	-25.9	0.5	-0.6	5.27	5.13	0.37	1.15	14.6
4.250	Mar 15 2027	3	56.0	3.472	3.271	3.264	3.075	-20.8	-19.6	1.2	0.4	-18.0	-16.7	1.4	-1.9	-25.6	-24.5	1.1	0.0	5.27	5.13	0.37	1.15	0.0
0.625	Mar 31 2027	7	36.3	3.487	3.296	3.258	3.071	-22.9	-22.5	0.4	-0.7	-22.2	-20.9	1.3	-4.7	-27.7	-27.4	0.3	-1.0	5.27	5.13	0.35	1.09	37.9
2.500	Mar 31 2027	5	60.5	3.464	3.267	3.258	3.071	-20.6	-19.6	1.1	0.0	-18.4	-17.2	1.2	-0.9	-25.4	-24.5	0.9	-0.3	5.27	5.13	0.36	1.11	15.7
4.500	Apr 15 2027	3	59.0	3.480	3.284	3.252	3.068	-22.8	-21.6	1.3	0.2	-19.2	-18.4	0.7	-1.2	-27.7	-26.5	1.1	-0.2	5.27	5.13	0.37	1.12	1.6
0.500	Apr 30 2027	7	38.0	3.472	3.287	3.246	3.064	-22.6	-22.2	0.3	-0.9	-22.3	-21.0	1.3	-2.5	-27.4	-27.2	0.2	-1.2	5.27	5.13	0.34	1.05	15.7
2.750	Apr 30 2027	5	55.8	3.474	3.283	3.246	3.064	-22.7	-21.9	0.9	-0.3	-20.6	-19.7	0.9	-0.5	-27.6	-26.8	0.7	-0.7	5.27	5.13	0.35	1.08	12.2
4.500	May 15 2027	3	65.3	3.481	3.289	3.241	3.061	-24.0	-22.8	1.2	0.0	-20.0	-19.3	0.6	-1.8	-28.9	-27.8	1.1	-0.2	5.27	5.13	0.36	1.09	11.2
2.375	May 15 2027	10	71.0	3.485	3.298	3.241	3.061	-24.4	-23.7	0.7	-0.5	-21.9	-21.0	0.9	-3.0	-29.3	-28.7	0.6	-0.8	5.27	5.13	0.35	1.06	22.5
0.500	May 31 2027	7	42.0	3.471	3.290	3.237	3.058	-23.4	-23.2	0.2	-1.1	-24.0	-22.9	1.1	-2.8	-28.3	-28.2	0.0	-1.4	5.27	5.13	0.33	1.02	25.5

* in \$ billions

Note:

1. Carry and slide calculated for swap spread receiving positions
2. A bp change in carry for a 10 bp change in repo rate

Derivatives Strategy

Issue Specific SOFR Swap Spread Detailed Report

Cpn	Mat	Orig Issue Size *	Yield	Interpolated Swap Yield		Matched Maturity Swap Spread				Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %		
			Spot	3m Fwd	Spot	3m Fwd	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	1m	3m	1m	3m		
2.625	May 31 2027	5	55.2	3.470	3.284	3.237	3.058	-23.3	-22.6	0.7	-0.5	-22.2	-21.4	0.8	-0.6	-28.2	-27.6	0.6	-0.8	5.27	5.13	0.34	1.05	13.1
4.625	Jun 15 2027	3	59.9	3.448	3.264	3.231	3.055	-21.7	-20.9	0.8	-0.4	-18.2	-17.9	0.2	-0.4	-26.6	-25.9	0.7	-0.7	5.18	5.07	0.35	1.06	3.1
0.500	Jun 30 2027	7	46.6	3.461	3.284	3.227	3.052	-23.4	-23.1	0.3	-1.0	-23.3	-22.1	1.2	-2.3	-28.4	-28.2	0.2	-1.3	5.27	5.13	0.32	0.98	20.6
3.250	Jun 30 2027	5	50.6	3.452	3.266	3.227	3.053	-22.5	-21.4	1.1	-0.3	-20.1	-18.9	1.2	-2.8	-27.4	-26.4	1.0	-0.5	5.27	5.13	0.33	1.02	7.1
4.375	Jul 15 2027	3	67.4	3.454	3.274	3.223	3.050	-23.1	-22.4	0.7	-0.6	-19.9	-19.4	0.5	-1.3	-28.0	-27.5	0.5	-0.9	5.18	5.07	0.33	1.02	14.0
0.375	Jul 31 2027	7	49.0	3.455	3.283	3.219	3.048	-23.6	-23.5	0.1	-1.2	-24.0	-22.8	1.1	-2.8	-28.6	-28.6	0.0	-1.4	5.27	5.13	0.31	0.95	11.1
2.750	Jul 31 2027	5	50.0	3.459	3.282	3.219	3.048	-24.1	-23.4	0.7	-0.6	-22.5	-21.5	1.0	-2.8	-29.0	-28.5	0.5	-0.9	5.27	5.13	0.32	0.98	8.0
6.375	Aug 15 2027	30	10.7	3.376	3.185	3.215	3.046	-16.2	-13.9	2.2	1.1	-11.8	-10.2	1.5	-9.4	-21.2	-19.1	2.1	0.8	5.27	5.13	0.33	1.01	60.5
3.750 Aug 15 2027	3	69.0	3.450	3.278	3.215	3.046	-23.5	-23.2	0.3	-0.8	-20.6	-20.1	0.5	0.7	-28.6	-28.3	0.2	-1.1	5.18	5.07	0.32	0.97	16.0	
2.250	Aug 15 2027	10	69.9	3.460	3.287	3.215	3.046	-24.6	-24.1	0.5	-0.7	-22.8	-21.8	1.0	-1.9	-29.6	-29.3	0.3	-1.0	5.27	5.13	0.31	0.96	37.7
3.125	Aug 31 2027	5	50.9	3.452	3.284	3.211	3.044	-24.1	-24.0	0.1	-0.6	-22.0	-21.0	1.0	-0.8	-29.1	-29.1	0.0	-0.9	5.27	5.13	0.31	0.96	11.5
0.500	Aug 31 2027	7	51.1	3.448	3.286	3.211	3.044	-23.8	-24.2	-0.5	-1.3	-23.7	-22.6	1.1	-0.8	-28.8	-29.4	-0.6	-1.5	5.27	5.13	0.30	0.92	26.8
3.375 Sep 15 2027	3	58.6	3.431	3.263	3.208	3.042	-22.3	-22.1	0.3	-0.3	-20.2	-19.1	1.1	-3.1	-27.4	-27.3	0.1	-0.6	5.27	5.13	0.31	0.94	0.0	
4.125	Sep 30 2027	5	44.0	3.427	3.258	3.203	3.041	-22.4	-21.7	0.7	-0.2	-19.3	-18.7	0.7	0.1	-27.5	-26.9	0.6	-0.5	5.27	5.13	0.31	0.94	0.0
0.375	Sep 30 2027	7	56.8	3.438	3.278	3.203	3.041	-23.5	-23.7	-0.2	-1.2	-23.5	-22.5	1.1	-1.3	-28.6	-28.9	-0.3	-1.5	5.27	5.13	0.29	0.89	15.7
4.125	Oct 31 2027	5	43.0	3.448	3.284	3.194	3.038	-25.4	-24.6	0.8	-0.5	-22.6	-22.3	0.3	-0.4	-30.5	-29.8	0.7	-0.8	5.27	5.13	0.30	0.92	0.0
0.500	Oct 31 2027	7	58.6	3.455	3.300	3.194	3.038	-26.1	-26.2	-0.1	-1.5	-26.5	-25.7	0.8	-3.2	-31.2	-31.4	-0.2	-1.7	5.27	5.13	0.29	0.87	19.8
6.125	Nov 15 2027	30	22.5	3.412	3.242	3.190	3.037	-22.3	-20.5	1.8	0.3	-17.5	-17.0	0.5	-6.1	-27.4	-25.7	1.7	0.0	5.27	5.13	0.31	0.93	64.7
2.250	Nov 15 2027	10	66.5	3.449	3.291	3.190	3.037	-26.0	-25.4	0.6	-1.0	-24.0	-23.4	0.5	-1.7	-31.1	-30.6	0.4	-1.2	5.27	5.13	0.29	0.88	32.5
3.875	Nov 30 2027	5	47.7	3.445	3.285	3.186	3.036	-26.0	-24.9	1.1	-0.6	-22.8	-22.4	0.3	-1.1	-31.1	-30.2	0.9	-0.8	5.27	5.13	0.29	0.89	9.8
0.625	Nov 30 2027	7	63.8	3.444	3.291	3.186	3.036	-25.8	-25.5	0.2	-1.4	-25.4	-24.6	0.8	-2.5	-30.9	-30.8	0.1	-1.6	5.27	5.13	0.28	0.85	21.5
3.875	Dec 31 2027	5	43.0	3.423	3.263	3.178	3.033	-24.5	-23.0	1.4	-0.5	-21.1	-20.2	0.9	-2.6	-29.6	-28.3	1.3	-0.7	5.27	5.13	0.29	0.87	0.0
0.625	Dec 31 2027	7	68.0	3.443	3.293	3.178	3.032	-26.5	-26.1	0.4	-1.5	-25.9	-25.0	0.8	-3.1	-31.7	-31.4	0.3	-1.7	5.27	5.13	0.27	0.82	18.0
3.500	Jan 31 2028	5	43.0	3.436	3.282	3.172	3.028	-26.4	-25.4	1.0	-0.8	-23.3	-22.5	0.7	-1.4	-31.6	-30.7	0.9	-1.0	5.27	5.13	0.28	0.84	0.0
0.750	Jan 31 2028	7	70.4	3.442	3.296	3.172	3.028	-27.0	-26.7	0.3	-1.5	-26.3	-25.5	0.8	-0.6	-32.3	-32.1	0.2	-1.8	5.27	5.13	0.27	0.80	12.8
2.750	Feb 15 2028	10	70.6	3.454	3.306	3.169	3.026	-28.5	-27.9	0.6	-1.1	-26.0	-25.3	0.6	-2.5	-33.8	-33.3	0.5	-1.4	5.27	5.13	0.27	0.82	14.4
4.000	Feb 29 2028	5	52.8	3.435	3.289	3.166	3.025	-26.9	-26.4	0.5	-0.7	-23.9	-23.2	0.6	-1.7	-32.2	-31.8	0.3	-0.9	5.27	5.13	0.27	0.82	18.5
1.125	Feb 29 2028	7	75.4	3.446	3.307	3.166	3.025	-28.0	-28.2	-0.3	-1.5	-27.4	-26.7	0.7	-2.6	-33.3	-33.6	-0.4	-1.7	5.27	5.13	0.26	0.79	17.8
3.625	Mar 31 2028	5	43.0	3.434	3.290	3.161	3.022	-27.2	-26.8	0.5	-0.8	-23.9	-23.7	0.2	-3.1	-32.5	-32.2	0.3	-1.0	5.27	5.13	0.27	0.80	0.0
1.250	Mar 31 2028	7	73.1	3.450	3.313	3.161	3.022	-28.9	-29.1	-0.2	-1.5	-27.8	-27.4	0.4	-2.3	-34.2	-34.5	-0.3	-1.7	5.27	5.13	0.26	0.77	23.1
3.500	Apr 30 2028	5	47.2	3.438	3.297	3.157	3.020	-28.1	-27.7	0.4	-0.9	-25.6	-25.5	0.1	-2.5	-33.4	-33.2	0.2	-1.1	5.27	5.13	0.26	0.78	8.9
1.250	Apr 30 2028	7	73.8	3.452	3.318	3.157	3.020	-29.5	-29.8	-0.3	-1.6	-29.3	-28.9	0.3	-3.3	-34.9	-35.3	-0.4	-1.8	5.27	5.13	0.25	0.75	16.1
2.875	May 15 2028	10	75.1	3.451	3.313	3.155	3.019	-29.6	-29.4	0.2	-1.1	-27.2	-27.1	0.1	-1.4	-35.0	-34.9	0.0	-1.4	5.27	5.13	0.26	0.76	14.5
3.625	May 31 2028	5	51.1	3.438	3.300	3.153	3.018	-28.5	-28.2	0.4	-0.9	-25.4	-25.3	0.1	-1.6	-33.9	-33.7	0.3	-1.2	5.27	5.13	0.26	0.77	15.8
1.250	May 31 2028	7	74.0	3.445	3.312	3.153	3.018	-29.2	-29.4	-0.2	-1.6	-28.3	-27.9	0.4	-1.3	-34.6	-34.9	-0.4	-1.8	5.27	5.13	0.24	0.73	16.3
4.000	Jun 30 2028	5	43.0	3.429	3.290	3.149	3.017	-27.9	-27.3	0.6	-0.8	-24.7	-24.1	0.6	-1.4	-33.4	-32.9	0.5	-1.0	5.27	5.13	0.25	0.75	0.0
1.250	Jun 30 2028	7	71.4	3.443	3.312	3.149	3.017	-29.3	-29.5	-0.2	-1.6	-28.7	-28.1	0.6	-1.4	-34.8	-35.1	-0.3	-1.8	5.27	5.13	0.24	0.72	19.9

* in \$ billions

Note:

1. Carry and slide calculated for swap spread receiving positions

2. A bp change in carry for a 10 bp change in repo rate

Derivatives Strategy

Issue Specific SOFR Swap Spread Detailed Report

Cpn	Mat	Orig Issue Size *	Yield	Interpolated Swap Yield		Matched Maturity Swap Spread			Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %			
			Spot	3m Fwd	Spot	3m Fwd	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	1m	3m	1m	3m		
4.125	Jul 31 2028	5	43.0	3.436	3.300	3.146	3.016	-28.9	-28.5	0.5	-0.9	-25.7	-25.2	0.5	-0.6	-34.4	-34.1	0.3	-1.1	5.27	5.13	0.25	0.74	0.0
1.000	Jul 31 2028	7	67.9	3.445	3.318	3.146	3.016	-29.9	-30.2	-0.3	-1.8	-29.6	-29.0	0.5	-0.8	-35.3	-35.8	-0.5	-2.0	5.27	5.13	0.23	0.70	10.2
5.500	Aug 15 2028	30	11.8	3.340	3.196	3.145	3.016	-19.5	-18.1	1.4	0.2	-15.5	-14.5	1.0	3.4	-25.0	-23.7	1.3	-0.1	5.27	5.13	0.25	0.74	60.6
2.875	Aug 15 2028	10	75.5	3.452	3.323	3.145	3.016	-30.7	-30.7	0.0	-1.3	-28.6	-28.2	0.4	-1.8	-36.2	-36.3	-0.1	-1.5	5.27	5.13	0.24	0.71	14.2
4.375	Aug 31 2028	5	50.8	3.441	3.313	3.144	3.015	-29.7	-29.8	0.0	-0.9	-26.5	-26.0	0.5	-1.5	-35.2	-35.4	-0.2	-1.1	5.27	5.13	0.24	0.72	9.4
1.125	Aug 31 2028	7	69.8	3.443	3.322	3.144	3.015	-29.9	-30.7	-0.8	-1.7	-29.5	-29.0	0.5	-1.7	-35.4	-36.3	-0.9	-1.9	5.27	5.13	0.23	0.68	13.2
4.625	Sep 30 2028	5	49.0	3.439	3.312	3.140	3.015	-29.9	-29.7	0.2	-0.8	-26.1	-26.3	-0.1	-1.3	-35.4	-35.4	0.1	-1.1	5.27	5.13	0.24	0.71	0.0
1.250	Sep 30 2028	7	69.5	3.448	3.329	3.140	3.015	-30.8	-31.4	-0.6	-1.7	-30.4	-30.2	0.2	-2.0	-36.4	-37.1	-0.7	-2.0	5.27	5.13	0.22	0.67	12.4
4.875	Oct 31 2028	5	52.0	3.438	3.311	3.136	3.015	-30.2	-29.6	0.5	-0.8	-25.9	-26.0	-0.2	0.0	-35.8	-35.3	0.4	-1.0	5.27	5.13	0.24	0.70	0.0
1.375	Oct 31 2028	7	68.3	3.444	3.326	3.136	3.015	-30.8	-31.1	-0.3	-1.7	-29.9	-29.7	0.2	-0.6	-36.4	-36.8	-0.4	-1.9	5.27	5.13	0.22	0.66	15.9
5.250	Nov 15 2028	30	10.9	3.407	3.277	3.134	3.015	-27.2	-26.2	1.0	-0.5	-22.7	-22.6	0.0	-7.0	-32.8	-31.9	0.9	-0.7	5.27	5.13	0.24	0.70	29.3
3.125	Nov 15 2028	10	80.5	3.455	3.334	3.134	3.015	-32.1	-31.9	0.2	-1.3	-29.3	-29.4	-0.1	-0.5	-37.7	-37.6	0.1	-1.5	5.27	5.13	0.23	0.68	25.8
4.375	Nov 30 2028	5	55.6	3.439	3.315	3.133	3.016	-30.6	-29.9	0.7	-0.9	-26.7	-26.9	-0.2	-0.1	-36.2	-35.6	0.5	-1.1	5.27	5.13	0.23	0.69	1.1
1.500	Nov 30 2028	7	63.9	3.446	3.329	3.133	3.015	-31.3	-31.4	-0.1	-1.6	-30.3	-30.1	0.2	-0.9	-36.9	-37.1	-0.2	-1.9	5.27	5.13	0.22	0.65	9.7
3.750	Dec 31 2028	5	58.0	3.437	3.315	3.130	3.015	-30.7	-30.0	0.7	-0.9	-27.7	-27.3	0.4	-1.9	-36.3	-35.8	0.6	-1.1	5.27	5.13	0.22	0.66	0.0
1.375	Dec 31 2028	7	63.6	3.437	3.321	3.130	3.015	-30.7	-30.6	0.1	-1.6	-30.0	-29.6	0.4	0.0	-36.3	-36.3	0.0	-1.8	5.27	5.13	0.21	0.63	12.0
1.750	Jan 31 2029	7	60.9	3.448	3.335	3.128	3.014	-32.1	-32.0	0.0	-1.5	-30.6	-30.3	0.4	-1.1	-37.7	-37.8	-0.1	-1.7	5.27	5.13	0.21	0.62	13.0
4.000	Jan 31 2029	5	61.0	3.434	3.314	3.128	3.014	-30.6	-29.9	0.7	-0.8	-27.0	-26.6	0.4	-1.5	-36.3	-35.7	0.5	-1.1	5.27	5.13	0.22	0.65	0.0
5.250	Feb 15 2029	30	11.3	3.344	3.217	3.126	3.014	-21.7	-20.3	1.4	0.0	-17.4	-16.5	0.8	4.4	-27.4	-26.1	1.3	-0.2	5.27	5.13	0.22	0.66	62.3
2.625	Feb 15 2029	10	81.5	3.444	3.329	3.126	3.014	-31.8	-31.5	0.2	-1.3	-29.4	-29.0	0.4	-0.5	-37.4	-37.3	0.1	-1.5	5.27	5.13	0.21	0.63	26.4
1.875	Feb 28 2029	7	58.6	3.449	3.341	3.126	3.014	-32.3	-32.7	-0.4	-1.5	-31.3	-31.0	0.3	-1.4	-38.0	-38.5	-0.5	-1.7	5.27	5.13	0.21	0.61	14.6
4.250	Feb 28 2029	5	66.8	3.425	3.310	3.126	3.014	-29.9	-29.6	0.3	-0.7	-26.7	-26.3	0.4	-0.4	-35.6	-35.4	0.2	-0.9	5.27	5.13	0.21	0.64	4.1
2.375	Mar 31 2029	7	55.8	3.452	3.343	3.125	3.014	-32.7	-33.0	-0.2	-1.3	-31.2	-31.3	-0.1	-1.1	-38.4	-38.8	-0.4	-1.5	5.27	5.13	0.20	0.61	15.7
4.125	Mar 31 2029	5	67.0	3.435	3.322	3.125	3.014	-31.1	-30.8	0.2	-0.8	-27.7	-27.9	-0.2	0.2	-36.8	-36.6	0.1	-1.0	5.27	5.13	0.21	0.63	0.0
2.875	Apr 30 2029	7	50.1	3.450	3.342	3.123	3.014	-32.7	-32.8	-0.1	-1.2	-30.4	-30.6	-0.1	0.3	-38.4	-38.6	-0.2	-1.4	5.27	5.13	0.20	0.60	12.2
4.625	Apr 30 2029	5	70.3	3.431	3.318	3.123	3.014	-30.8	-30.4	0.4	-0.7	-26.9	-27.1	-0.2	0.3	-36.5	-36.2	0.3	-0.8	5.27	5.13	0.21	0.63	0.5
2.375	May 15 2029	10	84.4	3.448	3.342	3.123	3.015	-32.5	-32.7	-0.2	-1.3	-30.8	-30.9	0.0	-1.4	-38.3	-38.5	-0.3	-1.5	5.27	5.13	0.20	0.59	41.8
2.750	May 31 2029	7	48.3	3.450	3.344	3.123	3.015	-32.8	-32.9	-0.1	-1.2	-30.6	-30.7	-0.1	0.8	-38.5	-38.7	-0.2	-1.4	5.27	5.13	0.20	0.59	13.1
4.500	May 31 2029	5	74.2	3.425	3.313	3.123	3.015	-30.2	-29.8	0.4	-0.6	-26.4	-26.5	-0.1	0.4	-36.0	-35.7	0.3	-0.8	5.27	5.13	0.21	0.62	5.6
3.250	Jun 30 2029	7	43.1	3.457	3.350	3.122	3.016	-33.5	-33.4	0.0	-1.1	-31.2	-30.9	0.3	-0.3	-39.2	-39.3	-0.1	-1.3	5.27	5.13	0.20	0.59	7.1
4.250	Jun 30 2029	5	72.4	3.438	3.332	3.122	3.016	-31.6	-31.6	0.0	-1.1	-28.3	-28.3	0.0	-0.6	-37.3	-37.5	-0.1	-1.3	5.20	5.07	0.20	0.60	3.4
2.625	Jul 31 2029	7	41.3	3.456	3.353	3.122	3.017	-33.4	-33.6	-0.2	-1.2	-31.7	-31.3	0.3	-1.5	-39.2	-39.4	-0.3	-1.4	5.27	5.13	0.19	0.57	8.0
4.000	Jul 31 2029	5	73.9	3.435	3.331	3.122	3.017	-31.3	-31.4	-0.1	-1.1	-28.2	-28.2	0.0	2.2	-37.0	-37.3	-0.2	-1.3	5.20	5.07	0.20	0.59	5.2
6.125	Aug 15 2029	30	11.2	3.436	3.325	3.122	3.018	-31.4	-30.7	0.6	-0.3	-26.5	-26.2	0.4	-0.1	-37.2	-36.6	0.5	-0.4	5.27	5.13	0.20	0.61	64.1
1.625	Aug 15 2029	10	92.6	3.421	3.319	3.122	3.018	-29.8	-30.1	-0.2	-1.3	-29.1	-28.7	0.5	1.2	-35.6	-36.0	-0.3	-1.5	5.27	5.13	0.19	0.55	50.9
3.125	Aug 31 2029	7	41.8	3.455	3.355	3.122	3.018	-33.3	-33.7	-0.4	-1.1	-31.1	-30.8	0.3	-0.8	-39.1	-39.6	-0.5	-1.2	5.27	5.13	0.19	0.57	11.5
3.625	Aug 31 2029	5	75.6	3.423	3.323	3.122	3.018	-30.1	-30.5	-0.4	-1.0	-27.5	-27.3	0.2	2.8	-35.9	-36.4	-0.5	-1.2	5.18	5.09	0.19	0.57	7.4

* in \$ billions

Note:

1. Carry and slide calculated for swap spread receiving positions

2. A bp change in carry for a 10 bp change in repo rate

Derivatives Strategy

Issue Specific SOFR Swap Spread Detailed Report

Cpn	Mat	Orig Issue Size *	Yield	Interpolated Swap Yield		Matched Maturity Swap Spread				Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %		
			Spot	3m Fwd	Spot	3m Fwd	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	1m	3m	1m	3m		
3.875	Sep 30 2029	7	36.0	3.460	3.360	3.121	3.020	-33.9	-34.0	-0.1	-0.9	-30.8	-31.2	-0.3	0.6	-39.7	-39.9	-0.3	-1.1	5.27	5.13	0.19	0.57	0.0
4.000	Oct 31 2029	7	35.0	3.466	3.366	3.120	3.021	-34.6	-34.5	0.1	-0.9	-31.0	-31.4	-0.4	1.0	-40.4	-40.4	0.0	-1.1	5.27	5.13	0.19	0.56	0.0
1.750	Nov 15 2029	10	88.6	3.435	3.339	3.120	3.023	-31.5	-31.6	-0.1	-1.3	-30.4	-30.3	0.1	-1.3	-37.4	-37.6	-0.2	-1.4	5.27	5.13	0.18	0.53	61.6
3.875	Nov 30 2029	7	38.8	3.467	3.369	3.119	3.023	-34.8	-34.6	0.2	-0.9	-31.4	-31.8	-0.4	0.1	-40.7	-40.6	0.1	-1.1	5.27	5.13	0.19	0.55	9.8
3.875	Dec 31 2029	7	35.0	3.472	3.375	3.119	3.025	-35.4	-35.0	0.4	-0.8	-31.9	-31.7	0.2	-1.2	-41.3	-41.0	0.3	-1.0	5.27	5.13	0.18	0.54	0.0
3.500	Jan 31 2030	7	35.0	3.470	3.375	3.118	3.025	-35.2	-35.0	0.2	-0.9	-32.2	-32.0	0.2	-1.4	-41.1	-41.0	0.1	-1.0	5.27	5.13	0.18	0.53	0.0
1.500	Feb 15 2030	10	88.1	3.468	3.378	3.118	3.026	-35.0	-35.2	-0.3	-1.4	-34.2	-33.9	0.3	-4.0	-40.9	-41.2	-0.4	-1.5	5.27	5.13	0.17	0.50	33.5
4.000	Feb 28 2030	7	43.0	3.473	3.382	3.118	3.026	-35.5	-35.5	-0.1	-0.8	-32.5	-32.3	0.2	-1.2	-41.4	-41.5	-0.2	-0.9	5.27	5.13	0.18	0.53	18.6
3.625	Mar 31 2030	7	35.0	3.476	3.386	3.119	3.027	-35.8	-35.9	-0.1	-0.8	-32.8	-33.2	-0.4	-0.5	-41.7	-41.9	-0.2	-1.0	5.27	5.13	0.17	0.51	0.0
3.500	Apr 30 2030	7	38.4	3.478	3.389	3.119	3.029	-35.9	-36.0	-0.1	-0.8	-33.0	-33.4	-0.4	-0.4	-41.8	-42.0	-0.2	-1.0	5.27	5.13	0.17	0.51	8.9
6.250	May 15 2030	31	17.0	3.475	3.380	3.120	3.030	-35.5	-35.0	0.5	-0.2	-30.0	-30.6	-0.6	-0.5	-41.5	-41.1	0.4	-0.3	5.27	5.13	0.18	0.53	62.2
0.625	May 15 2030	10	109.9	3.473	3.390	3.120	3.030	-35.3	-36.0	-0.7	-1.5	-36.3	-36.2	0.1	-2.2	-41.3	-42.1	-0.8	-1.6	5.27	5.13	0.16	0.47	27.3
3.750	May 31 2030	7	41.6	3.485	3.396	3.120	3.030	-36.5	-36.6	-0.1	-0.8	-33.4	-33.8	-0.4	-0.5	-42.5	-42.7	-0.2	-0.9	5.27	5.13	0.17	0.50	15.9
3.750	Jun 30 2030	7	35.0	3.489	3.400	3.121	3.032	-36.8	-36.8	0.0	-0.7	-34.1	-33.9	0.2	-1.4	-42.8	-42.9	-0.1	-0.9	5.27	5.13	0.17	0.50	0.0
4.000	Jul 31 2030	7	35.0	3.490	3.402	3.122	3.034	-36.8	-36.9	0.0	-0.7	-33.7	-33.5	0.2	-0.9	-42.8	-42.9	-0.1	-0.8	5.27	5.13	0.17	0.49	0.0
0.625	Aug 15 2030	10	133.0	3.486	3.406	3.122	3.035	-36.3	-37.1	-0.8	-1.5	-37.6	-37.3	0.2	-1.5	-42.3	-43.2	-0.9	-1.6	5.27	5.13	0.15	0.45	21.3
4.125	Aug 31 2030	7	39.7	3.493	3.410	3.123	3.036	-37.0	-37.4	-0.3	-0.6	-34.1	-33.9	0.2	-0.9	-43.0	-43.5	-0.4	-0.8	5.27	5.13	0.16	0.49	9.4
4.625	Sep 30 2030	7	37.0	3.497	3.412	3.123	3.038	-37.3	-37.4	-0.1	-0.5	-33.1	-33.7	-0.6	1.5	-43.3	-43.5	-0.2	-0.7	5.27	5.13	0.17	0.49	0.0
4.875	Oct 31 2030	7	38.0	3.496	3.411	3.123	3.040	-37.3	-37.1	0.1	-0.4	-32.8	-33.3	-0.6	1.5	-43.3	-43.3	0.0	-0.6	5.27	5.13	0.17	0.48	0.0
0.875	Nov 15 2030	10	133.7	3.482	3.406	3.123	3.041	-35.9	-36.5	-0.6	-1.3	-36.5	-36.5	0.0	1.0	-42.0	-42.6	-0.7	-1.5	5.27	5.13	0.15	0.43	18.6
4.375	Nov 30 2030	7	39.5	3.503	3.421	3.123	3.042	-38.0	-37.8	0.2	-0.6	-34.2	-34.8	-0.6	0.4	-44.0	-43.9	0.1	-0.7	5.27	5.13	0.16	0.47	1.1
3.750	Dec 31 2030	7	40.0	3.504	3.422	3.123	3.044	-38.0	-37.8	0.2	-0.6	-34.8	-34.6	0.2	-1.8	-44.1	-44.0	0.1	-0.8	5.27	5.13	0.16	0.46	0.0
4.000	Jan 31 2031	7	41.0	3.507	3.426	3.124	3.045	-38.2	-38.1	0.2	-0.6	-34.8	-34.6	0.1	-2.1	-44.3	-44.2	0.1	-0.7	5.27	5.13	0.15	0.46	0.0
5.375	Feb 15 2031	30	16.4	3.435	3.349	3.124	3.046	-31.1	-30.3	0.7	0.1	-26.1	-25.8	0.4	5.2	-37.1	-36.5	0.6	0.0	5.27	5.13	0.16	0.47	50.6
1.125	Feb 15 2031	10	140.1	3.469	3.394	3.124	3.046	-34.5	-34.8	-0.3	-1.1	-34.0	-33.7	0.3	2.1	-40.5	-40.9	-0.4	-1.2	5.27	5.13	0.14	0.42	24.9
4.250	Feb 28 2031	7	43.8	3.504	3.426	3.125	3.047	-37.9	-38.0	-0.1	-0.5	-34.6	-34.5	0.1	-0.6	-43.9	-44.1	-0.2	-0.6	5.27	5.13	0.15	0.45	4.1
4.125	Mar 31 2031	7	43.0	3.509	3.432	3.126	3.048	-38.3	-38.4	-0.1	-0.5	-34.5	-35.0	-0.5	0.8	-44.4	-44.6	-0.2	-0.6	5.27	5.13	0.15	0.45	0.0
4.625	Apr 30 2031	7	44.2	3.511	3.434	3.127	3.050	-38.4	-38.4	0.0	-0.4	-34.3	-34.9	-0.6	1.1	-44.5	-44.6	-0.1	-0.5	5.27	5.13	0.15	0.45	0.5
1.625	May 15 2031	10	148.5	3.520	3.450	3.128	3.051	-39.3	-39.9	-0.6	-1.1	-39.2	-39.4	-0.2	-5.0	-45.4	-46.1	-0.7	-1.3	5.27	5.13	0.14	0.41	29.9
4.625	May 31 2031	7	46.6	3.518	3.441	3.128	3.052	-39.0	-39.0	0.0	-0.4	-35.0	-35.6	-0.6	0.3	-45.1	-45.1	-0.1	-0.5	5.27	5.13	0.15	0.44	5.6
4.250	Jun 30 2031	7	45.5	3.513	3.439	3.129	3.054	-38.3	-38.6	-0.2	-0.7	-34.8	-34.9	-0.1	-0.2	-44.4	-44.8	-0.3	-0.8	5.20	5.07	0.15	0.43	3.4
4.125 Jul 31 2031	7	46.4	3.519	3.447	3.131	3.056	-38.8	-39.1	-0.3	-0.8	-35.5	-35.6	-0.1	-1.1	-44.9	-45.3	-0.4	-0.9	5.20	5.07	0.14	0.43	5.2	
1.250	Aug 15 2031	10	142.2	3.533	3.465	3.132	3.057	-40.1	-40.8	-0.7	-1.2	-40.9	-40.7	0.1	-1.8	-46.2	-47.1	-0.8	-1.3	5.27	5.13	0.13	0.39	19.7
3.750 Aug 31 2031	7	47.5	3.523	3.455	3.132	3.058	-39.0	-39.7	-0.7	-0.8	-36.6	-36.7	-0.1	-1.5	-45.1	-45.9	-0.8	-1.0	5.20	5.07	0.14	0.42	7.4	
1.375	Nov 15 2031	10	144.6	3.543	3.478	3.134	3.064	-40.8	-41.4	-0.6	-1.1	-40.9	-41.1	-0.2	0.2	-47.0	-47.7	-0.7	-1.3	5.27	5.13	0.13	0.38	23.3
1.875	Feb 15 2032	10	141.2	3.559	3.495	3.137	3.069	-42.1	-42.6	-0.4	-1.0	-41.5	-41.4	0.1	-0.7	-48.3	-48.9	-0.5	-1.1	5.27	5.13	0.13	0.37	25.6
2.875	May 15 2032	10	133.3	3.565	3.502	3.141	3.074	-42.4	-42.8	-0.4	-0.7	-40.1	-40.6	-0.5	1.8	-48.6	-49.0	-0.5	-0.9	5.27	5.13	0.13	0.37	23.5

* in \$ billions

Note:

1. Carry and slide calculated for swap spread receiving positions

2. A bp change in carry for a 10 bp change in repo rate

Derivatives Strategy

Issue Specific SOFR Swap Spread Detailed Report

Cpn	Mat	Orig Issue Size *	Yield	Interpolated Swap Yield		Matched Maturity Swap Spread				Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %		
			Spot	3m Fwd	Spot	3m Fwd	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	1m	3m	1m	3m		
2.750	Aug 15 2032	10	121.1	3.579	3.518	3.146	3.081	-43.2	-43.7	-0.5	-0.8	-41.7	-41.6	0.1	-1.6	-49.4	-50.0	-0.6	-0.9	5.27	5.13	0.12	0.36	18.3
4.125	Nov 15 2032	10	111.3	3.573	3.511	3.150	3.088	-42.3	-42.4	0.0	-0.5	-38.5	-39.1	-0.6	3.8	-48.6	-48.7	-0.1	-0.6	5.27	5.13	0.13	0.37	11.0
3.500	Feb 15 2033	10	114.7	3.597	3.539	3.153	3.093	-44.4	-44.5	-0.2	-0.6	-41.6	-41.5	0.1	-3.1	-50.7	-50.9	-0.2	-0.7	5.27	5.13	0.12	0.35	13.7
3.375	May 15 2033	10	108.5	3.608	3.553	3.158	3.099	-45.0	-45.4	-0.3	-0.6	-42.3	-42.9	-0.6	0.0	-51.3	-51.7	-0.4	-0.7	5.27	5.13	0.12	0.34	8.8
3.875	Aug 15 2033	10	122.2	3.620	3.565	3.164	3.106	-45.7	-45.9	-0.3	-0.6	-42.7	-42.6	0.1	-0.5	-52.0	-52.3	-0.4	-0.7	5.27	5.13	0.11	0.34	11.7
4.500	Nov 15 2033	10	114.7	3.622	3.567	3.168	3.113	-45.4	-45.5	-0.1	-0.4	-41.0	-41.8	-0.8	2.4	-51.7	-51.9	-0.1	-0.5	5.27	5.13	0.12	0.34	0.7
4.000	Feb 15 2034	10	123.7	3.638	3.588	3.172	3.119	-46.6	-46.9	-0.3	-0.8	-43.2	-43.3	-0.1	-1.9	-52.9	-53.3	-0.4	-0.8	5.20	5.07	0.11	0.32	3.0
4.375	May 15 2034	10	132.9	3.643	3.594	3.178	3.124	-46.5	-46.9	-0.4	-0.7	-42.4	-43.4	-1.0	1.7	-52.9	-53.3	-0.5	-0.8	5.20	5.07	0.11	0.32	9.7
3.875	Aug 15 2034	10	89.4	3.649	3.602	3.184	3.131	-46.5	-47.1	-0.6	-0.9	-43.6	-43.7	-0.2	-1.0	-52.8	-53.5	-0.6	-0.9	5.03	5.04	0.11	0.31	16.0
4.500	Feb 15 2036	30	26.4	3.578	3.531	3.214	3.170	-36.4	-36.1	0.3	-0.2	-32.7	-32.4	0.3	1.5	-42.8	-42.6	0.2	-0.3	5.27	5.13	0.10	0.28	68.3
4.750	Feb 15 2037	30	16.6	3.652	3.609	3.234	3.193	-41.8	-41.6	0.2	-0.4	-37.5	-37.3	0.2	-1.4	-48.3	-48.1	0.1	-0.5	5.27	5.13	0.09	0.26	70.0
5.000	May 15 2037	30	21.4	3.668	3.627	3.239	3.198	-42.9	-42.9	0.1	-0.5	-38.3	-38.9	-0.6	-0.1	-49.4	-49.4	0.0	-0.6	5.27	5.13	0.09	0.26	70.0
4.375	Feb 15 2038	30	22.5	3.702	3.664	3.252	3.214	-45.0	-44.9	0.0	-0.7	-41.2	-41.0	0.2	-1.2	-51.5	-51.5	0.0	-0.8	5.27	5.13	0.08	0.24	70.0
4.500	May 15 2038	30	25.5	3.720	3.682	3.257	3.219	-46.3	-46.3	-0.1	-0.8	-42.0	-42.7	-0.6	-0.2	-52.8	-53.0	-0.1	-0.9	5.27	5.13	0.08	0.24	70.0
3.500	Feb 15 2039	30	25.9	3.758	3.724	3.268	3.232	-49.0	-49.2	-0.2	-1.2	-46.7	-46.5	0.2	-1.7	-55.6	-55.8	-0.2	-1.3	5.27	5.13	0.08	0.22	69.8
4.250	May 15 2039	30	38.8	3.785	3.752	3.271	3.235	-51.4	-51.6	-0.2	-1.2	-47.5	-48.2	-0.8	0.0	-58.0	-58.3	-0.3	-1.2	5.27	5.13	0.08	0.23	70.0
4.500	Aug 15 2039	30	41.4	3.800	3.766	3.274	3.239	-52.5	-52.7	-0.2	-1.2	-48.7	-48.5	0.2	-1.4	-59.1	-59.4	-0.3	-1.3	5.27	5.13	0.08	0.23	70.0
4.375	Nov 15 2039	30	44.6	3.808	3.775	3.276	3.242	-53.1	-53.3	-0.2	-1.3	-48.9	-49.8	-0.8	0.6	-59.8	-60.0	-0.2	-1.4	5.27	5.13	0.08	0.22	70.0
4.625	Feb 15 2040	30	44.9	3.811	3.779	3.278	3.245	-53.3	-53.4	-0.1	-1.3	-49.1	-48.9	0.2	-0.3	-59.9	-60.1	-0.1	-1.4	5.27	5.13	0.08	0.22	70.0
4.375	May 15 2040	30	43.5	3.816	3.784	3.281	3.247	-53.5	-53.7	-0.2	-1.4	-49.3	-50.1	-0.8	0.6	-60.2	-60.4	-0.3	-1.4	5.27	5.13	0.08	0.22	70.0
1.125	May 15 2040	20	60.4	3.931	3.907	3.281	3.247	-65.0	-66.0	-1.0	-2.4	-72.2	-72.7	-0.5	-0.4	-71.7	-72.7	-1.0	-2.5	5.27	5.13	0.06	0.18	33.4
3.875	Aug 15 2040	30	43.2	3.838	3.807	3.283	3.250	-55.4	-55.8	-0.3	-1.5	-52.7	-52.5	0.2	-3.5	-62.1	-62.5	-0.4	-1.6	5.27	5.13	0.07	0.21	70.0
1.125	Aug 15 2040	20	76.5	3.956	3.933	3.283	3.250	-67.3	-68.3	-1.0	-2.5	-75.4	-75.3	0.1	-3.2	-73.9	-75.0	-1.1	-2.6	5.27	5.13	0.06	0.18	35.8
4.250	Nov 15 2040	30	42.9	3.841	3.811	3.285	3.253	-55.6	-55.8	-0.2	-1.5	-51.5	-52.4	-0.8	2.0	-62.2	-62.5	-0.3	-1.5	5.27	5.13	0.07	0.21	70.0
1.375	Nov 15 2040	20	85.6	3.982	3.959	3.285	3.253	-69.7	-70.6	-1.0	-2.5	-76.6	-77.2	-0.7	-0.4	-76.3	-77.3	-1.0	-2.5	5.27	5.13	0.06	0.18	36.0
4.750	Feb 15 2041	30	43.0	3.833	3.802	3.286	3.255	-54.7	-54.8	-0.1	-1.4	-50.2	-50.0	0.2	1.1	-61.4	-61.5	-0.1	-1.4	5.27	5.13	0.07	0.21	68.3
1.875	Feb 15 2041	20	89.7	3.990	3.966	3.286	3.255	-70.4	-71.2	-0.8	-2.3	-75.1	-75.0	0.1	1.3	-77.0	-77.9	-0.9	-2.4	5.27	5.13	0.06	0.18	26.1
4.375	May 15 2041	30	42.0	3.864	3.835	3.288	3.256	-57.6	-57.9	-0.3	-1.5	-53.3	-54.2	-0.9	-2.3	-64.3	-64.6	-0.3	-1.6	5.27	5.13	0.07	0.21	70.0
2.250	May 15 2041	20	86.2	3.997	3.974	3.288	3.256	-70.9	-71.7	-0.9	-2.2	-73.7	-74.6	-1.0	2.4	-77.6	-78.5	-0.9	-2.3	5.27	5.13	0.06	0.19	34.1
3.750	Aug 15 2041	30	42.5	3.910	3.882	3.291	3.259	-61.9	-62.4	-0.5	-1.7	-59.6	-59.4	0.2	-6.3	-68.6	-69.1	-0.5	-1.8	5.27	5.13	0.07	0.20	70.0
1.750	Aug 15 2041	20	83.7	4.032	4.010	3.291	3.259	-74.1	-75.1	-1.0	-2.4	-80.6	-80.5	0.1	-6.8	-80.8	-81.9	-1.0	-2.5	5.27	5.13	0.06	0.18	10.5
3.125	Nov 15 2041	30	44.6	3.948	3.922	3.292	3.261	-65.6	-66.2	-0.6	-1.9	-64.6	-65.6	-1.0	-3.9	-72.3	-72.9	-0.6	-2.0	5.27	5.13	0.07	0.19	70.0
2.000	Nov 15 2041	20	70.6	4.037	4.015	3.292	3.261	-74.6	-75.4	-0.9	-2.4	-79.2	-80.2	-1.0	2.3	-81.3	-82.2	-0.9	-2.4	5.27	5.13	0.06	0.18	10.8
3.125	Feb 15 2042	30	47.2	3.980	3.955	3.292	3.262	-68.7	-69.3	-0.6	-2.0	-68.2	-68.1	0.1	-3.7	-75.5	-76.1	-0.6	-2.0	5.27	5.13	0.07	0.19	70.0
2.375	Feb 15 2042	20	59.4	4.044	4.022	3.292	3.262	-75.2	-76.0	-0.8	-2.2	-78.4	-78.3	0.1	-13.6	-81.9	-82.8	-0.8	-2.3	5.27	5.13	0.06	0.18	14.4
3.000	May 15 2042	30	43.9	4.017	3.994	3.294	3.263	-72.4	-73.1	-0.7	-2.0	-72.3	-73.4	-1.1	-3.0	-79.1	-79.9	-0.8	-2.1	5.27	5.13	0.07	0.19	70.0
3.250	May 15 2042	20	49.8	4.021	3.997	3.294	3.263	-72.7	-73.4	-0.7	-2.0	-71.8	-72.9	-1.2	-2.4	-79.4	-80.2	-0.7	-2.0	5.27	5.13	0.07	0.19	9.8

* in \$ billions

Note:

1. Carry and slide calculated for swap spread receiving positions

2. A bp change in carry for a 10 bp change in repo rate

Derivatives Strategy

Issue Specific SOFR Swap Spread Detailed Report

Cpn	Mat	Orig Issue Size *	Yield	Interpolated Swap Yield		Matched Maturity Swap Spread				Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %		
			Spot	3m Fwd	Spot	3m Fwd	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	Spot	3m Fwd	3m Carry	C + S	1m	3m	1m	3m		
3.375	Aug 15 2042	20	40.9	4.025	4.001	3.295	3.264	-73.0	-73.7	-0.7	-1.9	-72.3	-72.2	0.1	-0.1	-79.8	-80.5	-0.7	-2.0	5.27	5.13	0.07	0.19	4.8
2.750	Aug 15 2042	30	42.0	4.040	4.018	3.295	3.264	-74.5	-75.3	-0.8	-2.1	-76.4	-76.3	0.1	-4.1	-81.3	-82.1	-0.9	-2.2	5.27	5.13	0.06	0.18	63.3
4.000	Nov 15 2042	20	40.6	4.000	3.975	3.295	3.266	-70.4	-71.0	-0.5	-1.8	-66.9	-68.0	-1.2	10.5	-77.2	-77.8	-0.5	-1.8	5.27	5.13	0.07	0.19	4.0
2.750	Nov 15 2042	30	42.0	4.048	4.026	3.295	3.266	-75.3	-76.1	-0.8	-2.1	-76.5	-77.7	-1.1	1.0	-82.1	-82.9	-0.8	-2.1	5.27	5.13	0.06	0.18	46.8
3.125	Feb 15 2043	30	42.0	4.056	4.034	3.295	3.266	-76.1	-76.8	-0.7	-2.0	-76.4	-76.2	0.1	0.0	-82.9	-83.6	-0.7	-2.0	5.27	5.13	0.06	0.18	54.4
3.875	Feb 15 2043	20	43.6	4.022	3.998	3.295	3.266	-72.7	-73.2	-0.5	-1.8	-70.1	-69.9	0.1	6.2	-79.4	-80.0	-0.6	-1.8	5.27	5.13	0.07	0.19	10.5
3.875	May 15 2043	20	41.7	4.037	4.014	3.295	3.266	-74.1	-74.8	-0.6	-1.8	-71.1	-72.4	-1.3	6.6	-80.9	-81.6	-0.7	-1.8	5.27	5.13	0.07	0.19	6.8
2.875	May 15 2043	30	42.0	4.073	4.051	3.295	3.266	-77.7	-78.5	-0.8	-2.0	-78.8	-80.1	-1.2	-1.3	-84.5	-85.4	-0.9	-2.1	5.27	5.13	0.06	0.18	27.9
3.625	Aug 15 2043	30	42.0	4.065	4.043	3.296	3.266	-76.9	-77.7	-0.7	-1.8	-75.5	-75.4	0.2	3.1	-83.7	-84.5	-0.7	-1.9	5.27	5.13	0.06	0.19	48.2
4.375	Aug 15 2043	20	43.7	4.023	3.999	3.296	3.266	-72.7	-73.3	-0.5	-1.6	-68.8	-68.6	0.2	9.6	-79.5	-80.1	-0.6	-1.7	5.27	5.13	0.07	0.19	3.8
3.750	Nov 15 2043	30	42.0	4.065	4.043	3.295	3.266	-77.0	-77.7	-0.6	-1.8	-74.5	-75.8	-1.3	2.4	-83.8	-84.5	-0.7	-1.8	5.27	5.13	0.06	0.19	47.3
4.750	Nov 15 2043	20	42.2	4.015	3.991	3.295	3.266	-72.0	-72.5	-0.4	-1.5	-66.4	-67.6	-1.3	10.2	-78.8	-79.3	-0.5	-1.6	5.27	5.13	0.07	0.19	0.4
3.625	Feb 15 2044	30	42.0	4.074	4.052	3.294	3.266	-78.1	-78.7	-0.6	-1.7	-76.6	-76.5	0.1	-2.2	-84.9	-85.5	-0.7	-1.8	5.27	5.13	0.06	0.18	43.9
4.500	Feb 15 2044	20	42.7	4.040	4.016	3.294	3.266	-74.6	-75.1	-0.5	-1.5	-70.2	-70.0	0.2	4.0	-81.4	-81.9	-0.5	-1.6	5.27	5.13	0.07	0.19	1.8
3.375	May 15 2044	30	42.0	4.082	4.061	3.293	3.265	-78.9	-79.7	-0.7	-1.7	-77.9	-79.2	-1.3	-0.1	-85.8	-86.5	-0.8	-1.8	5.27	5.13	0.06	0.18	48.0
4.625	May 15 2044	20	44.1	4.045	4.022	3.293	3.265	-75.2	-75.8	-0.5	-1.5	-69.8	-71.1	-1.3	8.1	-82.1	-82.6	-0.6	-1.5	5.27	5.13	0.07	0.19	4.8
4.125	Aug 15 2044	20	13.0	4.043	4.026	3.292	3.264	-75.1	-76.3	-1.2	-2.1	-71.9	-72.4	-0.4	6.3	-81.9	-83.1	-1.2	-2.2	4.22	4.80	0.07	0.19	7.4
3.125	Aug 15 2044	30	42.0	4.086	4.065	3.292	3.264	-79.4	-80.1	-0.8	-1.7	-80.3	-80.2	0.2	-2.5	-86.2	-87.0	-0.8	-1.8	5.27	5.13	0.06	0.17	33.0
3.000	Nov 15 2044	30	42.0	4.089	4.069	3.290	3.263	-79.9	-80.6	-0.7	-1.7	-80.7	-82.0	-1.3	0.9	-86.7	-87.5	-0.8	-1.8	5.27	5.13	0.06	0.17	41.5
2.500	Feb 15 2045	30	42.0	4.095	4.075	3.288	3.261	-80.7	-81.5	-0.8	-1.7	-85.0	-84.9	0.2	-4.3	-87.5	-88.4	-0.8	-1.8	5.27	5.13	0.06	0.16	22.2
3.000	May 15 2045	30	42.4	4.088	4.068	3.286	3.259	-80.1	-80.9	-0.8	-1.5	-81.2	-82.4	-1.2	5.1	-87.0	-87.8	-0.8	-1.6	5.27	5.13	0.06	0.17	63.1
2.875	Aug 15 2045	30	42.3	4.089	4.069	3.285	3.257	-80.5	-81.3	-0.8	-1.5	-83.0	-82.8	0.2	-1.9	-87.3	-88.2	-0.8	-1.5	5.27	5.13	0.06	0.17	49.3
3.000	Nov 15 2045	30	42.1	4.083	4.063	3.282	3.255	-80.1	-80.8	-0.7	-1.3	-81.2	-82.4	-1.2	3.0	-87.0	-87.7	-0.8	-1.4	5.27	5.13	0.06	0.17	69.5
2.500	Feb 15 2046	30	40.3	4.098	4.079	3.279	3.253	-81.9	-82.7	-0.8	-1.3	-86.8	-86.6	0.2	-5.7	-88.8	-89.6	-0.8	-1.4	5.27	5.13	0.05	0.16	34.3
2.500	May 15 2046	30	43.2	4.101	4.083	3.277	3.250	-82.4	-83.3	-0.8	-1.2	-86.9	-88.2	-1.2	1.1	-89.4	-90.2	-0.9	-1.3	5.27	5.13	0.05	0.16	38.0
2.250	Aug 15 2046	30	40.5	4.105	4.087	3.275	3.248	-83.0	-83.9	-0.9	-1.2	-90.2	-90.0	0.2	-3.4	-89.9	-90.9	-0.9	-1.3	5.27	5.13	0.05	0.15	18.4
2.875	Nov 15 2046	30	42.9	4.101	4.082	3.271	3.246	-82.9	-83.7	-0.8	-1.1	-85.2	-86.5	-1.3	6.1	-89.9	-90.6	-0.8	-1.1	5.27	5.13	0.06	0.16	65.3
3.000	Feb 15 2047	30	40.8	4.106	4.087	3.268	3.242	-83.7	-84.4	-0.7	-1.0	-86.1	-85.9	0.2	-1.1	-90.7	-91.4	-0.7	-1.0	5.27	5.13	0.06	0.16	28.0
3.000	May 15 2047	30	44.2	4.110	4.092	3.265	3.240	-84.5	-85.2	-0.8	-0.9	-86.3	-87.6	-1.3	1.1	-91.4	-92.2	-0.8	-1.0	5.27	5.13	0.06	0.16	48.8
2.750	Aug 15 2047	30	43.5	4.116	4.098	3.263	3.237	-85.3	-86.2	-0.8	-0.9	-89.7	-89.4	0.2	-3.5	-92.3	-93.2	-0.9	-0.9	5.27	5.13	0.05	0.15	25.6
2.750	Nov 15 2047	30	41.2	4.118	4.101	3.259	3.234	-85.9	-86.7	-0.8	-0.9	-89.5	-90.9	-1.3	1.5	-92.9	-93.7	-0.8	-0.9	5.27	5.13	0.05	0.15	20.8
3.000	Feb 15 2048	30	45.0	4.118	4.101	3.256	3.231	-86.3	-87.0	-0.7	-0.8	-89.0	-88.7	0.2	0.3	-93.3	-94.0	-0.8	-0.8	5.27	5.13	0.05	0.16	17.2
3.125	May 15 2048	30	49.2	4.112	4.095	3.253	3.227	-86.0	-86.7	-0.8	-0.7	-87.3	-88.7	-1.4	3.0	-93.0	-93.8	-0.8	-0.8	5.27	5.13	0.05	0.16	18.7
3.000	Aug 15 2048	30	50.4	4.114	4.097	3.250	3.224	-86.4	-87.2	-0.8	-0.7	-89.4	-89.2	0.3	-2.3	-93.5	-94.3	-0.8	-0.7	5.27	5.13	0.05	0.15	13.0
3.375	Nov 15 2048	30	54.9	4.110	4.093	3.246	3.222	-86.4	-87.1	-0.7	-0.6	-86.3	-87.7	-1.4	4.4	-93.4	-94.2	-0.7	-0.7	5.27	5.13	0.05	0.16	18.1
3.000	Feb 15 2049	30	55.6	4.111	4.093	3.243	3.218	-86.8	-8															

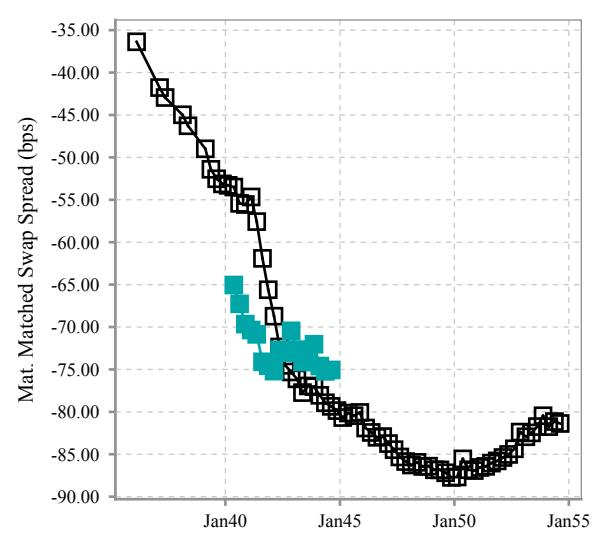
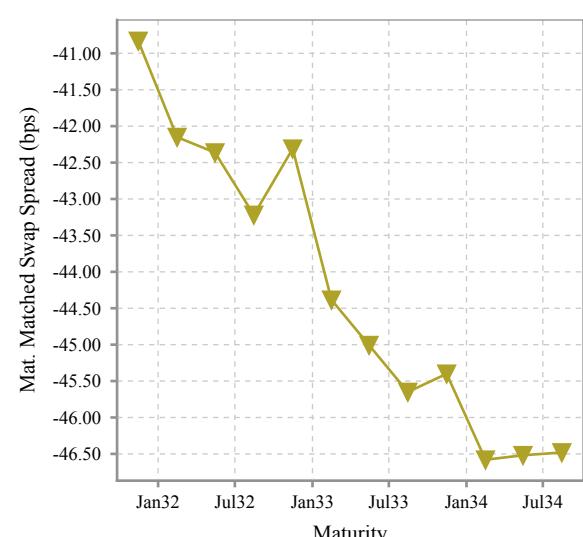
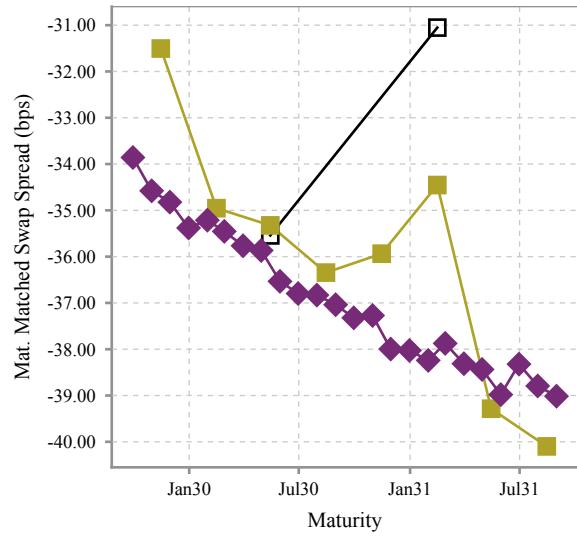
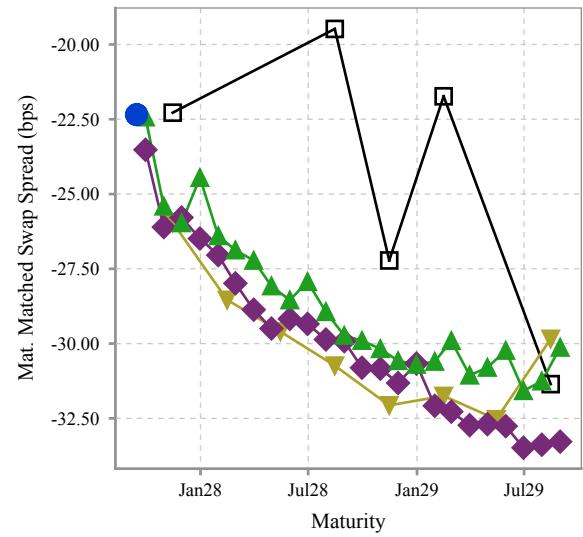
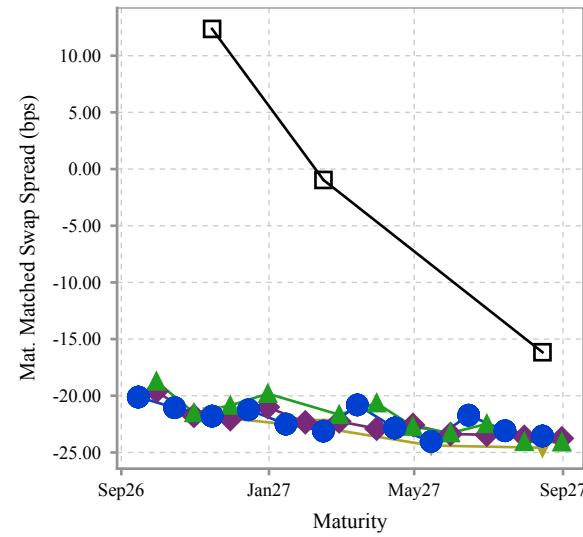
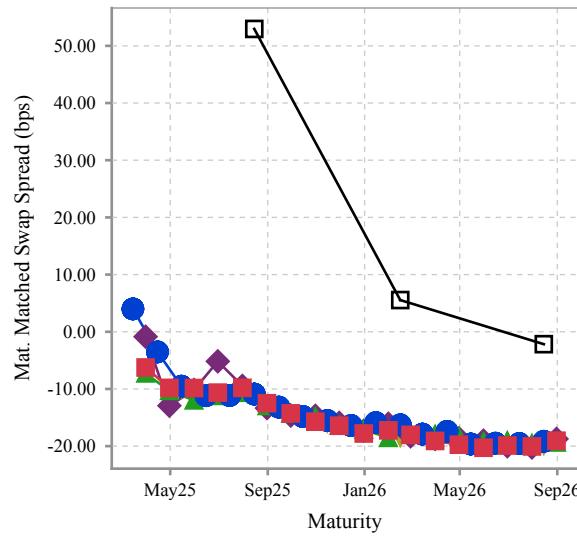
* in \$ billions

Note:

1. Carry and slide calculated for swap spread receiving positions

2. A bp change in carry for a 10 bp change in repo rate

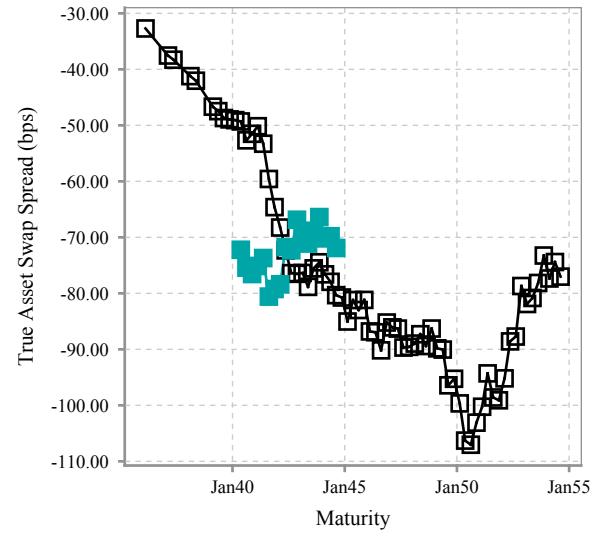
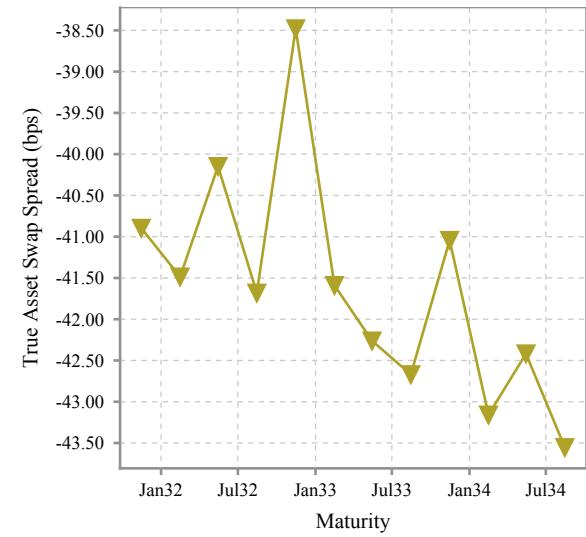
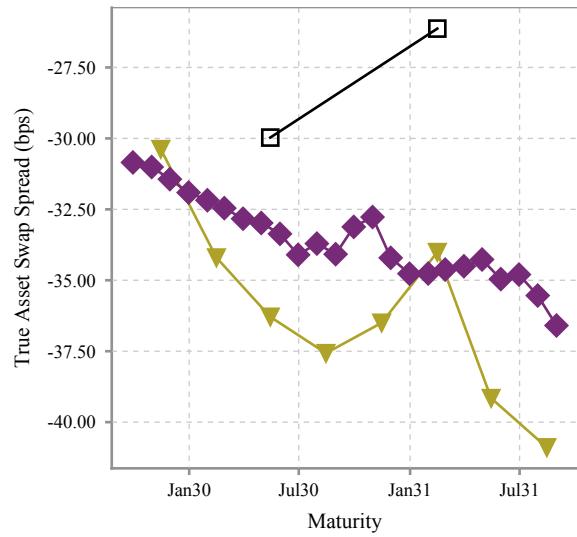
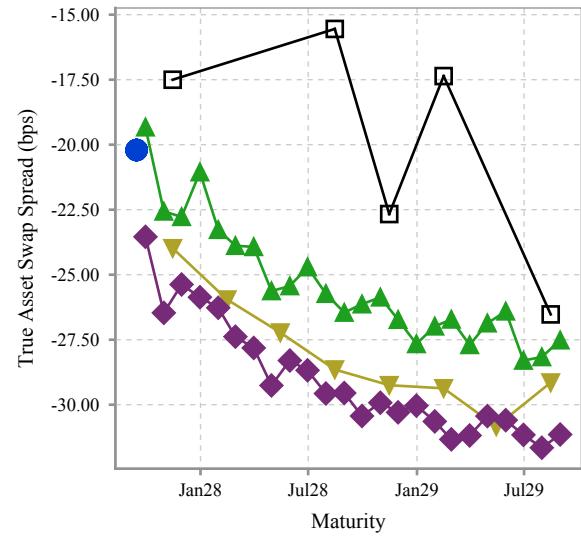
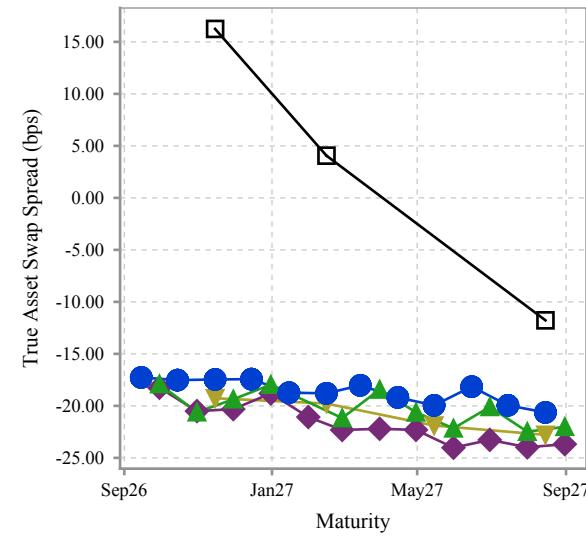
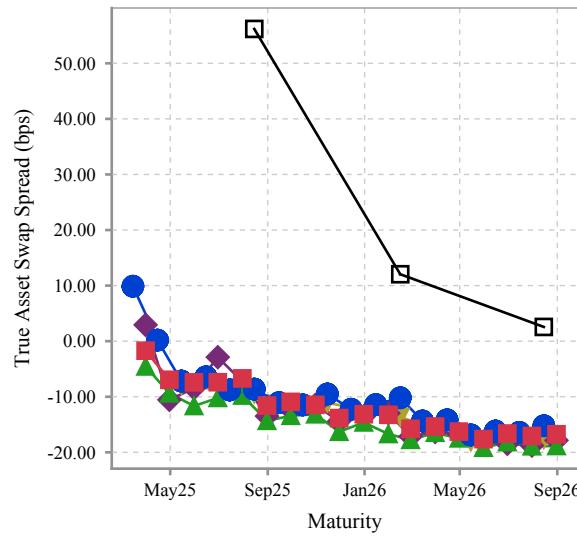
Issue Specific Maturity Matched SOFR Swap Spread



1) The charts are broken down into six buckets, that is, shorter than 2yr, 2yr-3yr, 3yr-5yr, 5yr-7yr, 7yr-10yr and 10yr+ remaining maturities

2) Notes/bonds in each bucket are grouped based on their original issue maturities: 2-, 3-, 5-, 7-, 10-, 20- and 30-year.

Issue Specific SOFR True Asset Swap Spread



1) The charts are broken down into six buckets, that is, shorter than 2yr, 2yr-3yr, 3yr-5yr, 5yr-7yr, 7yr-10yr and 10yr+ remaining maturities

2) Notes/bonds in each bucket are grouped based on their original issue maturities: 2-, 3-, 5-, 7-, 10-, 20- and 30-year.

■ 2y ● 3y ▲ 5y △ 7y ▽ 10y □ 20y ▨ 30y

Derivatives Strategy

Issue-Specific Treasury Relative Value Report

Remaining Maturity	Richest issue by yield error					Cheapest issue by yield error					Yield Error differential stats				ASW differential stats					
	Original Mat		Old	Yld Err	ASW	Original Mat		Old	Yld Err	ASW	Curr	1Y Avg	R/C	Z-score	Curr	1Y Avg	R/C	Z-score		
1y-3y	6.5%	NOV-26	30	76	-44.1	24.9	0.25%	AUG-25	5	47	8.0	-10.5	52.2	13.2	38.9	2.4	-35.3	2.7	-38.1	-2.2
3y-5y	5.5%	AUG-28	30	72	-11.7	-16.1	0.375%	JUL-27	7	48	3.6	-21.7	15.3	4.0	11.3	2.0	-5.6	3.8	-9.4	-2.4
5y-10y	5.375%	FEB-31	30	67	-9.0	-28.4	3.875%	AUG-33	10	3	5.4	-44.6	14.3	7.4	7.0	1.5	-16.2	-5.3	-10.9	-1.8
10y-30y	4.5%	FEB-36	30	66	-7.2	-36.2	2.25%	MAY-41	20	12	3.5	-70.6	10.7	6.6	4.0	0.8	-34.5	-32.6	-1.9	-0.4

*Yield error and maturity matched spread differential stats for selected pairs in various maturity buckets. The selection is based on max/min yield error irrespective of original issue sector.

Original Maturity	Remaining Maturity	Richest issue by yield error					Cheapest issue by yield error					Yield Error differential stats				ASW differential stats					
		Original Mat		Old	Yld Err	ASW	Original Mat		Old	Yld Err	ASW	Curr	1Y Avg	R/C	Z-score	Curr	1Y Avg	R/C	Z-score		
3s	1y-3y	4%	FEB-26	3	17	-0.7	-15.6	3.5%	SEP-25	3	22	2.6	-9.3	3.3	0.4	3.0	1.8	6.3	6.4	0.0	0.0
5s	1y-3y	1.25%	DEC-26	5	31	-0.7	-17.1	0.25%	AUG-25	5	47	8.0	-10.5	8.7	2.4	6.3	1.7	6.6	12.2	-5.6	-1.3
5s	3y-5y	4.5%	MAY-29	5	2	-3.4	-28.3	2.75%	JUL-27	5	24	3.0	-22.1	6.4	5.0	1.4	0.8	6.2	8.6	-2.4	-1.5
7s	1y-3y	1.875%	JUN-26	7	61	1.0	-15.6	2.75%	AUG-25	7	71	7.6	-10.4	6.6	1.7	4.9	1.9	5.3	9.4	-4.1	-1.4
7s	3y-5y	2.75%	MAY-29	7	26	-0.5	-30.7	0.375%	JUL-27	7	48	3.6	-21.7	4.1	2.3	1.8	1.4	8.9	10.4	-1.5	-1.0
7s	5y-10y	3.875%	NOV-29	7	20	-0.9	-32.8	4.625%	MAY-31	7	2	1.0	-37.5	1.9	3.0	-1.1	-0.9	-4.7	-4.5	-0.2	-0.3
10s	1y-3y	1.625%	FEB-26	10	33	-0.2	-15.6	1.625%	MAY-26	10	32	2.4	-16.5	2.6	-0.2	2.9	2.0	-0.9	-1.2	0.3	0.2
10s	3y-5y	2.625%	FEB-29	10	21	-0.3	-30.2	2.875%	MAY-28	10	24	3.0	-28.3	3.3	2.4	0.9	1.3	1.9	3.1	-1.2	-1.7
10s	5y-10y	1.75%	NOV-29	10	18	-4.2	-28.9	3.875%	AUG-33	10	3	5.4	-44.6	9.6	8.7	0.9	0.3	-15.7	-8.9	-6.8	-1.2
30s	1y-3y	6.5%	NOV-26	30	76	-44.1	24.9	6.75%	AUG-26	30	77	-18.6	0.8	25.5	-2.8	28.3	1.8	-24.0	6.3	-30.3	-1.8
30s	3y-5y	5.5%	AUG-28	30	72	-11.7	-16.1	5.25%	NOV-28	30	71	-5.3	-24.4	6.3	-0.4	6.7	1.5	-8.3	-2.1	-6.2	-1.5
30s	5y-10y	5.375%	FEB-31	30	67	-9.0	-28.4	6.25%	MAY-30	30	68	-1.4	-33.8	7.5	0.1	7.4	1.5	-5.4	1.2	-6.5	-1.4
30s	10y-30y	4.5%	FEB-36	30	66	-7.2	-36.2	3.375%	NOV-48	30	22	2.2	-86.0	9.4	5.0	4.4	0.9	-49.8	-46.2	-3.6	-0.7

*Yield error and maturity matched spread differential stats for selected pairs in various maturity buckets. The selection is based on max/min yield error segregated by original issue sector.

Notes: Old refers to the number of newer issues in that original maturity series: OTR=0, Olds=1, double olds=2, etc. The 1Y avg, residual and z-score are estimated rolling to the equivalently old issues. R/C is the difference between the current and 1Y Average. Asset swap spreads are based on SOFR swaps.

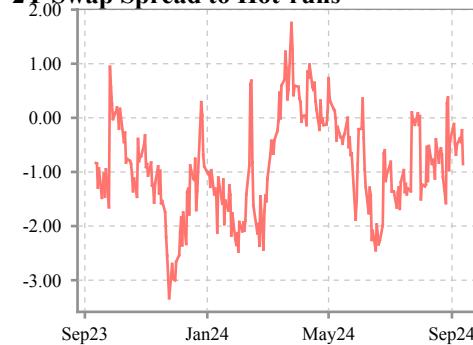
Derivatives Strategy

Treasury Futures Asset Swap Report - Front Contract

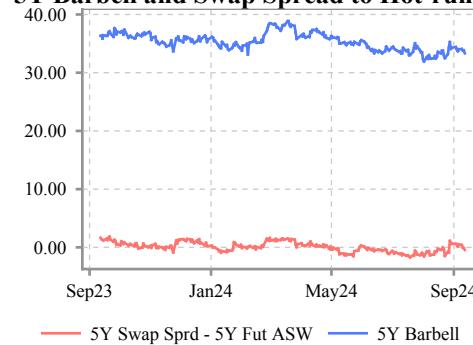
Swap Spread		ASW		Carry to Deliver			Spread to Hot-Run			Weighted Spread to Hot-Run			Barbell to Hot-Run			Weighted Barbell to Hot-Run					
Futures	CTD	Cash	Futures	Current	Average	ZScore	Current	Average	ZScore	Weight	Current	Average	Zscore	Current	Average	ZScore	Weight 1	Weight 2	Current	Average	ZScore
TUU24	0.875 06/30/2026	-20.84	-22.94	-2.10	0.53	-1.72	2.58	-0.32	2.50	1.10	0.49	-1.61	1.62								
FVU24	4.375 11/30/2028	-31.72	-30.39	1.33	0.46	0.92	-0.61	-0.66	0.05	0.90	2.48	1.95	0.46	4.71	6.18	-0.91	-0.53	2.06	-22.78	-21.93	-0.69
TYU24	4.625 04/30/2031	-39.91	-39.33	0.57	-0.13	1.73	-7.89	-5.42	-1.43	0.50	15.63	14.76	0.85	0.22	1.70	-1.08	2.02	-0.80	14.38	14.32	0.05
USU24	4.375 11/15/2039	-54.14	-54.53	-0.40	-0.05	-0.31	-21.57	-18.97	-0.98	0.76	-3.59	-2.52	-0.51	-7.13	-4.42	-1.14	1.96	-0.55	3.84	9.52	-1.86
WNU24	4.750 11/15/2053	-80.74	-82.30	-1.56	-4.18	0.88	0.55	3.25	-0.91	0.43	46.94	47.11	-0.04	3.37	7.10	-1.60	-0.20	2.27	-87.97	-80.93	-2.77

OIS Spread		ASW		Carry to Deliver			Spread to Hot-Run			Weighted Spread to Hot-Run			Barbell to Hot-Run			Weighted Barbell to Hot-Run					
Futures	CTD	Cash	Futures	Current	Average	ZScore	Current	Average	ZScore	Weight	Current	Average	Zscore	Current	Average	ZScore	Weight 1	Weight 2	Current	Average	ZScore
TUU24	0.875 06/30/2026	-24.99	-31.93	-6.94	-3.95	-1.10	7.06	4.17	1.28	1.05	5.80	3.41	1.15								
FVU24	4.375 11/30/2028	-37.28	-38.36	-1.08	-2.12	0.60	1.59	1.77	-0.10	0.90	5.39	4.90	0.25	12.68	12.62	0.03	-0.58	2.92	-40.24	-37.30	-1.57
TYU24	4.625 04/30/2031	-45.97	-46.75	-0.78	-2.05	1.96	-6.82	-3.90	-2.00	0.60	14.45	14.07	0.31	7.64	7.96	-0.32	1.54	-0.08	2.83	4.16	-1.32
USU24	4.375 11/15/2039	-60.76	-61.76	-1.00	-0.96	-0.03	-21.18	-18.31	-1.12	0.80	-4.21	-2.96	-0.62	0.10	1.64	-0.83	1.34	0.03	-3.73	0.39	-1.81
WNU24	4.750 11/15/2053	-87.96	-89.93	-1.97	-4.79	0.94	0.93	3.83	-0.98	0.56	40.18	40.54	-0.08	11.00	13.61	-0.88	0.17	1.97	-84.49	-77.46	-2.94

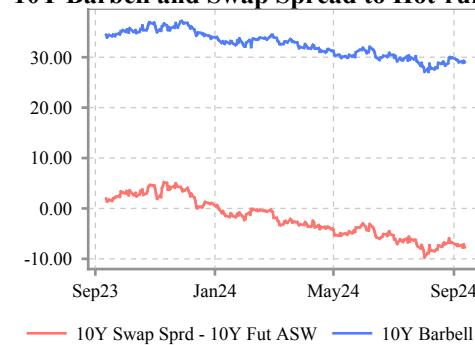
2Y Swap Spread to Hot-runs



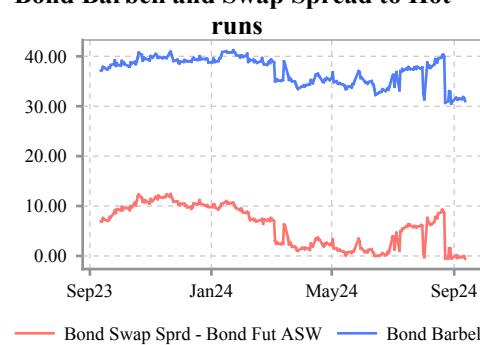
5Y Barbell and Swap Spread to Hot-runs



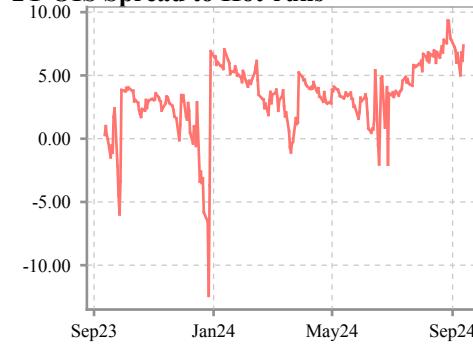
10Y Barbell and Swap Spread to Hot-runs



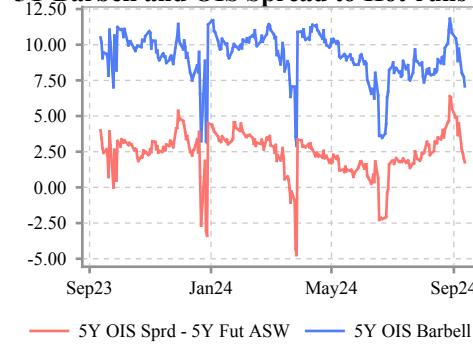
Bond Barbell and Swap Spread to Hot-runs



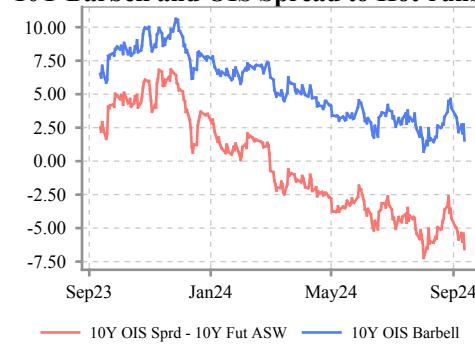
2Y OIS Spread to Hot-runs



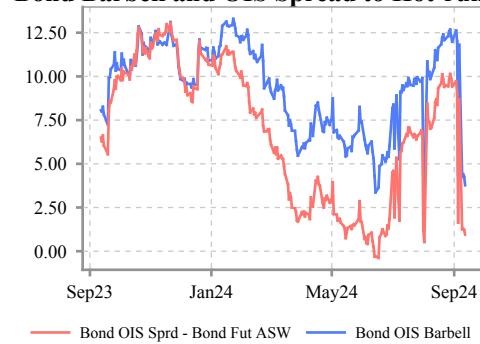
5Y Barbell and OIS Spread to Hot-runs



10Y Barbell and OIS Spread to Hot-runs



Bond Barbell and OIS Spread to Hot-runs



Notes: The weight on the spread to HR is the curve neutral risk weighting on the HR and the Wt1 on the weighted barbell refer to the curve- and leve-neutral risk weightings in the short and long legs of the barbell.

The 5y barbell to HR is defined as $0.5 * (2Y \text{ OTR swap sprd} + 5Y \text{ OTR swap sprd}) - 5Y \text{ futures ASW}$. The 10y barbell to HR is defined as $0.5 * (5Y \text{ OTR swap sprd} + 10Y \text{ OTR swap sprd}) - 10Y \text{ futures ASW}$.

The bond barbell to HR is defined as $0.5 * (10Y \text{ OTR swap sprd} + 20Y \text{ swap sprd}) - \text{bond futures ASW}$. The Ultra-bond barbell to HR is defined as $0.5 * (20Y \text{ swap sprd} + 30Y \text{ OTR swap sprd}) - \text{ultra-bond futures ASW}$.

Asset swap spreads are based on SQFR swaps.

Derivatives Strategy

Treasury Futures Asset Swap Report - Back Contract

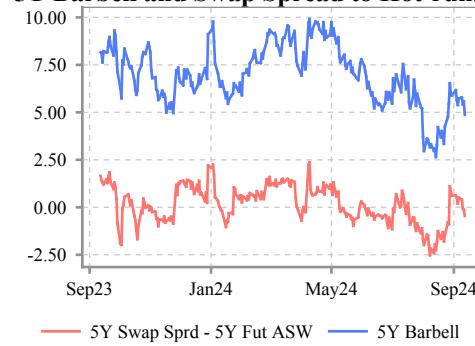
Swap Spread		ASW		Carry to Deliver			Spread to Hot-Run			Weighted Spread to Hot-Run				Barbell to Hot-Run			Weighted Barbell to Hot-Run				
Futures	CTD	Cash	Futures	Current	Average	ZScore	Current	Average	ZScore	Weight	Current	Average	Zscore	Current	Average	ZScore	Weight 1	Weight 2	Current	Average	ZScore
TUZ24	0.875 09/30/2026	-20.11	-19.51	0.59	1.85	-0.89	-0.85	-0.37	-0.41	1.07	-2.25	-1.23	-0.72								
FVZ24	4.250 02/28/2029	-30.78	-30.55	0.23	-0.45	0.86	-0.45	-0.14	-0.31	0.92	1.94	1.88	0.06	4.87	6.70	-0.96	-0.46	1.68	-12.14	-12.21	0.08
TYZ24	4.250 06/30/2031	-39.58	-39.51	0.07	-0.70	0.73	-7.71	-4.79	-1.30	0.54	14.05	13.89	0.12	0.40	2.33	-1.02	4.08	-2.32	22.44	22.36	0.03
USZ24	4.625 02/15/2040	-54.22	-54.42	-0.20	-1.30	1.18	-21.69	-17.21	-1.25	0.76	-3.55	-0.63	-1.08	-7.24	-2.67	-1.43	4.09	-2.07	18.69	30.64	-2.23
WNZ24	4.750 11/15/2053	-80.74	-81.21	-0.47	-1.49	0.53	-0.54	0.56	-0.54	0.20	65.11	62.64	0.88	2.28	4.41	-0.86	-1.83	3.91	-98.84	-96.74	-0.78

OIS Spread		ASW		Carry to Deliver			Spread to Hot-Run			Weighted Spread to Hot-Run				Barbell to Hot-Run			Weighted Barbell to Hot-Run				
Futures	CTD	Cash	Futures	Current	Average	ZScore	Current	Average	ZScore	Weight	Current	Average	Zscore	Current	Average	ZScore	Weight 1	Weight 2	Current	Average	ZScore
TUZ24	0.875 09/30/2026	-24.44	-31.74	-7.29	-3.38	-1.60	6.86	5.06	1.40	1.01	6.62	4.91	1.34								
FVZ24	4.250 02/28/2029	-36.42	-39.94	-3.52	-3.38	-0.19	3.17	2.71	0.50	0.91	6.30	5.29	1.13	14.26	13.57	0.65	-0.15	1.71	-10.06	-10.09	0.04
TYZ24	4.250 06/30/2031	-45.66	-47.74	-2.08	-2.70	0.56	-5.83	-3.28	-1.16	0.63	14.14	13.69	0.34	8.63	8.68	-0.04	2.68	-1.03	13.33	13.33	0.00
USZ24	4.625 02/15/2040	-60.85	-61.97	-1.12	-2.24	1.19	-20.97	-16.51	-1.25	0.80	-4.17	-1.31	-1.08	0.30	3.44	-1.37	1.57	-0.38	17.05	21.62	-1.85
WNZ24	4.750 11/15/2053	-87.96	-89.09	-1.13	-2.18	0.56	0.09	1.22	-0.57	0.38	55.55	53.09	0.91	10.16	11.00	-0.43	-1.25	3.23	-80.07	-78.45	-0.74

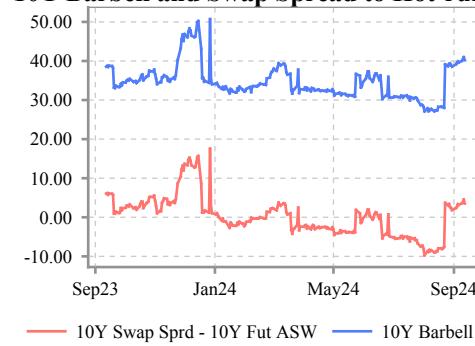
2Y Swap Spread to Hot-runs



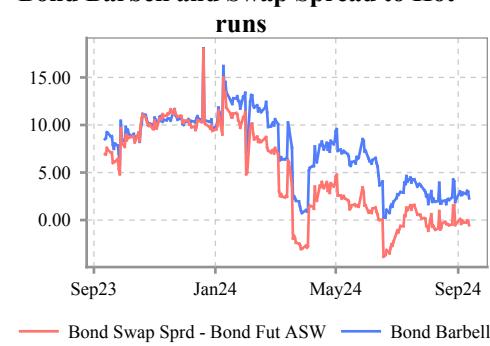
5Y Barbell and Swap Spread to Hot-runs



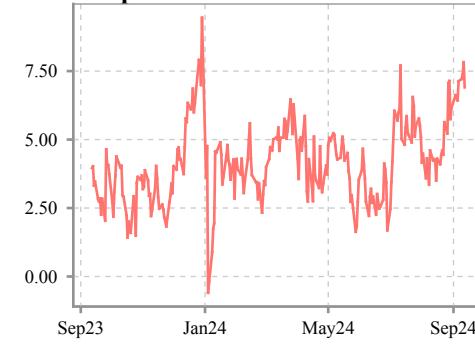
10Y Barbell and Swap Spread to Hot-runs



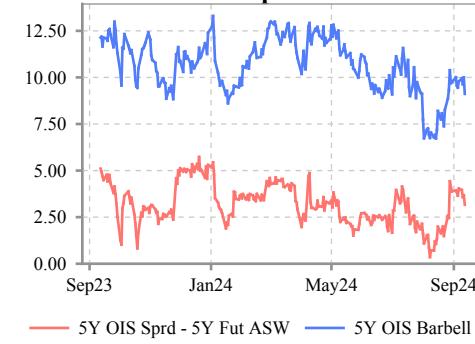
Bond Barbell and Swap Spread to Hot-runs



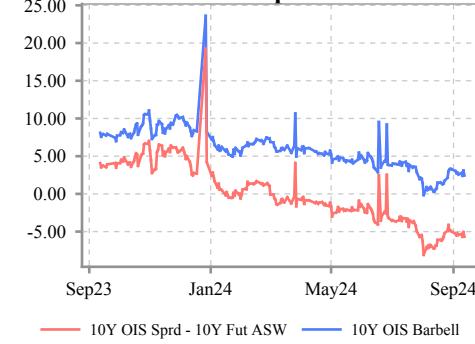
2Y OIS Spread to Hot-runs



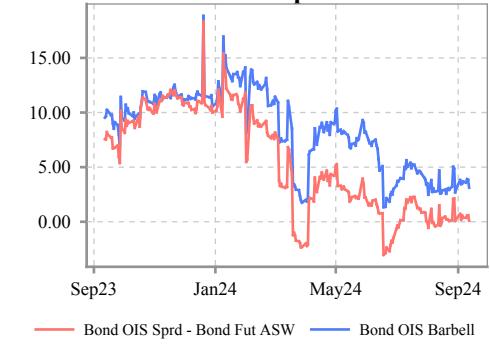
5Y Barbell and OIS Spread to Hot-runs



10Y Barbell and OIS Spread to Hot-runs



Bond Barbell and OIS Spread to Hot-runs



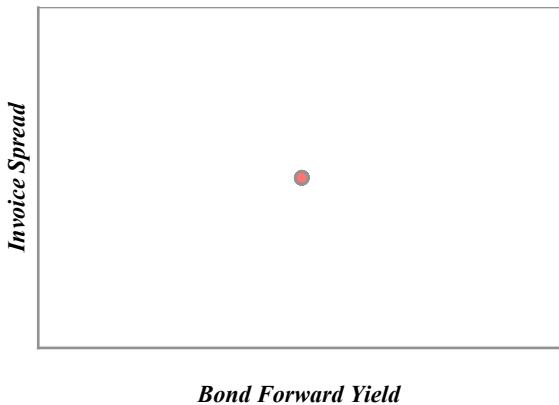
US Fixed Income Rates Strategy

USD Conditional SOFR Swap Spread Report

Dec24 Bond Isopremium Line

FRONT US CTD Swap Spread (bp), (beta = -8.2 , $r^2 = 32.3\%$)

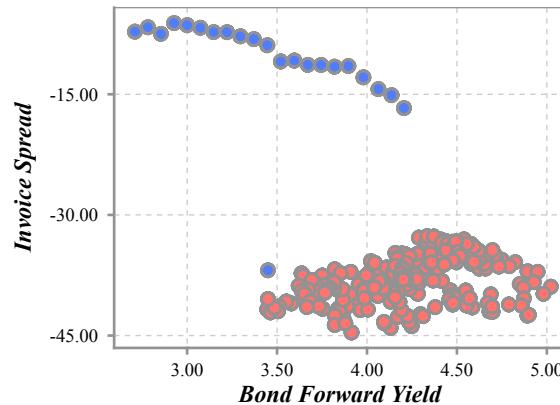
Bond vol = 6.74 bp/day, Swaption vol = 6.42 bp/day



Dec24 Note Isopremium Line

FRONT TY CTD Swap Spread (bp), (beta = 2.9 , $r^2 = 13.5\%$)

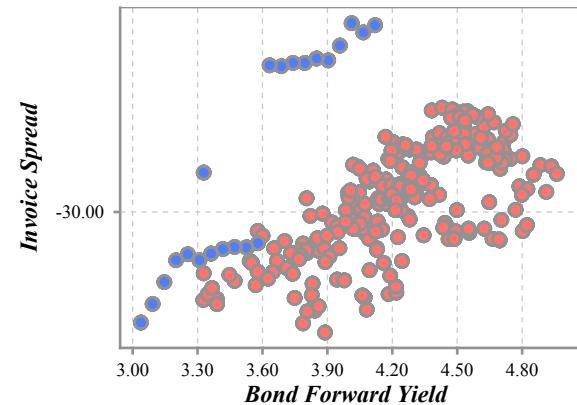
Note vol = 7.41 bp/day, Swaption vol = 7.23 bp/day



Dec24 5-Year Isopremium Line

FRONT FV CTD Swap Spread (bp), (beta = 5.4 , $r^2 = 45.5\%$)

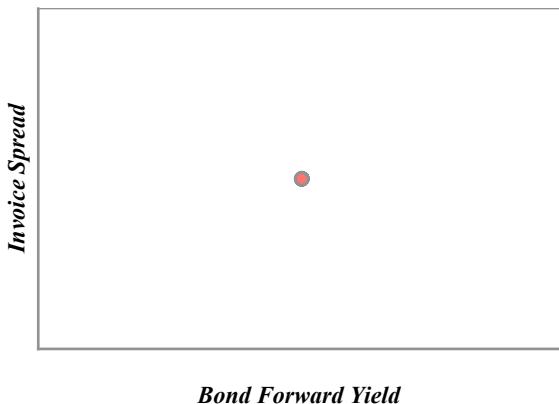
5-Year vol 7.00 bp/day, Swaption vol = 7.76 bp/day



Mar25 Bond Isopremium Line

BACK US CTD Swap Spread (bp), (beta = -9.5 , $r^2 = 43.6\%$)

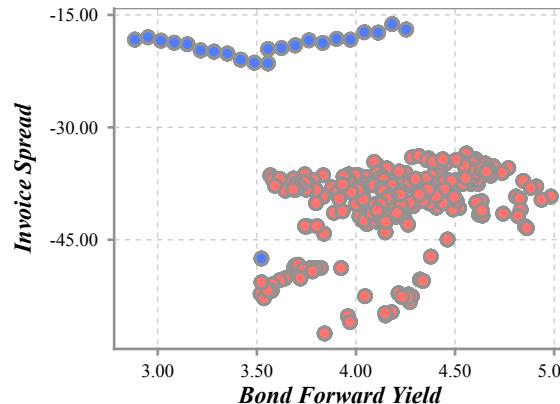
Bond vol = 6.25 bp/day, Swaption vol = 6.12 bp/day



Mar25 Note Isopremium Line

BACK TY CTD Swap Spread (bp), (beta = 5.1 , $r^2 = 10.7\%$)

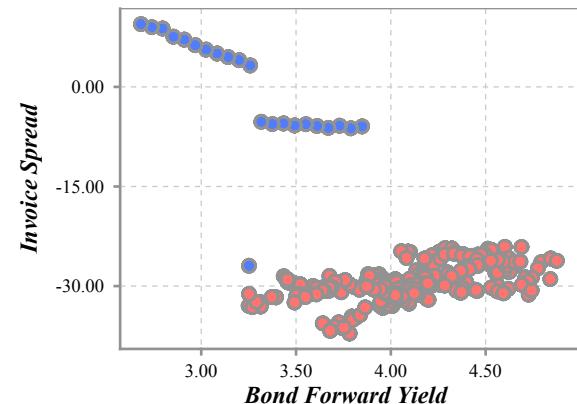
Note vol = 6.58 bp/day, Swaption vol = 6.73 bp/day



Mar25 5-Year Isopremium Line

BACK FV CTD Swap Spread (bp), (beta = 4.0 , $r^2 = 33.4\%$)

5-Year vol 7.67 bp/day, Swaption vol = 7.14 bp/day



US Fixed Income Rates Strategy

Bond vs. Swap TradeMaker

Dec24 Bond Futures vs. Swaps																
Future			Swap				Future Option / Swaption									
Price	126.72	Start Date	2024-11-26	Expiry Date	2024-11-22											
CTD	UST 4.62 FEB40	End Date	2040-02-15													
Future Delivery Date	2024-12-31															
Type	CTD					Swap				Swap Spread	Options per 100 mln					
PUT	117.00	-	-	-	-	-	-	-	-	-	-					
PUT	118.00	-	-	-	-	-	-	-	-	-	-					
PUT	119.00	-	-	-	-	-	-	-	-	-	-					
PUT	120.00	-	-	-	-	-	-	-	-	-	-					
PUT	121.00	-	-	-	-	-	-	-	-	-	-					
PUT	122.00	-	-	-	-	-	-	-	-	-	-					
PUT	123.00	-	-	-	-	-	-	-	-	-	-					
PUT	124.00	-	-	-	-	-	-	-	-	-	-					
PUT	125.00	-	-	-	-	-	-	-	-	-	-					
PUT	126.00	-	-	-	-	-	-	-	-	-	-					
PUT	127.00	-	-	-	-	-	-	-	-	-	-					
FORWARD	126.72	3.79	15.05	3.254		12.03	-53.1	799.5								
CALL	127.00	-	-	-	-	-	-	-	-	-	-					
CALL	128.00	-	-	-	-	-	-	-	-	-	-					
CALL	129.00	-	-	-	-	-	-	-	-	-	-					
CALL	130.00	-	-	-	-	-	-	-	-	-	-					
CALL	131.00	-	-	-	-	-	-	-	-	-	-					
CALL	132.00	-	-	-	-	-	-	-	-	-	-					
CALL	133.00	-	-	-	-	-	-	-	-	-	-					
CALL	134.00	-	-	-	-	-	-	-	-	-	-					
CALL	135.00	-	-	-	-	-	-	-	-	-	-					
CALL	136.00	-	-	-	-	-	-	-	-	-	-					
CALL	137.00	-	-	-	-	-	-	-	-	-	-					

US Fixed Income Rates Strategy

Note vs. Swap TradeMaker

Dec24 Note Futures vs. Swaps														
Future				Swap				Future Option / Swaption						
Price		115.42		Start Date		2024-11-26		Expiry Date	2024-11-22					
CTD		UST 4.25 JUN31		End Date		2031-06-30								
Future Delivery Date														
CTD						Swap				Swap Spread	Options per 100 mln			
Type	Strike Rate	Strike Yld	Premium	Volatility	PVBP	Strike	Premium	Volatility	PVBP					
PUT	110.50	4.205	0.156	7.81	6.44	4.038				-16.7	0.0			
PUT	111.00	4.136	0.188	7.62	6.44	3.985				-15.1	0.0			
PUT	111.50	4.063	0.234	7.51	6.44	3.920				-14.4	0.0			
PUT	112.00	3.980	0.297	7.44	6.47	3.851				-12.9	0.0			
PUT	112.50	3.896	0.375	7.36	6.51	3.782				-11.5	0.0			
PUT	113.00	3.819	0.484	7.38	6.55	3.703				-11.6	0.0			
PUT	113.50	3.745	0.609	7.34	6.59	3.632				-11.3	0.0			
PUT	114.00	3.671	0.766	7.35	6.63	3.557				-11.3	0.0			
PUT	114.50	3.596	0.938	7.30	6.64	3.488				-10.8	0.0			
PUT	115.00	3.521	1.156	7.35	6.65	3.412				-10.9	0.0			
PUT	115.50		1.406	7.41	-	-	-	-	-	-	-			
FORWARD	115.42	3.449		6.97		3.080			6.05	-36.9	868.2			
CALL	115.50	3.446	1.328	7.41	6.67	3.357				-8.9	0.0			
CALL	116.00	3.371	1.125	7.54	6.69	3.289				-8.1	0.0			
CALL	116.50	3.296	0.938	7.61	6.71	3.218				-7.8	0.0			
CALL	117.00	3.221	0.781	7.71	6.74	3.149				-7.3	0.0			
CALL	117.50	3.147	0.641	7.77	6.76	3.075				-7.3	0.0			
CALL	118.00	3.073	0.531	7.90	6.79	3.006				-6.7	0.0			
CALL	118.50	3.000	0.438	8.02	6.82	2.936				-6.4	0.0			
CALL	119.00	2.927	0.359	8.13	6.86	2.865				-6.2	0.0			
CALL	119.50	2.854	0.281	8.12	6.89	2.779				-7.5	0.0			
CALL	120.00	2.782	0.234	8.29	6.92	2.715				-6.7	0.0			
CALL	120.50	2.710	0.188	8.37	6.95	2.637				-7.2	0.0			

US Fixed Income Rates Strategy

5-Year vs. Swap TradeMaker

Dec245-Year Futures vs. Swaps												
Future				Swap				Future Option / Swaption				
Price		110.66		Start Date		2024-11-26		Expiry Date	2024-11-22			
CTD		UST 4.25 FEB29		End Date		2029-02-28						
Future Delivery Date		2025-01-06										
Type	CTD					Swap				Swap Spread		
Type	Strike Rate	Strike Yld	Premium	Volatility	PVBP	Strike	Premium	Volatility	PVBP	Options per 100 mln		
PUT	108.25	4.120	0.180	6.83	4.86	3.922				-19.8 0.0		
PUT	108.50	4.066	0.219	6.81	4.87	3.864				-20.2 0.0		
PUT	108.75	4.012	0.258	6.71	4.88	3.815				-19.7 0.0		
PUT	109.00	3.958	0.320	6.79	4.90	3.749				-20.9 0.0		
PUT	109.25	3.904	0.391	6.84	4.91	3.687				-21.7 0.0		
PUT	109.50	3.850	0.461	6.82	4.92	3.633				-21.6 0.0		
PUT	109.75	3.796	0.547	6.84	4.93	3.577				-21.9 0.0		
PUT	110.00	3.741	0.641	6.86	4.95	3.523				-21.9 0.0		
PUT	110.25	3.687	0.750	6.90	4.96	3.467				-22.0 0.0		
PUT	110.50	3.633	0.867	6.94	4.97	3.413				-22.0 0.0		
PUT	110.75		1.000	7.00	-	-	-	-	-	-		
FORWARD	110.66	3.328			4.52	3.050			4.10	-27.8 908.7		
CALL	110.75	3.579	0.914	7.00	4.99	3.262				-31.7 0.0		
CALL	111.00	3.525	0.805	7.03	5.00	3.206				-31.9 0.0		
CALL	111.25	3.471	0.711	7.11	5.01	3.152				-31.9 0.0		
CALL	111.50	3.417	0.625	7.18	5.02	3.097				-32.0 0.0		
CALL	111.75	3.363	0.547	7.23	5.04	3.040				-32.3 0.0		
CALL	112.00	3.309	0.477	7.29	5.05	2.982				-32.6 0.0		
CALL	112.25	3.255	0.422	7.41	5.06	2.932				-32.3 0.0		
CALL	112.50	3.201	0.367	7.48	5.08	2.874				-32.6 0.0		
CALL	112.75	3.146	0.312	7.48	5.09	2.808				-33.8 0.0		
CALL	113.00	3.092	0.266	7.50	5.10	2.742				-35.0 0.0		
CALL	113.25	3.038	0.227	7.54	5.11	2.678				-36.0 0.0		

US Fixed Income Rates Strategy

Bond vs. Swap TradeMaker

Mar25 Bond Futures vs. Swaps																
Future			Swap				Future Option / Swaption									
Price	126.94	Start Date	2025-02-25	Expiry Date	2025-02-21											
CTD	UST 4.38 MAY40	End Date	2040-05-15													
Future Delivery Date	2025-03-31															
Type	CTD					Swap				Swap Spread	Options per 100 mln					
PUT	117.00	-	-	-	-	-	-	-	-	-	-					
PUT	118.00	-	-	-	-	-	-	-	-	-	-					
PUT	119.00	-	-	-	-	-	-	-	-	-	-					
PUT	120.00	-	-	-	-	-	-	-	-	-	-					
PUT	121.00	-	-	-	-	-	-	-	-	-	-					
PUT	122.00	-	-	-	-	-	-	-	-	-	-					
PUT	123.00	-	-	-	-	-	-	-	-	-	-					
PUT	124.00	-	-	-	-	-	-	-	-	-	-					
PUT	125.00	-	-	-	-	-	-	-	-	-	-					
PUT	126.00	-	-	-	-	-	-	-	-	-	-					
PUT	127.00	-	-	-	-	-	-	-	-	-	-					
FORWARD	126.94	3.789	16.17	3.236		12.05	-55.3	745.3								
CALL	127.00	-	-	-	-	-	-	-	-	-	-					
CALL	128.00	-	-	-	-	-	-	-	-	-	-					
CALL	129.00	-	-	-	-	-	-	-	-	-	-					
CALL	130.00	-	-	-	-	-	-	-	-	-	-					
CALL	131.00	-	-	-	-	-	-	-	-	-	-					
CALL	132.00	-	-	-	-	-	-	-	-	-	-					
CALL	133.00	-	-	-	-	-	-	-	-	-	-					
CALL	134.00	-	-	-	-	-	-	-	-	-	-					
CALL	135.00	-	-	-	-	-	-	-	-	-	-					
CALL	136.00	-	-	-	-	-	-	-	-	-	-					
CALL	137.00	-	-	-	-	-	-	-	-	-	-					

US Fixed Income Rates Strategy

Note vs. Swap TradeMaker

Mar25 Note Futures vs. Swaps												
Future				Swap				Future Option / Swaption				
Price		115.73		Start Date		2025-02-25		Expiry Date		2025-02-21		
CTD		UST 1.38 NOV31		End Date		2031-11-15						
Future Delivery Date		2025-03-31										
Type	CTD					Swap				Swap Spread		
Type	Strike Rate	Strike Yld	Premium	Volatility	PVBP	Strike	Premium	Volatility	PVBP	Options per 100 mln		
PUT	110.50	4.253	0.406	6.73	7.01	4.084				-16.9 0.0		
PUT	111.00	4.183	0.469	6.63	7.03	4.021				-16.2 0.0		
PUT	111.50	4.112	0.562	6.63	7.06	3.939				-17.4 0.0		
PUT	112.00	4.042	0.656	6.57	7.08	3.869				-17.3 0.0		
PUT	112.50	3.972	0.781	6.58	7.11	3.789				-18.3 0.0		
PUT	113.00	3.902	0.906	6.53	7.14	3.720				-18.2 0.0		
PUT	113.50	3.832	1.062	6.54	7.17	3.645				-18.7 0.0		
PUT	114.00	3.763	1.219	6.48	7.20	3.579				-18.4 0.0		
PUT	114.50	3.694	1.422	6.53	7.23	3.503				-19.1 0.0		
PUT	115.00	3.625	1.641	6.56	7.26	3.430				-19.4 0.0		
PUT	115.50	3.556	1.875	6.58	7.29	3.360				-19.6 0.0		
FORWARD	115.73	3.523			7.89	3.048			6.28	-47.5 796.8		
CALL	115.50	3.556	2.109	6.58	7.29	3.341				-21.5 0.0		
CALL	116.00	3.487	1.875	6.61	7.32	3.274				-21.4 0.0		
CALL	116.50	3.419	1.672	6.67	7.35	3.209				-21.0 0.0		
CALL	117.00	3.352	1.500	6.78	7.39	3.150				-20.2 0.0		
CALL	117.50	3.284	1.328	6.83	7.42	3.085				-19.9 0.0		
CALL	118.00	3.216	1.172	6.87	7.45	3.019				-19.7 0.0		
CALL	118.50	3.150	1.047	6.98	7.49	2.961				-18.9 0.0		
CALL	119.00	3.083	0.922	7.03	7.52	2.896				-18.7 0.0		
CALL	119.50	3.016	0.812	7.09	7.56	2.832				-18.4 0.0		
CALL	120.00	2.951	0.719	7.17	7.59	2.771				-18.0 0.0		
CALL	120.50	2.885	0.625	7.20	7.62	2.702				-18.3 0.0		

US Fixed Income Rates Strategy

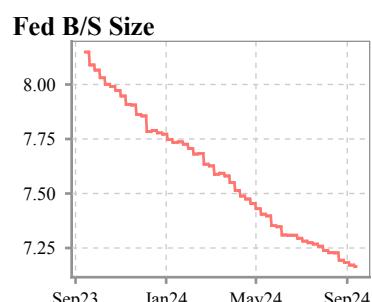
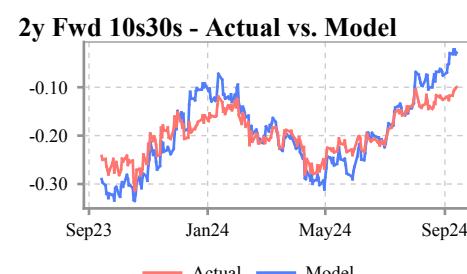
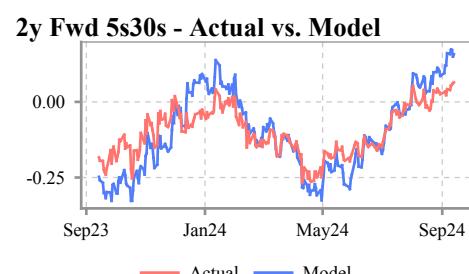
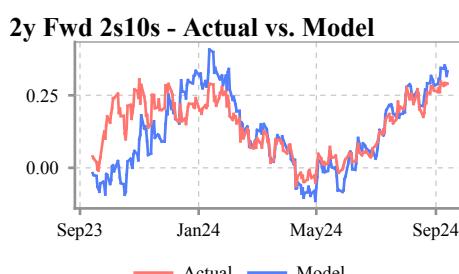
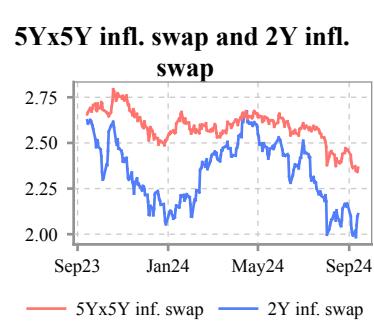
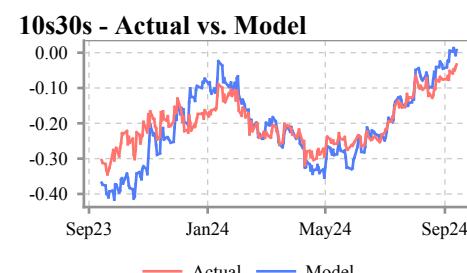
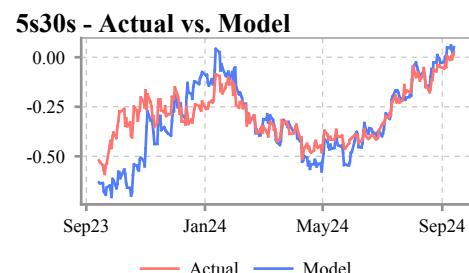
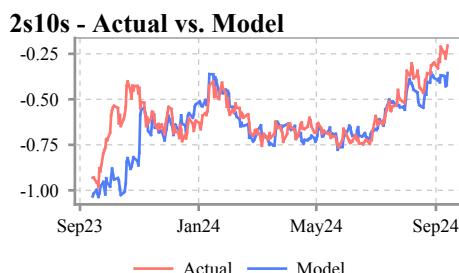
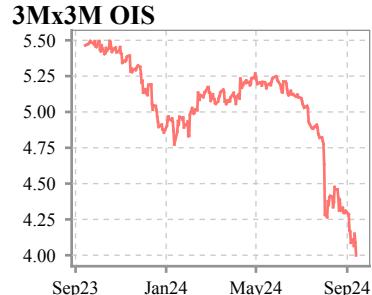
5-Year vs. Swap TradeMaker

Mar25 5-Year Futures vs. Swaps										
Future			Swap			Future Option / Swaption				
Price	110.98	Start Date	2025-02-25	Expiry Date	2025-02-21					
CTD	UST 4.50 MAY29	End Date	2029-05-31							
Future Delivery Date		2025-04-03								
Type	CTD					Swap			Swap Spread	
Type	Strike Rate	Strike Yld	Premium	Volatility	PVBP	Strike	Premium	Volatility	PVBP	Options per 100 mln
PUT	108.50	3.849	0.430	7.38	4.18	3.789				-5.9 0.0
PUT	108.75	3.789	0.492	7.41	4.19	3.727				-6.2 0.0
PUT	109.00	3.730	0.555	7.39	4.20	3.671				-5.8 0.0
PUT	109.25	3.670	0.633	7.43	4.21	3.609				-6.2 0.0
PUT	109.50	3.611	0.711	7.43	4.22	3.552				-5.9 0.0
PUT	109.75	3.552	0.797	7.44	4.23	3.496				-5.6 0.0
PUT	110.00	3.493	0.898	7.50	4.24	3.435				-5.8 0.0
PUT	110.25	3.434	1.000	7.51	4.25	3.379				-5.5 0.0
PUT	110.50	3.375	1.117	7.58	4.26	3.319				-5.6 0.0
PUT	110.75	3.317	1.234	7.60	4.27	3.264				-5.3 0.0
PUT	111.00		1.367	7.67	-	-	-	-	-	-
FORWARD	110.98	3.252			4.80	2.983		4.28	-26.9	890.4
CALL	111.00	3.258	1.344	7.67	4.28	3.290			3.2	0.0
CALL	111.25	3.200	1.242	7.75	4.29	3.240			4.0	0.0
CALL	111.50	3.142	1.141	7.80	4.31	3.187			4.5	0.0
CALL	111.75	3.084	1.047	7.86	4.32	3.134			5.0	0.0
CALL	112.00	3.026	0.961	7.92	4.33	3.082			5.6	0.0
CALL	112.25	2.968	0.883	8.00	4.34	3.031			6.3	0.0
CALL	112.50	2.911	0.812	8.09	4.35	2.982			7.1	0.0
CALL	112.75	2.853	0.742	8.14	4.36	2.929			7.6	0.0
CALL	113.00	2.796	0.688	8.26	4.37	2.884			8.8	0.0
CALL	113.25	2.739	0.625	8.30	4.39	2.829			9.0	0.0
CALL	113.50	2.682	0.570	8.37	4.40	2.777			9.5	0.0

Derivatives Strategy

SOFR Swap Curve Fair Value Model Report

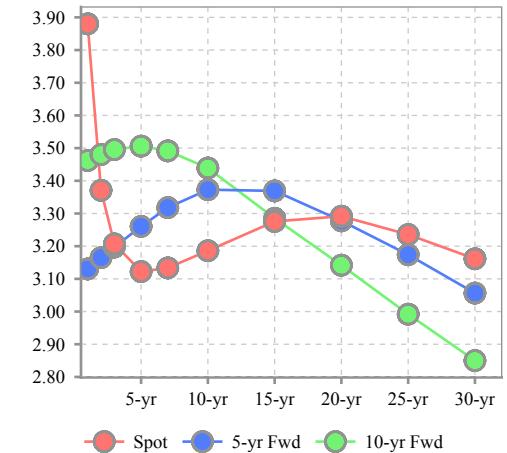
Curve	Coefficients									Model Info.			Results Summary			Current Driver	Values
	Intercept	Guidance	3Mx3M OIS Fed Expec. Crv	Fed B/S	5Yx5Y Infl. swap	2Y Infl. swap	Intercept shift	Rsq	Std. Err.	Cur. Curve	Fair Value	Residual	Guidance	0.00			
Curve	-1.08	-0.04	-0.27	0.05	-0.03	0.91	-0.12	0.15	96 %	0.10	-0.26	-0.40	0.14				
2s/5s	-1.64	-0.07	-0.50	-0.15	-0.04	1.53	-0.21	0.22	95 %	0.17	-0.20	-0.36	0.15	3Mx3M OIS	4.00		
2s/10s	-1.65	-0.11	-0.73	-0.41	-0.07	1.90	-0.25	0.27	95 %	0.21	-0.24	-0.35	0.11	Fed Expec. Crv	-1.23		
2s/30s	-0.56	-0.03	-0.23	-0.20	-0.01	0.62	-0.09	0.07	91 %	0.08	0.06	0.04	0.01	Fed B/S	7.17		
5s/10s	-0.56	-0.07	-0.46	-0.46	-0.04	0.99	-0.12	0.12	93 %	0.14	0.02	0.05	-0.03	5Yx5Y Infl.swap	2.36		
5s/30s	-0.56	-0.07	-0.46	-0.46	-0.04	0.99	-0.12	0.12	94 %	0.07	-0.03	0.01	-0.04	2Y Infl. swap	2.11		
10s/30s	-0.00	-0.04	-0.23	-0.27	-0.03	0.37	-0.03	0.05	97 %	0.02	-0.13	-0.10	-0.03	Intercept shift	1.00		
20s/30s	0.11	-0.01	-0.08	-0.08	-0.02	0.06	-0.00	0.02									
1Y fwd 2s/5s	-0.94	-0.03	-0.26	-0.27	-0.02	0.82	-0.12	0.09	89 %	0.10	0.10	0.04	0.06				
1Y fwd 2s/10s	-1.25	-0.06	-0.43	-0.52	-0.02	1.25	-0.18	0.12	89 %	0.15	0.26	0.21	0.05				
1Y fwd 2s/30s	-1.11	-0.09	-0.62	-0.79	-0.06	1.48	-0.19	0.16	92 %	0.19	0.23	0.24	-0.01				
1Y fwd 5s/10s	-0.31	-0.03	-0.17	-0.25	-0.01	0.43	-0.06	0.03	85 %	0.07	0.17	0.18	-0.01				
1Y fwd 5s/30s	-0.17	-0.05	-0.36	-0.51	-0.04	0.66	-0.07	0.07	90 %	0.12	0.14	0.20	-0.07				
1Y fwd 10s/30s	0.14	-0.03	-0.19	-0.27	-0.03	0.23	-0.01	0.03	92 %	0.06	-0.03	0.03	-0.06				
1Y fwd 20s/30s	0.14	-0.00	-0.06	-0.07	-0.02	0.03	0.00	0.01	97 %	0.02	-0.14	-0.10	-0.04				
2Y fwd 2s/5s	-0.45	-0.02	-0.17	-0.24	0.00	0.45	-0.07	0.02	80 %	0.08	0.13	0.15	-0.02				
2Y fwd 2s/10s	-0.52	-0.04	-0.28	-0.43	0.00	0.68	-0.10	0.02	80 %	0.13	0.29	0.33	-0.04				
2Y fwd 2s/30s	-0.23	-0.06	-0.42	-0.65	-0.03	0.77	-0.10	0.04	87 %	0.16	0.19	0.30	-0.11				
2Y fwd 5s/10s	-0.07	-0.02	-0.11	-0.19	-0.00	0.23	-0.03	-0.00	75 %	0.06	0.16	0.19	-0.02				
2Y fwd 5s/30s	0.22	-0.04	-0.26	-0.41	-0.04	0.32	-0.02	0.01	87 %	0.10	0.06	0.16	-0.09				
2Y fwd 10s/30s	0.29	-0.02	-0.14	-0.21	-0.04	0.09	0.01	0.01	92 %	0.05	-0.10	-0.03	-0.07				
2Y fwd 20s/30s	0.18	-0.00	-0.05	-0.06	-0.02	-0.00	0.01	0.00	96 %	0.02	-0.16	-0.12	-0.04				



Derivatives Strategy

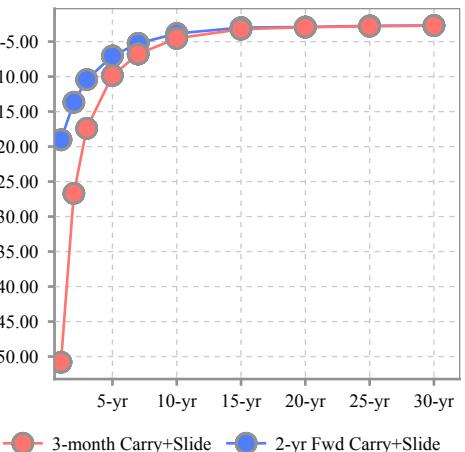
USD SOFR 3M Swap Carry+Slide Matrix

		1-yr	2-yr	3-yr	5-yr	7-yr	10-yr	15-yr	20-yr	25-yr	30-yr
Spot	Rate	3.88	3.37	3.21	3.12	3.13	3.19	3.28	3.29	3.24	3.16
	1D Chg	-8.46	-5.78	-4.19	-3.28	-2.68	-2.27	-1.97	-1.76	-1.68	-1.55
	5D Chg	-9.72	-6.57	-5.44	-5.80	-5.89	-5.66	-4.95	-4.34	-4.00	-3.79
	20D Chg	-51.41	-49.90	-44.03	-35.44	-30.76	-26.51	-22.69	-20.56	-19.19	-18.37
	Carry + Slide	-62.52	-30.58	-19.03	-10.43	-7.05	-4.67	-3.24	-2.94	-2.82	-2.72
6-mo Fwd	Rate	3.06	2.95	2.93	2.97	3.03	3.12	3.23	3.25	3.19	3.12
	Carry + Slide	-41.68	-23.40	-15.94	-9.27	-6.48	-4.38	-3.16	-2.92	-2.78	-2.70
1-yr Fwd	Rate	2.85	2.86	2.88	2.96	3.03	3.13	3.23	3.24	3.18	3.11
	Carry + Slide	-30.58	-19.03	-13.67	-8.41	-6.04	-4.17	-3.11	-2.93	-2.79	-2.72
2-yr Fwd	Rate	2.87	2.90	2.94	3.03	3.10	3.19	3.28	3.26	3.19	3.10
	Carry + Slide	-19.03	-13.67	-10.43	-7.05	-5.25	-3.84	-3.00	-2.92	-2.75	-2.70
3-yr Fwd	Rate	2.94	2.99	3.03	3.11	3.18	3.26	3.32	3.27	3.19	3.09
	Carry + Slide	-13.67	-10.43	-8.41	-6.04	-4.67	-3.53	-2.94	-2.89	-2.74	-2.70
5-yr Fwd	Rate	3.13	3.16	3.20	3.26	3.32	3.37	3.37	3.28	3.17	3.06
	Carry + Slide	-8.41	-7.05	-6.04	-4.67	-3.84	-3.24	-2.94	-2.82	-2.72	-2.67
10-yr Fwd	Rate	3.46	3.48	3.50	3.51	3.49	3.44	3.29	3.14	2.99	2.85
	Carry + Slide	-4.17	-3.84	-3.53	-3.24	-3.00	-2.94	-2.82	-2.72	-2.67	-2.61



USD OIS Swap 3M Carry+Slide Matrix

		1-yr	2-yr	3-yr	5-yr	7-yr	10-yr	15-yr	20-yr	25-yr	30-yr
Spot	Rate	3.84	3.33	3.16	3.06	3.07	3.12	3.21	3.22	3.16	3.09
	1D Chg	-8.65	-5.87	-4.25	-3.32	-2.71	-2.28	-1.98	-1.77	-1.69	-1.55
	5D Chg	-9.34	-6.32	-5.28	-5.70	-5.82	-5.61	-4.90	-4.30	-3.97	-3.76
	20D Chg	-53.72	-52.80	-46.89	-38.62	-34.10	-29.94	-25.77	-23.46	-22.00	-21.09
	Carry + Slide	-61.64	-30.19	-18.75	-10.30	-6.94	-4.60	-3.20	-2.91	-2.80	-2.71
6-mo Fwd	Rate	3.02	2.90	2.88	2.91	2.97	3.06	3.16	3.18	3.12	3.04
	Carry + Slide	-42.43	-23.99	-15.85	-9.49	-6.53	-4.49	-3.18	-2.97	-2.82	-2.73
1-yr Fwd	Rate	2.80	2.80	2.82	2.89	2.96	3.06	3.17	3.17	3.11	3.03
	Carry + Slide	-30.19	-18.75	-13.31	-8.28	-5.95	-4.11	-3.06	-2.90	-2.77	-2.70



Derivatives Strategy

USD Front-end Bullish SOFR Swaption Structures Report

Structure	Swaprate			Rec swaption prem (bp/yl)			Outrights (bp/yl)			Spreads (bp/yl)			1x2s (bp/yl)		Ladders (bp/yl)		Bflies (bp/yl)		Condors (bp/yl)	
	Fwd (%)	3M aged (%)	3M Carry (bp)	ATMF	ATMS	ATMS-1C	Cost	Proj Ret	Cost	Proj Ret	Cost	Proj Ret	Cost	Proj Ret	Cost	Proj Ret	Cost	Proj Ret		
3Mx1Y	3.372	3.880	-50.8	24.7	56.7	102.6	24.7	-50.8	-31.9	-50.8	-88.6	-50.8	-134.6	-50.8	14.0	-50.8	18.3	-50.8		
3Mx2Y	3.104	3.371	-26.7	25.4	40.2	59.8	25.4	-26.7	-14.8	-26.7	-55.1	-26.7	-74.7	-26.7	4.7	-26.7	8.2	-26.7		
3Mx3Y	3.033	3.207	-17.4	24.9	34.3	45.9	24.9	-17.4	-9.4	-17.4	-43.7	-17.4	-55.3	-17.4	2.2	-17.4	3.5	-17.4		
3Mx5Y	3.024	3.122	-9.9	23.0	28.1	34.2	23.0	-9.9	-5.1	-9.9	-33.2	-9.9	-39.2	-9.9	0.9	-9.9	1.6	-9.9		
6Mx1Y	3.061	3.372	-31.1	34.0	88.2	165.4	34.0	-19.5	-54.2	11.7	-142.4	42.8	-219.6	42.8	22.9	11.8	26.2	13.0		
6Mx2Y	2.948	3.104	-15.6	33.9	58.5	91.2	33.9	-14.5	-24.6	3.4	-83.1	21.4	-115.8	21.1	8.1	3.8	14.5	4.1		
6Mx3Y	2.933	3.033	-10.0	33.1	48.2	67.1	33.1	-12.3	-15.0	1.3	-63.2	15.0	-82.1	14.9	3.9	1.4	7.0	2.1		
6Mx5Y	2.971	3.024	-5.2	30.7	38.9	48.3	30.7	-9.9	-8.2	0.7	-47.1	11.3	-56.5	11.4	1.3	0.6	2.3	1.6		
1Yx1Y	2.847	2.908	-6.1	48.8	116.2	209.6	48.8	-9.1	-67.4	0.2	-183.6	9.5	-277.0	6.5	26.0	3.2	33.4	2.2		
1Yx2Y	2.856	2.877	-2.1	46.6	76.1	115.1	46.6	-6.4	-29.5	-0.1	-105.6	6.2	-144.7	5.0	9.5	1.1	17.0	1.5		
1Yx3Y	2.882	2.891	-0.9	45.4	63.3	85.1	45.4	-5.3	-18.0	-0.1	-81.3	5.1	-103.1	4.4	3.8	0.6	7.1	0.9		
1Yx5Y	2.959	2.955	0.4	42.3	51.1	61.1	42.3	-4.7	-8.8	-0.1	-59.9	4.5	-69.9	4.2	1.2	0.2	1.8	0.2		
18Mx1Y	2.831	2.828	0.3	57.3	125.3	216.6	57.3	-3.7	-68.0	-1.0	-193.3	1.7	-284.6	-0.8	23.3	1.6	32.0	0.9		
18Mx2Y	2.866	2.856	1.0	54.8	83.9	120.6	54.8	-3.3	-29.1	-0.2	-113.0	2.8	-149.7	1.8	7.6	0.8	14.7	1.0		
18Mx3Y	2.904	2.889	1.5	53.5	70.4	90.2	53.5	-3.0	-16.9	-0.2	-87.3	2.7	-107.1	2.2	2.9	0.3	5.4	0.5		
18Mx5Y	2.988	2.971	1.7	50.5	57.7	65.4	50.5	-2.9	-7.2	-0.1	-64.9	2.7	-72.6	2.5	0.6	0.1	1.3	0.1		
2Yx1Y	2.865	2.845	2.0	63.1	128.8	214.5	63.1	-1.3	-65.7	-0.8	-194.5	-0.3	-280.2	-2.0	20.0	0.9	29.1	0.8		
2Yx2Y	2.900	2.882	1.8	61.0	88.7	122.2	61.0	-1.5	-27.7	-0.1	-116.4	1.3	-149.9	0.7	5.7	0.5	11.7	0.9		
2Yx3Y	2.944	2.923	2.1	59.6	74.3	91.0	59.6	-1.4	-14.7	-0.1	-89.0	1.1	-105.7	0.9	2.0	0.1	3.8	0.2		
2Yx5Y	3.028	3.008	2.0	57.1	62.2	67.5	57.1	-1.7	-5.0	-0.1	-67.2	1.6	-72.5	1.5	0.3	0.0	0.6	0.1		

Swaprates shown for at-the-money forward (ATMF) and 3M aged ATMF. 3M carry defined as (ATMF - 3M aged ATMF).

Swaption premia shown for options struck ATMF, at-the-money spot (ATMS), and ATMS - (ATMF-ATMS). For example: for 6Mx1Y, ATMF corresponds to 6Mx1Y swaption struck at 6Mx1Y swaprate, ATMS corresponds to 6Mx1Y swaption struck at 1Y swaprate, and ATMS-1C corresponds to 6Mx1Y swaption struck at (1Y swaprate - (6Mx1Y - 1Y)).

bpyld: All swaption premiums are defined in bp of yield.

Trade cost defined as the initial cost to enter the trade (negative number indicates a credit at inception). Projected return defined as P/L from unwinding these trades in 3M assuming unchanged yield curve and volatility surface. All #s in bp of yield.

Trade structures:

Rec Spreads: +ATMF/-ATMS

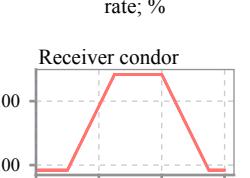
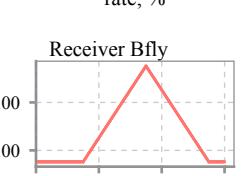
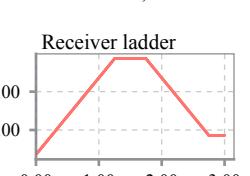
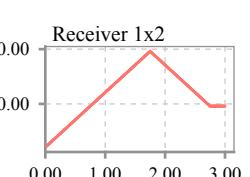
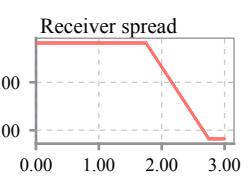
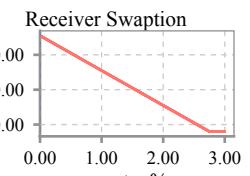
1x2: +ATMF/-2xATMS

Ladders: +ATMF/-ATMS/-/(ATMS-1C)

Bflies: +ATMF/-2*ATMS/+(ATMS-1C)

Condors: +ATMF/-ATMS/-/(ATMS-1C)/+(ATMS-2C); ATMS-2C is defined as swaption struck at (ATMS - 2*(ATMF-ATMS))

Stylized payoff (bp) profile of various bullish structures



Derivatives Strategy

USD Front-end Bullish SOFR Swaption Structures Statistics Report: 3M expiry

3Mx1Y ATMF: 3.372 ATMS: 3.880 3M Carry: -50.8 1Y min: 3.880 1Y max: 5.487

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Downside / Payoff
					Lower	Upper	Upside	Downside	
Outright	3.372	+1	24.7	-50.8	-	312.5	-	24.7	-306%
Spread	3.372/3.880	+1/-1	-31.9	-50.8	-	369.2	-18.9	-31.9	59%
1x2	3.372/3.880	+1/-2	-88.6	-50.8	350.2	425.8	37.8	-37.8	-43%
Ladder	3.372/3.880/4.388	+1/-1/-1	-134.6	-50.8	355.1	471.8	83.8	-32.9	-62%
Ladder	3.372/3.880/4.896	+1/-1/-1	-184.8	-50.8	355.6	522.0	134.0	-32.4	-73%
Butterfly	3.372/3.880/4.388	+1/-2/+1	14.0	-50.8	452.9	323.2	-64.8	14.0	-462%
Condor	3.372/3.880/4.388/4.896	+1/-1/-1/+1	18.3	-50.8	508.0	318.9	-69.1	18.3	-378%
									-36%

Proj payoff: Projected payoff of the structure at option maturity under the assumption that the forward rate rolls to current spot.

Proj return: Projected return defined as (proj payoff – cost) / cost.

Yield bounds: Lower and upper breakeven levels at option maturity.

Max P&L: Maximum upside is achieved if the forward rolls to current spot rate (for all structures except outright receivers). For outright receivers, 1:1 spreads, butterflies and condors, maximum downside is limited to the upfront trade cost. For 1:2 spreads and ladders, maximum downside is defined as the P/L achieved if rates fall to the minimum level of the past 12M.

3Mx2Y ATMF: 3.104 ATMS: 3.371 3M Carry: -26.7 1Y min: 3.371 1Y max: 5.097

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Downside / Payoff
					Lower	Upper	Upside	Downside	
Outright	3.104	+1	25.4	-26.7	-	285.0	-	25.4	-205%
Spread	3.104/3.371	+1/-1	-14.8	-26.7	-	325.3	-11.8	-14.8	80%
1x2	3.104/3.371	+1/-2	-55.1	-26.7	308.7	365.5	28.4	-28.4	-52%
Ladder	3.104/3.371/3.638	+1/-1/-1	-74.7	-26.7	315.8	385.1	48.0	-21.3	-64%
Ladder	3.104/3.371/3.905	+1/-1/-1	-97.7	-26.7	319.4	408.1	71.0	-17.7	-73%
Butterfly	3.104/3.371/3.638	+1/-2/+1	4.7	-26.7	368.5	305.7	-31.4	4.7	-664%
Condor	3.104/3.371/3.638/3.905	+1/-1/-1/+1	8.2	-26.7	398.7	302.2	-34.9	8.2	-425%
									-31%

3Mx3Y ATMF: 3.033 ATMS: 3.207 3M Carry: -17.4 1Y min: 3.207 1Y max: 4.864

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Downside / Payoff
					Lower	Upper	Upside	Downside	
Outright	3.033	+1	24.9	-17.4	-	278.4	-	24.9	-170%
Spread	3.033/3.207	+1/-1	-9.4	-17.4	-	312.7	-8.0	-9.4	86%
1x2	3.033/3.207	+1/-2	-43.7	-17.4	294.4	347.0	26.3	-26.3	-60%
Ladder	3.033/3.207/3.381	+1/-1/-1	-55.3	-17.4	300.3	358.6	37.9	-20.5	-69%
Ladder	3.033/3.207/3.555	+1/-1/-1	-68.2	-17.4	304.8	371.5	50.7	-15.9	-74%
Butterfly	3.033/3.207/3.381	+1/-2/+1	2.2	-17.4	340.3	301.1	-19.6	2.2	-883%
Condor	3.033/3.207/3.381/3.555	+1/-1/-1/+1	3.5	-17.4	359.0	299.8	-20.9	3.5	-593%
									-20%

3Mx5Y ATMF: 3.024 ATMS: 3.122 3M Carry: -9.9 1Y min: 3.115 1Y max: 4.702

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Downside / Payoff
					Lower	Upper	Upside	Downside	
Outright	3.024	+1	23.0	-9.9	-	279.3	-	23.0	-143%
Spread	3.024/3.122	+1/-1	-5.1	-9.9	-	307.5	-4.8	-5.1	93%
1x2	3.024/3.122	+1/-2	-33.2	-9.9	288.9	335.6	23.4	-22.7	-70%
Ladder	3.024/3.122/3.221	+1/-1/-1	-39.2	-9.9	292.7	341.6	29.4	-18.8	-75%
Ladder	3.024/3.122/3.319	+1/-1/-1	-45.9	-9.9	295.9	348.3	36.1	-15.6	-79%
Butterfly	3.024/3.122/3.221	+1/-2/+1	0.9	-9.9	323.0	301.4	-10.8	0.9	-1158%
Condor	3.024/3.122/3.221/3.319	+1/-1/-1/+1	1.6	-9.9	333.5	300.8	-11.4	1.6	-731%
									-16%

Derivatives Strategy

USD Front-end Bullish SOFR Swaption Structures Statistics Report: 6M expiry

6Mx1Y ATMF: 3.061 ATMS: 3.880 6M Carry: -81.9 1Y min: 3.880 1Y max: 5.487

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Proj return (%)	Downside / Payoff
					Lower	Upper	Upside	Downside		
Outright	3.061	+1	34.0	-81.9	-	272.1	-	34.0	-341%	-42%
Spread	3.061/3.880	+1/-1	-54.2	-81.9	-	360.3	-27.7	-54.2	51%	66%
1x2	3.061/3.880	+1/-2	-142.4	-81.9	327.5	448.6	60.5	-60.5	-43%	74%
Ladder	3.061/3.880/4.699	+1/-1/-1	-219.6	-81.9	332.2	525.7	137.7	-55.8	-63%	68%
Ladder	3.061/3.880/5.518	+1/-1/-1	-300.0	-81.9	333.7	606.1	218.1	-54.3	-73%	66%
Butterfly	3.061/3.880/4.699	+1/-2/+1	22.9	-81.9	492.9	283.2	-104.8	22.9	-457%	-28%
Condor	3.061/3.880/4.699/5.518	+1/-1/-1/+1	26.2	-81.9	578.0	280.0	-108.1	26.2	-413%	-32%

6Mx2Y ATMF: 2.948 ATMS: 3.371 6M Carry: -42.3 1Y min: 3.371 1Y max: 5.097

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Proj return (%)	Downside / Payoff
					Lower	Upper	Upside	Downside		
Outright	2.948	+1	33.9	-42.3	-	260.9	-	33.9	-225%	-80%
Spread	2.948/3.371	+1/-1	-24.6	-42.3	-	319.4	-17.7	-24.6	72%	58%
1x2	2.948/3.371	+1/-2	-83.1	-42.3	296.3	377.9	40.8	-40.8	-49%	96%
Ladder	2.948/3.371/3.794	+1/-1/-1	-115.8	-42.3	305.9	410.6	73.5	-31.2	-63%	74%
Ladder	2.948/3.371/4.217	+1/-1/-1	-154.9	-42.3	309.1	449.7	112.6	-28.0	-73%	66%
Butterfly	2.948/3.371/3.794	+1/-2/+1	8.1	-42.3	387.5	286.7	-50.4	8.1	-620%	-19%
Condor	2.948/3.371/3.794/4.217	+1/-1/-1/+1	14.5	-42.3	436.1	280.3	-56.7	14.5	-393%	-34%

6Mx3Y ATMF: 2.933 ATMS: 3.207 6M Carry: -27.4 1Y min: 3.207 1Y max: 4.864

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Proj return (%)	Downside / Payoff
					Lower	Upper	Upside	Downside		
Outright	2.933	+1	33.1	-27.4	-	260.2	-	33.1	-183%	-121%
Spread	2.933/3.207	+1/-1	-15.0	-27.4	-	308.4	-12.3	-15.0	82%	55%
1x2	2.933/3.207	+1/-2	-63.2	-27.4	284.9	356.5	35.8	-35.8	-57%	131%
Ladder	2.933/3.207/3.481	+1/-1/-1	-82.1	-27.4	293.4	375.4	54.7	-27.3	-67%	100%
Ladder	2.933/3.207/3.755	+1/-1/-1	-104.2	-27.4	298.7	397.5	76.8	-22.0	-74%	80%
Butterfly	2.933/3.207/3.481	+1/-2/+1	3.9	-27.4	352.0	289.5	-31.2	3.9	-812%	-14%
Condor	2.933/3.207/3.481/3.755	+1/-1/-1/+1	7.0	-27.4	382.5	286.3	-34.4	7.0	-491%	-26%

6Mx5Y ATMF: 2.971 ATMS: 3.122 6M Carry: -15.1 1Y min: 3.115 1Y max: 4.702

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Proj return (%)	Downside / Payoff
					Lower	Upper	Upside	Downside		
Outright	2.971	+1	30.7	-15.1	-	266.4	-	30.7	-149%	-204%
Spread	2.971/3.122	+1/-1	-8.2	-15.1	-	305.3	-6.9	-8.2	85%	54%
1x2	2.971/3.122	+1/-2	-47.1	-15.1	280.3	344.2	32.0	-31.2	-68%	207%
Ladder	2.971/3.122/3.273	+1/-1/-1	-56.5	-15.1	285.9	353.6	41.4	-25.6	-73%	170%
Ladder	2.971/3.122/3.424	+1/-1/-1	-67.0	-15.1	290.5	364.1	51.9	-21.0	-77%	139%
Butterfly	2.971/3.122/3.273	+1/-2/+1	1.3	-15.1	328.6	295.9	-16.4	1.3	-1281%	-8%
Condor	2.971/3.122/3.273/3.424	+1/-1/-1/+1	2.3	-15.1	344.7	294.8	-17.4	2.3	-745%	-15%

Proj payoff: Projected payoff of the structure at option maturity under the assumption that the forward rate rolls to current spot.

Proj return: Projected return defined as (proj payoff - cost) / cost.

Yield bounds: Lower and upper break-even levels at option maturity.

Max P&L: Maximum upside is achieved if the forward rolls to current spot rate (for all structures except outright receivers). For outright receivers, 1:1 spreads, butterflies and condors, maximum downside is limited to the upfront trade cost. For 1:2 spreads and ladders, maximum downside is defined as the P/L achieved if rates fall to the minimum level of the past 12M.

Derivatives Strategy

USD Front-end Bullish SOFR Swaption Structures Statistics Report: 1Y expiry

1Yx1Y ATMF: 2.847 ATMS: 3.880 1Y Carry: -103.3 1Y min: 3.880 1Y max: 5.487

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff(bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Proj return (%)	Downside / Payoff
					Lower	Upper	Upside	Downside		
Outright	2.847	+1	48.8	-103.3	-	235.9	-	48.8	-312%	-47%
Spread	2.847/3.880	+1/-1	-67.4	-103.3	-	352.1	-36.0	-67.4	53%	65%
1x2	2.847/3.880	+1/-2	-183.6	-103.3	307.8	468.3	80.3	-80.3	-44%	78%
Ladder	2.847/3.880/4.914	+1/-1/-1	-277.0	-103.3	317.7	561.7	173.7	-70.3	-63%	68%
Ladder	2.847/3.880/5.947	+1/-1/-1	-377.8	-103.3	320.2	662.5	274.5	-67.8	-73%	66%
Butterfly	2.847/3.880/4.914	+1/-2/+1	26.0	-103.3	517.4	258.7	-129.3	26.0	-497%	-25%
Condor	2.847/3.880/4.914/5.947	+1/-1/-1/+1	33.4	-103.3	628.1	251.2	-136.8	33.4	-409%	-32%

Proj payoff: Projected payoff of the structure at option maturity under the assumption that the forward rate rolls to current spot.

Proj return: Projected return defined as (proj payoff – cost) / cost.

Yield bounds: Lower and upper breakeven levels at option maturity.

Max P&L: Maximum upside is achieved if the forward rolls to current spot rate (for all structures except outright receivers). For outright receivers, 1:1 spreads, butterflies and condors, maximum downside is limited to the upfront trade cost. For 1:2 spreads and ladders, maximum downside is defined as the P/L achieved if rates fall to the minimum level of the past 12M.

1Yx2Y ATMF: 2.856 ATMS: 3.371 1Y Carry: -51.5 1Y min: 3.371 1Y max: 5.097

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Proj return (%)	Downside / Payoff
					Lower	Upper	Upside	Downside		
Outright	2.856	+1	46.6	-51.5	-	239.0	-	46.6	-211%	-90%
Spread	2.856/3.371	+1/-1	-29.5	-51.5	-	315.1	-22.0	-29.5	74%	57%
1x2	2.856/3.371	+1/-2	-105.6	-51.5	283.0	391.2	54.1	-54.1	-51%	105%
Ladder	2.856/3.371/3.886	+1/-1/-1	-144.7	-51.5	295.5	430.2	93.1	-41.6	-64%	81%
Ladder	2.856/3.371/4.401	+1/-1/-1	-191.2	-51.5	300.4	476.8	139.7	-36.7	-73%	71%
Butterfly	2.856/3.371/3.886	+1/-2/+1	9.5	-51.5	398.1	276.1	-61.0	9.5	-642%	-18%
Condor	2.856/3.371/3.886/4.401	+1/-1/-1/+1	17.0	-51.5	457.1	268.6	-68.5	17.0	-403%	-33%

1Yx3Y ATMF: 2.882 ATMS: 3.207 1Y Carry: -32.5 1Y min: 3.207 1Y max: 4.864

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Proj return (%)	Downside / Payoff
					Lower	Upper	Upside	Downside		
Outright	2.882	+1	45.4	-32.5	-	242.9	-	45.4	-172%	-140%
Spread	2.882/3.207	+1/-1	-18.0	-32.5	-	306.2	-14.5	-18.0	81%	55%
1x2	2.882/3.207	+1/-2	-81.3	-32.5	271.9	369.5	48.8	-48.8	-60%	150%
Ladder	2.882/3.207/3.532	+1/-1/-1	-103.1	-32.5	282.6	391.3	70.6	-38.1	-68%	117%
Ladder	2.882/3.207/3.857	+1/-1/-1	-128.2	-32.5	290.0	416.4	95.7	-30.7	-75%	95%
Butterfly	2.882/3.207/3.532	+1/-2/+1	3.8	-32.5	357.0	284.4	-36.3	3.8	-951%	-12%
Condor	2.882/3.207/3.532/3.857	+1/-1/-1/+1	7.1	-32.5	392.8	281.1	-39.6	7.1	-558%	-22%

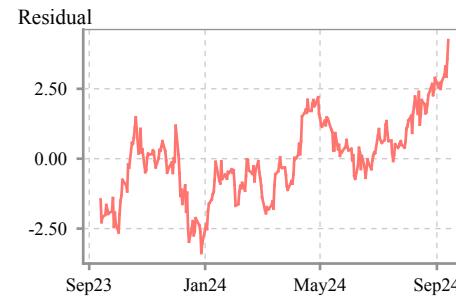
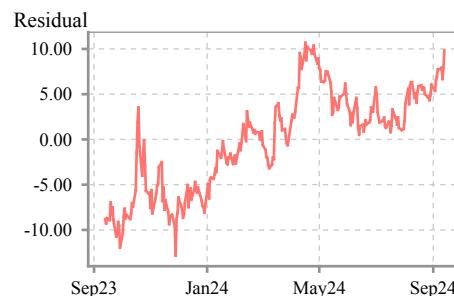
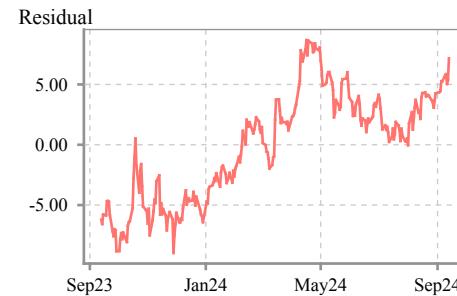
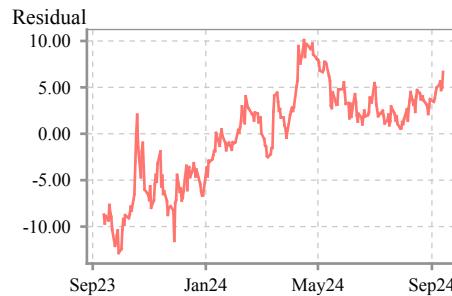
1Yx5Y ATMF: 2.959 ATMS: 3.122 1Y Carry: -16.4 1Y min: 3.115 1Y max: 4.702

Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Yield bounds (bpyld)		Max P&L (bpyld)		Proj return (%)	Downside / Payoff
					Lower	Upper	Upside	Downside		
Outright	2.959	+1	42.3	-16.4	-	253.6	-	42.3	-139%	-258%
Spread	2.959/3.122	+1/-1	-8.8	-16.4	-	304.7	-7.5	-8.8	85%	54%
1x2	2.959/3.122	+1/-2	-59.9	-16.4	268.7	355.8	43.6	-42.8	-73%	262%
Ladder	2.959/3.122/3.286	+1/-1/-1	-69.9	-16.4	275.1	365.8	53.5	-36.4	-77%	223%
Ladder	2.959/3.122/3.450	+1/-1/-1	-80.6	-16.4	280.8	376.4	64.2	-30.7	-80%	188%
Butterfly	2.959/3.122/3.286	+1/-2/+1	1.2	-16.4	329.7	294.7	-17.5	1.2	-1522%	-7%
Condor	2.959/3.122/3.286/3.450	+1/-1/-1/+1	1.8	-16.4	346.8	294.0	-18.2	1.8	-987%	-11%

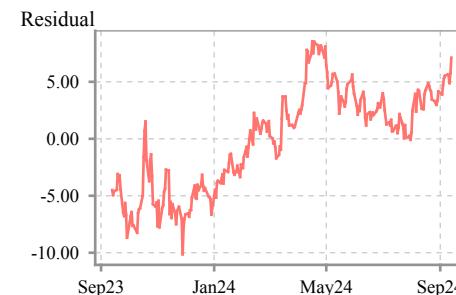
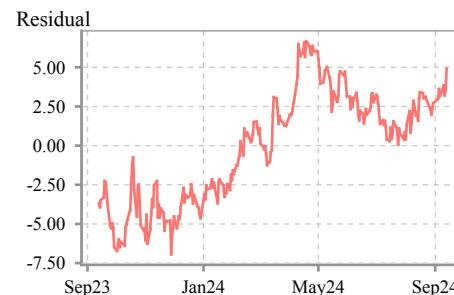
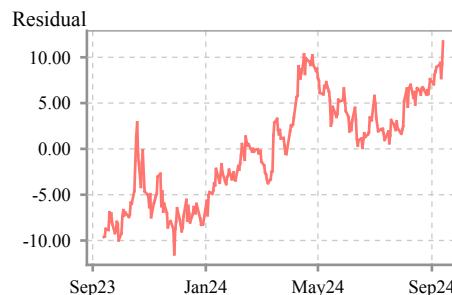
Derivatives Strategy

Most Mispriced SOFR Butterflies II – spot and fwd

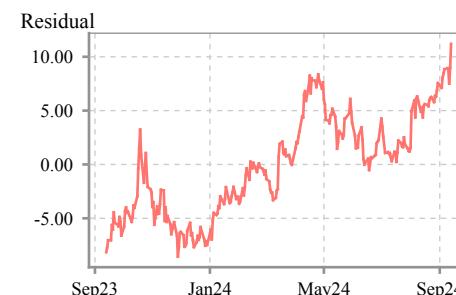
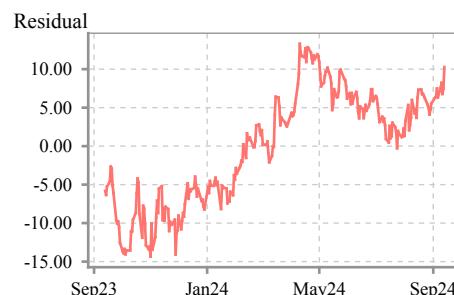
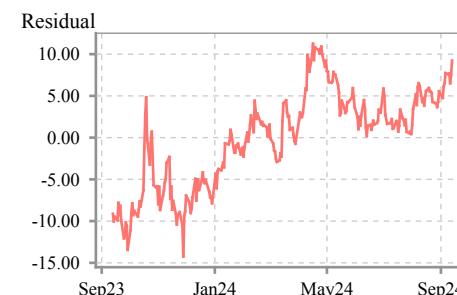
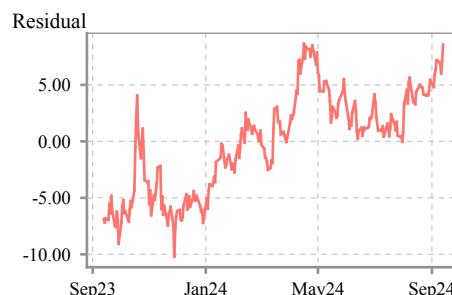
Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev				
1Yx1Y/2Yx1Y/4Yx1Y	52.0	43.7	5.9	6.7	2.7	-7.7	0.7	3Y/2Yx2Y/4Yx1Y	43.3	59.5	-29.4	7.2	2.7	-22.1	0.9	1Yx1Y/2Yx1Y/7Y	27.6	72.1	-18.1	9.8	2.6	-12.5	0.8	2Yx1Y/10Yx10Y/30Y	-30.4	131.2	16.2	4.2	2.6	42.6	0.9



Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev				
1Yx1Y/2Yx1Y/5Y	1.3	102.1	-35.9	11.7	2.6	-12.0	0.8	2Y/3Y/5Yx5Y	87.3	14.9	-22.1	4.3	2.6	-10.9	0.8	3Y/2Yx2Y/5Y	-85.3	188.0	-23.5	4.9	2.6	-26.4	0.8	3Y/2Yx2Y/7Y	-9.7	113.1	-33.2	7.1	2.6	-27.0	0.9



Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev				
1Yx1Y/2Yx2Y/7Y	2.6	98.8	-26.9	8.6	2.5	-9.0	0.9	1Yx1Y/2Yx1Y/10Y	42.3	55.7	-11.3	9.2	2.5	-15.1	0.8	2Y/2Yx1Y/4Yx1Y	44.2	66.1	-63.1	10.3	2.5	-33.9	0.9	1Yx1Y/2Yx2Y/5Y	-32.9	139.1	-50.8	11.2	2.5	-8.4	0.9



Note:

1. The most mispriced butterflies are the curve- and level-neutral structures that have the greatest z-scores (in absolute values)
2. CrvlSpd refers to the current value of the curve- and level-neutral spread. Wt1 and Wt2 refer to the curve- and level-neutral weightings in the short and long legs of the butterfly.
3. The expected time to mean reversion assumes that the residual will converge to the mean in three eights (i.e., average of half and a quarter) of the peak-to-peak period; and the period is reported in months.

Derivatives Strategy

SOFR Future Butterfly Spreads - Curve and Level Neutral Analysis

Price	3 - Month						6 - Month						9 - Month						12 - Month						
	Wt1	Wt2	CrvSprd	Res	Z	Carry	Wt1	Wt2	CrvSprd	Res	Z	Carry	Wt1	Wt2	CrvSprd	Res	Z	Carry	Wt1	Wt2	CrvSprd	Res	Z	Carry	
Sep24	95.145	69.7	51.7	-109.1	0.0	0.0	47.47	115.1	57.3	-386.5	-7.7	-2.8	56.99	141.6	64.6	-565.7	-8.2	-2.5	32.85	115.7	81.3	-503.6	-5.5	-1.5	15.43
Dec24	95.965	61.3	50.0	-60.8	-3.7	-3.4	-1.71	76.1	51.3	-149.0	-5.9	-2.7	-30.45	65.0	66.4	-160.5	-2.9	-1.0	-38.44	41.0	88.5	-136.1	-0.4	-0.1	-24.97
Mar25	96.625	58.1	47.1	-29.4	-1.5	-2.0	-10.20	52.7	58.0	-52.4	0.7	0.4	-21.46	35.3	78.9	-60.1	2.0	0.5	-15.75	17.7	100.8	-70.2	2.3	0.4	-7.19
Jun25	96.975	49.1	53.5	-11.4	0.9	1.5	-5.90	37.1	68.8	-23.2	1.9	0.8	-6.63	20.3	91.0	-41.4	2.1	0.5	-2.38	12.9	101.6	-54.3	2.6	0.4	-1.97
Sep25	97.120	42.6	58.6	-5.0	0.6	0.8	-1.35	28.4	76.6	-18.1	1.7	0.6	-0.58	19.8	88.5	-31.4	2.8	0.6	-1.16	21.2	86.1	-31.7	3.2	0.6	-2.49
Dec25	97.180	38.7	62.5	-4.4	0.5	0.6	-0.01	31.3	71.8	-12.6	2.0	0.7	-0.22	31.6	70.9	-12.9	2.6	0.7	-1.77	33.2	67.4	-8.3	3.1	0.9	-2.97
Mar26	97.200	42.3	58.2	-2.4	0.8	1.0	-0.18	41.4	58.9	-2.8	1.5	0.8	-1.36	38.9	61.0	-2.8	1.5	0.8	-1.95	37.0	61.8	-1.6	1.2	0.7	-1.08
Jun26	97.195	47.1	52.7	-0.3	0.2	0.4	-0.18	42.5	57.5	-0.9	0.5	0.6	-1.06	39.5	60.2	-1.7	0.3	0.4	-0.50	37.4	61.5	-0.7	0.5	0.4	-0.66
Sep26	97.175	45.6	54.5	-0.2	0.3	1.4	-0.73	41.6	58.6	-1.8	-0.2	-0.3	0.09	39.8	59.8	-1.0	0.2	0.3	-0.11	38.6	59.7	1.3	0.3	0.3	-0.14
Dec26	97.145	45.7	54.3	-0.5	-0.3	-1.3	0.50	43.4	56.4	-0.6	0.2	0.4	0.00	41.7	57.1	1.1	0.1	0.1	0.25	40.5	57.5	2.3	0.0	0.0	0.51
Mar27	97.120	46.1	54.0	-0.5	0.1	0.8	-0.23	45.0	54.4	1.1	0.2	0.6	0.03	43.1	55.7	1.6	0.0	0.1	0.03	42.1	55.9	2.4	0.4	0.3	0.07
Jun27	97.090	48.9	50.8	0.9	0.1	0.9	-0.01	45.2	54.2	0.8	-0.2	-0.6	0.25	45.4	53.3	2.3	0.2	0.3	0.00	41.5	56.9	0.9	0.4	0.4	0.02

Note:

1. Wt1 and Wt2 refer to the curve- and level-neutral weightings in the front and back legs of the butterfly. Wt1=40 and Wt2=55 mean that for every 100 middle-leg contracts we sell, we buy 40 front-leg contracts and 55 contracts.
2. CrvSprd refers to the current value of the curve- and level-neutral butterfly spread, i.e. body - Wt1 * short wing - Wt2 * long wing.
3. Res refers to the mispricing of the curve- and level neutral butterfly, is based on a model of the butterfly spread and is calculated on a turn adjusted basis. Z refers to the z-score of the residual.
4. Wt1 and Wt2 are estimated through a multiple regression using 1-year of historical data.
5. Carry is 3-month carry + slide and is presented in basis points of yield. Front contract carry is estimated via 3M Libor carry + slide

Derivatives Strategy

SOFR Futures Butterfly Carry Report

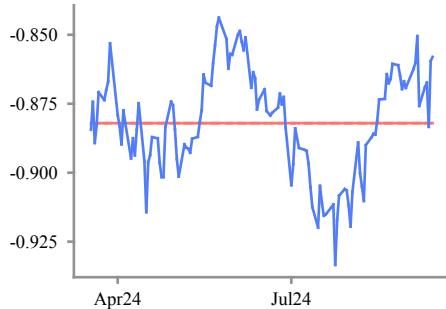
Structure	Trade	Left Wt	Belly Wt	Right Wt	Rsq	Wtd Fly Cur (%)	Wtd Fly Mean (%)	Resid (bp)	Wtd Fly Aged 3M (%)	Wtd Fly 3M Carry (bp)	Rlzd Vol Ann.	Risk Adj Ann. Carry
6Mx3M/9Mx3M/30Mx3M	Belly richening	-0.89	1.00	-0.30	98%	-0.86	-0.88	2.40	-1.1	22.3	18	5.0
6Mx3M/9Mx3M/36Mx3M	Belly richening	-0.91	1.00	-0.31	99%	-0.95	-0.98	2.87	-1.2	23.7	19	5.0
6Mx3M/9Mx3M/33Mx3M	Belly richening	-0.91	1.00	-0.30	99%	-0.91	-0.94	2.61	-1.1	23.0	19	5.0
6Mx3M/9Mx3M/27Mx3M	Belly richening	-0.88	1.00	-0.30	98%	-0.81	-0.83	2.06	-1.0	21.1	18	4.8
6Mx3M/9Mx3M/24Mx3M	Belly richening	-0.86	1.00	-0.31	98%	-0.75	-0.77	1.82	-0.9	19.9	17	4.6
6Mx3M/9Mx3M/21Mx3M	Belly richening	-0.82	1.00	-0.33	98%	-0.68	-0.69	1.44	-0.9	18.1	17	4.3
6Mx3M/9Mx3M/18Mx3M	Belly richening	-0.77	1.00	-0.36	97%	-0.59	-0.60	1.14	-0.8	15.6	15	4.1
6Mx3M/12Mx3M/30Mx3M	Belly richening	-0.65	1.00	-0.60	97%	-1.05	-1.08	2.88	-1.3	27.1	29	3.8
6Mx3M/9Mx3M/12Mx3M	Belly richening	-0.53	1.00	-0.53	95%	-0.31	-0.31	0.62	-0.4	7.0	7	3.8
6Mx3M/12Mx3M/36Mx3M	Belly richening	-0.69	1.00	-0.62	97%	-1.25	-1.29	3.75	-1.6	29.6	32	3.8
6Mx3M/12Mx3M/33Mx3M	Belly richening	-0.68	1.00	-0.61	97%	-1.16	-1.19	3.26	-1.4	28.3	30	3.8
6Mx3M/9Mx3M/15Mx3M	Belly richening	-0.69	1.00	-0.41	96%	-0.47	-0.47	0.62	-0.6	11.8	13	3.7
6Mx3M/12Mx3M/27Mx3M	Belly richening	-0.62	1.00	-0.61	97%	-0.95	-0.97	2.22	-1.2	24.9	28	3.6
6Mx3M/15Mx3M/30Mx3M	Belly richening	-0.47	1.00	-0.77	94%	-0.96	-1.00	3.72	-1.2	23.1	27	3.5
3Mx3M/15Mx3M/30Mx3M	Belly richening	-0.51	1.00	-0.91	98%	-1.85	-1.88	2.65	-2.2	33.7	39	3.4
6Mx3M/12Mx3M/24Mx3M	Belly richening	-0.58	1.00	-0.62	97%	-0.83	-0.85	1.77	-1.1	22.6	26	3.4
3Mx3M/12Mx3M/30Mx3M	Belly richening	-0.71	1.00	-0.81	99%	-2.29	-2.30	1.31	-2.7	41.6	49	3.4
6Mx3M/15Mx3M/33Mx3M	Belly richening	-0.50	1.00	-0.78	94%	-1.10	-1.14	4.21	-1.3	24.6	29	3.4
6Mx3M/15Mx3M/27Mx3M	Belly richening	-0.43	1.00	-0.77	94%	-0.83	-0.86	2.86	-1.0	20.2	24	3.4
3Mx3M/12Mx3M/33Mx3M	Belly richening	-0.74	1.00	-0.82	99%	-2.49	-2.50	1.73	-2.9	43.9	52	3.4
3Mx3M/12Mx3M/36Mx3M	Belly richening	-0.76	1.00	-0.85	99%	-2.65	-2.67	2.33	-3.1	46.0	55	3.4
3Mx3M/15Mx3M/27Mx3M	Belly richening	-0.46	1.00	-0.90	98%	-1.61	-1.62	1.75	-1.9	29.4	35	3.3
3Mx3M/15Mx3M/33Mx3M	Belly richening	-0.55	1.00	-0.93	98%	-2.07	-2.11	3.14	-2.4	36.3	44	3.3
6Mx3M/15Mx3M/36Mx3M	Belly richening	-0.51	1.00	-0.80	95%	-1.22	-1.26	4.83	-1.5	26.3	32	3.3
6Mx3M/15Mx3M/24Mx3M	Belly richening	-0.38	1.00	-0.79	94%	-0.68	-0.70	2.28	-0.8	17.3	21	3.3
3Mx3M/12Mx3M/27Mx3M	Belly richening	-0.67	1.00	-0.80	99%	-2.08	-2.08	0.54	-2.5	37.9	46	3.3
3Mx3M/15Mx3M/24Mx3M	Belly richening	-0.40	1.00	-0.91	98%	-1.32	-1.33	1.23	-1.6	24.7	30	3.3
3Mx3M/12Mx3M/24Mx3M	Belly richening	-0.61	1.00	-0.80	99%	-1.83	-1.83	0.13	-2.2	33.8	43	3.2
6Mx3M/12Mx3M/21Mx3M	Belly richening	-0.52	1.00	-0.65	96%	-0.69	-0.70	1.12	-0.9	19.4	25	3.1
3Mx3M/15Mx3M/21Mx3M	Belly richening	-0.30	1.00	-0.92	99%	-0.97	-0.98	0.54	-1.1	18.3	23	3.1
6Mx3M/15Mx3M/21Mx3M	Belly richening	-0.30	1.00	-0.83	95%	-0.50	-0.51	1.46	-0.6	13.2	17	3.1
6Mx3M/18Mx3M/24Mx3M	Belly richening	-0.21	1.00	-0.90	92%	-0.44	-0.45	1.41	-0.5	10.3	14	3.0
6Mx3M/18Mx3M/30Mx3M	Belly richening	-0.31	1.00	-0.87	88%	-0.76	-0.79	3.02	-0.9	16.8	23	2.9
6Mx3M/12Mx3M/18Mx3M	Belly richening	-0.43	1.00	-0.70	96%	-0.52	-0.53	0.65	-0.7	14.9	21	2.9
6Mx3M/18Mx3M/27Mx3M	Belly richening	-0.27	1.00	-0.88	88%	-0.61	-0.63	2.05	-0.7	13.6	19	2.9

Note: 3M SOFR futures are proxied via SOFR swap yields. To calculate the weights, a 6M empirical regression is used of the 50/50 weighted fly regressed against the belly rate and the difference in the wing rates so that the weights are constructed to be "level" and "curve" neutral: left weight = $(0.5\beta_{curve})/(1+\beta_{level})$ and right weight = $(0.5+0.5\beta_{curve})/(1-\beta_{level})$, where β_{level} and β_{curve} are calculated from the 6M regression described previously. The residual is the difference of the weighted spread with the 6M avg of the weighted spread. The trade will be a belly cheapener if the residual is less than 0 and a belly richener otherwise. Realized vol is calculated as the 2 year standard deviation of quarterly changes in the weighted spread, and multiplied by $\sqrt{4}$ to annualize. Risk adjusted ann. carry is the 3M slide in the weighted spread divided by the realized vol and table is sorted by highest risk adjusted ann. carry.

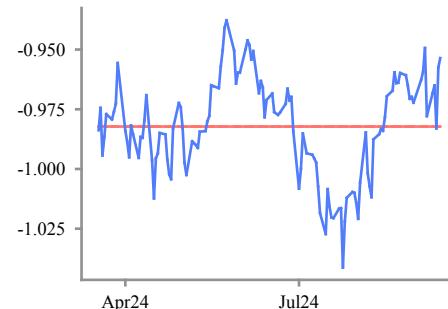
Derivatives Strategy

SOFR Futures Butterfly Carry Report

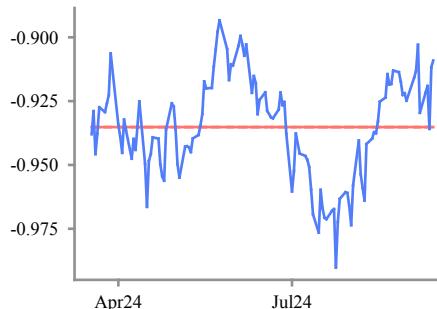
9Mx3M-0.89*6Mx3M-0.3*30Mx3M vs. 6M Avg; %



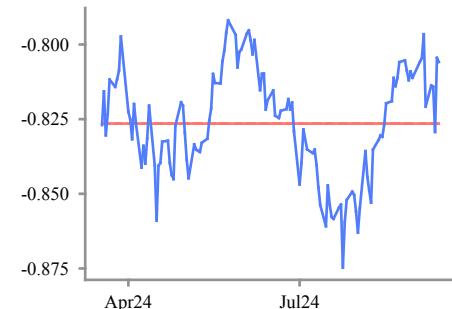
9Mx3M-0.91*6Mx3M-0.31*36Mx3M vs. 6M Avg; %



9Mx3M-0.91*6Mx3M-0.3*33Mx3M vs. 6M Avg; %



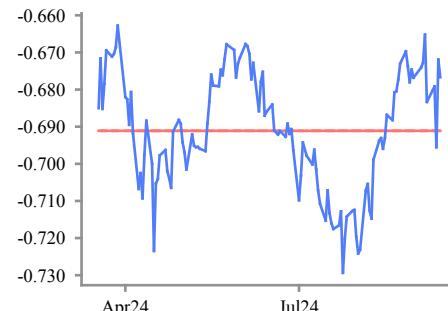
9Mx3M-0.88*6Mx3M-0.3*27Mx3M vs. 6M Avg; %



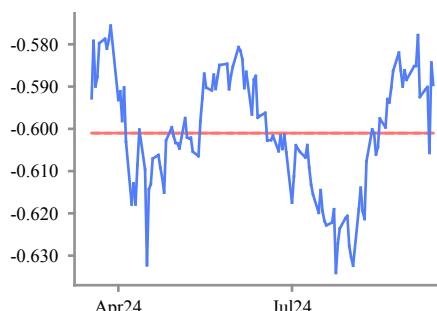
9Mx3M-0.86*6Mx3M-0.31*24Mx3M vs. 6M Avg; %



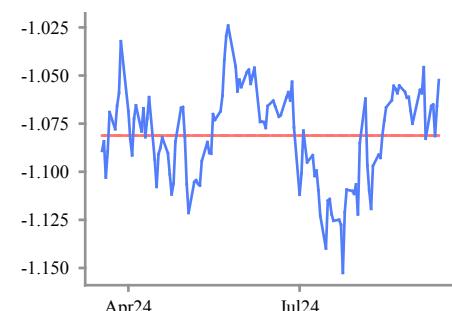
9Mx3M-0.82*6Mx3M-0.33*21Mx3M vs. 6M Avg; %



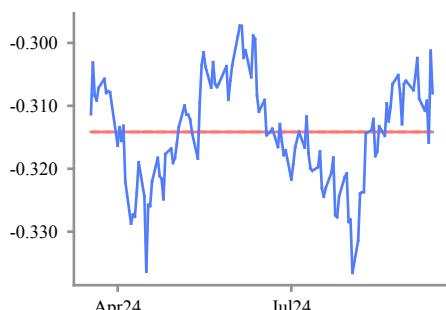
9Mx3M-0.77*6Mx3M-0.36*18Mx3M vs. 6M Avg; %



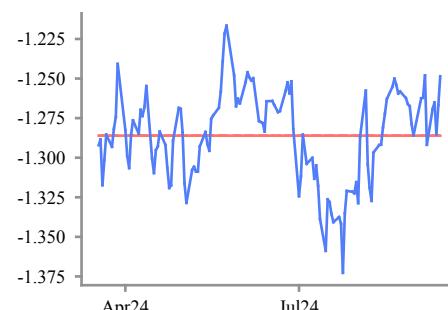
12Mx3M-0.65*6Mx3M-0.6*30Mx3M vs. 6M Avg; %



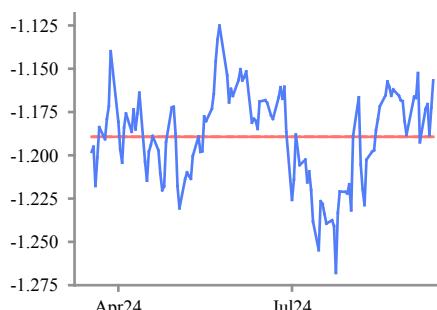
9Mx3M-0.53*6Mx3M-0.53*12Mx3M vs. 6M Avg; %



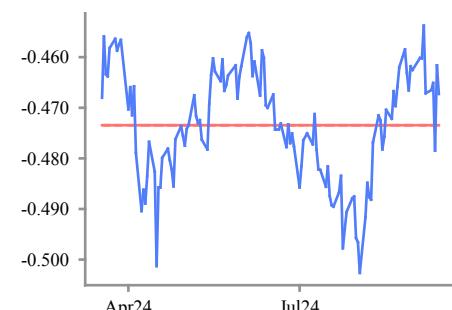
12Mx3M-0.69*6Mx3M-0.62*36Mx3M vs. 6M Avg; %



12Mx3M-0.68*6Mx3M-0.61*33Mx3M vs. 6M Avg; %



9Mx3M-0.69*6Mx3M-0.41*15Mx3M vs. 6M Avg; %



Note: 3M SOFR futures are proxied via SOFR swap yields. To calculate the weights, a 6M empirical regression is used of the 50/50 weighted fly regressed against the belly rate and the difference in the wing rates so that the weights are constructed to be "level" and "curve" neutral: left weight = $(0.5\beta_{curve})/(1\beta_{level})$ and right weight = $(0.5+1\beta_{curve})/(1\beta_{level})$, where β_{level} and β_{curve} are calculated from the 6M regression described previously. The residual is the difference of the weighted spread with the 6M avg of the weighted spread. The trade will be a belly cheapener if the residual is less than 0 and a belly richener otherwise. Realized vol is calculated as the 2 year standard deviation of quarterly changes in the weighted spread, and multiplied by $\sqrt{4}$ to annualize. Risk adjusted ann. carry is the 3M slide in the weighted spread divided by the realized vol and table is sorted by highest risk adjusted ann. carry.

Derivatives Strategy

SOFR Futures Box Trades Carry Report

Curve 1	Curve 2	Curve 1 Trade	Curve 2 Trade (Hedge)	Curve 1 Cur	Curve 2 Cur	Wtd Spread Cur.	Curve2 Rsk Wt	Residual (%)	Rsq	3M Carry Curve1 (bp)	3M Wtd Carry Curve2 (bp)	3M Net Carry (bp)	Rlzd Vol Ann	Risk Adj Ann. Carry
24Mx3M-9Mx3M	30Mx3M-6Mx3M	steepener	flattener	-0.22	-0.54	0.28	0.93	0.00	96%	-37.5	62.7	25.3	17	5.9
9Mx3M-6Mx3M	36Mx3M-27Mx3M	flattener	flattener	-0.36	0.06	0.31	-0.90	0.05	79%	29.8	0.7	30.5	21	5.8
33Mx3M-6Mx3M	27Mx3M-9Mx3M	flattener	steepener	-0.52	-0.20	0.32	0.99	0.03	97%	68.1	-38.1	30.0	21	5.8
9Mx3M-6Mx3M	36Mx3M-24Mx3M	flattener	flattener	-0.36	0.08	0.31	-0.63	0.05	77%	29.8	-0.1	29.8	21	5.8
27Mx3M-9Mx3M	33Mx3M-6Mx3M	steepener	flattener	-0.20	-0.52	0.31	0.97	-0.01	97%	-38.3	66.3	28.0	20	5.7
9Mx3M-6Mx3M	33Mx3M-24Mx3M	flattener	flattener	-0.36	0.06	0.31	-0.78	0.05	74%	29.8	-0.6	29.2	20	5.7
9Mx3M-6Mx3M	36Mx3M-21Mx3M	flattener	flattener	-0.36	0.09	0.32	-0.47	0.05	74%	29.8	-0.7	29.1	21	5.7
36Mx3M-6Mx3M	30Mx3M-9Mx3M	flattener	steepener	-0.50	-0.18	0.33	0.96	0.03	97%	67.4	-36.4	31.0	22	5.6
27Mx3M-6Mx3M	24Mx3M-9Mx3M	flattener	steepener	-0.56	-0.22	0.36	0.91	0.03	92%	68.1	-34.0	34.2	25	5.5
9Mx3M-6Mx3M	33Mx3M-21Mx3M	flattener	flattener	-0.36	0.08	0.32	-0.54	0.05	71%	29.8	-1.2	28.6	21	5.5
9Mx3M-6Mx3M	30Mx3M-21Mx3M	flattener	flattener	-0.36	0.05	0.32	-0.67	0.05	68%	29.8	-1.2	28.6	21	5.4
24Mx3M-6Mx3M	21Mx3M-9Mx3M	flattener	steepener	-0.58	-0.24	0.36	0.94	0.02	89%	67.3	-34.0	33.3	25	5.4
33Mx3M-6Mx3M	30Mx3M-9Mx3M	flattener	steepener	-0.52	-0.18	0.36	0.88	0.04	95%	68.1	-33.5	34.6	26	5.4
30Mx3M-6Mx3M	27Mx3M-9Mx3M	flattener	steepener	-0.54	-0.20	0.36	0.89	0.03	94%	67.7	-34.2	33.5	25	5.3
36Mx3M-6Mx3M	33Mx3M-9Mx3M	flattener	steepener	-0.50	-0.16	0.37	0.87	0.04	96%	67.4	-33.4	34.0	26	5.2
9Mx3M-6Mx3M	36Mx3M-18Mx3M	flattener	flattener	-0.36	0.09	0.33	-0.36	0.05	71%	29.8	-1.4	28.4	22	5.2
9Mx3M-6Mx3M	27Mx3M-21Mx3M	flattener	flattener	-0.36	0.04	0.33	-0.93	0.05	66%	29.8	-2.2	27.6	21	5.2
9Mx3M-6Mx3M	33Mx3M-18Mx3M	flattener	flattener	-0.36	0.08	0.33	-0.40	0.05	69%	29.8	-1.8	28.0	22	5.0
24Mx3M-12Mx3M	33Mx3M-6Mx3M	steepener	flattener	-0.07	-0.52	0.30	0.72	-0.01	92%	-16.3	49.0	32.7	26	5.0
27Mx3M-9Mx3M	36Mx3M-6Mx3M	steepener	flattener	-0.20	-0.50	0.26	0.91	-0.01	98%	-38.3	61.5	23.1	19	5.0
24Mx3M-12Mx3M	30Mx3M-6Mx3M	steepener	flattener	-0.07	-0.54	0.35	0.77	0.00	88%	-16.3	52.3	36.0	29	5.0
24Mx3M-9Mx3M	33Mx3M-6Mx3M	steepener	flattener	-0.22	-0.52	0.22	0.85	0.00	98%	-37.5	58.1	20.6	17	5.0
9Mx3M-6Mx3M	30Mx3M-18Mx3M	flattener	flattener	-0.36	0.05	0.34	-0.46	0.05	66%	29.8	-1.9	27.9	23	4.9
27Mx3M-6Mx3M	24Mx3M-12Mx3M	flattener	steepener	-0.56	-0.07	0.49	0.98	0.08	81%	68.1	-15.9	52.2	43	4.8
27Mx3M-12Mx3M	33Mx3M-6Mx3M	steepener	flattener	-0.05	-0.52	0.39	0.84	-0.02	90%	-17.1	57.3	40.1	33	4.8
30Mx3M-12Mx3M	36Mx3M-6Mx3M	steepener	flattener	-0.03	-0.50	0.42	0.90	-0.03	92%	-16.6	60.4	43.8	37	4.8
27Mx3M-12Mx3M	36Mx3M-6Mx3M	steepener	flattener	-0.05	-0.50	0.35	0.80	-0.02	93%	-17.1	53.6	36.5	31	4.8
33Mx3M-6Mx3M	30Mx3M-12Mx3M	flattener	steepener	-0.52	-0.03	0.49	0.94	0.09	88%	68.1	-15.6	52.5	44	4.7
24Mx3M-12Mx3M	36Mx3M-6Mx3M	steepener	flattener	-0.07	-0.50	0.27	0.68	-0.01	94%	-16.3	45.8	29.5	25	4.7
21Mx3M-12Mx3M	33Mx3M-6Mx3M	steepener	flattener	-0.09	-0.52	0.21	0.57	0.00	93%	-14.8	39.0	24.2	21	4.7
30Mx3M-6Mx3M	27Mx3M-12Mx3M	flattener	steepener	-0.54	-0.05	0.49	0.95	0.08	86%	67.7	-16.3	51.4	44	4.7
30Mx3M-12Mx3M	33Mx3M-6Mx3M	steepener	flattener	-0.03	-0.52	0.46	0.95	-0.03	88%	-16.6	64.4	47.8	41	4.7
36Mx3M-6Mx3M	33Mx3M-12Mx3M	flattener	steepener	-0.50	-0.01	0.50	0.91	0.09	90%	67.4	-15.7	51.7	44	4.7
9Mx3M-6Mx3M	36Mx3M-15Mx3M	flattener	flattener	-0.36	0.07	0.34	-0.28	0.06	68%	29.8	-2.2	27.6	24	4.6
18Mx3M-15Mx3M	27Mx3M-6Mx3M	steepener	flattener	-0.02	-0.56	0.11	0.24	0.00	79%	-3.9	16.2	12.3	11	4.6

Note: 3M SOFR futures are proxied via SOFR swap yields. This construction is designed to be a well hedged box trade that offers attractive risk adjusted carry. One reference leg curve is regressed against the other and that other curve is risk weighted based on this 6M empirical regression to serve as the hedge for the reference curve. The direction of the reference curve depends on the residual of the regression while the direction of the hedge curve depends on the residual of the regression as well as the regression beta. Realized vol is calculated as the 2 year standard deviation of quarterly changes in the weighted spread, and multiplied by sqrt(4) to annualize. Risk adjusted ann. carry is the 3M slide in the weighted spread divided by the realized vol and table is sorted by highest risk adjusted ann. carry.

Derivatives Strategy

Swap Curve Butterfly Carry Report

Structure	Trade	Left Wt	Belly Wt	Right Wt	Rsq	Wtd Fly Cur (%)	Wtd Fly Mean (%)	Resid (bp)	Wtd Fly Aged 3M (%)	Wtd Fly 3M Carry (bp)	Rlzd Vol Ann.	Risk Adj Ann. Carry
3Mx2Y/3Mx5Y/3Mx30Y	Belly richening	-0.50	1.00	-0.61	70%	-0.45	-0.48	2.18	-0.5	5.3	16	1.3
3Mx2Y/3Mx3Y/3Mx30Y	Belly richening	-0.79	1.00	-0.29	98%	-0.31	-0.33	1.74	-0.4	4.5	12	1.5
3Mx2Y/3Mx3Y/3Mx20Y	Belly richening	-0.76	1.00	-0.31	98%	-0.34	-0.36	1.54	-0.4	3.9	11	1.4
3Mx2Y/3Mx10Y/3Mx30Y	Belly richening	-0.22	1.00	-0.86	95%	-0.25	-0.26	1.08	-0.3	3.9	12	1.3
6Mx2Y/6Mx7Y/6Mx30Y	Belly richening	-0.36	1.00	-0.72	70%	-0.27	-0.29	1.41	-0.3	3.6	13	1.1
3Mx2Y/3Mx7Y/3Mx20Y	Belly richening	-0.30	1.00	-0.79	84%	-0.44	-0.45	1.19	-0.5	3.6	12	1.2
3Mx2Y/3Mx3Y/3Mx15Y	Belly richening	-0.74	1.00	-0.33	98%	-0.32	-0.34	1.43	-0.4	3.4	10	1.3
6Mx2Y/6Mx10Y/6Mx30Y	Belly richening	-0.23	1.00	-0.83	96%	-0.16	-0.16	0.91	-0.2	3.0	11	1.1
6Mx2Y/6Mx3Y/6Mx30Y	Belly richening	-0.79	1.00	-0.26	98%	-0.19	-0.20	1.54	-0.2	3.0	10	1.2
3Mx3Y/3Mx10Y/3Mx30Y	Belly richening	-0.30	1.00	-0.75	92%	-0.12	-0.12	0.64	-0.1	2.8	9	1.2
3Mx3Y/3Mx5Y/3Mx30Y	Belly richening	-0.66	1.00	-0.39	95%	-0.18	-0.20	1.11	-0.2	2.8	9	1.3
3Mx2Y/3Mx3Y/3Mx10Y	Belly richening	-0.69	1.00	-0.37	97%	-0.27	-0.28	1.29	-0.3	2.7	9	1.2
6Mx2Y/6Mx7Y/6Mx20Y	Belly richening	-0.31	1.00	-0.76	89%	-0.33	-0.34	0.98	-0.4	2.7	10	1.1
3Mx2Y/3Mx10Y/3Mx20Y	Belly richening	-0.17	1.00	-0.89	98%	-0.28	-0.29	0.55	-0.3	2.6	8	1.3
3Mx2Y/3Mx7Y/3Mx15Y	Belly richening	-0.25	1.00	-0.82	94%	-0.36	-0.37	0.95	-0.4	2.6	9	1.1
6Mx2Y/6Mx3Y/6Mx20Y	Belly richening	-0.76	1.00	-0.28	98%	-0.23	-0.24	1.38	-0.2	2.6	9	1.1
9Mx2Y/9Mx7Y/9Mx30Y	Belly richening	-0.37	1.00	-0.69	73%	-0.18	-0.19	1.11	-0.2	2.6	12	0.9
3Mx2Y/3Mx15Y/3Mx30Y	Belly richening	-0.12	1.00	-0.94	99%	-0.07	-0.08	0.81	-0.1	2.5	8	1.2
9Mx2Y/9Mx10Y/9Mx30Y	Belly richening	-0.24	1.00	-0.81	97%	-0.08	-0.09	0.77	-0.1	2.4	10	0.9
6Mx3Y/6Mx10Y/6Mx30Y	Belly richening	-0.31	1.00	-0.73	94%	-0.06	-0.06	0.49	-0.1	2.3	9	1.0
6Mx2Y/6Mx3Y/6Mx15Y	Belly richening	-0.74	1.00	-0.30	98%	-0.22	-0.23	1.30	-0.2	2.2	8	1.1
3Mx3Y/3Mx5Y/3Mx20Y	Belly richening	-0.62	1.00	-0.42	94%	-0.23	-0.24	0.90	-0.2	2.2	7	1.2
3Mx2Y/3Mx5Y/3Mx10Y	Belly richening	-0.32	1.00	-0.74	79%	-0.30	-0.31	1.31	-0.3	2.2	9	1.0
3Mx2Y/3Mx3Y/3Mx7Y	Belly richening	-0.62	1.00	-0.43	96%	-0.20	-0.21	0.98	-0.2	2.1	7	1.1
6Mx3Y/6Mx5Y/6Mx30Y	Belly richening	-0.66	1.00	-0.37	96%	-0.12	-0.13	0.88	-0.1	2.1	8	1.1
6Mx2Y/6Mx10Y/6Mx20Y	Belly richening	-0.17	1.00	-0.87	99%	-0.22	-0.22	0.43	-0.2	2.0	7	1.1
6Mx2Y/6Mx15Y/6Mx30Y	Belly richening	-0.12	1.00	-0.92	99%	-0.01	-0.02	0.74	0.0	2.0	8	1.0
3Mx3Y/3Mx15Y/3Mx30Y	Belly richening	-0.16	1.00	-0.88	99%	0.01	0.00	0.60	0.0	2.0	7	1.1
12Mx2Y/12Mx7Y/12Mx30Y	Belly richening	-0.39	1.00	-0.65	73%	-0.10	-0.11	0.77	-0.1	1.9	10	0.8
9Mx2Y/9Mx7Y/9Mx20Y	Belly richening	-0.32	1.00	-0.73	91%	-0.25	-0.26	0.74	-0.3	1.9	9	0.9
12Mx2Y/12Mx10Y/12Mx30Y	Belly richening	-0.25	1.00	-0.78	97%	-0.02	-0.03	0.56	0.0	1.9	10	0.8
6Mx2Y/6Mx7Y/6Mx15Y	Belly richening	-0.26	1.00	-0.79	96%	-0.28	-0.29	0.78	-0.3	1.9	8	1.0
3Mx3Y/3Mx10Y/3Mx20Y	Belly richening	-0.23	1.00	-0.80	98%	-0.18	-0.18	0.26	-0.2	1.9	6	1.2
9Mx3Y/9Mx10Y/9Mx30Y	Belly richening	-0.32	1.00	-0.71	94%	-0.02	-0.02	0.41	0.0	1.9	9	0.9
9Mx2Y/9Mx3Y/9Mx30Y	Belly richening	-0.79	1.00	-0.23	99%	-0.11	-0.13	1.24	-0.1	1.8	8	0.9

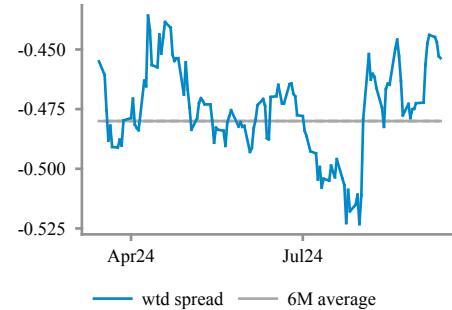
* To calculate the weights, a 6M empirical regression is used of the 50/50 weighted fly regressed against the belly rate and the difference in the wing rates so that the weights are constructed to be "level" and "curve" neutral: left weight = $(0.5 \cdot \text{beta_curve}) / (1 - \text{beta_level})$ and right weight = $(0.5 \cdot \text{beta_curve}) / (1 - \text{beta_level})$, where beta_level and beta_curve are calculated from the 6M regression described previously.

** The residual is the difference of the weighted spread with the 6M avg of the weighted spread. The trade will be a belly cheapener if the residual is less than 0 and a belly richener otherwise. Realized vol is calculated as the 2 year standard deviation of quarterly changes in the weighted spread, and multiplied by sqrt(4) to annualize. Risk-adjusted ann. carry is the 3M slide in the weighted spread divided by the realized vol and table is sorted by highest Wtd Fly 3M Carry.

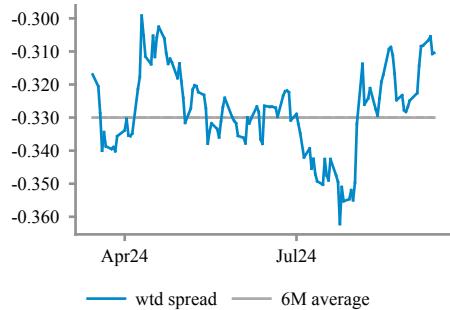
Derivatives Strategy

Swap Curve Butterfly Carry Report

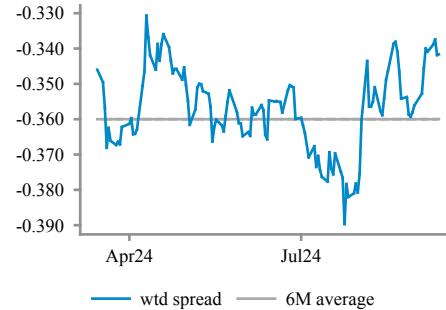
3Mx5Y-0.5*3Mx2Y-0.61*3Mx30Y vs. 6M Avg; %



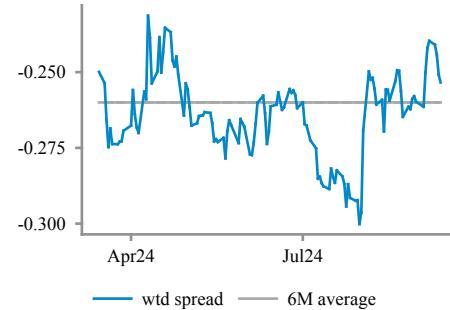
3Mx3Y-0.79*3Mx2Y-0.29*3Mx30Y vs. 6M Avg; %



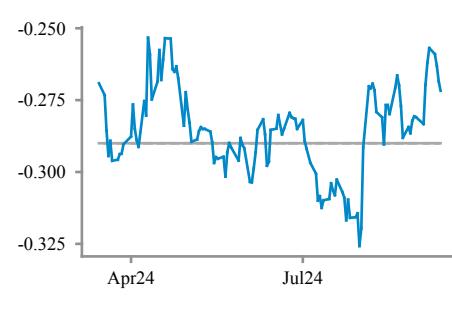
3Mx3Y-0.76*3Mx2Y-0.31*3Mx20Y vs. 6M Avg; %



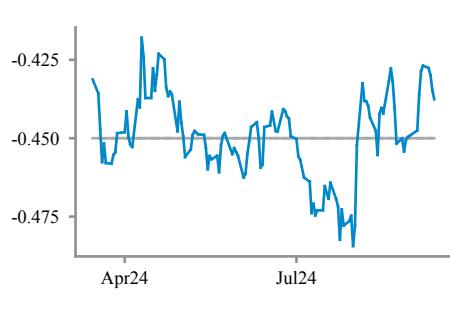
3Mx10Y-0.22*3Mx2Y-0.86*3Mx30Y vs. 6M Avg; %



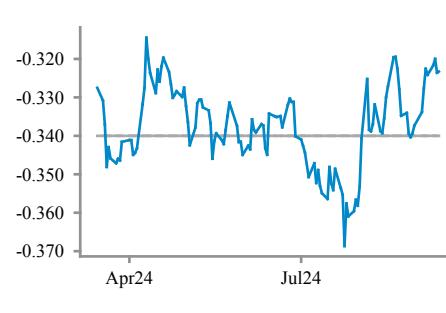
6Mx7Y-0.36*6Mx2Y-0.72*6Mx30Y vs. 6M Avg; %



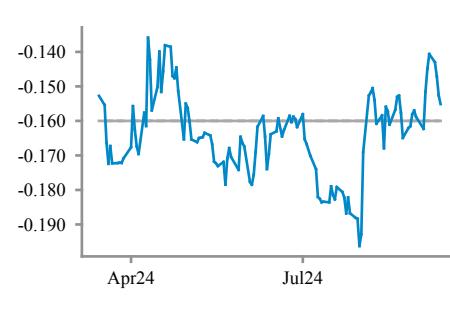
3Mx7Y-0.3*3Mx2Y-0.79*3Mx20Y vs. 6M Avg; %



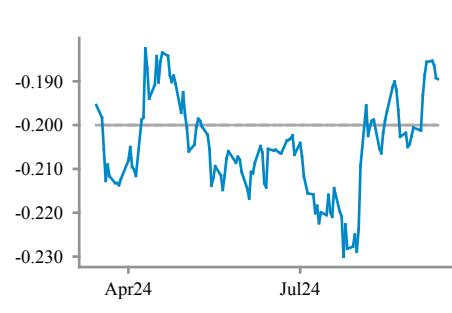
3Mx3Y-0.74*3Mx2Y-0.33*3Mx15Y vs. 6M Avg; %



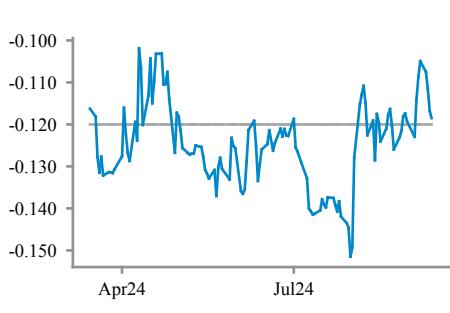
6Mx10Y-0.23*6Mx2Y-0.83*6Mx30Y vs. 6M Avg; %



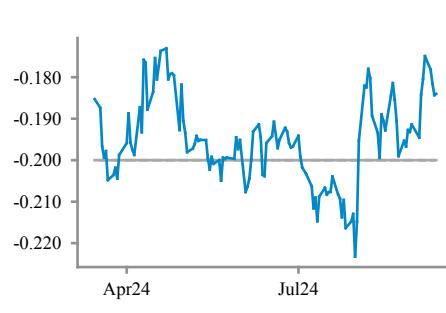
6Mx3Y-0.79*6Mx2Y-0.26*6Mx30Y vs. 6M Avg; %



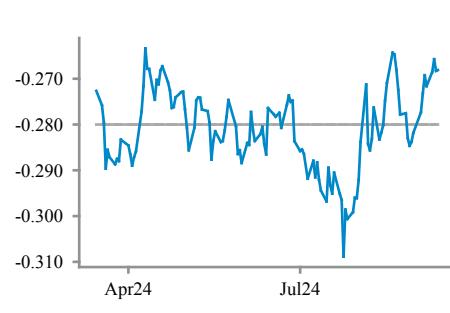
3Mx10Y-0.3*3Mx3Y-0.75*3Mx30Y vs. 6M Avg; %



3Mx5Y-0.66*3Mx3Y-0.39*3Mx30Y vs. 6M Avg; %



3Mx3Y-0.69*3Mx2Y-0.37*3Mx10Y vs. 6M Avg; %



* To calculate the weights, a 6M empirical regression is used of the 50/50 weighted fly regressed against the belly rate and the difference in the wing rates so that the weights are constructed to be "level" and "curve" neutral: left weight = $(0.5\beta_{beta_curve})/(1\beta_{beta_level})$ and right weight = $(0.5+\beta_{beta_curve})/(1-\beta_{beta_level})$, where beta_level and beta_curve are calculated from the 6M regression described previously.

** The residual is the difference of the weighted spread with the 6M avg of the weighted spread. The trade will be a belly cheapener if the residual is less than 0 and a belly richener otherwise. Realized vol is calculated as the 2-year standard deviation of quarterly changes in the weighted spread, and multiplied by sqrt(4) to annualize. Risk-adjusted ann. carry is the 3M slide in the weighted spread divided by the realized vol and table is sorted by highest Wld-By 3M-Carry.

Derivatives Strategy

i-PCA: Implied Principal Component Analysis Report

Implied Correlation, from YCSOs				
	2Y	5Y	10Y	30Y
2Y	1.00	0.93	0.82	0.62
5Y	0.93	1.00	0.96	0.84
10Y	0.82	0.96	1.00	0.94
30Y	0.62	0.84	0.94	1.00

combined with

Implied Vol, 6M Exp	
6M expiry btpvol	
2Y	7.70
5Y	6.97
10Y	6.29
30Y	5.68

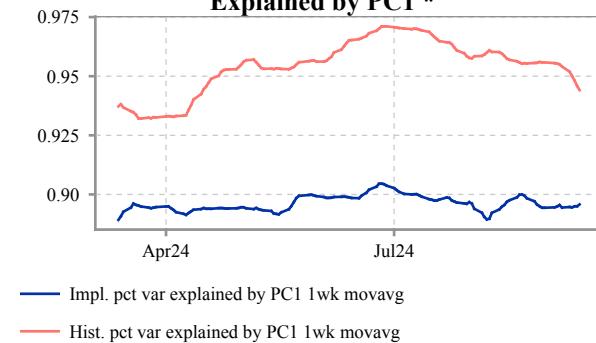
gives us

Implied Covariance Matrix				
	2Y	5Y	10Y	30Y
2Y	59.23	50.02	39.83	27.11
5Y	50.02	48.64	42.11	33.28
10Y	39.83	42.11	39.57	33.52
30Y	27.11	36.73	33.52	32.23

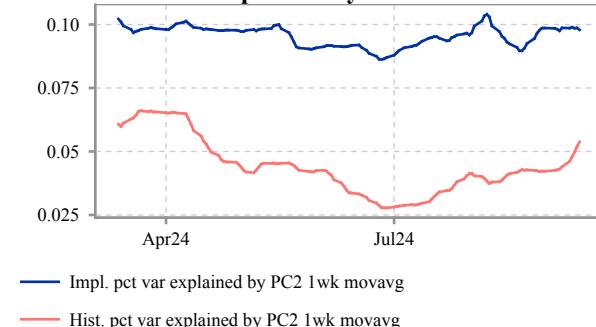
which
when
factorized
gives

Implied Principal Components			
	PC1	PC2	PC3
2Y	7.14	2.85	0.34
5Y	6.94	0.23	-0.36
10Y	6.12	-1.33	-0.38
30Y	4.90	-2.82	0.49

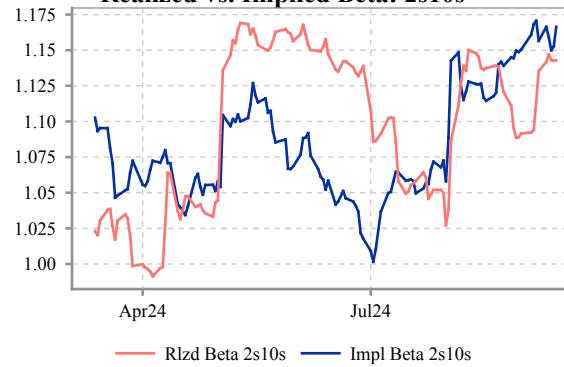
Historical vs. Implied Percent of Variance - Explained by PC1 *



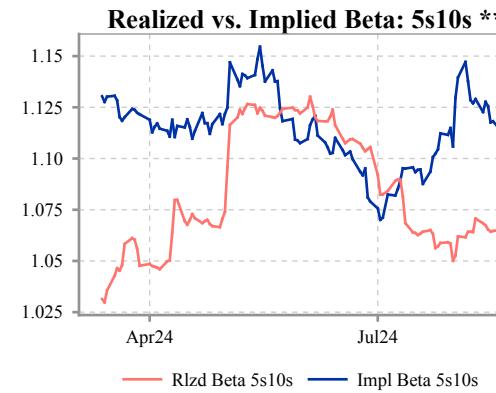
Historical vs. Implied Percent of Variance - Explained by PC2 *



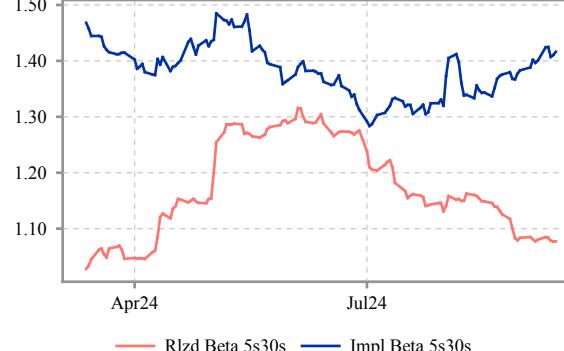
Realized vs. Implied Beta: 2s10s **



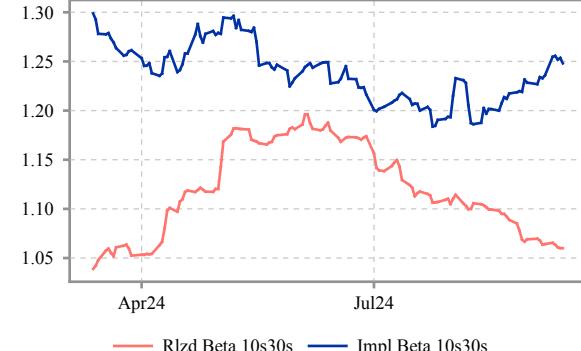
Realized vs. Implied Beta: 5s10s **



Realized vs. Implied Beta: 5s30s **



Realized vs. Implied Beta: 10s30s **



Note: * For each principal component, we define its loadings on the 2Y, 5Y, 10Y and 30Y sector to be the impact of a 1-sigma move in that component on 2Y, 5Y, 10Y and 30Y rates respectively. For each principal component, we also define a quantity called its norm, which is calculated as the square root of the sum of squares of the loadings. Finally, the percent variation explained by each component is calculated as the square of its norm, divided by the sum of squared norms of all the components.

** 6M rolling beta between weekly changes in 2Y yields versus 10Y yields, and the 6M lagged implied beta calculated from the first implied principal component; unitless. Implied beta is calculated as the ratio of left tenor weighting to the right tenor weighting (e.g. ratio of 2Y weighting to 10Y weighting for 2s10s) in the first implied principal component.

Derivatives Strategy

SOFR Carry Efficient Bearish Trades Report

Trade	Wts	6M		Fed tightening		3M Carry/Slide			Proj PnL			Wtd Sprd		Return to	
		Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio		
-3Mx2Y	-1/	1.00	100	1.00	0.0	26.7	21.3	1.3	51.7	26.7	1.7	65.6	0.8		
-BLUE/-SFR2/+SFR4	-0.403/-1.000/1.000	0.10	38	0.12	-15.9	50.3	11.8	2.6	52.9	50.3	47.7	27.1	2.0		
-GRNS/-SFR2/+SFR4	-0.513/-1.000/1.000	0.27	79	0.30	-13.7	50.1	13.3	2.6	56.8	50.1	43.4	29.6	1.9		
-SFR2/+SFR3/-SFR6	-1.000/1.000/-0.303	0.15	83	0.17	-6.0	30.5	7.8	2.9	34.3	30.5	26.7	18.1	1.9		
-3Mx10Y/-SFR2/+SFR4	-0.461/-1.000/1.000	0.13	43	0.11	-16.7	53.1	13.1	2.6	56.4	53.1	49.8	30.3	1.9		
-3Mx7Y/-SFR2/+SFR4	-0.535/-1.000/1.000	0.22	65	0.22	-16.3	54.6	14.6	2.6	60.2	54.6	49.1	32.7	1.8		
-3Mx1Y/-GRNS/+SFR4	-1.000/-0.372/1.000	0.19	78	0.19	-8.8	34.6	9.5	2.3	39.4	34.6	29.9	22.2	1.8		
-3Mx3Y/-SFR2/+SFR3	-0.436/-1.000/1.000	0.26	90	0.28	-7.8	37.4	10.7	2.8	43.8	37.4	31.0	25.4	1.7		
-3Mx5Y/-SFR2/+SFR4	-0.679/-1.000/1.000	0.38	84	0.40	-15.7	57.7	17.4	2.6	67.3	57.7	48.1	39.4	1.7		
-3Mx1Y/-3Mx7Y/+SFR4	-1.000/-0.388/1.000	0.16	64	0.14	-10.6	37.9	10.5	2.3	41.8	37.9	34.0	24.5	1.7		
-3Mx1Y/-3Mx3Y/+SFR5	-0.297/-1.000/1.000	0.16	75	0.14	-8.4	26.0	6.9	2.3	30.0	26.0	21.9	18.2	1.7		
-3Mx1Y/-3Mx5Y/+SFR4	-1.000/-0.492/1.000	0.27	83	0.27	-10.2	40.1	12.5	2.3	46.9	40.1	33.3	29.1	1.6		
-BLUE/-SFR2/+SFR5	-0.694/-1.000/1.000	0.35	73	0.34	-20.1	58.3	17.3	2.5	67.0	58.3	49.6	42.0	1.6		
-GOLD/-SFR2/+SFR5	-0.598/-1.000/1.000	0.22	53	0.19	-21.2	58.1	15.7	2.5	63.7	58.1	52.5	40.4	1.6		
-SFR2/+SFR4/-SFR7	-1.000/1.000/-0.719	0.51	95	0.55	-10.8	51.0	17.3	2.6	63.9	51.0	38.2	41.0	1.6		
-3Mx30Y/-SFR2/+SFR5	-0.689/-1.000/1.000	0.20	44	0.06	-22.7	61.4	18.0	2.5	66.5	61.4	56.4	43.7	1.5		
-3Mx3Y/-SFR2/+SFR4	-1.000/-0.766/1.000	0.55	95	0.57	-11.8	53.0	18.5	2.5	66.7	53.0	39.3	43.9	1.5		
-3Mx10Y/-SFR2/+SFR5	-0.794/-1.000/1.000	0.39	73	0.32	-21.5	63.2	19.7	2.5	73.0	63.2	53.3	48.2	1.5		
-3Mx20Y/-SFR2/+SFR5	-0.702/-1.000/1.000	0.25	53	0.12	-22.0	61.6	18.2	2.5	67.8	61.6	55.5	44.9	1.5		
-3Mx15Y/-SFR2/+SFR5	-0.723/-1.000/1.000	0.29	60	0.18	-21.7	61.9	18.5	2.5	69.1	61.9	54.7	45.8	1.5		
+3Mx20Y/-SFR2	1.000/-1.000	0.23	35	0.34	-36.6	62.9	30.4	2.3	68.7	62.9	57.2	46.1	1.5		
-GRNS/-SFR2/+SFR5	-0.883/-1.000/1.000	0.63	93	0.64	-16.4	58.1	19.9	2.5	73.8	58.1	42.4	49.7	1.5		
-3Mx5Y/-SFR2/+SFR5	-1.000/-0.817/1.000	0.52	88	0.50	-17.6	57.4	19.2	2.4	70.3	57.4	44.4	47.5	1.5		
-3Mx1Y/+SFR4/-SFR7	-1.000/1.000/-0.521	0.37	95	0.38	-6.6	35.3	12.4	2.3	44.4	35.3	26.1	30.0	1.5		
+REDS/-BLUE/-SFR2	1.000/-0.802/-1.000	0.42	78	0.43	-19.5	58.4	19.3	2.5	68.9	58.4	47.8	46.8	1.5		
-3Mx7Y/-SFR2/+SFR5	-0.922/-1.000/1.000	0.55	85	0.50	-20.9	65.8	22.1	2.4	79.6	65.8	52.0	54.0	1.5		
+REDS/-GOLD/-SFR2	1.000/-0.691/-1.000	0.28	60	0.26	-20.8	58.1	17.5	2.5	65.1	58.1	51.0	44.3	1.5		

Note:

- We assume a 25bp selloff in the reference leg's swap yield to compute the projected PnL. The assumed reversion to the mean of any mispricing is adjusted by the historical mean reversion time of the weighted spread.
- Beta is calculated by regressing daily changes in the weighted spread against daily changes in the reference leg's yield over the past six months.
- The risk of the weighted spread is calculated as the standard deviation of three month changes in the spread over the past 5 years.
- Fed tightening Beta is calculated by regressing daily changes in the weighted spread against daily changes in the reference leg's yield over the period March 16, 2022 to Sep 16, 2022, which is a Fed tightening period.
- Correlation is calculated by regressing daily changes in the weighted spread against daily changes in the reference leg's yield over the past six months.
- REDS, GRNS, BLUE, and GOLD refers to the 1Yx1Y, 2Yx1Y, 3Yx1Y, and 4Yx1Y SOFR swap rates respectively. SFR1 is the constant maturity swap rate proxy for the 3Mx3M SOFR rate, SFR2 proxies the 6Mx3M rate, and so on.

Derivatives Strategy

Carry Efficient Bearish Trades Report

Trade	Wts	6M Fed tightening			3M Carry/Slide			Proj PnL			Wtd Sprd Return to		
		Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
-3Mx5Y	-1/	1.00	100	1.00	0.0	9.9	9.3	0.6	34.9	9.9	-15.1	55.8	0.6
-3Mx2Y/-SFR3/+SFR4	-1.000/-0.196/1.000	0.12	79	0.12	-4.0	18.9	4.6	2.4	21.8	18.9	15.9	11.6	1.9
-GOLD/-SFR2/+SFR4	-0.444/-1.000/1.000	0.14	42	0.18	-16.7	49.9	10.8	2.6	53.4	49.9	46.4	29.6	1.8
-BLUE/-SFR2/+SFR4	-0.617/-1.000/1.000	0.33	77	0.39	-15.9	49.9	12.1	2.7	58.1	49.9	41.7	34.0	1.7
-3Mx20Y/-SFR2/+SFR4	-0.567/-1.000/1.000	0.18	48	0.14	-17.5	52.7	12.8	2.6	57.3	52.7	48.1	34.1	1.7
-3Mx15Y/-SFR2/+SFR4	-0.631/-1.000/1.000	0.26	62	0.22	-17.4	53.0	13.1	2.6	59.5	53.0	46.5	36.5	1.6
-3Mx1Y/-BLUE/+SFR4	-1.000/-0.427/1.000	0.21	73	0.24	-10.4	34.5	8.7	2.4	39.8	34.5	29.2	24.7	1.6
-3Mx1Y/-3Mx20Y/+SFR4	-1.000/-0.393/1.000	0.11	43	0.07	-11.4	36.4	9.1	2.3	39.3	36.4	33.6	25.0	1.6
-3Mx2Y/-3Mx10Y/+SFR5	-1.000/-0.266/1.000	0.14	68	0.11	-7.8	21.6	5.1	2.3	25.0	21.6	18.2	16.1	1.5
-3Mx1Y/-3Mx15Y/+SFR4	-1.000/-0.437/1.000	0.17	57	0.12	-11.4	36.7	9.4	2.3	40.8	36.7	32.5	26.5	1.5
-3Mx10Y/-SFR2/+SFR4	-0.848/-1.000/1.000	0.50	84	0.48	-17.4	54.8	14.9	2.6	67.2	54.8	42.5	45.0	1.5
-3Mx2Y/+SFR4	-1.000/0.746	0.20	95	0.20	-2.4	15.6	4.6	2.4	20.5	15.6	10.6	14.0	1.5
-3Mx3Y/-SFR4/+SFR5	-1.000/-0.238/1.000	0.17	86	0.16	-5.6	14.6	3.2	2.4	18.9	14.6	10.4	13.0	1.5
-3Mx1Y/-3Mx10Y/+SFR4	-1.000/-0.588/1.000	0.33	82	0.30	-11.4	37.9	10.6	2.3	46.2	37.9	29.7	32.1	1.4
-3Mx3Y/+REDS	-1.000/0.782	0.14	85	0.15	-4.2	12.6	3.1	2.4	16.0	12.6	9.3	11.2	1.4
-3Mx7Y/-SFR2/+SFR5	-1.000/-0.647/1.000	0.37	77	0.36	-16.5	43.1	10.8	2.5	52.3	43.1	33.9	36.7	1.4
-3Mx7Y/-SFR2/+SFR4	-1.000/-0.916/1.000	0.62	91	0.62	-15.8	52.3	14.8	2.6	67.6	52.3	36.9	47.6	1.4
-3Mx10Y/-SFR2/+SFR5	-1.000/-0.775/1.000	0.42	76	0.38	-19.0	49.3	13.1	2.5	59.8	49.3	38.7	43.8	1.4
-BLUE/-SFR2/+SFR5	-1.000/-0.883/1.000	0.58	87	0.64	-18.7	50.1	13.9	2.6	64.6	50.1	35.5	47.3	1.4
-3Mx7Y/+REDS/-SFR2	-1.000/1.000/-0.553	0.27	68	0.28	-14.7	37.1	9.5	2.5	43.8	37.1	30.5	32.3	1.4
-3Mx30Y/-SFR2/+SFR5	-1.000/-0.961/1.000	0.43	66	0.27	-23.5	59.7	17.6	2.5	70.4	59.7	49.0	52.1	1.4
-GOLD/-SFR2/+SFR5	-0.935/-1.000/1.000	0.57	80	0.61	-21.9	57.2	15.6	2.5	71.6	57.2	42.9	53.0	1.3
-SFR2/+SFR4	-1.000/0.128	0.71	84	0.67	-32.7	64.0	30.6	2.3	81.7	64.0	46.2	61.5	1.3
-3Mx20Y/-SFR2/+SFR5	-1.000/-0.918/1.000	0.44	70	0.32	-21.9	57.1	16.4	2.5	68.1	57.1	46.1	51.3	1.3
-3Mx15Y/-SFR2/+SFR5	-1.000/-0.874/1.000	0.44	72	0.35	-20.9	54.5	15.2	2.5	65.6	54.5	43.4	49.5	1.3
-3Mx2Y/+REDS/-GOLD	-1.000/1.000/-0.312	0.16	71	0.18	-7.4	19.8	5.5	2.3	23.8	19.8	15.8	18.0	1.3
+REDS/-BLUE/-SFR2	1.000/-1.000/-0.788	0.48	83	0.56	-16.9	44.0	12.5	2.6	56.0	44.0	32.1	42.4	1.3

Note:

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Derivatives Strategy

Carry Efficient Bearish Trades Report

Trade	Wts	6M Fed tightening			3M Carry/Slide			Proj PnL			Wtd Sprd Return to		
		Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
-3Mx10Y	-1/	1.00	100	1.00	0.0	4.5	4.6	-0.1	29.5	4.5	-20.5	51.1	0.6
-3Mx2Y/+SFR4	-1.000/0.797	0.15	89	0.15	-2.3	14.8	3.4	2.4	18.6	14.8	11.0	11.2	1.7
-GOLD/-SFR2/+SFR4	-0.666/-1.000/1.000	0.42	78	0.51	-16.4	49.3	10.7	2.7	59.7	49.3	39.0	37.4	1.6
-3Mx1Y/-GOLD/+SFR4	-1.000/-0.436/1.000	0.25	72	0.29	-10.7	34.2	7.7	2.4	40.3	34.2	28.0	26.1	1.5
-3Mx3Y/-SFR4/+SFR5	-1.000/-0.194/1.000	0.14	79	0.14	-5.5	14.0	2.3	2.4	17.5	14.0	10.4	11.4	1.5
-3Mx2Y/-3Mx20Y/+SFR5	-1.000/-0.279/1.000	0.15	66	0.12	-7.9	21.2	4.7	2.3	24.9	21.2	17.5	16.8	1.5
-SFR2/+SFR4	-1.000/0.225	0.59	73	0.55	-35.7	62.5	28.5	2.3	77.3	62.5	47.8	55.1	1.4
-3Mx3Y/+SFR5	-1.000/0.743	0.22	93	0.22	-4.1	12.7	2.4	2.4	18.2	12.7	7.2	13.1	1.4
-3Mx30Y/-SFR2/+SFR4	-1.000/-1.000/0.956	0.63	84	0.57	-18.4	54.4	14.9	2.6	70.2	54.4	38.6	50.8	1.4
-3Mx20Y/-SFR2/+SFR4	-1.000/-0.992/1.000	0.62	85	0.59	-17.3	53.4	13.8	2.6	68.9	53.4	37.9	50.2	1.4
-3Mx2Y/-3Mx3Y/+SFR4	-1.000/-0.361/1.000	0.31	95	0.31	-2.3	18.1	4.4	2.4	25.9	18.1	10.3	19.0	1.4
-3Mx15Y/-SFR2/+SFR4	-1.000/-0.950/1.000	0.62	87	0.61	-16.4	50.9	12.7	2.6	66.5	50.9	35.4	48.7	1.4
+3Mx3Y/-SFR2	0.272/-1.000	0.55	68	0.50	-37.2	61.1	29.3	2.3	74.9	61.1	47.4	55.3	1.4
+3Mx5Y/-SFR2	0.301/-1.000	0.52	64	0.46	-38.7	62.9	30.7	2.3	75.9	62.9	49.9	56.1	1.4
+3Mx2Y/-SFR2	0.254/-1.000	0.58	72	0.53	-35.6	59.1	28.1	2.3	73.5	59.1	44.7	54.5	1.3
+3Mx7Y/-SFR2	0.322/-1.000	0.51	61	0.44	-39.5	63.7	31.4	2.3	76.4	63.7	51.0	56.7	1.3
-SFR2/+SFR3	-1.000/0.226	0.61	76	0.56	-32.9	57.7	26.8	2.4	72.9	57.7	42.5	54.2	1.3
-3Mx30Y/-SFR2/+SFR5	-1.000/-0.827/1.000	0.41	65	0.33	-20.9	50.9	13.1	2.5	61.0	50.9	40.8	45.7	1.3
-3Mx2Y/-3Mx15Y/+SFR5	-1.000/-0.417/1.000	0.29	87	0.26	-7.8	21.7	5.3	2.3	28.9	21.7	14.5	22.1	1.3
-3Mx20Y/-SFR2/+SFR5	-1.000/-0.781/1.000	0.41	69	0.37	-19.2	48.1	11.8	2.5	58.4	48.1	37.8	44.6	1.3
-3Mx15Y/-SFR2/+SFR5	-1.000/-0.739/1.000	0.41	72	0.39	-18.3	45.6	10.6	2.5	55.9	45.6	35.3	42.9	1.3
+3Mx1Y/-SFR2	0.251/-1.000	0.61	76	0.57	-31.9	53.3	25.9	2.3	68.6	53.3	38.0	52.7	1.3
-GOLD/-SFR2/+SFR5	-1.000/-0.857/1.000	0.61	83	0.72	-19.0	47.7	10.7	2.6	63.0	47.7	32.3	48.4	1.3
-3Mx30Y/+REDS/-SFR2	-1.000/1.000/-0.755	0.32	55	0.26	-19.5	46.4	12.5	2.5	54.3	46.4	38.5	43.0	1.3
+REDS/-GOLD/-SFR2	1.000/-1.000/-0.785	0.52	79	0.65	-17.6	43.1	10.1	2.6	56.2	43.1	30.0	45.2	1.2
-3Mx20Y/+REDS/-SFR2	-1.000/1.000/-0.709	0.32	59	0.30	-17.8	43.6	11.2	2.5	51.7	43.6	35.5	41.8	1.2
-3Mx15Y/+REDS/-SFR2	-1.000/1.000/-0.667	0.32	63	0.32	-16.9	41.1	10.0	2.5	49.2	41.1	33.0	40.0	1.2

Note:

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Derivatives Strategy

Carry Efficient Bullish Trades Report

Trade	Wts	6M Fed tightening			3M Carry/Slide			Proj PnL			Wtd Sprd	Return to	
		Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25		
3Mx2Y	1/	1.00	100	1.00	0.0	-26.7	-21.3	-1.3	-51.7	-26.7	-1.7	65.6	0.0
-SFR2/+SFR4	-1.000/1.000	0.22	62	0.22	-22.8	51.0	11.0	2.6	45.5	51.0	56.5	24.8	2.3
-3Mx1Y/+SFR4	-1.000/1.000	0.16	63	0.18	-15.4	35.3	7.9	2.3	31.2	35.3	39.3	19.2	2.1
-3Mx1Y/-3Mx5Y/+SFR3	-1.000/-0.014/1.000	0.10	80	0.10	-2.7	14.2	1.0	2.5	11.7	14.2	16.7	8.7	1.9
-3Mx1Y/-GRNS/+SFR3	-1.000/-0.011/1.000	0.10	81	0.11	-2.7	14.1	0.9	2.5	11.5	14.1	16.6	8.7	1.9
-3Mx1Y/-3Mx7Y/+SFR3	-1.000/-0.011/1.000	0.10	81	0.11	-2.8	14.1	0.9	2.5	11.5	14.1	16.8	8.8	1.9
-3Mx1Y/-3Mx10Y/+SFR3	-1.000/-0.010/1.000	0.11	81	0.11	-2.8	14.1	0.9	2.5	11.5	14.1	16.8	8.8	1.9
-3Mx1Y/-BLUE/+SFR3	-1.000/-0.009/1.000	0.11	82	0.11	-2.7	14.1	0.9	2.5	11.4	14.1	16.7	8.8	1.9
-3Mx1Y/-3Mx15Y/+SFR3	-1.000/-0.009/1.000	0.11	82	0.11	-2.8	14.1	0.9	2.5	11.4	14.1	16.8	8.9	1.9
-3Mx1Y/-3Mx20Y/+SFR3	-1.000/-0.009/1.000	0.11	82	0.11	-2.8	14.1	0.9	2.5	11.4	14.1	16.8	8.9	1.9
-3Mx1Y/-GOLD/+SFR3	-1.000/-0.007/1.000	0.11	82	0.11	-2.8	14.1	0.9	2.5	11.3	14.1	16.8	8.9	1.9
-3Mx1Y/+SFR3	-0.981/1.000	0.13	87	0.13	-2.6	13.1	0.3	2.5	9.8	13.1	16.4	9.3	1.8
-3Mx3Y/+REDS/+GRNS	-1.000/1.000/0.030	0.15	82	0.15	-5.8	11.4	-0.5	2.5	7.5	11.4	15.2	12.8	1.2
-SFR2/+SFR3	-0.784/1.000	0.36	97	0.34	-5.5	15.6	-3.2	3.1	6.6	15.6	24.6	20.9	1.2
-3Mx3Y/+REDS/+SFR7	-1.000/1.000/0.042	0.17	84	0.17	-6.0	11.3	-0.7	2.5	7.1	11.3	15.5	13.7	1.1
+3Mx1Y/-SFR2/+SFR3	0.271/-1.000/1.000	0.42	97	0.40	-6.4	16.2	-4.2	3.2	5.7	16.2	26.8	24.7	1.1
-3Mx3Y/+REDS/+SFR6	-1.000/1.000/0.059	0.19	86	0.19	-6.1	11.2	-1.1	2.5	6.5	11.2	15.9	14.8	1.1
-3Mx3Y/+REDS	-0.915/1.000	0.21	89	0.21	-5.8	9.8	-1.6	2.5	4.6	9.8	15.0	15.3	1.0
-3Mx3Y/+GRNS/+SFR5	-1.000/0.166/1.000	0.27	92	0.29	-7.0	11.4	-2.8	2.6	4.6	11.4	18.2	20.5	0.9
-3Mx3Y/+SFR5/+SFR7	-1.000/1.000/0.233	0.35	93	0.37	-8.0	11.1	-4.1	2.6	2.3	11.1	19.9	25.7	0.8
-3Mx5Y/+GRNS/+SFR7	-1.000/0.043/1.000	0.17	70	0.21	-7.1	9.9	0.5	2.3	5.6	9.9	14.1	18.5	0.8
-3Mx5Y/+SFR7	-0.944/1.000	0.18	73	0.22	-6.9	9.2	0.1	2.3	4.8	9.2	13.7	18.4	0.7
-SFR2/+SFR3/+SFR4	-0.986/1.000/0.750	1.00	99	0.98	-10.5	17.7	-13.3	3.1	-7.4	17.7	42.8	61.4	0.7
-3Mx3Y/+SFR5/+SFR6	-1.000/1.000/0.332	0.47	95	0.48	-8.9	10.3	-6.3	2.6	-1.4	10.3	22.0	33.0	0.7
+3Mx3Y/-3Mx5Y/+SFR7	0.122/-1.000/1.000	0.25	82	0.29	-7.0	7.7	-1.2	2.3	1.5	7.7	13.8	21.2	0.7
-3Mx5Y/+GRNS/+SFR6	-1.000/0.255/1.000	0.41	91	0.44	-8.5	7.9	-4.4	2.3	-2.4	7.9	18.2	30.0	0.6
-3Mx1Y/+SFR3/+SFR4	-1.000/0.676/1.000	0.87	99	0.87	-7.3	10.9	-12.1	2.7	-10.9	10.9	32.7	54.0	0.6

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Trade	Wts	6M Fed tightening			3M Carry/Slide			Proj PnL			Wtd Sprd Return to		
		Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
3Mx5Y	1/	1.00	100	1.00	0.0	-9.9	-9.3	-0.6	-34.9	-9.9	15.1	55.8	0.3
-BLUE/-SFR2/+SFR3	-0.045/-1.000/1.000	0.14	71	0.13	-8.3	29.7	4.1	2.9	26.2	29.7	33.3	13.2	2.5
+3Mx1Y/-SFR2/+SFR3	0.019/-1.000/1.000	0.20	83	0.19	-8.1	28.9	3.4	2.9	23.8	28.9	34.0	14.1	2.4
-SFR2/+SFR3	-0.982/1.000	0.20	83	0.19	-8.0	28.6	3.4	2.9	23.6	28.6	33.7	14.0	2.4
+3Mx2Y/-SFR2/+SFR3	0.031/-1.000/1.000	0.22	84	0.20	-8.3	29.0	3.3	2.9	23.5	29.0	34.5	14.6	2.4
+3Mx1Y/-SFR2	1.000/-0.925	0.13	86	0.11	-4.6	10.8	0.6	3.4	7.5	10.8	14.1	7.7	1.8
-SFR2/+SFR3/+SFR4	-1.000/0.248/1.000	0.52	90	0.49	-14.7	42.1	3.7	2.7	28.9	42.1	55.2	31.9	1.7
+3Mx1Y/-SFR2/+SFR4	0.263/-1.000/1.000	0.51	91	0.47	-13.9	37.8	3.0	2.8	25.1	37.8	50.5	30.7	1.6
-SFR2/+SFR4	-0.757/1.000	0.47	91	0.44	-12.7	35.0	2.9	2.7	23.1	35.0	46.8	28.7	1.6
-3Mx1Y/+SFR3/+SFR4	-1.000/0.172/1.000	0.38	90	0.37	-9.5	29.1	2.8	2.4	19.6	29.1	38.5	23.8	1.6
-3Mx1Y/+SFR4	-0.818/1.000	0.37	91	0.35	-8.9	26.1	2.4	2.4	17.0	26.1	35.3	22.9	1.5
-3Mx1Y/+BLUE/+SFR3	-1.000/0.144/1.000	0.26	95	0.27	-2.7	14.3	0.6	2.5	7.9	14.3	20.8	13.6	1.5
-3Mx2Y/+SFR3/+SFR5	-1.000/0.078/1.000	0.19	83	0.19	-7.0	17.6	1.6	2.4	12.9	17.6	22.2	14.6	1.5
-3Mx2Y/+SFR4/+SFR5	-1.000/0.101/1.000	0.22	85	0.22	-7.6	18.9	1.6	2.4	13.4	18.9	24.3	16.4	1.5
+3Mx2Y/-SFR2/+SFR4	0.431/-1.000/1.000	0.71	93	0.67	-15.7	39.5	1.8	2.7	21.7	39.5	57.3	41.0	1.4
-3Mx2Y/+SFR5	-0.865/1.000	0.24	88	0.25	-7.3	16.8	1.0	2.4	10.7	16.8	22.9	17.1	1.3
-3Mx1Y/+3Mx2Y/+SFR4	-1.000/0.299/1.000	0.51	93	0.49	-10.2	27.3	1.5	2.4	14.6	27.3	40.0	29.9	1.3
-SFR2/+SFR3/+SFR5	-1.000/0.521/1.000	0.83	94	0.80	-17.6	40.8	0.7	2.7	20.1	40.8	61.4	48.1	1.3
-3Mx2Y/+REDS/+SFR3	-1.000/1.000/0.174	0.31	93	0.30	-5.9	14.3	0.5	2.4	6.7	14.3	22.0	17.7	1.2
+REDS/-SFR2/+SFR4	0.727/-1.000/0.943	1.05	94	0.99	-20.4	47.4	0.9	2.7	21.3	47.4	73.6	59.5	1.2
-SFR2/+SFR4/+SFR5	-1.000/0.677/0.998	1.04	94	1.00	-22.0	49.5	0.9	2.7	23.5	49.5	75.5	61.2	1.2
-3Mx2Y/+REDS/+SFR4	-1.000/1.000/0.225	0.38	93	0.36	-7.4	17.3	0.6	2.4	7.8	17.3	26.7	22.1	1.2
-3Mx3Y/+REDS	-1.000/1.000	0.12	66	0.10	-3.8	11.3	-0.3	2.5	8.4	11.3	14.3	11.8	1.2
+REDS/-SFR2/+SFR3	1.000/-1.000/0.617	0.95	95	0.91	-16.6	37.5	-0.4	2.8	13.9	37.5	61.2	52.3	1.2
-3Mx3Y/+SFR4/+SFR6	-1.000/0.090/1.000	0.19	78	0.17	-6.9	13.7	0.7	2.2	8.9	13.7	18.5	15.9	1.2
-SFR2/+SFR4/+SFR6	-0.905/1.000/0.618	1.05	95	1.00	-19.2	43.3	0.0	2.6	17.1	43.3	69.5	59.8	1.2
-3Mx3Y/+REDS/+GOLD	-1.000/1.000/0.157	0.26	93	0.25	-5.4	11.7	-0.2	2.4	5.2	11.7	18.3	15.9	1.1

Note:

- We assume a 25bp selloff in the reference leg's swap yield to compute the projected PnL. The assumed reversion to the mean of any mispricing is adjusted by the historical mean reversion time of the weighted spread.
- Beta is calculated by regressing daily changes in the weighted spread against daily changes in the reference leg's yield over the past six months.
- The risk of the weighted spread is calculated as the standard deviation of three month changes in the spread over the past 5 years.
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- Correlation is calculated by regressing daily changes in the weighted spread against daily changes in the reference leg's yield over the past six months.
- REDS, GRNS, BLUE, and GOLD refers to the 1Yx1Y, 2Yx1Y, 3Yx1Y, and 4Yx1Y SOFR swap rates respectively. SFR1 is the constant maturity swap rate proxy for the 3Mx3M SOFR rate, SFR2 proxies the 6Mx3M rate, and so on.

Derivatives Strategy

Carry Efficient Bullish Trades Report

Trade	Wts	6M Fed tightening			3M Carry/Slide			Proj PnL			Wtd Sprd Return to		
		Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
3Mx10Y	1/	1.00	100	1.00	0.0	-4.5	-4.6	0.1	-29.5	-4.5	20.5	51.1	0.4
-3Mx2Y/-SFR2/+SFR3	-0.038/-1.000/1.000	0.15	68	0.14	-8.5	30.8	4.8	2.9	27.1	30.8	34.6	13.4	2.6
-SFR2/+SFR3	-1.000/0.975	0.16	71	0.15	-8.7	30.7	4.7	2.9	26.6	30.7	34.8	13.6	2.6
-3Mx1Y/-SFR2/+SFR3	-0.027/-1.000/1.000	0.17	71	0.16	-8.8	31.2	4.8	2.9	27.0	31.2	35.3	13.8	2.6
+GOLD/-SFR2/+SFR3	0.128/-1.000/1.000	0.32	89	0.33	-8.6	30.1	4.1	2.9	22.0	30.1	38.2	17.1	2.2
-SFR2/+SFR5	-1.000/1.000	0.31	61	0.31	-30.6	59.6	16.1	2.5	51.8	59.6	67.4	32.5	2.1
-SFR2/+SFR3/+SFR4	-1.000/0.132/1.000	0.42	80	0.38	-16.0	46.2	7.1	2.7	35.8	46.2	56.7	27.4	2.1
+3Mx1Y/-SFR2/+SFR4	0.142/-1.000/1.000	0.41	81	0.37	-15.5	43.9	6.7	2.7	33.6	43.9	54.2	26.6	2.0
-SFR2/+SFR4	-0.864/1.000	0.40	81	0.36	-14.8	42.0	6.5	2.7	32.1	42.0	51.9	25.7	2.0
+3Mx2Y/-SFR2/+SFR4	0.197/-1.000/1.000	0.49	83	0.45	-16.7	45.7	6.8	2.7	33.6	45.7	57.9	30.1	1.9
-3Mx1Y/+SFR3/+SFR4	-1.000/0.087/1.000	0.30	80	0.29	-10.4	32.1	5.3	2.4	24.6	32.1	39.6	20.7	1.9
-3Mx1Y/+SFR4	-0.907/1.000	0.30	80	0.28	-10.1	30.6	5.1	2.4	23.2	30.6	38.0	20.2	1.9
+3Mx3Y/-SFR2/+SFR4	0.279/-1.000/1.000	0.58	86	0.54	-17.1	46.1	6.7	2.7	31.6	46.1	60.7	33.5	1.8
-3Mx1Y/+3Mx2Y/+SFR4	-1.000/0.129/1.000	0.35	83	0.33	-10.9	31.8	5.1	2.4	23.2	31.8	40.5	22.4	1.8
-3Mx1Y/+3Mx3Y/+SFR4	-1.000/0.183/1.000	0.41	86	0.40	-11.2	32.1	5.1	2.4	21.9	32.1	42.3	24.5	1.7
-3Mx2Y/+SFR3/+SFR5	-1.000/0.035/1.000	0.14	69	0.15	-7.5	19.1	2.9	2.4	15.5	19.1	22.7	13.1	1.7
-3Mx2Y/+SFR4/+SFR5	-1.000/0.041/1.000	0.15	70	0.16	-7.8	19.8	3.0	2.4	16.0	19.8	23.6	13.7	1.7
-3Mx2Y/+SFR5	-0.948/1.000	0.16	72	0.16	-7.6	19.0	2.8	2.4	15.0	19.0	23.0	13.8	1.7
-3Mx2Y/+3Mx3Y/+SFR5	-1.000/0.074/1.000	0.19	77	0.19	-7.8	19.1	2.8	2.4	14.4	19.1	23.7	14.5	1.6
-SFR2/+SFR3/+SFR5	-1.000/0.338/1.000	0.66	86	0.63	-19.7	47.4	6.1	2.6	30.8	47.4	63.9	39.4	1.6
-SFR2/+SFR4/+SFR5	-1.000/0.401/1.000	0.76	86	0.73	-22.6	53.6	7.0	2.6	34.5	53.6	72.7	45.7	1.6
-3Mx2Y/+REDS/+SFR3	-1.000/1.000/0.105	0.24	85	0.23	-6.7	16.8	2.6	2.4	10.7	16.8	22.9	14.6	1.6
-3Mx2Y/+REDS/+SFR4	-1.000/1.000/0.125	0.28	85	0.26	-7.6	18.7	2.9	2.3	11.9	18.7	25.6	16.5	1.6
+REDS/-SFR2/+SFR3	1.000/-1.000/0.408	0.76	88	0.72	-18.9	45.1	5.8	2.6	26.0	45.1	64.1	41.7	1.5
+REDS/-SFR2/+SFR4	1.000/-1.000/0.485	0.89	88	0.83	-22.4	52.6	6.9	2.6	30.4	52.6	74.7	49.3	1.5
+3Mx1Y/-SFR2/+SFR5	0.364/-1.000/1.000	0.64	87	0.61	-18.5	41.3	5.0	2.7	25.2	41.3	57.4	38.0	1.5
-3Mx2Y/+3Mx5Y/+SFR5	-1.000/0.151/1.000	0.27	86	0.28	-7.8	18.9	2.5	2.4	12.2	18.9	25.6	17.0	1.5

Note:

- We assume a 25bp selloff in the reference leg's swap yield to compute the projected PnL. The assumed reversion to the mean of any mispricing is adjusted by the historical mean reversion time of the weighted spread.
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- REDS, GRNS, BLUE, and GOLD refers to the 1Yx1Y, 2Yx1Y, 3Yx1Y, and 4Yx1Y SOFR swap rates respectively. SFR1 is the constant maturity swap rate proxy for the 3Mx3M SOFR rate, SFR2 proxies the 6Mx3M rate, and so on.

Derivatives Strategy

Carry Efficient Steepener Report

Trade	Wts	6M Fed tightening			3M Carry/Slide			Proj PnL			Wtd Sprd	Return to	3M Carry/Beta	
		Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25			
2s10s	1/	1.00	100	1.00	0.0	-22.2	-16.8	-1.4	2.8	-22.2	-47.2	32.0	0.1	-22.2
-3Mx30Y/-SFR2+SFR3	-0.187/-1.000/1.000	0.17	48	0.15	-9.2	30.3	4.5	2.9	34.6	30.3	26.0	14.9	2.3	175.55
-3Mx1Y/-3Mx10Y/+SFR3	-1.000/-0.115/1.000	0.11	56	0.08	-2.8	14.6	1.4	2.5	17.4	14.6	11.8	9.2	1.9	129.30
-3Mx1Y/-3Mx15Y/+SFR3	-1.000/-0.117/1.000	0.13	61	0.10	-2.9	14.4	1.3	2.5	17.7	14.4	11.2	9.4	1.9	111.84
-3Mx1Y/-3Mx20Y/+SFR3	-1.000/-0.121/1.000	0.14	63	0.11	-2.9	14.4	1.2	2.5	17.9	14.4	11.0	9.5	1.9	105.13
-3Mx1Y/-3Mx30Y/+SFR3	-1.000/-0.127/1.000	0.15	65	0.12	-3.1	14.4	1.2	2.5	18.1	14.4	10.7	9.7	1.9	97.51
-SFR2+SFR3	-0.871/1.000	0.32	48	0.21	-20.9	21.3	-0.3	3.0	29.3	21.3	13.4	16.9	1.7	67.14
-3Mx3Y+REDS/-SFR7	-1.000/1.000/-0.100	0.15	63	0.13	-5.1	11.3	0.5	2.5	15.0	11.3	7.7	9.1	1.7	77.05
-3Mx3Y+REDS/-GRNS	-1.000/1.000/-0.101	0.18	69	0.16	-5.3	11.2	0.1	2.5	15.7	11.2	6.6	9.9	1.6	61.83
-3Mx3Y-SFR4+SFR5	-1.000/-0.083/1.000	0.17	63	0.17	-6.0	12.3	-0.2	2.5	16.6	12.3	8.0	11.0	1.5	71.56
-3Mx3Y+REDS/-BLUE	-1.000/1.000/-0.104	0.22	74	0.21	-5.7	11.1	-0.1	2.5	16.7	11.1	5.6	11.1	1.5	50.09
-3Mx3Y+SFR5	-1.000/0.918	0.19	67	0.18	-5.6	11.6	-0.7	2.5	16.3	11.6	7.0	10.9	1.5	62.32
-3Mx3Y-REDS+SFR5	-1.000/-0.081/1.000	0.19	68	0.18	-5.6	11.6	-0.8	2.6	16.4	11.6	6.8	11.1	1.5	60.47
-3Mx3Y+SFR5-SFR6	-1.000/1.000/-0.083	0.20	70	0.18	-5.5	11.3	-1.1	2.6	16.3	11.3	6.3	11.2	1.5	56.85
-3Mx3Y+SFR5-SFR7	-1.000/1.000/-0.085	0.21	71	0.19	-5.4	11.1	-1.4	2.6	16.4	11.1	5.8	11.6	1.4	52.66
-3Mx3Y-GRNS+SFR5	-1.000/-0.087/1.000	0.24	74	0.21	-5.7	10.9	-1.7	2.6	16.9	10.9	5.0	12.4	1.4	45.91
-3Mx3Y-BLUE+SFR5	-1.000/-0.089/1.000	0.27	78	0.26	-6.0	10.9	-1.9	2.6	17.8	10.9	4.1	13.3	1.3	39.81
-3Mx3Y-3Mx5Y+SFR7	-0.042/-1.000/1.000	0.30	68	0.41	-7.6	10.5	1.3	2.2	17.9	10.5	3.1	16.7	1.1	35.63
-3Mx5Y+SFR7	-1.000/0.960	0.30	70	0.41	-7.3	9.8	1.0	2.3	17.3	9.8	2.3	16.3	1.1	32.76
-3Mx5Y-GRNS+SFR7	-1.000/-0.041/1.000	0.31	71	0.42	-7.4	9.7	0.8	2.3	17.5	9.7	1.9	16.6	1.1	31.16
-3Mx3Y-3Mx5Y+SFR6	-0.066/-1.000/1.000	0.44	84	0.50	-7.6	8.6	-2.3	2.3	19.6	8.6	-2.4	18.7	1.1	19.59
-3Mx5Y-BLUE+SFR7	-1.000/-0.042/1.000	0.33	72	0.44	-7.5	9.7	0.7	2.3	17.9	9.7	1.5	17.2	1.0	29.53
-3Mx5Y-SFR4+SFR6	-1.000/-0.061/1.000	0.42	83	0.49	-7.6	8.4	-1.9	2.3	18.9	8.4	-2.1	18.2	1.0	20.06
-3Mx5Y-REDS+SFR6	-1.000/-0.060/1.000	0.43	85	0.50	-7.3	7.8	-2.4	2.3	18.7	7.8	-3.0	18.1	1.0	18.17
-3Mx5Y+SFR6	-1.000/0.939	0.44	86	0.50	-7.2	7.6	-2.5	2.3	18.6	7.6	-3.3	18.1	1.0	17.43
-3Mx5Y+SFR6-SFR7	-1.000/1.000/-0.063	0.45	86	0.50	-7.2	7.5	-2.8	2.3	18.6	7.5	-3.7	18.3	1.0	16.78
-3Mx5Y-GRNS+SFR6	-1.000/-0.064/1.000	0.47	87	0.52	-7.3	7.4	-3.0	2.3	19.1	7.4	-4.3	18.9	1.0	15.79

Note:

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Derivatives Strategy

Carry Efficient Flatener Report

Trade	Wts	6M Fed tightening			3M Carry/Slide			Proj PnL			Wtd Sprd	Return to	3M Carry/Beta	
		Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25			
2s10s	1/	1.00	100	1.00	0.0	22.2	16.8	1.4	-2.8	22.2	47.2	32.0	1.5	22.2
+GOLD/-SFR2/+SFR3	0.501/-1.000/0.467	0.70	77	0.65	-2.3	50.3	20.0	2.5	32.8	50.3	67.8	29.4	2.3	71.81
-SFR2/+3Mx1Y/+3Mx10Y	-1.000/0.287/0.658	0.81	87	0.73	-3.1	48.5	21.8	2.4	28.1	48.5	68.9	31.6	2.2	59.55
-SFR2/+BLUE/+3Mx3Y	-1.000/0.320/0.576	0.72	73	0.52	-4.5	56.4	24.1	2.3	38.4	56.4	74.5	35.5	2.1	78.17
+SFR5/-3Mx3Y/+3Mx7Y	0.338/-1.000/0.685	0.28	93	0.32	0.0	10.6	4.9	2.1	3.6	10.6	17.7	9.8	1.8	37.66
-3Mx1Y/+GRNS/+SFR3	-1.000/0.808/0.073	0.77	76	0.46	-4.8	48.9	24.7	1.9	29.6	48.9	68.1	37.8	1.8	63.58
+GOLD/-SFR2/+SFR3	0.457/-1.000/0.365	0.84	87	0.74	-12.9	53.9	23.0	2.4	32.8	53.9	74.9	34.3	2.2	63.98
+3Mx1Y/+3Mx20Y/-SFR2	0.372/0.536/-1.000	0.84	93	0.76	-11.1	45.6	20.6	2.4	24.8	45.6	66.5	30.5	2.2	54.67
+3Mx1Y/+3Mx15Y/-SFR2	0.347/0.543/-1.000	0.83	92	0.75	-11.5	46.7	21.2	2.4	25.9	46.7	67.5	31.1	2.2	56.18
+3Mx1Y/+3Mx30Y/-SFR2	0.398/0.536/-1.000	0.84	93	0.78	-10.3	44.5	19.9	2.4	23.4	44.5	65.6	30.5	2.2	52.66
+3Mx1Y/+3Mx10Y/-SFR2	0.295/0.577/-1.000	0.82	89	0.72	-12.2	48.5	21.9	2.4	28.0	48.5	68.9	32.2	2.1	59.29
+3Mx1Y/+GOLD/-SFR2	0.398/0.470/-1.000	0.85	89	0.74	-11.6	47.1	21.7	2.4	25.9	47.1	68.3	32.0	2.1	55.52
+3Mx1Y/+3Mx7Y/-SFR2	0.218/0.635/-1.000	0.79	86	0.66	-13.4	50.6	22.7	2.4	30.8	50.6	70.5	33.3	2.1	63.89
+3Mx15Y/-3Mx30Y/-SFR2	1.000/-0.427/-0.703	0.84	92	0.74	-10.7	44.2	21.5	2.3	23.3	44.2	65.2	31.2	2.1	52.75
+3Mx7Y/-BLUE/-SFR2	1.000/-0.293/-0.853	0.80	87	0.68	-12.7	48.9	22.5	2.3	28.9	48.9	68.9	33.0	2.1	61.11
+3Mx20Y/-3Mx30Y/-SFR2	1.000/-0.435/-0.660	0.85	94	0.78	-9.7	41.7	20.3	2.3	20.5	41.7	62.9	30.2	2.1	49.13
+3Mx10Y/-GOLD/-SFR2	1.000/-0.329/-0.786	0.81	90	0.71	-11.5	46.4	21.6	2.3	26.2	46.4	66.6	32.0	2.1	57.45
+3Mx15Y/-GOLD/-SFR2	1.000/-0.374/-0.702	0.83	94	0.77	-9.7	42.1	20.0	2.3	21.2	42.1	62.9	30.2	2.1	50.44
+3Mx15Y/-3Mx20Y/-SFR2	1.000/-0.425/-0.682	0.85	93	0.76	-10.0	43.0	20.8	2.3	21.8	43.0	64.1	31.0	2.1	50.76
+3Mx15Y/-SFR2	0.572/-0.664	0.85	94	0.77	-9.6	41.9	20.4	2.3	20.6	41.9	63.2	30.6	2.1	49.20
+3Mx7Y/-SFR2	0.656/-0.793	0.80	87	0.67	-12.2	47.8	22.3	2.3	27.7	47.8	67.9	32.9	2.1	59.49
+3Mx10Y/-SFR2	0.603/-0.717	0.83	91	0.73	-10.6	44.5	21.3	2.3	23.7	44.5	65.3	31.7	2.1	53.36
+3Mx20Y/-SFR2	0.567/-0.639	0.86	95	0.79	-9.0	40.4	19.7	2.3	19.0	40.4	61.9	30.1	2.1	47.16
+3Mx10Y/-3Mx30Y/-SFR2	1.000/-0.376/-0.786	0.81	87	0.68	-12.4	48.3	22.9	2.3	28.0	48.3	68.5	33.4	2.1	59.53
+3Mx10Y/-3Mx15Y/-SFR2	1.000/-0.377/-0.752	0.82	89	0.71	-11.3	46.2	21.9	2.3	25.7	46.2	66.8	32.6	2.0	56.20
+3Mx10Y/-3Mx20Y/-SFR2	1.000/-0.374/-0.768	0.82	88	0.69	-11.7	47.2	22.3	2.3	26.7	47.2	67.6	33.1	2.0	57.65
+3Mx30Y/-SFR2	0.569/-0.611	0.87	96	0.80	-8.0	38.7	18.9	2.3	17.0	38.7	60.4	30.0	2.0	44.63

Note:

- We assume a 25bp selloff in the reference leg's swap yield to compute the projected PnL. The assumed reversion to the mean of any mispricing is adjusted by the historical mean reversion time of the weighted spread.
- Beta is calculated by regressing daily changes in the weighted spread against daily changes in the reference leg's yield over the past six months.
- The risk of the weighted spread is calculated as the standard deviation of three month changes in the spread over the past 5 years.
- Fed tightening Beta is calculated by regressing daily changes in the weighted spread against daily changes in the reference leg's yield over the period March 16, 2022 to Sep 16, 2022, which is a Fed tightening period.
- Correlation is calculated by regressing daily changes in the weighted spread against daily changes in the reference leg's yield over the past six months.
- REDS, GRNS, BLUE, and GOLD refers to the 1Yx1Y, 2Yx1Y, 3Yx1Y, and 4Yx1Y SOFR swap rates respectively. SFR1 is the constant maturity swap rate proxy for the 3Mx3M SOFR rate, SFR2 proxies the 6Mx3M rate, and so on.

SOFR Risk-adjusted Carry on Swap Curve Flatteners

Forward curves	3M carry (bp)	Current level	St dev over 5yrs	St dev over Fed pause	Risk Adj Carry*	Risk Adj Carry**	Avg level over last 6 mos	% of time flatter than current level over 6 mos	Mean Reversion (Months)
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Notes:

* 3M carry / st dev of 3M changes over the last 5 yrs.

** 3M carry / st dev of 3M changes from 6/30/2006 - present

SOFR Risk-adjusted Carry Report

Top Ten

Trade	Wts	3M Carry/Slide			Wtd Sprd	Risk Adj
		Current	6M Avg	ZScore		
EUR_U_1Y/+U_REDTS/+E_30Y	-1.000/0.214/1.000	47.63	25.24	2.37	40.13	2.66
EUR_U_1Y/+U_2Y/+E_30Y	-1.000/0.247/1.000	42.35	23.33	2.27	36.84	2.65
EUR_U_1Y/+U_10x2/+E_BLUE	-1.000/0.279/1.000	53.92	30.16	2.29	45.11	2.62
EUR_U_1Y/+E_30Y/+E_BLUE	-1.000/0.321/1.000	52.97	29.13	2.30	46.59	2.62
EUR_U_1Y/+U_30Y/+E_BLUE	-1.000/0.276/1.000	52.82	29.06	2.29	44.20	2.61
EUR_U_1Y/+E_5Y/+E_30Y	-1.000/0.328/1.000	46.89	26.19	2.24	43.29	2.61
EUR_U_1Y/+E_10Y/+E_30Y	-1.000/0.354/1.000	48.04	27.46	2.21	44.93	2.60
EUR_U_1Y/+U_5Y/+E_30Y	-1.000/0.270/1.000	46.28	26.09	2.21	40.82	2.59
XCCY_U_1Y/+C_1Y/+J_1Y/+J_REDTS	-0.900/0.835/1.000/1.000	24.03	20.27	1.56	17.18	2.53
XCCY_U_1Y/+C_1Y/+J_1Y/+J_2Y	-0.815/0.813/1.000/1.000	20.32	17.83	1.39	14.92	2.49

Swap Curves and Butterflies

Trade	Wts	3M Carry/Slide			Wtd Sprd	Risk Adj
		Current	6M Avg	ZScore		
-1Y/+2Y/+3Y/-1x2	-1.000/1.000/0.409/-0.537	18.14	8.45	2.39	12.83	2.13
-1Y/+2Y/+15Y/-5x2	-1.000/0.701/1.000/-0.859	27.11	11.44	2.50	20.77	2.12
-1Y/+2Y	-1.000/0.837	28.49	12.98	2.45	21.93	2.10
-1Y/+5Y	-1.000/0.906	41.89	22.41	2.25	35.17	2.10
-1Y/-3Y/+5Y	-1.000/-0.089/1.000	42.50	22.90	2.24	35.91	2.10
-1Y/-2Y/+5Y	-1.000/-0.087/1.000	43.28	23.39	2.23	36.72	2.09
-1Y/+3Y	-1.000/0.852	35.98	17.76	2.32	29.08	2.09
-1Y/-2Y/+3Y	-1.000/-0.145/1.000	37.28	18.58	2.30	30.37	2.09

USD/EUR Swap Curve

Trade	Wts	3M Carry/Slide			Wtd Sprd	Risk Adj
		Current	6M Avg	ZScore		
-U_1Y/+U_REDTS/+E_30Y	-1.000/0.214/1.000	47.63	25.24	2.37	40.13	2.66
-U_1Y/+U_2Y/+E_30Y	-1.000/0.247/1.000	42.35	23.33	2.27	36.84	2.65
-U_1Y/+U_10x2/+E_BLUE	-1.000/0.279/1.000	53.92	30.16	2.29	45.11	2.62
-U_1Y/+E_30Y/+E_BLUE	-1.000/0.321/1.000	52.97	29.13	2.30	46.59	2.62
-U_1Y/+U_30Y/+E_BLUE	-1.000/0.276/1.000	52.82	29.06	2.29	44.20	2.61
-U_1Y/+E_5Y/+E_30Y	-1.000/0.328/1.000	46.89	26.19	2.24	43.29	2.61
-U_1Y/+E_10Y/+E_30Y	-1.000/0.354/1.000	48.04	27.46	2.21	44.93	2.60
-U_1Y/+U_5Y/+E_30Y	-1.000/0.270/1.000	46.28	26.09	2.21	40.82	2.59

Note:

- Risk adjusted carry is expected return (assuming mean reversion of residual as well as carry/slide) divided by standard deviation.
- This report uses 1 year of history, except for the standard deviation of 3-month changes in the weighted, which is estimated over 5 years of history.
- A "+" indicates long position in yield curve trades, and a spread widening position in spread trades.

Eurodollar Curves and Butterflies

Trade	Wts	3M Carry/Slide			Wtd Sprd	Risk Adj
		Current	6M Avg	ZScore		
+SFR2/-SFR3/+SFR6/-SFR8	0.589/-1.000/1.000/-0.555	38.27	7.99	3.26	6.42	5.97
+SFR2/-SFR3/+SFR4/-SFR5	0.363/-1.000/1.000/-0.344	9.32	3.09	1.39	2.01	4.64
+SFR2/-SFR3/+SFR6/-SFR9	0.462/-1.000/1.000/-0.478	43.48	8.34	3.98	9.51	4.58
+SFR2/-SFR3/+SFR5/-SFR7	0.361/-1.000/1.000/-0.424	30.94	7.21	4.23	7.94	3.91
+SFR2/-SFR3/+SFR6/-SFR10	0.387/-1.000/1.000/-0.434	46.69	8.54	3.80	12.22	3.83
+SFR2/-SFR3/+SFR5/-SFR6	0.650/-1.000/1.000/-0.578	21.89	6.00	1.26	5.86	3.73
+SFR2/-SFR3/+SFR6/-SFR11	0.337/-1.000/1.000/-0.402	48.96	8.94	3.61	14.24	3.45
-SFR4/+SFR6/+SFR7/-SFR8	-0.764/1.000/0.752/-1.000	33.44	4.61	3.23	9.91	3.37

Swap Spread Curves

Trade	Wts	3M Carry/Slide			Wtd Sprd	Risk Adj
		Current	6M Avg	ZScore		

USD/CAD/JPY Swap Curve

Trade	Wts	3M Carry/Slide			Wtd Sprd	Risk Adj
		Current	6M Avg	ZScore		
-U_1Y/+C_1Y/+J_1Y/+J_REDTS	-0.900/0.835/1.000/1.000	24.03	20.27	1.56	17.18	2.53
-U_1Y/+C_1Y/+J_1Y/+J_2Y	-0.815/0.813/1.000/1.000	20.32	17.83	1.39	14.92	2.49
-U_1Y/+C_1Y/+J_1Y/+J_10Y	-0.836/0.642/1.000/1.000	26.69	20.59	1.87	18.98	2.48
-U_1Y/+C_1Y/+J_1Y/+J_5Y	-0.830/0.715/1.000/1.000	23.38	18.91	1.65	17.45	2.45
-U_1Y/+U_REDTS/+C_2Y/-C_REDTS	-1.000/0.569/1.000/-0.722	40.85	17.68	2.48	22.44	2.41
-U_1Y/+U_2Y/+C_1Y/+J_REDTS	-1.000/0.288/0.540/1.000	26.64	16.98	2.11	18.93	2.40
-U_1Y/+C_1Y/+J_2Y/+J_REDTS	-0.985/0.858/1.000/1.000	25.61	20.41	1.59	20.00	2.39
-U_2Y/+U_REDTS/+C_2Y/+J_1Y	-1.000/0.430/0.512/1.000	19.16	12.83	2.62	15.15	2.37

Derivatives Strategy

SOFR Swap Curves and Butterflies Risk-adjusted Carry Report

Trade	Wts	3M Carry/Slide			Mispricing	Wtd Sprd	Risk Adj	Std Dev	Carry	2y beta	beta
		Current	6M Avg	ZScore							
-1Y/+7Y/+10Y/-3x2	-0.404/1.000/0.331/-1.000	10.098	1.783	0.414	-5.510	4.873	2.072	0.005	0.000		
-1Y/+2Y/+3Y/-1x2	-1.000/1.000/0.409/-0.537	18.136	3.625	0.499	-9.168	8.763	2.070	0.025	0.000		
-1Y/+7Y/+10Y/-2x5	-0.386/1.000/0.315/-1.000	9.424	1.637	0.584	-5.241	4.794	1.966	0.013	0.000		
-1Y/+5Y/+7Y/-BLUE	-0.611/1.000/0.483/-1.000	16.108	3.582	0.517	-9.117	8.218	1.960	0.024	0.000		
-1Y/+7Y/-BLUE/+1x5	-0.239/0.145/-1.000/1.000	9.728	-0.006	0.297	-5.656	5.012	1.941	0.017	0.000		
-1Y/+2Y/+3Y/-GRNS	-1.000/0.329/1.000/-0.507	23.778	3.092	0.558	-12.865	12.279	1.936	0.037	0.000		
-1Y/+7Y/-3x2/+2x5	-0.359/1.000/-1.000/0.291	9.911	2.019	0.434	-5.642	5.149	1.925	0.003	0.000		
-1Y/+3Y/+5Y/-2x2	-1.000/1.000/0.623/-0.812	25.886	4.480	0.564	-14.553	13.807	1.875	0.038	0.000		
-1Y/+2Y/-BLUE/+1x5	-1.000/0.735/-0.964/1.000	29.864	2.300	0.462	-17.274	16.013	1.865	0.040	0.000		
-1Y/+12Y/+15Y/-3x5	-0.243/1.000/0.211/-1.000	5.890	0.721	0.485	-3.820	3.167	1.860	0.004	0.000		
-1Y/+2Y/-3x2/+2x5	-1.000/0.897/-1.000/0.925	26.595	3.237	0.458	-15.198	14.311	1.858	0.022	0.000		
-1Y/+2Y/+7Y/-3x2	-1.000/0.587/1.000/-0.771	26.726	4.014	0.503	-15.344	14.500	1.843	0.026	0.000		
-1Y/+5Y/-BLUE/+1x5	-0.587/1.000/-1.000/0.446	18.364	3.315	0.520	-10.861	10.006	1.835	0.026	0.000		
-1Y/+2Y/-5Y/-2x2	-1.000/1.000/-0.158/-0.020	25.649	2.651	0.502	-14.581	14.062	1.824	0.031	0.000		
-1Y/+12Y/+GOLD/-3x5	-0.221/1.000/0.184/-1.000	5.896	1.086	0.563	-3.882	3.240	1.820	0.009	0.000		
-1Y/+2Y/-5Y/-1x5	-1.000/1.000/-0.162/-0.015	25.713	2.716	0.504	-14.650	14.165	1.815	0.031	0.000		
-1Y/+3Y/-GRNS/+1x2	-1.000/0.769/-1.000/0.966	33.708	0.700	0.561	-19.479	18.577	1.814	0.054	0.000		
-1Y/+10Y/+15Y/-3x5	-0.330/1.000/0.275/-1.000	9.329	1.817	0.544	-5.939	5.158	1.809	0.011	0.000		
-1Y/+5Y/+10Y/-3x2	-0.664/1.000/0.541/-1.000	19.280	4.169	0.529	-11.417	10.668	1.807	0.015	0.000		
-1Y/+2Y/-GRNS/+1x2	-1.000/0.505/-0.771/1.000	33.928	-0.237	0.524	-19.689	18.785	1.806	0.052	0.000		
-1Y/+2Y/+5Y/-BLUE	-1.000/0.465/1.000/-0.658	27.367	4.873	0.536	-15.915	15.158	1.805	0.035	0.000		
-1Y/+3Y/+REDS/-1x2	-0.952/0.697/1.000/-1.000	32.256	-1.186	0.478	-18.794	17.948	1.797	0.050	0.000		
-1Y/+2Y/+7Y/-2x5	-1.000/0.597/1.000/-0.782	26.519	3.957	0.548	-15.308	14.854	1.785	0.033	0.000		
-1Y/+2Y/+REDS/-1x2	-1.000/0.336/1.000/-0.631	37.087	-2.687	0.455	-21.924	20.932	1.772	0.057	0.000		
-1Y/+10Y/+12Y/-3x5	-0.354/1.000/0.292/-1.000	10.350	2.182	0.552	-6.525	5.858	1.767	0.012	0.000		
-1Y/+10Y/+12Y/-GOLD	-0.314/1.000/0.282/-1.000	7.889	0.782	0.322	-4.357	4.467	1.766	-0.012	0.000		
-1Y/+2Y/+10Y/-3x5	-1.000/0.635/1.000/-0.816	27.696	4.326	0.535	-16.490	15.735	1.760	0.033	0.000		
-1Y/+2Y/-3Y/+REDS	-1.000/0.945/-1.000/0.750	38.441	-3.691	0.432	-22.872	21.843	1.760	0.057	0.000		
-1Y/+2Y	-1.000/0.837	28.486	4.859	0.553	-17.615	16.246	1.753	0.043	0.000		
-1Y/+2Y/+3Y/-2x2	-1.000/0.181/1.000/-0.367	27.962	4.751	0.555	-16.395	15.949	1.753	0.032	0.000		
-1Y/+2Y/+15Y/-5x2	-1.000/0.701/1.000/-0.859	27.114	3.413	0.553	-16.796	15.530	1.746	0.029	0.000		
-1Y/+3Y/+7Y/-BLUE	-1.000/1.000/0.430/-0.626	29.367	5.843	0.546	-17.555	16.835	1.744	0.032	0.000		

Note:

- We assume a 25bp selloff in 3Mx2Y swap yields to compute the projected PnL. The assumed reversion to the mean of any mispricing is adjusted by the historical mean reversion time of the weighted spread.
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Derivatives Strategy

SOFR Swap Curves and Butterflies Risk-adjusted Carry Report

Trade	Wts	3M Carry/Slide			Mispricing	Wtd Sprd	Risk Adj	Std Dev	Carry	2y beta	beta
		Current	6M Avg	ZScore							
-1Y/+REDS/-GRNS/+1x2	-1.000/0.511/-0.867/1.000	44.137	-3.342	0.502	-26.539	25.325	1.743	0.069	0.000		
-1Y/+2Y/-7Y/+BLUE	-1.000/1.000/-0.352/0.175	26.824	3.103	0.523	-15.597	15.407	1.741	0.031	0.000		
-1Y/+3Y/+REDS/-GRNS	-1.000/0.028/1.000/-0.380	43.601	-4.058	0.471	-26.247	25.053	1.740	0.068	0.000		
-1Y/+2Y/+REDS/-GRNS	-1.000/0.019/1.000/-0.371	43.596	-4.089	0.470	-26.246	25.051	1.740	0.068	0.000		
-1Y/+3Y/-BLUE/+1x5	-1.000/0.921/-1.000/0.847	33.312	5.131	0.525	-20.222	19.231	1.732	0.038	0.000		
-1Y/+2Y/-10Y/+GOLD	-1.000/1.000/-0.428/0.242	26.666	3.261	0.532	-15.463	15.417	1.730	0.037	0.000		
-1Y/+2Y/-12Y/+3x5	-1.000/1.000/-0.541/0.357	26.880	3.310	0.523	-15.415	15.546	1.729	0.033	0.000		
-1Y/+7Y/+BLUE/-3x2	-0.402/1.000/0.328/-1.000	12.096	2.596	0.519	-7.227	7.009	1.726	0.004	0.000		
-1Y/+2Y/+20Y/-5x5	-1.000/0.710/1.000/-0.857	27.381	3.358	0.552	-17.352	15.926	1.719	0.017	0.000		
+3Y/-5Y/-BLUE/+1x5	0.325/-1.000/-0.365/1.000	3.923	-1.601	0.005	-2.530	2.284	1.718	0.005	0.000		
-3Y/-15Y/+25Y/+REDS	-1.000/-0.979/1.000/0.887	12.357	-9.790	0.051	-8.274	7.203	1.715	0.006	0.000		
-1Y/+5Y/+1x2/-2x2	-0.901/0.638/1.000/-1.000	35.669	1.753	0.538	-21.768	20.831	1.712	0.048	0.000		
-1Y/+5Y/+10Y/-2x5	-0.646/1.000/0.525/-1.000	18.606	4.023	0.609	-11.148	10.867	1.712	0.024	0.000		
-1Y/+10Y/-GOLD/+3x2	-0.298/1.000/-1.000/0.263	8.658	1.345	0.428	-5.089	5.061	1.711	-0.008	0.000		
-1Y/+2Y/+30Y/-10x2	-1.000/0.700/1.000/-0.824	28.356	4.022	0.554	-17.358	16.577	1.711	0.024	0.000		
-1Y/+7Y/+12Y/-GOLD	-0.531/1.000/0.448/-1.000	16.015	3.071	0.494	-9.651	9.369	1.709	-0.004	0.000		
-1Y/+10Y/-3x2/+1x5	-0.370/0.264/-1.000/1.000	15.866	1.397	0.463	-9.880	9.284	1.709	0.010	0.000		
-1Y/-12Y/+30Y/+REDS	-1.000/-1.000/0.711/0.991	46.623	-3.815	0.476	-29.533	27.300	1.708	0.042	0.000		
-1Y/+2Y/-3x2/+1x5	-1.000/0.608/-0.831/1.000	33.192	3.685	0.508	-20.062	19.438	1.708	0.032	0.000		
-3Y/-7Y/+30Y/+REDS	-1.000/-0.528/0.405/1.000	13.801	-10.958	0.029	-8.833	8.086	1.707	0.018	0.000		
-1Y/+3Y/+10Y/-3x2	-1.000/1.000/0.423/-0.607	30.200	5.894	0.544	-18.268	17.715	1.705	0.024	0.000		
-1Y/+2Y/+10x2/-10x5	-1.000/0.881/0.915/-1.000	27.918	4.458	0.517	-15.809	16.404	1.702	0.032	0.000		
-1Y/+10Y/-GOLD/+2x5	-0.302/1.000/-1.000/0.267	8.833	1.382	0.384	-5.162	5.192	1.701	-0.011	0.000		
-1Y/+2Y/+10Y/-12Y	-1.000/0.832/0.980/-1.000	27.943	4.199	0.538	-16.299	16.425	1.701	0.035	0.000		
-1Y/+2Y/+7Y/-GOLD	-1.000/0.495/1.000/-0.674	29.134	5.020	0.530	-17.355	17.132	1.701	0.020	0.000		
-3Y/-5Y/+30Y/+REDS	-1.000/-0.374/0.233/1.000	14.374	-10.460	0.045	-9.093	8.470	1.697	0.023	0.000		
-3Y/-7Y/+10Y/+REDS	-1.000/-1.000/0.878/0.970	14.301	-9.723	0.050	-8.884	8.431	1.696	0.031	0.000		
-1Y/+2Y/+12Y/-15Y	-1.000/0.834/0.972/-1.000	28.109	4.424	0.537	-16.251	16.583	1.695	0.035	0.000		
-1Y/+2Y/+12Y/-5x2	-1.000/0.637/1.000/-0.808	28.362	4.428	0.564	-17.435	16.738	1.694	0.033	0.000		
-3Y/-15Y/+20Y/+REDS	-1.000/-0.959/1.000/0.847	12.399	-8.795	0.080	-8.200	7.325	1.693	0.016	0.000		
-1Y/-10Y/+30Y/+REDS	-1.000/-0.776/0.460/1.000	46.999	-3.636	0.477	-29.718	27.791	1.691	0.046	0.000		
-1Y/-3Y/+REDS/-2x2	-1.000/-0.115/1.000/-0.241	46.327	-3.137	0.475	-28.563	27.398	1.691	0.064	0.000		
-1Y/-12Y/+25Y/+REDS	-1.000/-1.000/0.717/0.974	46.647	-3.429	0.481	-29.731	27.594	1.690	0.044	0.000		

Note:

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Derivatives Strategy

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Trade	Wts	3M Carry/Slide			Mispricing	Wtd Sprd	Risk Adj		
		Current	6M Avg	ZScore			Std Dev	Carry	2y beta
-1Y/+5Y/+7Y/-3x2	-0.817/1.000/0.659/-1.000	25.063	5.791	0.557	-15.169	14.833	1.690	0.020	0.000
-3Y/-12Y/+30Y/+REDS	-1.000/-1.000/0.946/0.975	12.678	-11.531	0.019	-8.401	7.508	1.689	0.002	0.000
-1Y/+2Y/+30Y/-10x5	-1.000/0.700/1.000/-0.842	28.933	4.680	0.545	-17.323	17.135	1.689	0.023	0.000
-3Y/-7Y/+25Y/+REDS	-1.000/-0.555/0.425/1.000	13.888	-10.889	0.031	-8.998	8.231	1.687	0.019	0.000
-1Y/-2Y/+REDS/-2x2	-1.000/-0.089/1.000/-0.268	46.655	-2.885	0.480	-28.827	27.663	1.687	0.064	0.000
-1Y/+2Y/+25Y/-30Y	-1.000/0.871/0.921/-1.000	27.694	4.078	0.534	-16.342	16.426	1.686	0.039	0.000
-1Y/-10Y/+25Y/+REDS	-1.000/-0.827/0.504/1.000	47.061	-3.597	0.478	-29.903	27.916	1.686	0.048	0.000
-1Y/+2Y/-25Y/+5x5	-1.000/1.000/-0.829/0.596	27.527	4.341	0.517	-14.875	16.334	1.685	0.053	0.000
-3Y/-7Y/+REDS/+5x5	-1.000/-0.438/1.000/0.280	14.798	-10.037	0.051	-9.106	8.785	1.684	0.030	0.000
-3Y/-5Y/+25Y/+REDS	-1.000/-0.385/0.240/1.000	14.439	-10.407	0.047	-9.193	8.578	1.683	0.024	0.000
-1Y/+3Y/+10Y/-2x5	-1.000/1.000/0.490/-0.675	29.834	5.765	0.573	-18.074	17.725	1.683	0.030	0.000
-1Y/+7Y/+10Y/-GOLD	-0.575/1.000/0.481/-1.000	17.784	3.624	0.508	-10.736	10.572	1.682	-0.001	0.000
-1Y/+2Y/-7Y/+1x5	-1.000/0.991/-1.000/0.799	31.443	2.721	0.516	-18.889	18.694	1.682	0.037	0.000
-1Y/+2Y/+5Y/-3x2	-1.000/0.379/1.000/-0.567	29.640	5.801	0.557	-17.819	17.626	1.682	0.029	0.000
-3Y/-12Y/+REDS/+5x5	-1.000/-0.740/1.000/0.577	15.157	-9.787	0.062	-9.163	9.020	1.680	0.032	0.000
-3Y/-7Y/+12Y/+REDS	-1.000/-0.851/0.698/1.000	14.460	-10.274	0.041	-9.051	8.611	1.679	0.029	0.000
-3Y/-15Y/+REDS/+5x5	-1.000/-0.930/1.000/0.757	15.689	-9.285	0.070	-9.171	9.357	1.677	0.034	0.000
-1Y/-10Y/+20Y/+REDS	-1.000/-0.927/0.596/1.000	47.180	-3.489	0.480	-29.978	28.142	1.677	0.051	0.000
-1Y/+2Y/+20Y/-25Y	-1.000/0.859/0.929/-1.000	27.950	4.351	0.540	-16.176	16.672	1.676	0.044	0.000
-3Y/-10Y/+REDS/+5x5	-1.000/-0.613/1.000/0.453	14.917	-9.976	0.057	-9.141	8.902	1.676	0.030	0.000
-3Y/-5Y/+10Y/+REDS	-1.000/-0.543/0.381/1.000	14.940	-9.913	0.058	-9.292	8.918	1.675	0.032	0.000
-3Y/-7Y/+20Y/+REDS	-1.000/-0.602/0.463/1.000	14.037	-10.740	0.036	-9.061	8.381	1.675	0.023	0.000
-3Y/-5Y/+REDS/+5x5	-1.000/-0.335/1.000/0.174	14.931	-9.935	0.058	-9.234	8.915	1.675	0.031	0.000
-1Y/-15Y/+25Y/+REDS	-1.000/-1.000/0.783/0.912	46.294	-2.295	0.493	-29.349	27.641	1.675	0.043	0.000
-3Y/-5Y/+20Y/+REDS	-1.000/-0.402/0.251/1.000	14.545	-10.308	0.050	-9.236	8.689	1.674	0.027	0.000
-1Y/-7Y/+30Y/+REDS	-1.000/-0.485/0.143/1.000	47.626	-2.985	0.481	-29.886	28.469	1.673	0.057	0.000
-12Y/-15Y/+REDS/+5x5	-1.000/-0.414/0.354/1.000	4.762	-3.930	-0.119	-2.136	2.847	1.673	0.012	0.000
-3Y/-10Y/+30Y/+REDS	-1.000/-0.846/0.751/1.000	13.117	-11.663	0.018	-8.650	7.842	1.673	0.006	0.000
-3Y/-5Y/+12Y/+REDS	-1.000/-0.479/0.319/1.000	14.834	-10.004	0.056	-9.265	8.880	1.671	0.030	0.000
-5Y/-7Y/+REDS/+3x5	-1.000/-1.000/0.930/0.930	12.846	-10.617	-0.018	-7.558	7.690	1.670	0.023	0.000
-1Y/-7Y/+25Y/+REDS	-1.000/-0.494/0.150/1.000	47.657	-2.965	0.481	-29.944	28.533	1.670	0.058	0.000
-1Y/-3Y/+REDS/-BLUE	-1.000/-0.184/1.000/-0.175	47.616	-2.546	0.481	-29.673	28.525	1.669	0.063	0.000
-3Y/-12Y/+25Y/+REDS	-1.000/-1.000/0.954/0.951	12.710	-10.973	0.032	-8.665	7.617	1.669	0.007	0.000

Note:

- We assume a 25bp selloff in 3Mx2Y swap yields to compute the projected PnL. The assumed reversion to the mean of any mispricing is adjusted by the historical mean reversion time of the weighted spread.
- Beta is calculated by regressing daily changes in the weighted spread against daily changes in the 3Mx2Y yield over the past six months.
- The risk of the weighted spread is calculated as the standard deviation of three month changes in the spread over the past 5 years.
- Fed tightening Beta is calculated by regressing daily changes in the weighted spread against daily changes in the 3Mx2Y yield over the period March 16, 2022 to Sep 16, 2022, which is a Fed tightening period.
- Correlation is calculated by regressing daily changes in the weighted spread against daily changes in the 3Mx2Y yield over the past six months.
- REDS, GRNS, BLUE, and GOLD refers to the 1Yx1Y, 2Yx1Y, 3Yx1Y, and 4Yx1Y SOFR swap rates respectively. SFR1 is the constant maturity swap rate proxy for the 3Mx3M SOFR rate, SFR2 proxies the 6Mx3M rate, and so on.

Derivatives Strategy

SOFR Swap Curves and Butterflies Risk-adjusted Carry Report

Trade	Wts	3M Carry/Slide			Mispricing	Wtd Sprd	Risk Adj		
		Current	6M Avg	ZScore			Std Dev	Carry	2y beta
-1Y/+2Y/+3Y/-5Y	-1.000/0.330/1.000/-0.514	29.675	4.984	0.548	-17.916	17.784	1.669	0.028	0.000
-1Y/-12Y/+20Y/+REDS	-1.000/-1.000/0.731/0.947	46.678	-2.763	0.489	-29.683	27.981	1.668	0.050	0.000
-1Y/+2Y/+25Y/-10x2	-1.000/0.674/1.000/-0.819	28.952	4.480	0.560	-18.021	17.359	1.668	0.029	0.000
-1Y/-15Y/+REDS/+10x5	-1.000/-0.793/1.000/0.446	47.539	-3.073	0.482	-29.795	28.504	1.668	0.055	0.000
-1Y/+2Y/-GOLD/+2x5	-1.000/0.768/-0.939/1.000	29.970	4.641	0.498	-18.003	17.970	1.668	0.013	0.000
-1Y/-7Y/+20Y/+REDS	-1.000/-0.511/0.164/1.000	47.710	-2.911	0.482	-29.966	28.612	1.668	0.059	0.000
-1Y/-12Y/+REDS/+10x5	-1.000/-0.668/1.000/0.324	47.432	-3.199	0.482	-29.858	28.447	1.667	0.055	0.000
-1Y/+3Y/+5Y/-BLUE	-1.000/1.000/0.206/-0.400	30.663	6.334	0.563	-18.677	18.394	1.667	0.031	0.000
-1Y/+2Y/+3Y/-BLUE	-1.000/0.094/1.000/-0.285	30.381	5.957	0.559	-18.459	18.229	1.667	0.031	0.000
-3Y/-7Y/+REDS/+5x2	-1.000/-0.475/1.000/0.310	15.178	-9.766	0.065	-9.347	9.109	1.666	0.031	0.000
-3Y/-5Y/+15Y/+REDS	-1.000/-0.434/0.277/1.000	14.706	-10.138	0.054	-9.253	8.828	1.666	0.029	0.000
-3Y/-7Y/+15Y/+REDS	-1.000/-0.695/0.546/1.000	14.275	-10.480	0.040	-9.067	8.570	1.666	0.028	0.000
-1Y/-10Y/+REDS/+10x5	-1.000/-0.576/1.000/0.231	47.471	-3.151	0.482	-29.890	28.514	1.665	0.055	0.000
-1Y/+2Y/-12Y/+GOLD	-1.000/1.000/-0.615/0.420	27.490	3.832	0.552	-16.054	16.513	1.665	0.043	0.000
-1Y/-7Y/+REDS/+10x5	-1.000/-0.437/1.000/0.087	47.744	-2.871	0.482	-29.935	28.691	1.664	0.059	0.000
-1Y/-12Y/+REDS/+10x2	-1.000/-0.668/1.000/0.317	47.656	-2.946	0.480	-29.846	28.639	1.664	0.055	0.000
-1Y/-7Y/+15Y/+REDS	-1.000/-0.544/0.193/1.000	47.794	-2.817	0.483	-29.969	28.729	1.664	0.061	0.000
-1Y/-7Y/+10Y/+REDS	-1.000/-0.704/0.351/1.000	47.910	-2.695	0.483	-29.962	28.799	1.664	0.062	0.000
-3Y/-5Y/+REDS/+10x2	-1.000/-0.313/1.000/0.156	14.605	-10.196	0.046	-9.133	8.782	1.663	0.027	0.000
-1Y/-7Y/+12Y/+REDS	-1.000/-0.599/0.247/1.000	47.859	-2.747	0.483	-29.963	28.784	1.663	0.061	0.000
-1Y/-10Y/+REDS/+10x2	-1.000/-0.576/1.000/0.226	47.631	-2.970	0.481	-29.882	28.651	1.662	0.055	0.000
-1Y/-7Y/+REDS/+10x2	-1.000/-0.437/1.000/0.086	47.804	-2.802	0.482	-29.931	28.757	1.662	0.059	0.000
-1Y/-5Y/+REDS/-2x2	-1.000/-0.308/1.000/-0.048	47.682	-2.739	0.481	-29.738	28.691	1.662	0.062	0.000
-1Y/-15Y/+REDS/+10x2	-1.000/-0.792/1.000/0.437	47.847	-2.727	0.479	-29.779	28.801	1.661	0.053	0.000
-3Y/-5Y/+REDS/+10x5	-1.000/-0.313/1.000/0.159	14.495	-10.321	0.049	-9.139	8.727	1.661	0.027	0.000
-1Y/-7Y/+REDS/+5x5	-1.000/-0.453/1.000/0.099	47.979	-2.662	0.483	-29.982	28.901	1.660	0.062	0.000
-2Y/+5Y/-BLUE/+1x5	-0.303/0.251/-1.000/1.000	4.213	-0.240	0.044	-2.681	2.538	1.660	0.009	0.000
-5Y/-15Y/+25Y/+1x2	-1.000/-0.801/1.000/0.792	7.954	-4.268	0.214	-6.264	4.792	1.660	-0.019	0.000
-1Y/+5Y/-3x2/+2x5	-0.590/1.000/-1.000/0.476	18.974	4.543	0.543	-11.634	11.431	1.660	0.012	0.000
-1Y/+2Y/+1x5/-2x5	-1.000/0.620/1.000/-0.843	32.968	3.593	0.548	-20.023	19.872	1.659	0.039	0.000
-3Y/-12Y/+20Y/+REDS	-1.000/-1.000/0.972/0.915	12.751	-10.083	0.054	-8.601	7.691	1.658	0.015	0.000

Note:

- We assume a 25bp sell-off in 3Mx2Y swap yields to compute the projected PnL. The assumed reversion to the mean of any mispricing is adjusted by the historical mean reversion time of the weighted spread.
- Beta is calculated by regressing daily changes in the weighted spread against daily changes in the 3Mx2Y yield over the past six months.
- The risk of the weighted spread is calculated as the standard deviation of three month changes in the spread over the past 5 years.
- Fed tightening Beta is calculated by regressing daily changes in the weighted spread against daily changes in the 3Mx2Y yield over the period March 16, 2022 to Sep 16, 2022, which is a Fed tightening period.
- Correlation is calculated by regressing daily changes in the weighted spread against daily changes in the 3Mx2Y yield over the past six months.
- REDS, GRNS, BLUE, and GOLD refers to the 1Yx1Y, 2Yx1Y, 3Yx1Y, and 4Yx1Y SOFR swap rates respectively. SFR1 is the constant maturity swap rate proxy for the 3Mx3M SOFR rate, SFR2 proxies the 6Mx3M rate, and so on.

US Fixed Income Derivatives Strategy

SOFR Implied and delivered directionality report - USD

		Directionality*: %						Weighted curve**; bp			3M regression stats***			
Trades	Implied vol; bp/day	Implied		Deliv	(Imp - Deliv)	Implied weights; %		Short	Long	3M fwd	Spot	3M Carry	Beta	Rsq
	Short	Long	Current	3M Lagged	Levels	Levels	Short	Long	3M fwd	Spot	3M Carry			
1s/3s	7.87	7.95	1 %	22 %	-0 %	-0 %	100 %	99 %	-37		34	-24 %	88 %	
1s/5s	7.87	7.34	-7 %	20 %	-46 %	-46 %	100 %	107 %	-13		40	-39 %	83 %	
1s/10s	7.87	6.48	-21 %	13 %	-81 %	-81 %	100 %	121 %	44		45	-60 %	72 %	
1s/30s	7.87	6.48	-35 %	1 %	-124 %	-124 %	100 %	135 %	86		47	-89 %	57 %	
2s/5s	7.87	7.34	-10 %	-1 %	-34 %	-34 %	100 %	110 %	23		16	-24 %	81 %	
2s/7s	8.09	7.34	-10 %	-1 %	-50 %	-50 %	100 %	116 %	45		19	-34 %	74 %	
2s/10s	8.09	6.48	-16 %	-5 %	-66 %	-66 %	100 %	125 %	81		21	-42 %	65 %	
2s/20s	8.09	6.48	-25 %	-10 %	-94 %	-94 %	100 %	132 %	121		23	-62 %	56 %	
2s/30s	8.09	6.48	-39 %	-26 %	-106 %	-106 %	100 %	139 %	124		23	-68 %	49 %	
3s/5s	8.09	7.34	-8 %	-2 %	-20 %	-20 %	100 %	108 %	24		7	-12 %	72 %	
3s/7s	7.95	6.98	-14 %	-6 %	-34 %	-34 %	100 %	114 %	46		10	-20 %	67 %	
3s/10s	7.95	6.48	-23 %	-12 %	-49 %	-49 %	100 %	123 %	82		12	-26 %	55 %	
3s/20s	7.95	6.11	-30 %	-20 %	-74 %	-74 %	100 %	130 %	121		14	-44 %	49 %	
3s/30s	7.95	5.83	-36 %	-27 %	-85 %	-85 %	100 %	136 %	124		14	-49 %	41 %	
5s/10s	7.95	6.48	-13 %	-9 %	-25 %	-25 %	100 %	113 %	53		5	-12 %	46 %	
5s/20s	7.34	6.11	-20 %	-17 %	-46 %	-46 %	100 %	120 %	90		6	-26 %	45 %	
5s/30s	7.34	5.83	-26 %	-24 %	-56 %	-56 %	100 %	126 %	92		6	-30 %	36 %	
10s/30s	7.34	5.83	-11 %	-14 %	-27 %	-27 %	100 %	111 %	34		2	-16 %	39 %	
TU/FV	8.84	7.00	-26 %	6 %	-23 %	-23 %	100 %	126 %				3 %	8 %	
TU/TY	8.84	7.41	-19 %	-0 %	-41 %	-41 %	100 %	119 %				-22 %	54 %	
FV/TY	7.00	7.41	5 %	-7 %	-15 %	-15 %	100 %	95 %				-20 %	86 %	
Fronts/reds							100 %							
Fronts/greens							100 %							
Fronts/blues							100 %							
Reds/greens							100 %							
Reds/blues							100 %							
Greens/blues							100 %							

* Implied directionality is defined as: (1 - (Implied vol on short maturity/Implied vol on long maturity)). We use 3M expiry swaptions and front futures options (rolled 20D before option expiry).

Delivered directionality is defined as: (1 - 3M beta obtained from regressing short maturity yields to long maturity yields). For swaps, we use 3M forward swap curve for the calculation of delivered directionality and regression stats. For futures, we use the futures yield.

** Curve weighted by the implied weights listed in the adjacent column.

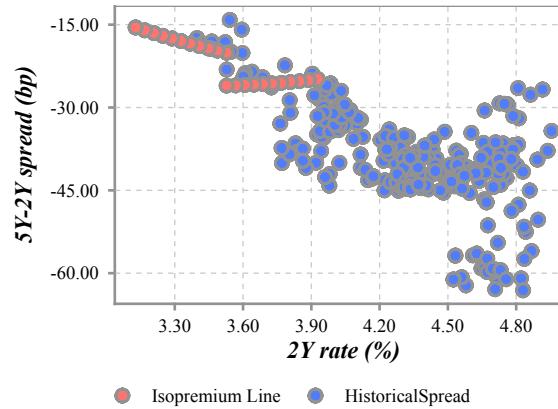
*** 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields.

Derivatives Strategy

USD Swaption Conditional Curve Report (3M Expiry)

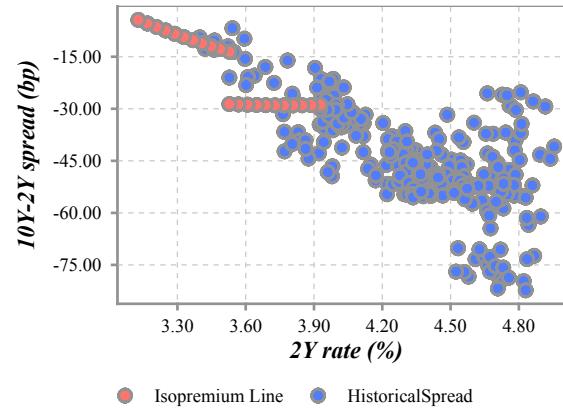
3Mx(2s/5s) Isopremium Line

Conditional Directionality: 3 % (pay), -11 % (rec), Lost Carry: -3.0 (bp)
Historical beta(R2): 1M -22 % (71 %) 3M -24 % (80 %) 1Y -15 % (16 %)
3Mx2Y vol: 8.17 bp/day, 3Mx5Y vol 7.69 bp/day



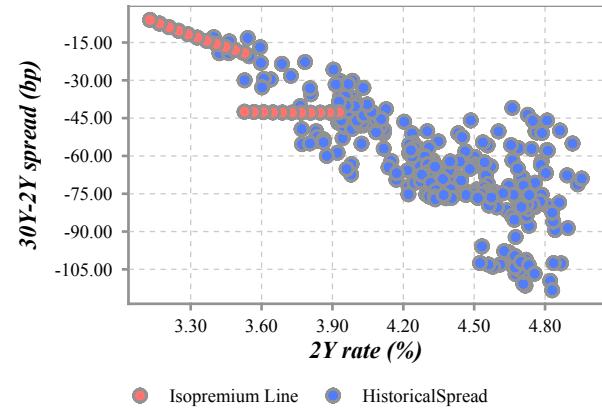
3Mx(2s/10s) Isopremium Line

Conditional Directionality: -1 % (pay), -23 % (rec), Lost Carry: -7.5 (bp)
Historical beta(R2): 1M -31 % (70 %) 3M -40 % (86 %) 1Y -26 % (27 %)
3Mx2Y vol: 8.17 bp/day, 3Mx10Y vol 6.89 bp/day



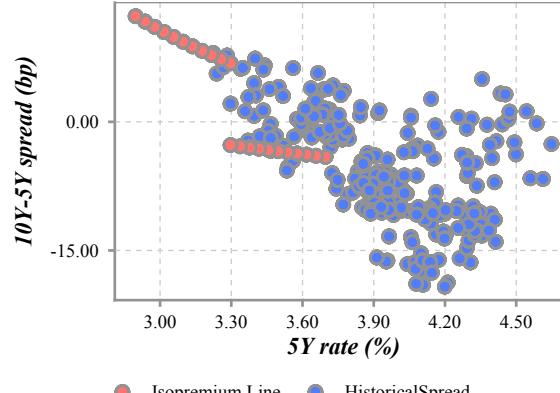
3Mx(2s/30s) Isopremium Line

Conditional Directionality: -1 % (pay), -33 % (rec), Lost Carry: -11.6 (bp)
Historical beta(R2): 1M -38 % (72 %) 3M -56 % (88 %) 1Y -41 % (45 %)
3Mx5Y vol: 8.17 bp/day, 3Mx10Y vol 6.23 bp/day



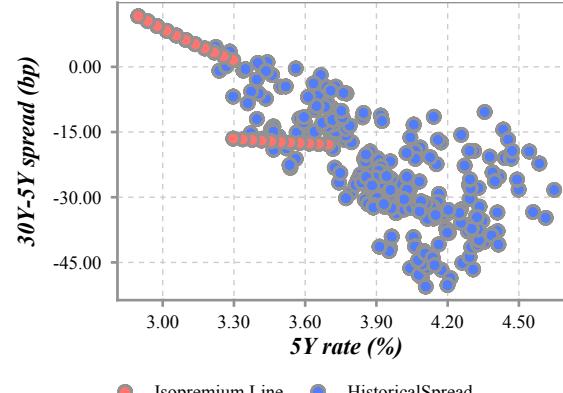
3Mx(5s/10s) Isopremium Line

Conditional Directionality: -3 % (pay), -14 % (rec), Lost Carry: -4.8 (bp)
Historical beta(R2): 1M -11 % (49 %) 3M -21 % (82 %) 1Y -10 % (21 %)
3Mx5Y vol: 7.69 bp/day, 3Mx10Y vol 6.89 bp/day



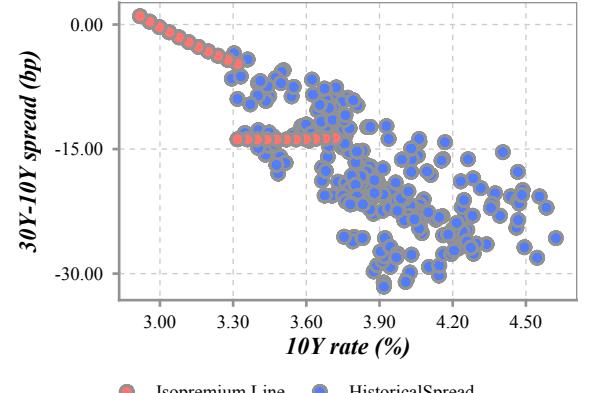
3Mx(5s/30s) Isopremium Line

Conditional Directionality: -3 % (pay), -25 % (rec), Lost Carry: -9.0 (bp)
Historical beta(R2): 1M -19 % (53 %) 3M -41 % (84 %) 1Y -26 % (41 %)
3Mx5Y vol: 7.69 bp/day, 3Mx30Y vol 6.23 bp/day



3Mx(10s/30s) Isopremium Line

Conditional Directionality: 0 % (pay), -14 % (rec), Lost Carry: -4.5 (bp)
Historical beta(R2): 1M -9 % (43 %) 3M -24 % (76 %) 1Y -15 % (44 %)
3Mx10Y vol: 6.89 bp/day, 3Mx30Y vol 6.23 bp/day



Lost carry measures the jump in spread required to go from an unconditional trade to a conditional trade and is defined as (closest to the money payer spread - closest to the money receiver spread) / 2.

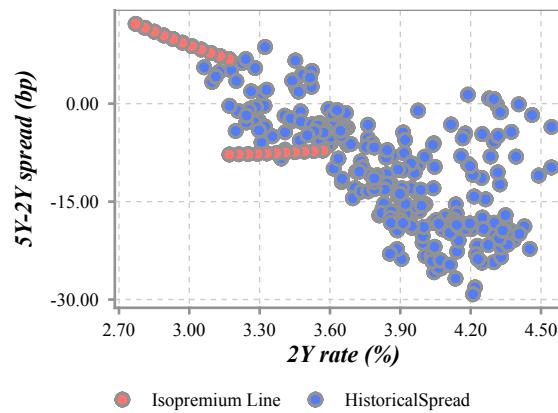
Conditional directionality is the directionality implied from zero cost conditional curve trades, i.e. the slope of the red lines. Payer directionality is calculated as (closest to the money zero cost spread with payers - farthest from the money zero cost spread with payers) / (closest to the money strike - farthest from the money strike). Regression over past 12M

Derivatives Strategy

USD Swaption Conditional Curve Report (1Y Expiry)

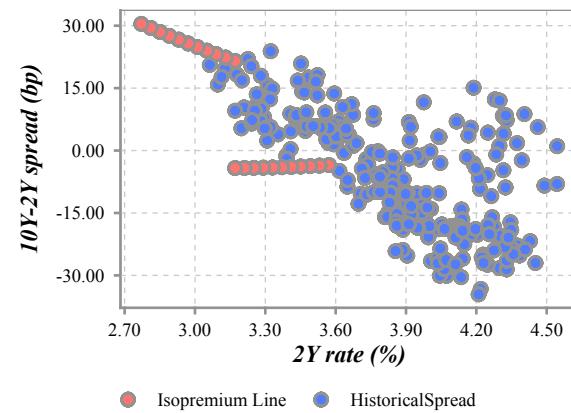
1Yx(2s/5s) Isopremium Line

Conditional Directionality: 2 % (pay), -14 % (rec), Lost Carry: -7.3 (bp)
Historical beta(R2): 1M -16 % (71 %) 3M -24 % (80 %) 1Y -15 % (16 %)
1Yx2Y vol: 7.62 bp/day, 1Yx5Y vol 7.02 bp/day



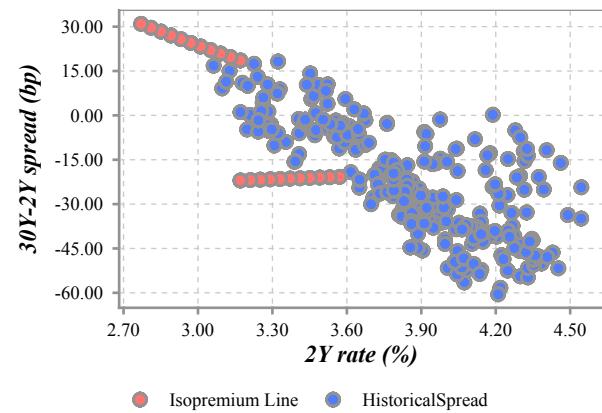
1Yx(2s/10s) Isopremium Line

Conditional Directionality: 2 % (pay), -22 % (rec), Lost Carry: -12.9 bp
Historical beta(R2): 1M -23 % (70 %) 3M -39 % (86 %) 1Y -26 % (27 %)
1Yx2Y vol: 7.62 bp/day, 1Yx10Y vol 6.53 bp/day



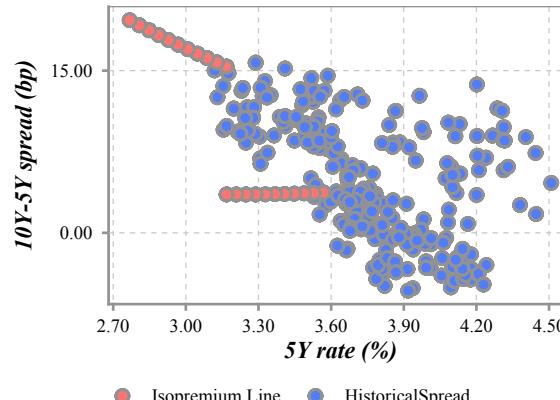
1Yx(2s/30s) Isopremium Line

Conditional Directionality: 3 % (pay), -31 % (rec), Lost Carry: -20.3 bp
Historical beta(R2): 1M -29 % (72 %) 3M -54 % (88 %) 1Y -40 % (45 %)
1Yx5Y vol: 7.62 bp/day, 1Yx10Y vol 5.98 bp/day



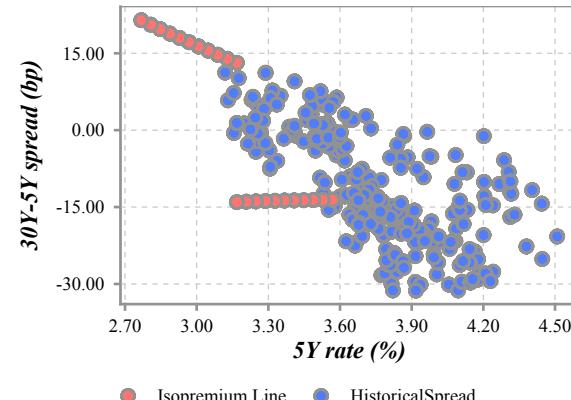
1Yx(5s/10s) Isopremium Line

Conditional Directionality: 0 % (pay), -11 % (rec), Lost Carry: -5.9 (bp)
Historical beta(R2): 1M -7 % (49 %) 3M -18 % (82 %) 1Y -9 % (21 %)
1Yx5Y vol: 7.02 bp/day, 1Yx10Y vol 6.53 bp/day



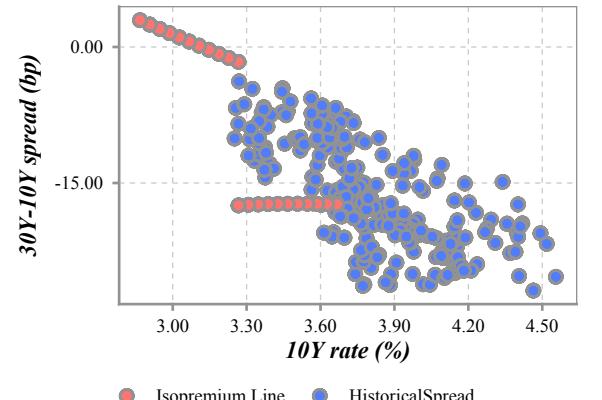
1Yx(5s/30s) Isopremium Line

Conditional Directionality: 1 % (pay), -21 % (rec), Lost Carry: -13.6 bp
Historical beta(R2): 1M -13 % (53 %) 3M -37 % (84 %) 1Y -24 % (41 %)
1Yx5Y vol: 7.02 bp/day, 1Yx30Y vol 5.98 bp/day



1Yx(10s/30s) Isopremium Line

Conditional Directionality: 0 % (pay), -11 % (rec), Lost Carry: -7.9 (bp)
Historical beta(R2): 1M -6 % (43 %) 3M -22 % (76 %) 1Y -14 % (44 %)
1Yx10Y vol: 6.53 bp/day, 1Yx30Y vol 5.98 bp/day



Derivatives Strategy

Conditional Isopremium Curve Trades Report - 1M Expiry

Curve Structure	Curve Left Struct	Curve Right Struct	Spot Rate Left (%)	Spot Rate Right (%)	Spot Curve (bp)	ATMF Left (%)	ATMF Right (%)	ATMF Curve (bp)	Bp vol Left	Bp vol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq	Carry on Stpnrs (bp)	Trade Risk (bp)	Trade 1 Bull	Trade1 Left Strike (%)	Trade1 Right Strike (%)	0 Cost Entry Bull (bp)	Pickup vs. Spot Crv (Bull)	Pickup vs. ATMF Crv (Bull)	Bull Entry %ile	Below ATMF Beta	Below ATMF Rsq	Trade 2 Bear	Trade2 Left Strike (%)	Trade2 Right Strike (%)	0 Cost Entry Bear (bp)	Pickup vs. Spot Crv (Bear)	Pickup vs. ATMF Crv (Bear)	Bear Entry %ile	Above ATMF Beta	Above ATMF Rsq
1m 1s/2s	1Mx1Y	1Mx2Y	3.965	3.429	-53.6	3.784	3.331	-45.4	7.47	7.75	0.507	0.12	23%	-8.2	37	steepener	3.784	3.314	-47	-6.6	1.6	35	None	None	flattener	3.784	3.344	-44	9.6	1.4	13	0.12	23%
1m 1s/3s	1Mx1Y	1Mx3Y	3.965	3.249	-71.6	3.784	3.185	-60.0	7.47	7.56	0.342	0.06	4%	-11.6	52	steepener	3.784	3.184	-60	-11.6	0.0	7	None	None	flattener	3.784	3.184	-60	11.6	0.0	4	0.06	4%
1m 1s/5s	1Mx1Y	1Mx5Y	3.965	3.155	-81.0	3.784	3.119	-66.6	7.47	6.88	0.212	-0.04	1%	-14.4	65	flattener	3.759	3.119	-64	17.0	2.6	99	None	None	steepener	3.799	3.119	-68	-13.0	1.4	99	-0.04	1%
1m 1s/7s	1Mx1Y	1Mx7Y	3.965	3.160	-80.5	3.784	3.135	-64.9	7.47	6.49	0.156	-0.10	7%	-15.5	72	flattener	3.755	3.135	-62	18.5	2.9	99	None	None	steepener	3.815	3.135	-68	-12.5	3.1	99	-0.10	7%
1m 1s/10s	1Mx1Y	1Mx10Y	3.965	3.209	-75.6	3.784	3.191	-59.3	7.47	5.96	0.114	-0.17	15%	-16.3	78	flattener	3.731	3.191	-54	21.6	5.3	99	None	None	steepener	3.831	3.191	-64	-11.6	4.7	99	-0.17	15%
1m 1s/20s	1Mx1Y	1Mx20Y	3.965	3.309	-65.6	3.784	3.298	-48.6	7.47	5.56	0.067	-0.27	30%	-16.9	88	flattener	3.718	3.298	-42	23.6	6.6	99	None	None	steepener	3.848	3.298	-55	-10.6	6.4	99	-0.27	30%
1m 1s/30s	1Mx1Y	1Mx30Y	3.965	3.177	-78.8	3.784	3.167	-61.7	7.47	5.27	0.051	-0.33	39%	-17.0	93	flattener	3.717	3.167	-55	23.8	6.7	99	None	None	steepener	3.857	3.167	-69	-9.8	7.3	99	-0.33	39%
1m 2s/3s	1Mx2Y	1Mx3Y	3.429	3.249	-18.0	3.331	3.185	-14.6	7.75	7.56	0.675	-0.04	15%	-3.4	19	flattener	3.325	3.185	-14	4.0	0.6	99	None	None	steepener	3.335	3.185	-15	-3.0	0.4	99	-0.04	15%
1m 2s/5s	1Mx2Y	1Mx5Y	3.429	3.155	-27.4	3.331	3.119	-21.2	7.75	6.88	0.418	-0.12	34%	-6.1	38	flattener	3.299	3.119	-18	9.4	3.2	99	None	None	steepener	3.359	3.119	-24	-3.4	2.8	99	-0.12	34%
1m 2s/7s	1Mx2Y	1Mx7Y	3.429	3.160	-26.8	3.331	3.135	-19.6	7.75	6.49	0.307	-0.18	40%	-7.3	50	flattener	3.285	3.135	-15	11.8	4.6	99	None	None	steepener	3.375	3.135	-24	-2.8	4.4	99	-0.18	40%
1m 2s/10s	1Mx2Y	1Mx10Y	3.429	3.209	-22.0	3.331	3.191	-13.9	7.75	5.96	0.225	-0.24	45%	-8.1	61	flattener	3.271	3.191	-8	14.0	5.9	99	None	None	steepener	3.391	3.191	-20	-2.0	6.1	99	-0.24	45%
1m 2s/20s	1Mx2Y	1Mx20Y	3.429	3.309	-11.9	3.331	3.298	-3.2	7.75	5.56	0.131	-0.33	54%	-8.7	76	flattener	3.258	3.298	4	15.9	7.2	99	None	None	steepener	3.398	3.298	-10	-1.9	6.8	99	-0.33	54%
1m 2s/30s	1Mx2Y	1Mx30Y	3.429	3.177	-25.2	3.331	3.167	-16.4	7.75	5.27	0.101	-0.39	60%	-8.8	84	flattener	3.247	3.167	-8	17.2	8.4	99	None	None	steepener	3.407	3.167	-24	-1.2	7.6	99	-0.39	60%
1m 3s/5s	1Mx3Y	1Mx5Y	3.249	3.155	-9.4	3.185	3.119	-6.6	7.56	6.88	0.619	-0.08	37%	-2.8	21	flattener	3.159	3.119	-4	5.4	2.6	99	None	None	steepener	3.209	3.119	-9	-0.4	2.4	99	-0.08	37%
1m 3s/7s	1Mx3Y	1Mx7Y	3.249	3.160	-8.9	3.185	3.135	-5.0	7.56	6.49	0.455	-0.14	40%	-3.9	34	flattener	3.145	3.135	-1	7.9	4.0	99	None	None	steepener	3.215	3.135	-8	-0.9	3.0	99	-0.14	40%
1m 3s/10s	1Mx3Y	1Mx10Y	3.249	3.209	-4.0	3.185	3.191	0.7	7.56	5.96	0.333	-0.19	43%	-4.7	46	flattener	3.131	3.191	6	10.0	5.3	99	None	None	steepener	3.231	3.191	-4	0.0	4.7	99	-0.19	43%
1m 3s/20s	1Mx3Y	1Mx20Y	3.249	3.309	6.0	3.185	3.298	11.4	7.56	5.56	0.194	-0.29	52%	-5.3	64	flattener	3.118	3.298	18	12.0	6.6	99	None	None	steepener	3.248	3.298	5	1.0	6.4	99	-0.29	52%
1m 3s/30s	1Mx3Y	1Mx30Y	3.249	3.177	-7.2	3.185	3.167	-1.8	7.56	5.27	0.149	-0.35	59%	-5.4	72	flattener	3.107	3.167	6	13.2	7.8	99	None	None	steepener	3.257	3.167	-9	1.8	7.2	99	-0.35	59%
1m 5s/7s	1Mx5Y	1Mx7Y	3.155	3.160	0.5	3.119	3.135	1.6	6.88	6.49	0.736	-0.05	32%	-1.1	13	flattener	3.105	3.135	3	2.5	1.4	99	None	None	steepener	3.135	3.135	0	0.5	1.6	98	-0.05	30%
1m 5s/10s	1Mx5Y	1Mx10Y	3.155	3.209	5.4	3.119	3.191	7.3	6.88	5.96	0.539	-0.11	36%	-1.9	26	flattener	3.091	3.191	10	4.6	2.7	99	None	None	steepener	3.151	3.191	4	1.4	3.3	98	-0.11	35%
1m 5s/20s	1Mx5Y	1Mx20Y	3.155	3.309	15.4	3.119	3.298	18.0	6.88	5.56	0.314	-0.21	47%	-2.6	45	flattener	3.078	3.298	22	6.6	4.0	99	None	None	steepener	3.158	3.298	14	1.4	4.0	99	-0.21	46%
1m 8s/30s	1Mx5Y	1Mx30Y	3.155	3.177	2.2	3.119	3.167	4.8	6.88	5.27	0.241	-0.27	55%	-2.7	54	flattener	3.067	3.167	10	7.8	5.2	99	None	None	steepener	3.167	3.167	0	2.2	4.8	99	-0.26	54%
1m 7s/10s	1Mx7Y	1Mx10Y	3.160	3.209	4.8	3.135	3.191	5.6	6.49	5.96	0.733	-0.05	33%	-0.8	13	flattener	3.111	3.191	8	3.2	2.4	99	None	None	steepener	3.151	3.191	4	0.8	1.6	98	-0.05	32%
1m 7s/20s	1Mx7Y	1Mx20Y	3.160	3.309	14.9	3.135	3.298	16.3	6.49	5.56	0.427	-0.15	45%	-1.4	33	flattener	3.108	3.298	19	4.1	2.7	99	None	None	steepener	3.168	3.298	13	1.9	3.3	98	-0.15	44%
1m 7s/30s	1Mx7Y	1Mx30Y	3.160	3.177	1.7	3.135	3.167	3.2	6.49	5.27	0.327	-0.21	55%	-1.5	42	flattener	3.097	3.167	7	5.3	3.8	99	None	None	steepener	3.177	3.167	-1	2.7	4.2	98	-0.21	54%
1m 10s/20s	1Mx10Y	1Mx20Y	3.209	3.309	10.1	3.191	3.298	10.7	5.96	5.56	0.583	-0.09	46%	-0.6	20	flattener	3.178	3.298	12	1.9	1.3	99	None	None	steepener	3.208	3.298	9	1.1	1.7	99	-0.09	44%
1m 10s/30s	1Mx10Y	1Mx30Y	3.209	3.177	-3.2	3.191	3.167	-2.4	5.96	5.27	0.446	-0.16	57%	-0.7	30	flattener	3.167	3.167	0	3.2	2.4	99	None	None	steepener	3.217	3.167	-5	1.8	2.6	98	-0.15	56%
1m 20s/30s	1Mx20Y	1Mx30Y	3.309	3.177	-13.2	3.298	3.167	-13.1	5.56	5.27	0.766	-0.06	66%	-0.1	10	flattener	3.287	3.167	-12	1.2	1.1	99	None	None	steepener	3.307	3.167	-14	0.8	0.9	97	-0.06	65%

*The table provides various benchmark curve trades that can be done conditionally in a rally or a selloff for various forwards (1M, 3M, 6M and 9M) and relevant statistics. For example, a given benchmark structure such as 3m 2s/10s can be broken down into a left structure (3Mx2Y) and right structure (3Mx10Y) with the relevant left and right spot rates, ATMF rates, and swaption vols. Fwd risk ratio is the ratio between the annuities of the left swap to the right swap. 1Y beta and 1Y rsq columns indicate the regression stats for regressing the spot curve against the spot rates. Carry on steepener column indicates the 3M slide (i.e. slide) of the specific curve pair for a steepener, except for 1M expiries which will show 1M slide. Trade risk is the 2Y standard deviation of quarterly changes in the weighted yield spread, annualized by multiplying by sqrt(4).

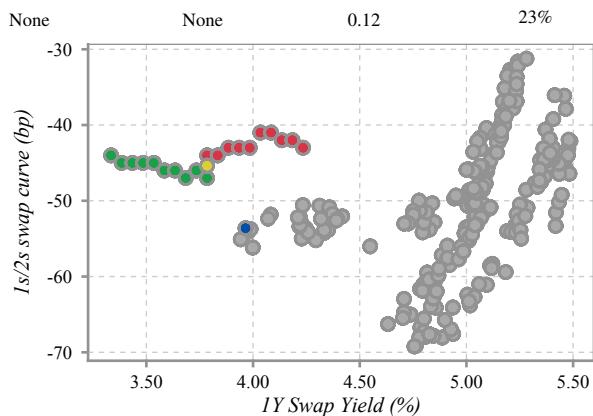
** Trade 1 (Trade 2) is a conditional bull (bear) trade done with receiver (payer) swaptions. In this construction, it will take the vol that is lower and assume it buys that swaption at the ATMF strike. Then, the strike on the other leg is iterated OTM until a risk weighted premium neutral ratio can be found, and the implied yield spread on those strikes is labeled as the "0 Cost Entry" bull (bear) columns. This implied spread is compared with both the current spot curve and the current ATMF curve, and the differences will be labeled in the "Pickup" columns. Lastly, we run two separate regressions for the spot yield curve (Y) against the spot rates (X) for all X coordinates below and above the current ATMF, and record the beta and R-squared (note these stats will be labeled as "None" if no such points exist). For more details, refer to the footnotes of this report where the historical spread charts and isopremium lines are plotted.

Derivatives Strategy

Conditional Isopremium Curve Trades Report - 1M Expiry

1m 1s/2s

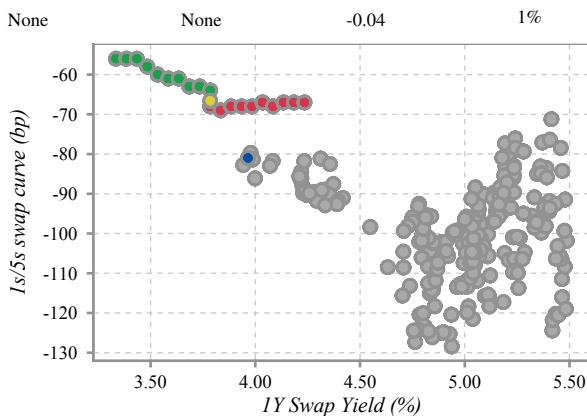
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.47 Beta below ATMF	7.75 Rsq below ATMF	0.51 Beta above ATMF	0.12 Rsq above ATMF	23% Rsq above ATMF



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

1m 1s/5s

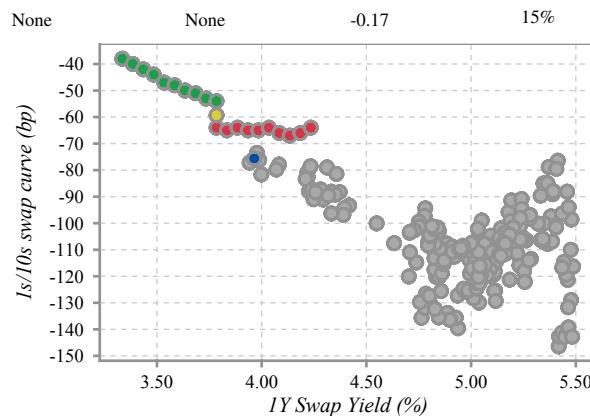
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.47 Beta below ATMF	6.88 Rsq below ATMF	0.21 Beta above ATMF	-0.04 Rsq above ATMF	1% Rsq above ATMF



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

1m 1s/10s

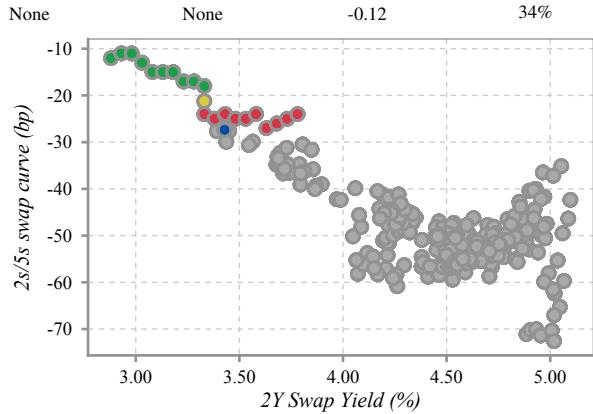
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.47 Beta below ATMF	5.96 Rsq below ATMF	0.11 Beta above ATMF	-0.17 Rsq above ATMF	15% Rsq above ATMF



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

1m 2s/5s

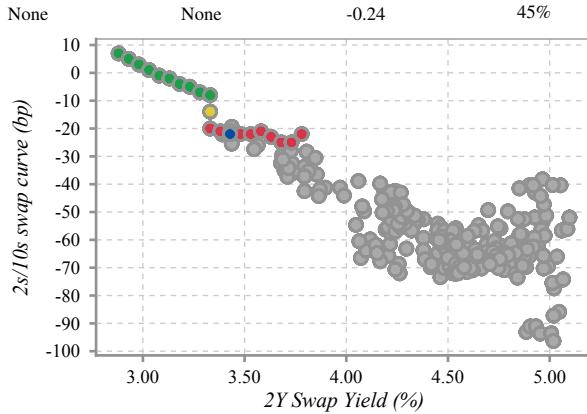
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.75 Beta below ATMF	6.88 Rsq below ATMF	0.42 Beta above ATMF	-0.12 Rsq above ATMF	34% Rsq above ATMF



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

1m 2s/10s

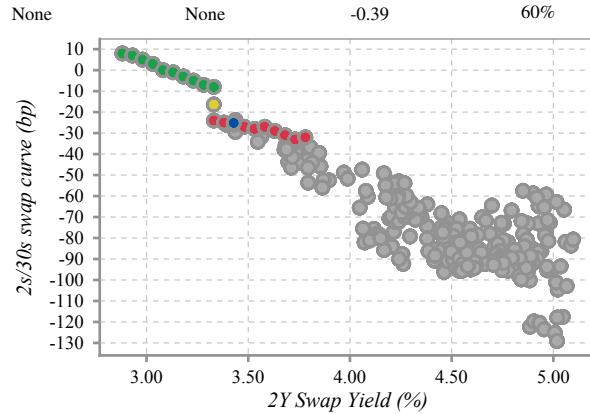
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.75 Beta below ATMF	5.96 Rsq below ATMF	0.23 Beta above ATMF	-0.24 Rsq above ATMF	45% Rsq above ATMF



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

1m 2s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.75 Beta below ATMF	5.27 Rsq below ATMF	0.10 Beta above ATMF	-0.39 Rsq above ATMF	60% Rsq above ATMF



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

* On the X axis, the chart shows the left spot rate and the Y axis shows the spot swap yield curve. For example, for 1m fwd 2s/5s (or any other fwd such as 3m, 6m, and 9m), spot 2s/5s SOFR swap curve (bp) is shown on the Y axis versus spot 2Y SOFR swap yield (%) on the X axis. Overlaid on this chart are premium neutral entry points into conditional bull (green dots) and bear trades (red dots) with respective expiries (either 1m, 3m, 6m or 9m) with different levels of moneyness (note steeper or flatter directions will depend on which vol is cheaper, as it always will assume buying the cheaper vol) as well as dots corresponding to current spot (blue dot) and current ATM (yellow dot); past 1Y history.

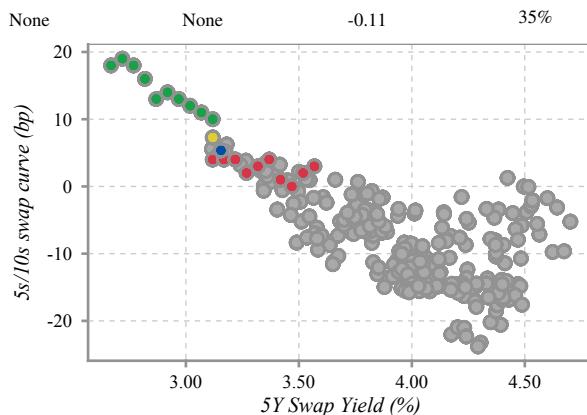
** Premium neutral strike levels are determined by starting at the ATM strike on the leg one is buying and backing out the premium neutral strike level for the leg that is being sold for the implied curve level. This exercise is repeated for strike increments of +5bp on the long/buying leg. Also shown are statistics for the 1Y regression of spot yield curve vs spot yields (Beta and R-squared) as well as the wvol for each leg risk ratio, and two other separate regression stats of beta above and below ATM rates (spot yield curve (Y) against the spot rates (X) for all t-cordinates below and above the current ATM); stats will be labeled as "None" if no such points exist. For more details, refer to the footnotes of this report where the full statistics tables are shown.

Derivatives Strategy

Conditional Isopremium Curve Trades Report - 1M Expiry

1m 5s/10s

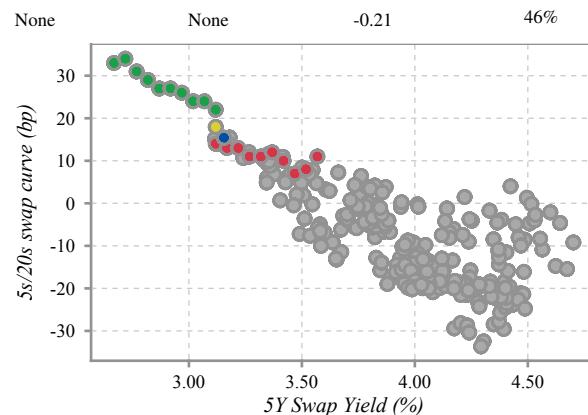
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.88	5.96	0.54	-0.11	36%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATMF

1m 5s/20s

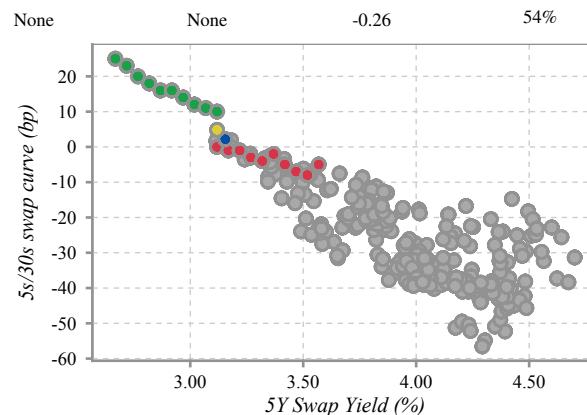
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.88	5.56	0.31	-0.21	47%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATMF

1m 5s/30s

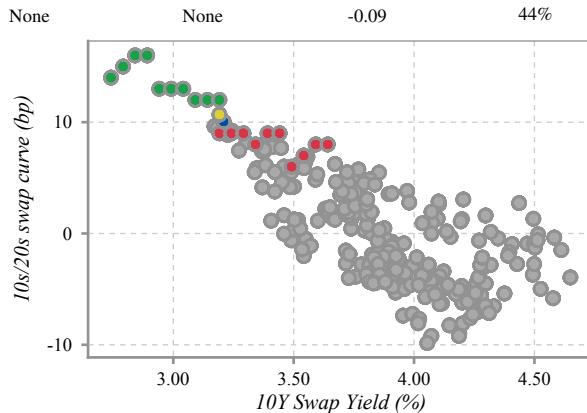
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.88	5.27	0.24	-0.27	55%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATMF

1m 10s/20s

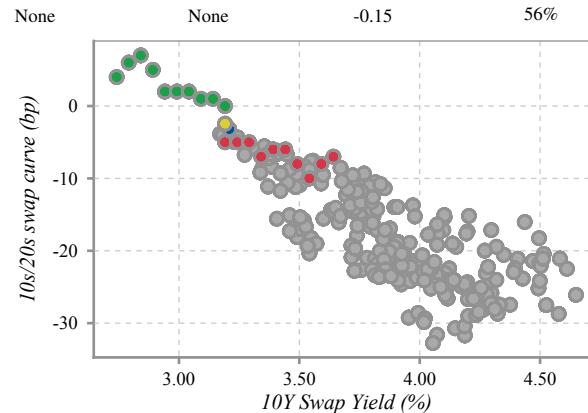
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
5.96	5.56	0.58	-0.09	46%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATMF

1m 10s/30s

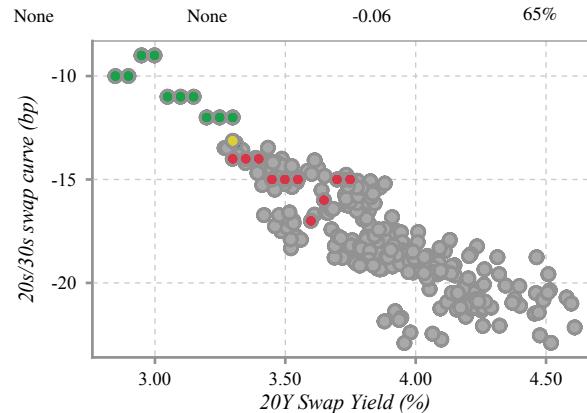
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
5.96	5.27	0.45	-0.16	57%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATMF

1m 20s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
5.56	5.27	0.77	-0.06	66%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATMF

* On the X axis, the chart shows the left spot rate and the Y axis shows the spot swap yield curve. For example, for 1m fwd 2s/5s (or any other fwd such as 3m, 6m, and 9m), spot 2s/5s SOFR swap curve (bp) is shown on the Y axis versus spot 2Y SOFR swap yield (%) on the X axis. Overlaid on this chart are premium neutral entry points into conditional bull (green dots) and bear trades (red dots) with respective expiries (either 1m, 3m, 6m or 9m) with different levels of moneyness (note steeper or flatter directions will depend on which vol is cheaper, as it always will assume buying the cheaper vol) as well as dots corresponding to current spot (blue dot) and current ATMF (yellow dot); past 1Y history.

** Premium neutral strike levels are determined by starting at the ATMF strike on the leg one is buying and backing out the premium neutral strike level for the leg that is being sold for the implied curve level. This exercise is repeated for strike increments of +5bp on the long/buying leg. Also shown are statistics for the 1Y regression of spot yield curve vs spot yields (Beta and R-squared) as well as the wvol for each leg risk ratio, and two other separate regression stats of beta above and below ATMF rates (spot yield curve (Y) against the spot rates (X) for all x-coordinates below and above the current ATMF; stats will be labeled "None" if no such points exist). For more details, refer to the footnotes of this report where the full statistics tables are shown.

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Derivatives Strategy

Conditional Isopremium Curve Trades Report - 3M Expiry

Curve Structure	Curve Left Struct	Curve Right Struct	Spot Rate Left (%)	Spot Rate Right (%)	Spot Curve (bp)	ATMF Left (%)	ATMF Right (%)	ATMF Curve (bp)	Bp vol Left	Bp vol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq	Carry on Stprn (bp)	Trade Risk (bp)	Trade 1 Bull	Trade1 Left Strike (%)	Trade1 Right Strike (%)	0 Cost Entry Bull (bp)	Pickup vs. Spot Crv (Bull)	Pickup vs. ATMF Crv (Bull)	Bull Entry %ile	Below ATMF Beta	Below ATMF Rsrq	Trade 2 Bear	Trade2 Left Strike (%)	Trade2 Right Strike (%)	0 Cost Entry Bear (bp)	Pickup vs. Spot Crv (Bear)	Pickup vs. ATMF Crv (Bear)	Bear Entry %ile	Above ATMF Beta	Above ATMF Rsrq
3m 1s/2s	3Mx1Y 3Mx2Y	3.965 3.429 -53.6	3.454 3.155 -29.9	7.67 7.88 0.507	0.12 23%	-23.7 33	steepener	3.454	3.144	-31	-22.6	1.1	1	None None	flattener	3.454	3.164	-29	24.6	0.9	1	0.12	23%										
3m 1s/3s	3Mx1Y 3Mx3Y	3.965 3.249 -71.6	3.454 3.071 -38.4	7.67 7.77 0.343	0.06 4%	-33.2 48	steepener	3.454	3.064	-39	-32.6	0.6	1	None None	flattener	3.454	3.074	-38	33.6	0.4	1	0.06	4%										
3m 1s/5s	3Mx1Y 3Mx5Y	3.965 3.155 -81.0	3.454 3.054 -40.0	7.67 7.21 0.212	-0.04 1%	-41.0 63	flattener	3.424	3.054	-37	44.0	3.0	99	None None	steepener	3.484	3.054	-43	-38.0	3.0	99	-0.04	1%										
3m 1s/7s	3Mx1Y 3Mx7Y	3.965 3.160 -80.5	3.454 3.091 -36.4	7.67 6.89 0.156	-0.10 7%	-44.1 71	flattener	3.411	3.091	-32	48.5	4.4	99	None None	steepener	3.501	3.091	-41	-39.5	4.6	99	-0.10	7%										
3m 1s/10s	3Mx1Y 3Mx10Y	3.965 3.209 -75.6	3.454 3.162 -29.2	7.67 6.45 0.114	-0.17 15%	-46.4 80	flattener	3.382	3.162	-22	53.6	7.2	99	None None	steepener	3.522	3.162	-36	-39.6	6.8	99	-0.17	15%										
3m 1s/20s	3Mx1Y 3Mx20Y	3.965 3.309 -65.6	3.454 3.279 -17.5	7.67 6.07 0.067	-0.27 30%	-48.0 92	flattener	3.359	3.279	-8	57.6	9.5	99	None None	steepener	3.549	3.279	-27	-38.6	9.5	99	-0.27	30%										
3m 1s/30s	3Mx1Y 3Mx30Y	3.965 3.177 -78.8	3.454 3.149 -30.5	7.67 5.79 0.051	-0.33 39%	-48.3 98	flattener	3.349	3.149	-20	58.8	10.5	99	None None	steepener	3.559	3.149	-41	-37.8	10.5	99	-0.33	39%										
3m 2s/3s	3Mx2Y 3Mx3Y	3.429 3.249 -18.0	3.155 3.071 -8.5	7.88 7.77 0.676	-0.04 15%	-9.5 18	flattener	3.151	3.071	-8	10.0	0.5	99	None None	steepener	3.161	3.071	-9	-9.0	0.5	99	-0.04	15%										
3m 2s/5s	3Mx2Y 3Mx5Y	3.429 3.155 -27.4	3.155 3.054 -10.1	7.88 7.21 0.417	-0.12 34%	-17.3 38	flattener	3.114	3.054	-6	21.4	4.1	99	None None	steepener	3.194	3.054	-14	-13.4	3.9	99	-0.12	34%										
3m 2s/7s	3Mx2Y 3Mx7Y	3.429 3.160 -26.8	3.155 3.091 -6.5	7.88 6.89 0.307	-0.18 40%	-20.4 50	flattener	3.101	3.091	-1	25.8	5.5	99	None None	steepener	3.211	3.091	-12	-14.8	5.5	99	-0.18	40%										
3m 2s/10s	3Mx2Y 3Mx10Y	3.429 3.209 -22.0	3.155 3.162 0.7	7.88 6.45 0.225	-0.24 45%	-22.7 61	flattener	3.072	3.162	9	31.0	8.3	99	None None	steepener	3.242	3.162	-8	-14.0	8.7	99	-0.24	45%										
3m 2s/20s	3Mx2Y 3Mx20Y	3.429 3.309 -11.9	3.155 3.279 12.4	7.88 6.07 0.131	-0.33 54%	-24.3 78	flattener	3.059	3.279	22	33.9	9.6	99	None None	steepener	3.259	3.279	2	-13.9	10.4	99	-0.33	54%										
3m 2s/30s	3Mx2Y 3Mx30Y	3.429 3.177 -25.2	3.155 3.149 -0.6	7.88 5.79 0.101	-0.39 60%	-24.6 86	flattener	3.039	3.149	11	36.2	11.6	99	None None	steepener	3.279	3.149	-13	-12.2	12.4	99	-0.39	60%										
3m 3s/5s	3Mx3Y 3Mx5Y	3.249 3.155 -9.4	3.071 3.054 -1.6	7.77 7.21 0.617	-0.08 37%	-7.7 21	flattener	3.034	3.054	2	11.4	3.6	99	None None	steepener	3.104	3.054	-5	-4.4	3.4	99	-0.08	37%										
3m 3s/7s	3Mx3Y 3Mx7Y	3.249 3.160 -8.9	3.071 3.091 2.0	7.77 6.89 0.455	-0.14 40%	-10.9 34	flattener	3.021	3.091	7	15.9	5.0	99	None None	steepener	3.121	3.091	-3	-5.9	5.0	99	-0.14	40%										
3m 3s/10s	3Mx3Y 3Mx10Y	3.249 3.209 -4.0	3.071 3.162 9.1	7.77 6.45 0.333	-0.19 43%	-13.2 46	flattener	2.992	3.162	17	21.0	7.9	99	None None	steepener	3.152	3.162	1	-5.0	8.1	99	-0.19	43%										
3m 3s/20s	3Mx3Y 3Mx20Y	3.249 3.309 6.0	3.071 3.279 20.8	7.77 6.07 0.194	-0.29 52%	-14.8 64	flattener	2.979	3.279	30	24.0	9.2	99	None None	steepener	3.169	3.279	11	-5.0	9.8	99	-0.29	52%										
3m 3s/30s	3Mx3Y 3Mx30Y	3.249 3.177 -7.2	3.071 3.149 7.8	7.77 5.79 0.149	-0.35 59%	-15.1 73	flattener	2.959	3.149	19	26.2	11.2	99	None None	steepener	3.179	3.149	-3	-4.2	10.8	99	-0.35	59%										
3m 5s/7s	3Mx5Y 3Mx7Y	3.155 3.160 0.5	3.054 3.091 3.6	7.21 6.89 0.736	-0.05 32%	-3.1 13	flattener	3.031	3.091	6	5.5	2.4	99	None None	steepener	3.071	3.091	2	-1.5	1.6	99	-0.05	32%										
3m 5s/10s	3Mx5Y 3Mx10Y	3.155 3.209 5.4	3.054 3.162 10.8	7.21 6.45 0.539	-0.11 36%	-5.4 26	flattener	3.012	3.162	15	9.6	4.2	99	None None	steepener	3.102	3.162	6	-0.6	4.8	99	-0.11	36%										
3m 5s/20s	3Mx5Y 3Mx20Y	3.155 3.309 15.4	3.054 3.279 22.5	7.21 6.07 0.315	-0.21 47%	-7.1 45	flattener	2.989	3.279	29	13.6	6.5	99	None None	steepener	3.119	3.279	16	-0.6	6.5	99	-0.21	47%										
3m 5s/30s	3Mx5Y 3Mx30Y	3.155 3.177 2.2	3.054 3.149 9.5	7.21 5.79 0.241	-0.27 55%	-7.3 55	flattener	2.969	3.149	18	15.8	8.5	99	None None	steepener	3.139	3.149	1	1.2	8.5	99	-0.27	55%										
3m 7s/10s	3Mx7Y 3Mx10Y	3.160 3.209 4.8	3.091 3.162 7.1	6.89 6.45 0.732	-0.05 33%	-2.3 13	flattener	3.062	3.162	10	5.2	2.9	99	None None	steepener	3.112	3.162	5	-0.2	2.1	99	-0.05	33%										
3m 7s/20s	3Mx7Y 3Mx20Y	3.160 3.309 14.9	3.091 3.279 18.8	6.89 6.07 0.427	-0.15 45%	-3.9 33	flattener	3.039	3.279	24	9.1	5.2	99	None None	steepener	3.139	3.279	14	0.9	4.8	99	-0.15	45%										
3m 7s/30s	3Mx7Y 3Mx30Y	3.160 3.177 1.7	3.091 3.149 5.8	6.89 5.79 0.327	-0.21 55%	-4.2 42	flattener	3.029	3.149	12	10.3	6.2	99	None None	steepener	3.159	3.149	-1	2.7	6.8	98	-0.21	55%										
3m 10s/20s	3Mx10Y 3Mx20Y	3.209 3.309 10.1	3.162 3.279 11.7	6.45 6.07 0.584	-0.09 46%	-1.7 20	flattener	3.139	3.279	14	3.9	2.3	99	None None	steepener	3.189	3.279	9	1.1	2.7	99	-0.09	46%										
3m 10s/30s	3Mx10Y 3Mx30Y	3.209 3.177 -3.2	3.162 3.149 -1.3	6.45 5.79 0.447	-0.16 57%	-1.9 30	flattener	3.129	3.149	2	5.2	3.3	99	None None	steepener	3.199	3.149	-5	1.8	3.7	98	-0.16	57%										
3m 20s/30s	3Mx20Y 3Mx30Y	3.309 3.177 -13.2	3.279 3.149 -13.0	6.07 5.79 0.765	-0.06 66%	-0.2 10	flattener	3.259	3.149	-11	2.2	2.0	99	None None	steepener	3.299	3.149	-15	1.8	2.0	88	-0.06	65%										

*The table provides various benchmark curve trades that can be done conditionally in a rally or a selloff for various forwards (1M, 3M, 6M and 9M) and relevant statistics. For example, a given benchmark structure such as 3m 2s/10s can be broken down into a left structure (3Mx2Y) and right structure (3Mx10Y) with the relevant left and right spot rates, ATMF rates, and swaption vols. Fwd risk ratio is the ratio between the annuities of the left swap to the right swap. 1Y beta and 1Y rsq columns indicate the regression stats for regressing the spot curve against the spot rates. Carry on steepener column indicates the 3M slide (i.e. slide) of the specific curve pair for a steepener, except for 1M expiries which will show 1M slide. Trade risk is the 2Y standard deviation of quarterly changes in the weighted yield spread, annualized by multiplying by sqrt(4).

** Trade 1 (Trade 2) is a conditional bull (bear) trade done with receiver (payer) swaptions. In this construction, it will take the vol that is lower and assume it buys that swaption at the ATMF strike. Then, the strike on the other leg is iterated OTM until a risk weighted premium neutral ratio can be found, and the implied yield spread on those strikes is labeled as the "0 Cost Entry" bull (bear) columns. This implied spread is compared with both the current spot curve and the current ATMF curve, and the differences will be labeled in the "Pickup" columns. Lastly, we run two separate regressions for the spot yield curve (Y) against the spot rates (X) for all X coordinates below and above the current ATMF, and record the beta and Rsquared (note these stats will be labeled as "None" if no such points exist). For more details, refer to the footnotes of this report where the historical spread charts and isopremium lines are plotted.

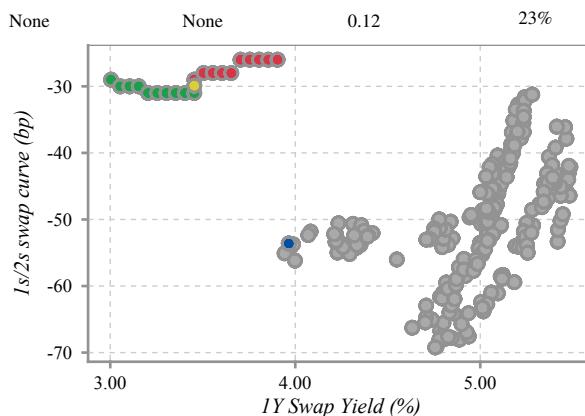
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Derivatives Strategy

Conditional Isopremium Curve Trades Report - 3M Expiry

3m 1s/2s

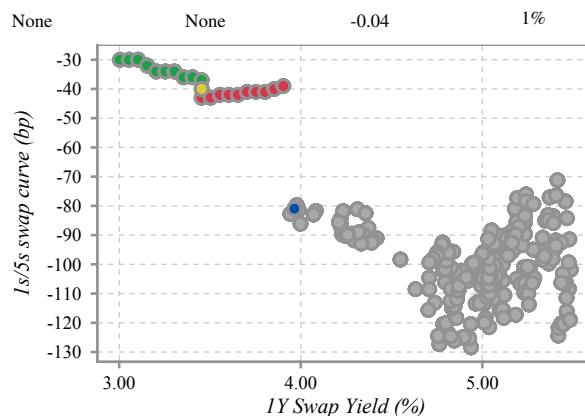
Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.67 Beta below ATMF	7.88 Rsq below ATMF	0.51 Beta above ATMF	0.12 Rsq above ATMF	23% Rsq above ATMF



- Historical spread
- Isopremium (Bull)
- Isopremium (Bear)
- Spot
- ATMF

3m 1s/5s

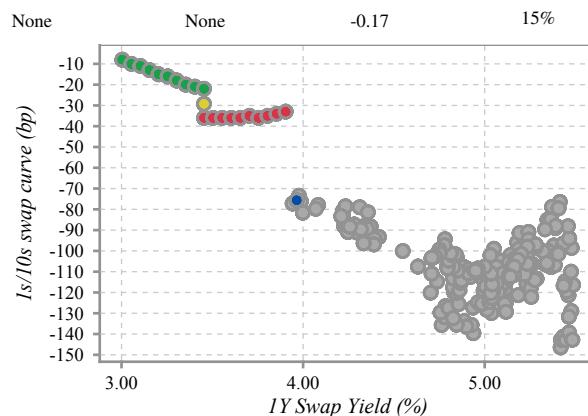
Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.67 Beta below ATMF	7.21 Rsq below ATMF	0.21 Beta above ATMF	-0.04 Rsq above ATMF	1% Rsq above ATMF



- Historical spread
- Isopremium (Bull)
- Isopremium (Bear)
- Spot
- ATMF

3m 1s/10s

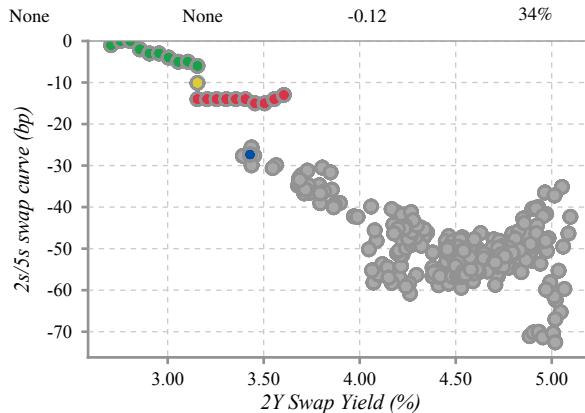
Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.67 Beta below ATMF	6.45 Rsq below ATMF	0.11 Beta above ATMF	-0.17 Rsq above ATMF	15% Rsq above ATMF



- Historical spread
- Isopremium (Bull)
- Isopremium (Bear)
- Spot
- ATMF

3m 2s/5s

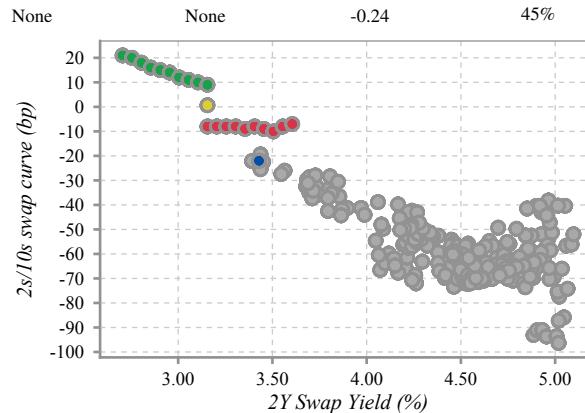
Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.88 Beta below ATMF	7.21 Rsq below ATMF	0.42 Beta above ATMF	-0.12 Rsq above ATMF	34% Rsq above ATMF



- Historical spread
- Isopremium (Bull)
- Isopremium (Bear)
- Spot
- ATMF

3m 2s/10s

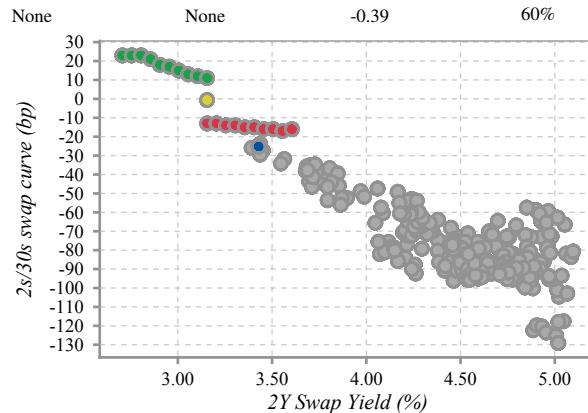
Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.88 Beta below ATMF	6.45 Rsq below ATMF	0.23 Beta above ATMF	-0.24 Rsq above ATMF	45% Rsq above ATMF



- Historical spread
- Isopremium (Bull)
- Isopremium (Bear)
- Spot
- ATMF

3m 2s/30s

Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.88 Beta below ATMF	5.79 Rsq below ATMF	0.10 Beta above ATMF	-0.39 Rsq above ATMF	60% Rsq above ATMF



- Historical spread
- Isopremium (Bull)
- Isopremium (Bear)
- Spot
- ATMF

* On the X axis, the chart shows the left spot rate and the Y axis shows the spot swap yield curve. For example, for 1m fwd 2s/5s (or any other fwd such as 3m, 6m, and 9m), spot 2s/5s SOFR swap curve (bp) is shown on the Y axis versus spot 2Y SOFR swap yield (%) on the X axis. Overlaid on this chart are premium neutral entry points into conditional bull (green dots) and bear trades (red dots) with respective expiries (either 1m, 3m, 6m or 9m) with different levels of moneyness (note steeper or flatter directions will depend on which vol is cheaper, as it always will assume buying the cheaper vol) as well as dots corresponding to current spot (blue dot) and current ATM (yellow dot); past 1Y history.

** Premium neutral strike levels are determined by starting at the ATM strike on the leg one is buying and backing out the premium neutral strike level for the leg that is being sold for the implied curve level. This exercise is repeated for strike increments of +5bp on the long/buying leg. Also shown are statistics for the 1Y regression of spot yield curve vs spot yields (Beta and R-squared) as well as the wvol for each leg risk ratio, and two other separate regression stats of beta above and below ATM rates (spot yield curve (Y) against the spot rates (X) for all x-coordinates below and above the current ATM); stats will be labeled as "None" if no such points exist. For more details, refer to the footnotes of this report where the full statistics tables are shown.

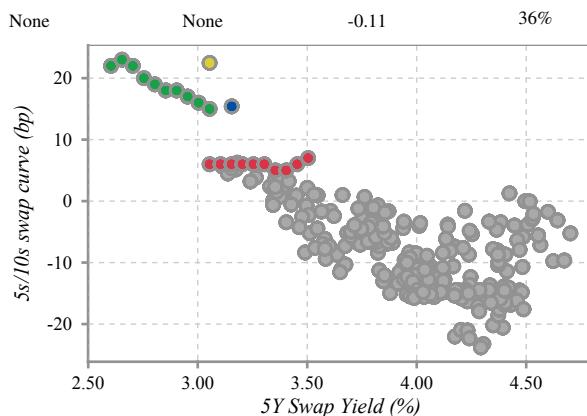
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Derivatives Strategy

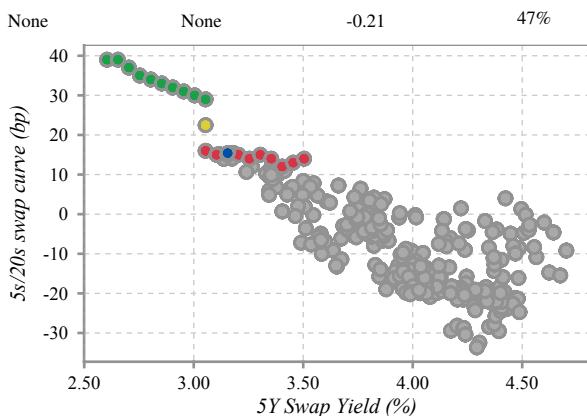
Conditional Isopremium Curve Trades Report - 3M Expiry

3m 5s/10s

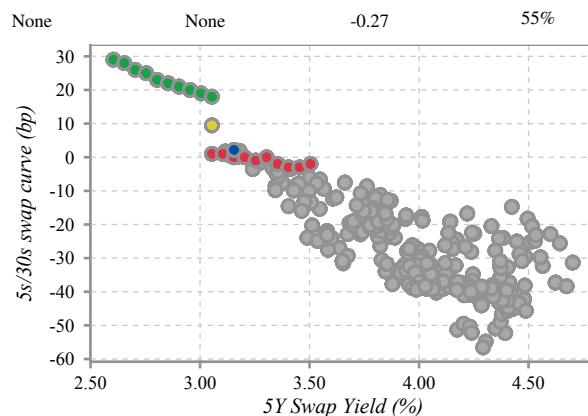
Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.21	6.45	0.54	-0.11	36%



Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.21	6.07	0.31	-0.21	47%

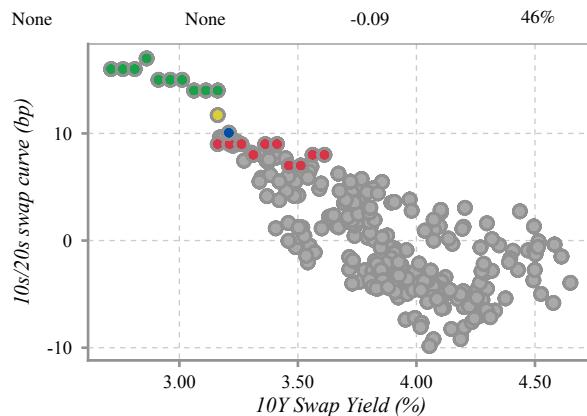


Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.21	5.79	0.24	-0.27	55%

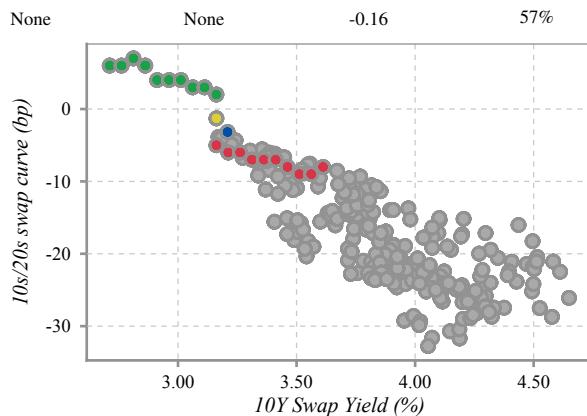


3m 10s/20s

Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
6.45	6.07	0.58	-0.09	46%

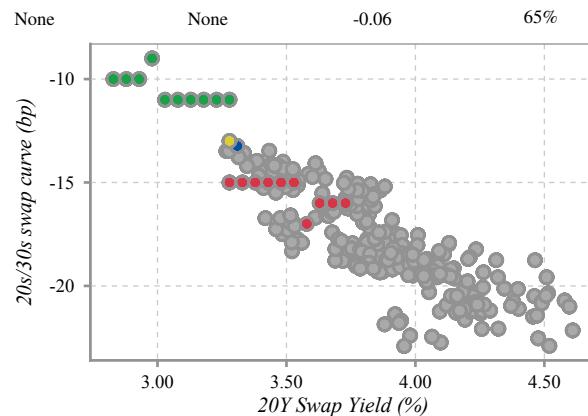


Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
6.45	5.79	0.45	-0.16	57%



3m 20s/30s

Bpvols Left	Bpvols Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
6.07	5.79	0.77	-0.06	66%



Derivatives Strategy

Conditional Isopremium Curve Trades Report - 6M Expiry

Curve Structure	Curve Left Struct	Curve Right Struct	Spot Rate Left (%)	Spot Rate Right (%)	Spot Curve (bp)	ATMF Left (%)	ATMF Right (%)	ATMF Curve (bp)	Bp vol Left	Bp vol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq	Carry on Stpnrs (bp)	Trade Risk (bp)	Trade 1 Bull	Trade1 Left Strike (%)	Trade1 Right Strike (%)	0 Cost Entry Bull (bp)	Pickup vs. Spot Crv (Bull)	Pickup vs. ATMF Crv (Bull)	Bull Entry %ile	Below ATMF Beta	Below ATMF Rsrq	Trade 2 Bear	Trade2 Left Strike (%)	Trade2 Right Strike (%)	0 Cost Entry Bear (bp)	Pickup vs. Spot Crv (Bear)	Pickup vs. ATMF Crv (Bear)	Bear Entry %ile	Above ATMF Beta	Above ATMF Rsrq
6m 1s/2s	6Mx1Y	6Mx2Y	3.965	3.429	-53.6	3.127	2.987	-14.0	7.61	7.58	0.506	0.12	23%	-15.9	31	flattener	3.117	2.987	-13	40.6	1.0	99	None	None	steepener	3.137	2.987	-15	-38.6	1.0	99	0.12	23%
6m 1s/3s	6Mx1Y	6Mx3Y	3.965	3.249	-71.6	3.127	2.963	-16.4	7.61	7.42	0.342	0.06	4%	-22.0	46	flattener	3.103	2.963	-14	57.6	2.4	99	None	None	steepener	3.143	2.963	-18	-53.6	1.6	99	0.06	4%
6m 1s/5s	6Mx1Y	6Mx5Y	3.965	3.155	-81.0	3.127	2.997	-13.0	7.61	6.90	0.211	-0.04	1%	-27.0	62	flattener	3.057	2.997	-6	75.0	7.0	99	None	None	steepener	3.187	2.997	-19	-62.0	6.0	99	-0.04	1%
6m 1s/7s	6Mx1Y	6Mx7Y	3.965	3.160	-80.5	3.127	3.053	-7.4	7.61	6.63	0.155	-0.10	7%	-29.0	72	flattener	3.043	3.053	1	81.5	8.4	99	None	None	steepener	3.213	3.053	-16	-64.5	8.6	99	-0.10	7%
6m 1s/10s	6Mx1Y	6Mx10Y	3.965	3.209	-75.6	3.127	3.138	1.2	7.61	6.27	0.114	-0.17	15%	-30.4	82	flattener	3.018	3.138	12	87.6	10.8	99	None	None	steepener	3.238	3.138	-10	-65.6	11.2	99	-0.17	15%
6m 1s/20s	6Mx1Y	6Mx20Y	3.965	3.309	-65.6	3.127	3.262	13.5	7.61	5.90	0.067	-0.27	30%	-31.0	96	flattener	2.992	3.262	27	92.6	13.5	99	None	None	steepener	3.272	3.262	-1	-64.6	14.5	99	-0.27	30%
6m 1s/30s	6Mx1Y	6Mx30Y	3.965	3.177	-78.8	3.127	3.131	0.5	7.61	5.62	0.051	-0.33	39%	-31.0	103	flattener	2.971	3.131	16	94.8	15.5	99	None	None	steepener	3.291	3.131	-16	-62.8	16.5	99	-0.33	39%
6m 2s/3s	6Mx2Y	6Mx3Y	3.429	3.249	-18.0	2.987	2.963	-2.4	7.58	7.42	0.676	-0.04	15%	-6.1	17	flattener	2.973	2.963	-1	17.0	1.4	99	None	None	steepener	3.003	2.963	-4	-14.0	1.6	99	-0.04	15%
6m 2s/5s	6Mx2Y	6Mx5Y	3.429	3.155	-27.4	2.987	2.997	1.0	7.58	6.90	0.417	-0.12	34%	-11.1	37	flattener	2.927	2.997	7	34.4	6.0	99	None	None	steepener	3.047	2.997	-5	-22.4	6.0	99	-0.12	34%
6m 2s/7s	6Mx2Y	6Mx7Y	3.429	3.160	-26.8	2.987	3.053	6.6	7.58	6.63	0.307	-0.18	40%	-13.1	49	flattener	2.903	3.053	15	41.8	8.4	99	None	None	steepener	3.063	3.053	-1	-25.8	7.6	99	-0.18	40%
6m 2s/10s	6Mx2Y	6Mx10Y	3.429	3.209	-22.0	2.987	3.138	15.2	7.58	6.27	0.225	-0.24	45%	-14.5	61	flattener	2.878	3.138	26	48.0	10.8	99	None	None	steepener	3.098	3.138	4	-26.0	11.2	99	-0.24	45%
6m 2s/20s	6Mx2Y	6Mx20Y	3.429	3.309	-11.9	2.987	3.262	27.5	7.58	5.90	0.131	-0.33	54%	-15.1	78	flattener	2.852	3.262	41	52.9	13.5	99	None	None	steepener	3.122	3.262	14	-25.9	13.5	99	-0.33	54%
6m 2s/30s	6Mx2Y	6Mx30Y	3.429	3.177	-25.2	2.987	3.131	14.5	7.58	5.62	0.101	-0.39	60%	-15.1	86	flattener	2.841	3.131	29	54.2	14.5	99	None	None	steepener	3.141	3.131	-1	-24.2	15.5	99	-0.39	60%
6m 3s/5s	6Mx3Y	6Mx5Y	3.249	3.155	-9.4	2.963	2.997	3.4	7.42	6.90	0.617	-0.08	37%	-5.0	21	flattener	2.917	2.997	8	17.4	4.6	99	None	None	steepener	3.007	2.997	-1	-8.4	4.4	99	-0.08	37%
6m 3s/7s	6Mx3Y	6Mx7Y	3.249	3.160	-8.9	2.963	3.053	9.0	7.42	6.63	0.454	-0.14	40%	-7.0	33	flattener	2.893	3.053	16	24.9	7.0	99	None	None	steepener	3.033	3.053	2	-10.9	7.0	99	-0.14	40%
6m 3s/10s	6Mx3Y	6Mx10Y	3.249	3.209	-4.0	2.963	3.138	17.5	7.42	6.27	0.333	-0.19	43%	-8.4	46	flattener	2.868	3.138	27	31.0	9.5	99	None	None	steepener	3.058	3.138	8	-12.0	9.5	99	-0.19	43%
6m 3s/20s	6Mx3Y	6Mx20Y	3.249	3.309	6.0	2.963	3.262	29.9	7.42	5.90	0.194	-0.29	52%	-9.1	64	flattener	2.842	3.262	42	36.0	12.1	99	None	None	steepener	3.092	3.262	17	-11.0	12.9	99	-0.29	52%
6m 3s/30s	6Mx3Y	6Mx30Y	3.249	3.177	-7.2	2.963	3.131	16.8	7.42	5.62	0.149	-0.35	59%	-9.0	73	flattener	2.821	3.131	31	38.2	14.2	99	None	None	steepener	3.111	3.131	2	-9.2	14.8	99	-0.35	59%
6m 5s/7s	6Mx5Y	6Mx7Y	3.155	3.160	0.5	2.997	3.053	5.6	6.90	6.63	0.737	-0.05	32%	-2.0	13	flattener	2.973	3.053	8	7.5	2.4	99	None	None	steepener	3.023	3.053	3	-2.5	2.6	99	-0.05	32%
6m 5s/10s	6Mx5Y	6Mx10Y	3.155	3.209	5.4	2.997	3.138	14.1	6.90	6.27	0.540	-0.11	36%	-3.4	26	flattener	2.948	3.138	19	13.6	4.9	99	None	None	steepener	3.048	3.138	9	-3.6	5.1	99	-0.11	36%
6m 5s/20s	6Mx5Y	6Mx20Y	3.155	3.309	15.4	2.997	3.262	26.5	6.90	5.90	0.315	-0.21	47%	-4.0	45	flattener	2.912	3.262	35	19.6	8.5	99	None	None	steepener	3.082	3.262	18	-2.6	8.5	99	-0.21	47%
6m 5s/30s	6Mx5Y	6Mx30Y	3.155	3.177	2.2	2.997	3.131	13.4	6.90	5.62	0.241	-0.27	55%	-4.0	54	flattener	2.901	3.131	23	20.8	9.6	99	None	None	steepener	3.101	3.131	3	-0.8	10.4	99	-0.27	55%
6m 7s/10s	6Mx7Y	6Mx10Y	3.160	3.209	4.8	3.053	3.138	8.5	6.63	6.27	0.733	-0.05	33%	-1.4	13	flattener	3.018	3.138	12	7.2	3.5	99	None	None	steepener	3.088	3.138	5	-0.2	3.5	99	-0.05	33%
6m 7s/20s	6Mx7Y	6Mx20Y	3.160	3.309	14.9	3.053	3.262	20.9	6.63	5.90	0.427	-0.15	45%	-2.1	32	flattener	2.992	3.262	27	12.1	6.1	99	None	None	steepener	3.112	3.262	15	-0.1	5.9	99	-0.15	45%
6m 7s/30s	6Mx7Y	6Mx30Y	3.160	3.177	1.7	3.053	3.131	7.8	6.63	5.62	0.327	-0.21	55%	-2.0	42	flattener	2.971	3.131	16	14.3	8.2	99	None	None	steepener	3.141	3.131	-1	2.7	8.8	98	-0.21	55%
6m 10s/20s	6Mx10Y	6Mx20Y	3.209	3.309	10.1	3.138	3.262	12.3	6.27	5.90	0.583	-0.09	46%	-0.6	20	flattener	3.112	3.262	15	4.9	2.7	99	None	None	steepener	3.172	3.262	9	1.1	3.3	99	-0.09	46%
6m 10s/30s	6Mx10Y	6Mx30Y	3.209	3.177	-3.2	3.138	3.131	-0.7	6.27	5.62	0.446	-0.16	57%	-0.6	29	flattener	3.091	3.131	4	7.2	4.7	99	None	None	steepener	3.191	3.131	-6	2.8	5.3	97	-0.16	57%
6m 20s/30s	6Mx20Y	6Mx30Y	3.309	3.177	-13.2	3.262	3.131	-13.1	5.90	5.62	0.765	-0.06	66%	0.1	10	flattener	3.241	3.131	-11	2.2	2.1	99	None	None	steepener	3.281	3.131	-15	1.8	1.9	88	-0.06	66%

*The table provides various benchmark curve trades that can be done conditionally in a rally or a selloff for various forwards (1M, 3M, 6M and 9M) and relevant statistics. For example, a given benchmark structure such as 3m 2s/10s can be broken down into a left structure (3Mx2Y) and right structure (3Mx10Y) with the relevant left and right spot rates, ATMF rates, and swaption vols. Fwd risk ratio is the ratio between the annuities of the left swap to the right swap. 1Y beta and 1Y rsq columns indicate the regression stats for regressing the spot curve against the spot rates. Carry on steepener column indicates the 3M slide (i.e. slide) of the specific curve pair for a steepener, except for 1M expiries which will show 1M slide. Trade risk is the 2Y standard deviation of quarterly changes in the weighted yield spread, annualized by multiplying by sqrt(4).

** Trade 1 (Trade 2) is a conditional bull (bear) trade done with receiver (payer) swaptions. In this construction, it will take the vol that is lower and assume it buys that swaption at the ATMF strike. Then, the strike on the other leg is iterated OTM until a risk weighted premium neutral ratio can be found, and the implied yield spread on those strikes is labeled as the "0 Cost Entry" bull (bear) columns. This implied spread is compared with both the current spot curve and the current ATMF curve, and the differences will be labeled in the "Pickup" columns. Lastly, we run two separate regressions for the spot yield curve (Y) against the spot rates (X) for all X coordinates below and above the current ATMF, and record the beta and R squared (note these stats will be labeled as "None" if no such points exist). For more details, refer to the footnotes of this report where the historical spread charts and isopremium lines are plotted.

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Derivatives Strategy

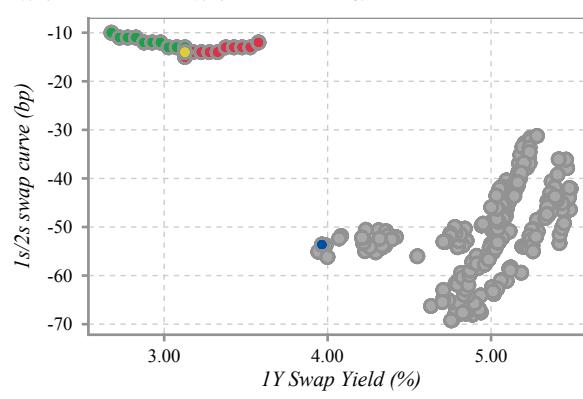
Conditional Isopremium Curve Trades Report - 6M Expiry

6m 1s/2s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.61	7.58	0.51	0.12	23%

Beta below ATMF Rsq below ATMF Beta above ATMF Rsq above ATMF

None None 0.12 23%



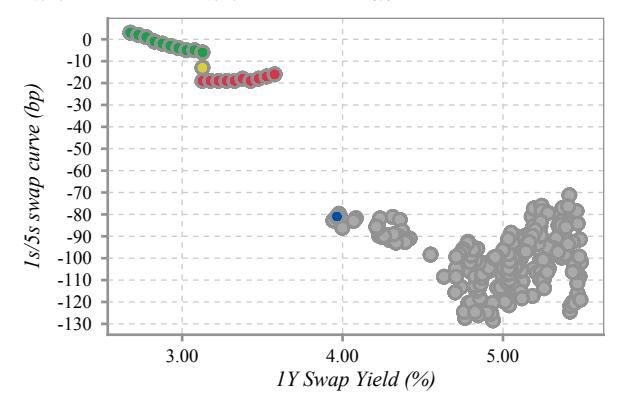
● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

6m 1s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.61	6.90	0.21	-0.04	1%

Beta below ATMF Rsq below ATMF Beta above ATMF Rsq above ATMF

None None -0.04 1%



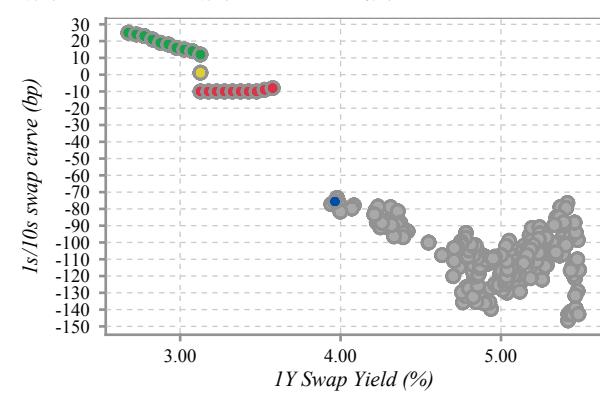
● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

6m 1s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.61	6.27	0.11	-0.17	15%

Beta below ATMF Rsq below ATMF Beta above ATMF Rsq above ATMF

None None -0.17 15%



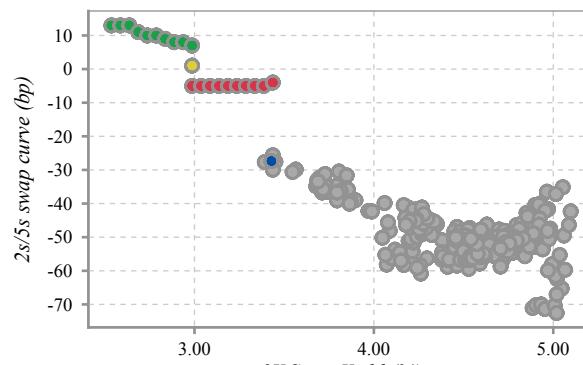
● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

6m 2s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.58	6.90	0.42	-0.12	34%

Beta below ATMF Rsq below ATMF Beta above ATMF Rsq above ATMF

None None -0.12 34%



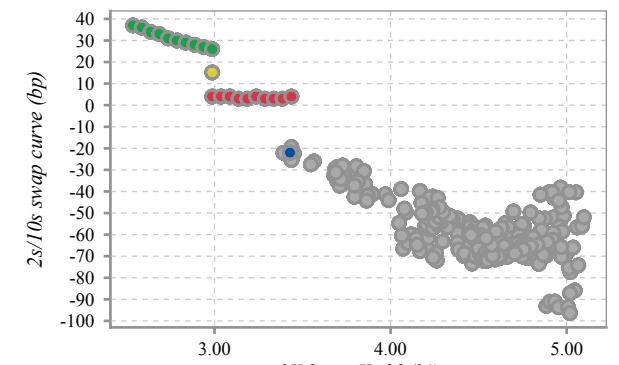
● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

6m 2s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.58	6.27	0.23	-0.24	45%

Beta below ATMF Rsq below ATMF Beta above ATMF Rsq above ATMF

None None -0.24 45%



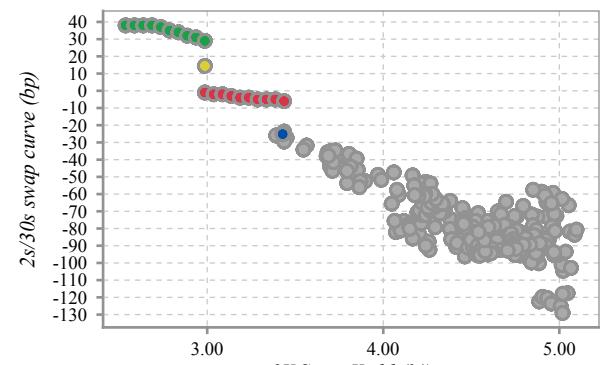
● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

6m 2s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.58	5.62	0.10	-0.39	60%

Beta below ATMF Rsq below ATMF Beta above ATMF Rsq above ATMF

None None -0.39 60%



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

* On the X axis, the chart shows the left spot rate and the Y axis shows the spot swap yield curve. For example, for 1m fwd 2s/5s (or any other fwd such as 3m, 6m, and 9m), spot 2s/5s SOFR swap curve (bp) is shown on the Y axis versus spot 2Y SOFR swap yields (%) on the X axis. Overlaid on this chart are premium neutral entry points into conditional bull (green dots) and bear trades (red dots) with respective expiries (either 1m, 3m, 6m or 9m) with different levels of moneyness (note steeper or flatter directions will depend on which vol is cheaper, as it always will assume buying the cheaper vol) as well as dots corresponding to current spot (blue dot) and current ATM (yellow dot); past 1Y history.

** Premium neutral strike levels are determined by starting at the ATM strike on the leg one is buying and backing out the premium neutral strike level for the leg that is being sold and solving for the implied curve level. This exercise is repeated for strike increments of +5bp on the long/buying leg. Also shown are statistics for the 1Y regression of spot yield curve vs spot yields (Beta and Rsq) as well as the results for other regression stats of Beta above and below ATM rates (spot yield curve (Y) against the spot rates (X) for all X coordinates below and above the current ATM; rates will be labeled as "None" if no such points exist). For more details refer to the footnotes of this report where the full statistics tables are shown.

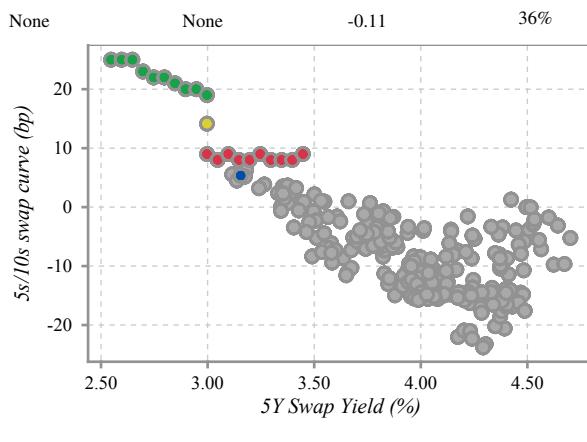
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Derivatives Strategy

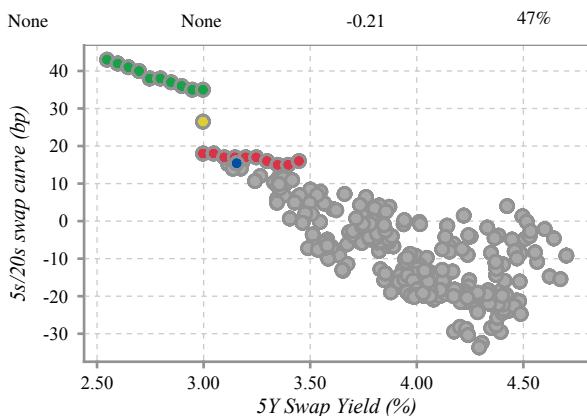
Conditional Isopremium Curve Trades Report - 6M Expiry

6m 5s/10s

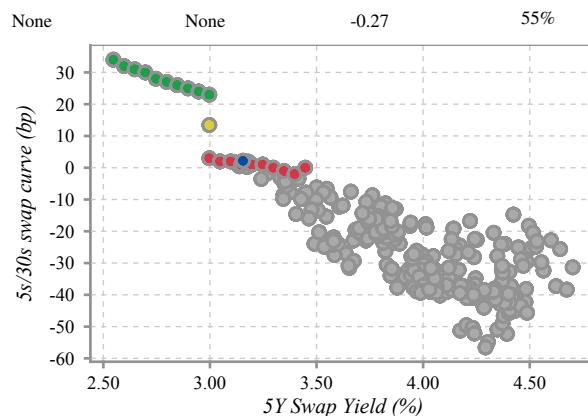
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
6.90	6.27	0.54	-0.11	36%



Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
6.90	5.90	0.31	-0.21	47%

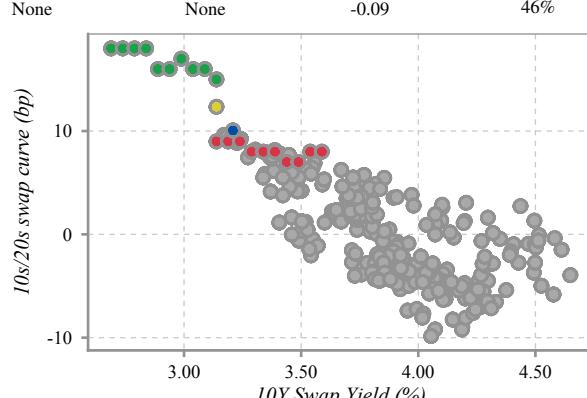


Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
6.90	5.62	0.24	-0.27	55%

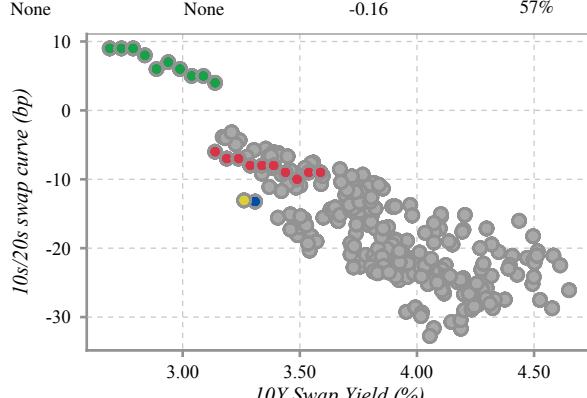


6m 10s/20s

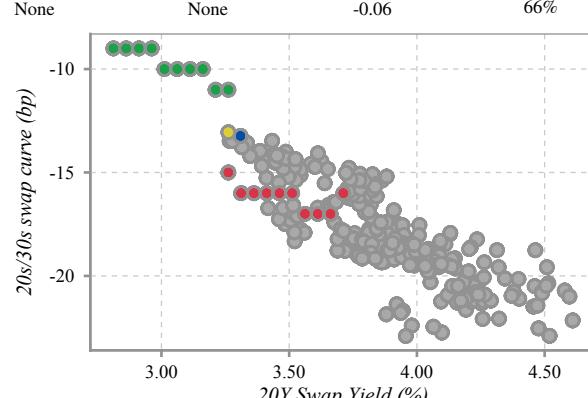
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
6.27	5.90	0.58	-0.09	46%



Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
6.27	5.62	0.45	-0.16	57%



Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
5.90	5.62	0.77	-0.06	66%



Derivatives Strategy

Conditional Isopremium Curve Trades Report - 9M Expiry

Curve Structure	Curve Left Struct	Curve Right Struct	Spot Rate Left (%)	Spot Rate Right (%)	Spot Curve (bp)	ATMF Left (%)	ATMF Right (%)	ATMF Curve (bp)	Bp vol Left	Bp vol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq	Carry on Stpnrs (bp)	Trade Risk (bp)	Trade 1 Bull	Trade1 Left Strike (%)	Trade1 Right Strike (%)	0 Cost Entry Bull (bp)	Pickup vs. Spot Crv (Bull)	Pickup vs. ATMF Crv (Bull)	Bull Entry %ile	Below ATMF Beta	Below ATMF Rsrq	Trade 2 Bear	Trade2 Left Strike (%)	Trade2 Right Strike (%)	0 Cost Entry Bear (bp)	Pickup vs. Spot Crv (Bear)	Pickup vs. ATMF Crv (Bear)	Bear Entry %ile	Above ATMF Beta	Above ATMF Rsrq
9m 1s/2s	9Mx1Y 9Mx2Y	3.965 3.429 -53.6	2.957 2.906 -5.1	7.66 7.44 0.507	0.12 23%	-9.0 27	flattener	2.936 2.906 -3	50.6	2.1	99	None	None	steepener	2.976 2.906 -7	-46.6	1.9	99	0.12	23%													
9m 1s/3s	9Mx1Y 9Mx3Y	3.965 3.249 -71.6	2.957 2.915 -4.2	7.66 7.28 0.343	0.06 4%	-12.2 42	flattener	2.915 2.915 0	71.6	4.2	99	None	None	steepener	2.995 2.915 -8	-63.6	3.8	99	0.06	4%													
9m 1s/5s	9Mx1Y 9Mx5Y	3.965 3.155 -81.0	2.957 2.976 2.0	7.66 6.77 0.212	-0.04 1%	-14.9 58	flattener	2.866 2.976 11	92.0	9.0	99	None	None	steepener	3.046 2.976 -7	-74.0	9.0	99	-0.04	1%													
9m 1s/7s	9Mx1Y 9Mx7Y	3.965 3.160 -80.5	2.957 3.042 8.6	7.66 6.55 0.156	-0.10 7%	-16.0 69	flattener	2.842 3.042 20	100.5	11.4	99	None	None	steepener	3.072 3.042 -3	-77.5	11.6	99	-0.10	7%													
9m 1s/10s	9Mx1Y 9Mx10Y	3.965 3.209 -75.6	2.957 3.135 17.9	7.66 6.21 0.114	-0.17 15%	-16.7 79	flattener	2.815 3.135 32	107.6	14.1	99	None	None	steepener	3.105 3.135 3	-78.6	14.9	99	-0.17	15%													
9m 1s/20s	9Mx1Y 9Mx20Y	3.965 3.309 -65.6	2.957 3.256 29.9	7.66 5.81 0.067	-0.27 30%	-16.4 94	flattener	2.786 3.256 47	112.6	17.1	99	None	None	steepener	3.146 3.256 11	-76.6	18.9	99	-0.27	30%													
9m 1s/30s	9Mx1Y 9Mx30Y	3.965 3.177 -78.8	2.957 3.122 16.5	7.66 5.57 0.051	-0.33 39%	-16.1 102	flattener	2.762 3.122 36	114.8	19.5	99	None	None	steepener	3.162 3.122 -4	-74.8	20.5	99	-0.33	39%													
9m 2s/3s	9Mx2Y 9Mx3Y	3.429 3.249 -18.0	2.906 2.915 0.9	7.44 7.28 0.676	-0.04 15%	-3.2 16	flattener	2.895 2.915 2	20.0	1.1	99	None	None	steepener	2.925 2.915 -1	-17.0	1.9	99	-0.04	15%													
9m 2s/5s	9Mx2Y 9Mx5Y	3.429 3.155 -27.4	2.906 2.976 7.0	7.44 6.77 0.418	-0.12 34%	-6.0 35	flattener	2.836 2.976 14	41.4	7.0	99	None	None	steepener	2.976 2.976 0	-27.4	7.0	99	-0.12	34%													
9m 2s/7s	9Mx2Y 9Mx7Y	3.429 3.160 -26.8	2.906 3.042 13.6	7.44 6.55 0.308	-0.18 40%	-7.0 47	flattener	2.812 3.042 23	49.8	9.4	99	None	None	steepener	3.002 3.042 4	-30.8	9.6	99	-0.18	40%													
9m 2s/10s	9Mx2Y 9Mx10Y	3.429 3.209 -22.0	2.906 3.135 22.9	7.44 6.21 0.225	-0.24 45%	-7.7 59	flattener	2.785 3.135 35	57.0	12.1	99	None	None	steepener	3.035 3.135 10	-32.0	12.9	99	-0.24	45%													
9m 2s/20s	9Mx2Y 9Mx20Y	3.429 3.309 -11.9	2.906 3.256 35.0	7.44 5.81 0.132	-0.33 54%	-7.5 75	flattener	2.756 3.256 50	61.9	15.0	99	None	None	steepener	3.066 3.256 19	-30.9	16.0	99	-0.33	54%													
9m 2s/30s	9Mx2Y 9Mx30Y	3.429 3.177 -25.2	2.906 3.122 21.6	7.44 5.57 0.101	-0.39 60%	-7.1 84	flattener	2.732 3.122 39	64.2	17.4	99	None	None	steepener	3.092 3.122 3	-28.2	18.6	99	-0.39	60%													
9m 3s/5s	9Mx3Y 9Mx5Y	3.249 3.155 -9.4	2.915 2.976 6.2	7.28 6.77 0.618	-0.08 37%	-2.8 20	flattener	2.856 2.976 12	21.4	5.8	99	None	None	steepener	2.966 2.976 1	-10.4	5.2	99	-0.08	37%													
9m 3s/7s	9Mx3Y 9Mx7Y	3.249 3.160 -8.9	2.915 3.042 12.8	7.28 6.55 0.455	-0.14 40%	-3.8 32	flattener	2.842 3.042 20	28.9	7.2	99	None	None	steepener	2.992 3.042 5	-13.9	7.8	99	-0.14	40%													
9m 3s/10s	9Mx3Y 9Mx10Y	3.249 3.209 -4.0	2.915 3.135 22.0	7.28 6.21 0.333	-0.19 43%	-4.5 44	flattener	2.805 3.135 33	37.0	11.0	99	None	None	steepener	3.025 3.135 11	-15.0	11.0	99	-0.19	43%													
9m 3s/20s	9Mx3Y 9Mx20Y	3.249 3.309 6.0	2.915 3.256 34.1	7.28 5.81 0.195	-0.29 52%	-4.2 62	flattener	2.776 3.256 48	42.0	13.9	99	None	None	steepener	3.066 3.256 19	-13.0	15.1	99	-0.29	52%													
9m 3s/30s	9Mx3Y 9Mx30Y	3.249 3.177 -7.2	2.915 3.122 20.7	7.28 5.57 0.149	-0.35 59%	-3.9 70	flattener	2.752 3.122 37	44.2	16.3	99	None	None	steepener	3.082 3.122 4	-11.2	16.7	99	-0.35	59%													
9m 5s/7s	9Mx5Y 9Mx7Y	3.155 3.160 0.5	2.976 3.042 6.6	6.77 6.55 0.737	-0.05 32%	-1.0 12	flattener	2.952 3.042 9	8.5	2.4	99	None	None	steepener	3.002 3.042 4	-3.5	2.6	99	-0.05	32%													
9m 5s/10s	9Mx5Y 9Mx10Y	3.155 3.209 5.4	2.976 3.135 15.9	6.77 6.21 0.540	-0.11 36%	-1.7 25	flattener	2.925 3.135 21	15.6	5.1	99	None	None	steepener	3.035 3.135 10	-4.6	5.9	99	-0.11	36%													
9m 5s/20s	9Mx5Y 9Mx20Y	3.155 3.309 15.4	2.976 3.256 28.0	6.77 5.81 0.315	-0.21 47%	-1.5 43	flattener	2.886 3.256 37	21.6	9.0	99	None	None	steepener	3.076 3.256 18	-2.6	10.0	99	-0.21	47%													
9m 5s/30s	9Mx5Y 9Mx30Y	3.155 3.177 2.2	2.976 3.122 14.6	6.77 5.57 0.241	-0.27 55%	-1.1 52	flattener	2.862 3.122 26	23.8	11.4	99	None	None	steepener	3.102 3.122 2	0.2	12.6	99	-0.27	55%													
9m 7s/10s	9Mx7Y 9Mx10Y	3.160 3.209 4.8	3.042 3.135 9.3	6.55 6.21 0.733	-0.05 33%	-0.7 12	flattener	3.005 3.135 13	8.2	3.7	99	None	None	steepener	3.075 3.135 6	-1.2	3.3	99	-0.05	33%													
9m 7s/20s	9Mx7Y 9Mx20Y	3.160 3.309 14.9	3.042 3.256 21.3	6.55 5.81 0.428	-0.15 45%	-0.5 31	flattener	2.966 3.256 29	14.1	7.7	99	None	None	steepener	3.126 3.256 13	1.9	8.3	98	-0.15	45%													
9m 7s/30s	9Mx7Y 9Mx30Y	3.160 3.177 1.7	3.042 3.122 8.0	6.55 5.57 0.327	-0.21 55%	-0.1 40	flattener	2.942 3.122 18	16.3	10.0	99	None	None	steepener	3.142 3.122 -2	3.7	10.0	98	-0.21	55%													
9m 10s/20s	9Mx10Y 9Mx20Y	3.209 3.309 10.1	3.135 3.256 12.1	6.21 5.81 0.584	-0.09 46%	0.3 19	flattener	3.096 3.256 16	5.9	3.9	99	None	None	steepener	3.176 3.256 8	2.1	4.1	97	-0.09	46%													
9m 10s/30s	9Mx10Y 9Mx30Y	3.209 3.177 -3.2	3.135 3.122 -1.3	6.21 5.57 0.447	-0.16 57%	0.6 29	flattener	3.072 3.122 5	8.2	6.3	99	None	None	steepener	3.202 3.122 -8	4.8	6.7	93	-0.16	57%													
9m 20s/30s	9Mx20Y 9Mx30Y	3.309 3.177 -13.2	3.256 3.122 -13.4	5.81 5.57 0.765	-0.06 66%	0.3 10	flattener	3.232 3.122 -11	2.2	2.4	99	None	None	steepener	3.282 3.122 -16	2.8	2.6	78	-0.06	66%													

*The table provides various benchmark curve trades that can be done conditionally in a rally or a selloff for various forwards (1M, 3M, 6M and 9M) and relevant statistics. For example, a given benchmark structure such as 3m 2s/10s can be broken down into a left structure (3Mx2Y) and right structure (3Mx10Y) with the relevant left and right spot rates, ATMF rates, and swaption vols. Fwd risk ratio is the ratio between the annuities of the left swap to the right swap. 1Y beta and 1Y rsq columns indicate the regression stats for regressing the spot curve against the spot rates. Carry on steepener column indicates the 3M slide (i.e. slide) of the specific curve pair for a steepener, except for 1M expiries which will show 1M slide. Trade risk is the 2Y standard deviation of quarterly changes in the weighted yield spread, annualized by multiplying by sqrt(4).

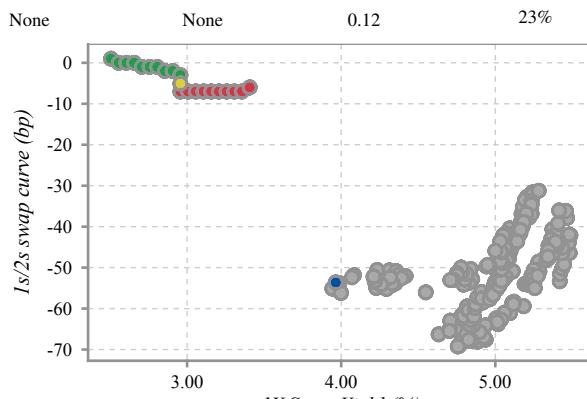
** Trade 1 (Trade 2) is a conditional bull (bear) trade done with receiver (payer) swaptions. In this construction, it will take the vol that is lower and assume it buys that swaption at the ATMF strike. Then, the strike on the other leg is iterated OTM until a risk weighted premium neutral ratio can be found, and the implied yield spread on those strikes is labeled as the "0 Cost Entry" bull (bear) columns. This implied spread is compared with both the current spot curve and the current ATMF curve, and the differences will be labeled in the "Pickup" columns. Lastly, we run two separate regressions for the spot yield curve (Y) against the spot rates (X) for all X coordinates below and above the current ATMF, and record the beta and Rsquared (note these stats will be labeled as "None" if no such points exist). For more details, refer to the footnotes of this report where the historical spread charts and isopremium lines are plotted.

Derivatives Strategy

Conditional Isopremium Curve Trades Report - 9M Expiry

9m 1s/2s

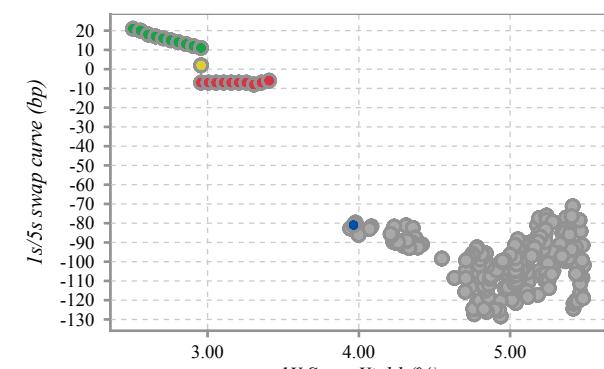
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.66	7.44	0.51	0.12	23%



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

9m 1s/5s

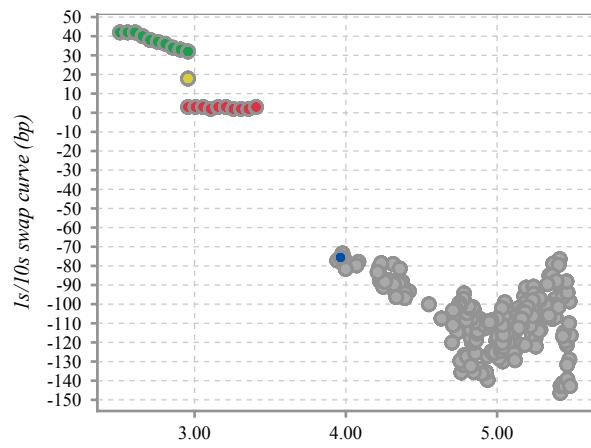
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.66	6.77	0.21	-0.04	1%



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

9m 1s/10s

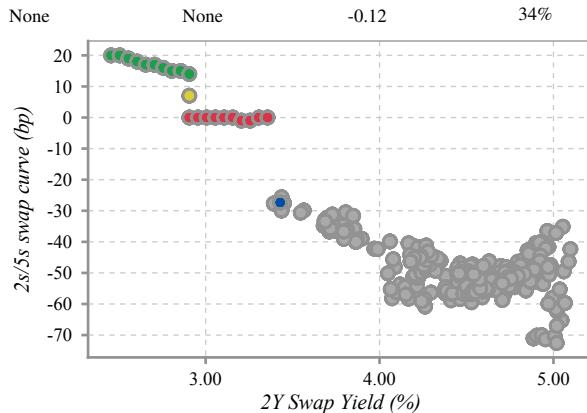
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.66	6.77	0.21	-0.04	1%



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

9m 2s/5s

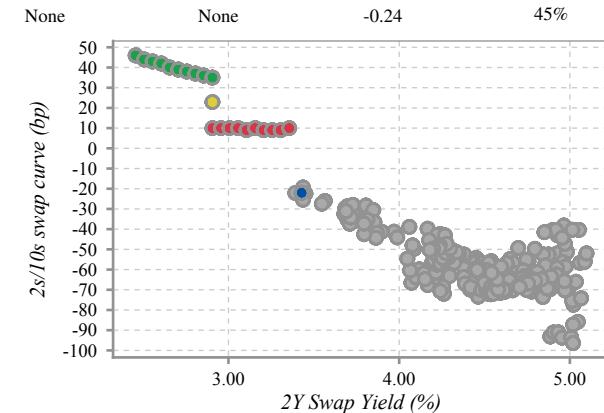
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.44	6.77	0.42	-0.12	34%



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

9m 2s/10s

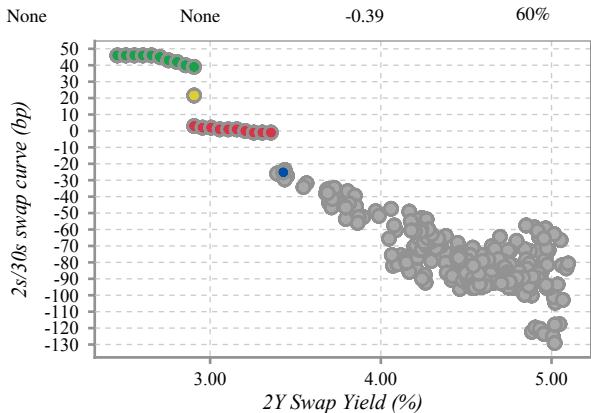
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.44	6.21	0.23	-0.24	45%



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

9m 2s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	
7.44	5.57	0.10	-0.39	60%



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

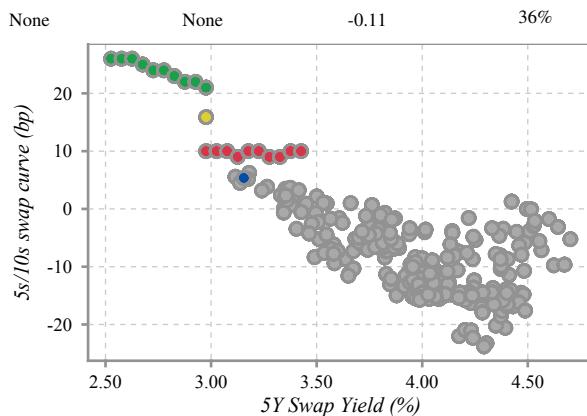
* On the X axis, the chart shows the left spot rate and the Y axis shows the spot swap yield curve. For example, for 1m fwd 2s/5s (or any other fwd such as 3m, 6m, and 9m), spot 2s/5s SOFR swap curve (bp) is shown on the Y axis versus spot 2Y SOFR swap yield (%) on the X axis. Overlaid on this chart are premium neutral entry points into conditional bull (green dots) and bear trades (red dots) with respective expiries (either 1m, 3m, 6m or 9m) with different levels of moneyness (note steeper or flatter directions will depend on which vol is cheaper, as it always will assume buying the cheaper vol) as well as dots corresponding to current spot (blue dot) and current ATM (yellow dot); past 1Y history.
** Premium neutral strike levels are determined by starting at the ATMF strike on the leg one is buying and backing out the premium neutral strike level for the leg that is being sold for the implied curve level. This exercise is repeated for strike increments of +5bp on the long/buying leg. Also shown are statistics for the 1Y regression of spot yield curve vs spot yields (Beta and R-squared) as well as the wvol for each leg risk ratio, and two other separate regression stats of beta above and below ATM rates (spot yield curve (Y) against the spot rates (X) for all x-coordinates below and above the current ATM); stats will be labeled as "None" if no such points exist. For more details, refer to the footnotes of this report where the full statistics tables are shown.

Derivatives Strategy

Conditional Isopremium Curve Trades Report - 9M Expiry

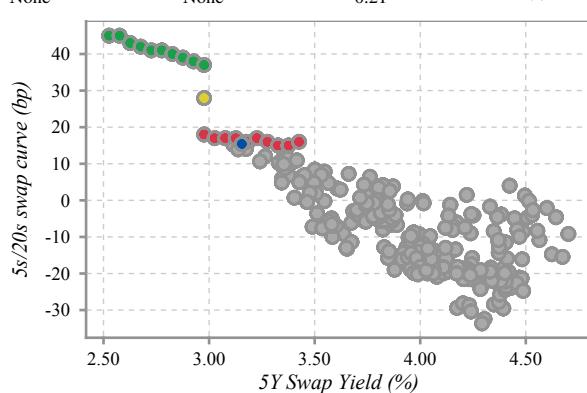
9m 5s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.77	6.21	0.54	-0.11	36%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



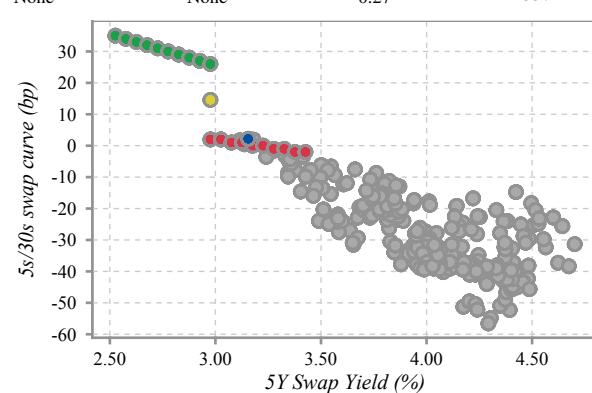
● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.77	5.81	0.32	-0.21	47%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

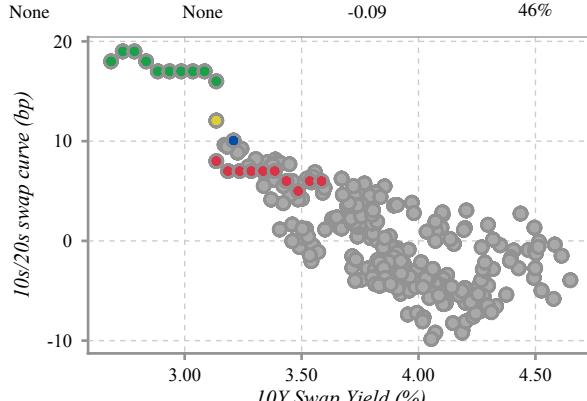
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.77	5.57	0.24	-0.27	55%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

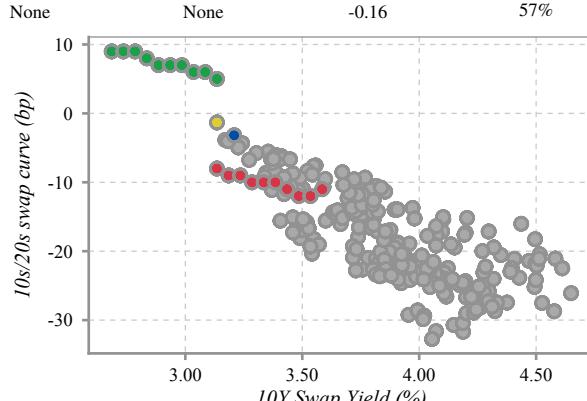
9m 10s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.21	5.81	0.58	-0.09	46%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

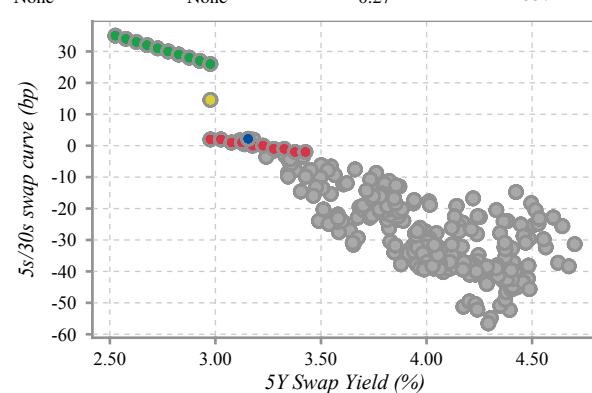
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.21	5.57	0.45	-0.16	57%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

9m 10s/30s

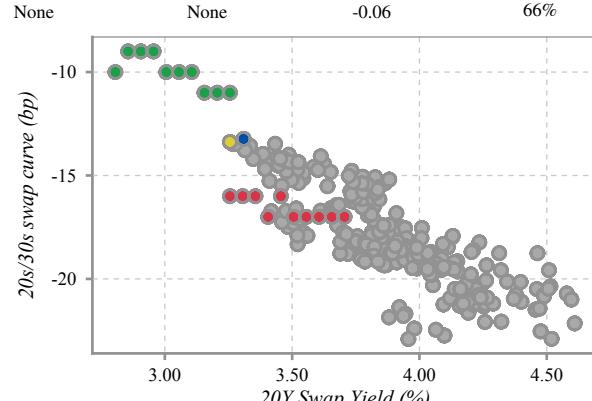
Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
5.81	5.57	0.77	-0.06	66%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

9m 20s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
5.81	5.57	0.77	-0.06	66%
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF	



● Historical spread ● Isopremium (Bull) ● Isopremium (Bear)
● Spot ● ATM

* On the X axis, the chart shows the left spot rate and the Y axis shows the spot swap yield curve. For example, for 1m fwd 2s/5s (or any other fwd such as 3m, 6m, and 9m), spot 2s/5s SOFR swap curve (bp) is shown on the Y axis versus spot 2Y SOFR swap yield (%) on the X axis. Overlaid on this chart are premium neutral entry points into conditional bull (green dots) and bear trades (red dots) with respective expiries (either 1m, 3m, 6m or 9m) with different levels of moneyness (note steeper or flatter directions will depend on which vol is cheaper, as it always will assume buying the cheaper vol) as well as dots corresponding to current spot (blue dot) and current ATM (yellow dot); past 1Y history.

** Premium neutral strike levels are determined by starting at the ATM level on the leg one is buying and backing out the premium neutral strike level for the leg that is being sold for the implied curve level. This exercise is repeated for strike increments of +5bp on the long/buying leg. Also shown are statistics for the 1Y regression of spot yield curve vs spot yields (Beta and R-squared) as well as the wvol for each leg risk ratio, and two other separate regression stats of beta above and below ATM rates (spot yield curve (Y) against the spot rates (X) for all coordinates below and above the current ATM); stats will be labeled as "None" if no such points exist. For more details, refer to the footnotes of this report where the full statistics tables are shown.

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Derivatives Strategy

Volatility Fair Value Model Report

Structure	Coefficients						Model Info.	Drivers Pt. 1	Current and Projected Bpvol					Drivers Pt. 2			
	Intercept	ATMF	Fed b/s	Log of market depth	2Y Real rates	Fwd guidance	Intercept Shift		Rsq	Std. Err.	Cur. ATMF	Cur. Bpvol	Modeled Ref. Vol	Modeled Deviation	Fair Value	Residual	
6Mx1Y	-1.42	-0.75	0.09	-2.70	0.12	-0.05	-0.35	0.77	0.89	3.06	7.72	5.56	0.43	5.99	1.73	Fed b/s (\$tn)	7.17
1Yx1Y	-1.83	-0.43	0.19	-2.25	0.19	-0.04	-0.19	0.88	0.65	2.85	7.76	5.38	1.39	6.76	1.00	Market depth (\$bn)	0.26
2Yx1Y	-1.67	-0.16	0.20	-1.66	0.11	-0.04	-0.48	0.92	0.45	2.87	7.09	5.39	1.20	6.59	0.50	2Y Real rates (%)	1.26
3Yx1Y	-1.70	0.04	0.18	-1.25	0.02	-0.03	-0.52	0.92	0.37	2.94	6.67	5.45	0.92	6.37	0.30	Fwd guidance (# months)	0.00
5Yx1Y	-1.46	0.12	0.10	-0.87	-0.06	-0.02	-0.39	0.91	0.27	3.13	6.34	5.63	0.38	6.01	0.33	Intcpt Shift	1.00
10Yx1Y	-0.51	-0.28	0.06	-0.34	-0.03	-0.01	0.03	0.81	0.16	3.46	5.73	5.96	-0.61	5.35	0.38		
6Mx2Y	-1.17	-0.61	0.12	-2.45	0.21	-0.05	-0.50	0.86	0.68	2.95	7.70	5.46	0.98	6.44	1.26		
1Yx2Y	-1.55	-0.33	0.17	-2.00	0.18	-0.04	-0.37	0.91	0.52	2.86	7.41	5.38	1.29	6.68	0.73		
2Yx2Y	-1.67	-0.07	0.19	-1.45	0.09	-0.03	-0.50	0.92	0.41	2.90	6.85	5.42	1.05	6.48	0.37		
3Yx2Y	-1.80	0.13	0.15	-1.16	-0.02	-0.02	-0.52	0.91	0.35	2.99	6.50	5.50	0.73	6.22	0.28		
5Yx2Y	-1.39	0.10	0.09	-0.80	-0.06	-0.02	-0.35	0.91	0.25	3.16	6.17	5.66	0.25	5.92	0.25		
10Yx2Y	-0.43	-0.31	0.05	-0.30	-0.03	-0.01	0.04	0.80	0.16	3.48	5.61	5.98	-0.72	5.26	0.36		
6Mx3Y	-1.12	-0.54	0.13	-2.23	0.20	-0.05	-0.52	0.89	0.57	2.93	7.52	5.45	1.02	6.47	1.05		
1Yx3Y	-1.66	-0.25	0.18	-1.82	0.14	-0.04	-0.42	0.92	0.45	2.88	7.20	5.41	1.15	6.56	0.64		
2Yx3Y	-1.91	0.03	0.18	-1.36	0.05	-0.02	-0.51	0.93	0.37	2.94	6.71	5.46	0.86	6.32	0.39		
3Yx3Y	-1.93	0.18	0.14	-1.11	-0.04	-0.02	-0.49	0.92	0.33	3.03	6.41	5.54	0.57	6.10	0.30		
5Yx3Y	-1.38	0.07	0.09	-0.76	-0.06	-0.02	-0.32	0.91	0.23	3.20	6.09	5.69	0.13	5.83	0.26		
10Yx3Y	-0.37	-0.33	0.05	-0.28	-0.04	-0.01	0.03	0.80	0.15	3.50	5.52	6.00	-0.83	5.17	0.35		
6Mx5Y	-2.00	-0.20	0.17	-1.76	0.08	-0.02	-0.44	0.92	0.42	2.97	6.97	5.48	0.66	6.15	0.83		
1Yx5Y	-2.23	-0.02	0.18	-1.46	0.06	-0.01	-0.41	0.93	0.36	2.96	6.72	5.47	0.67	6.14	0.58		
2Yx5Y	-2.15	0.11	0.16	-1.18	0.00	-0.01	-0.44	0.92	0.32	3.03	6.43	5.53	0.51	6.04	0.39		
3Yx5Y	-1.88	0.11	0.13	-0.97	-0.03	-0.01	-0.39	0.92	0.27	3.11	6.22	5.61	0.31	5.91	0.31		
5Yx5Y	-1.32	-0.02	0.10	-0.64	-0.05	-0.01	-0.24	0.90	0.21	3.26	5.93	5.75	-0.09	5.66	0.27		
10Yx5Y	-0.26	-0.38	0.04	-0.24	-0.03	-0.01	0.00	0.81	0.15	3.51	5.33	6.01	-1.02	4.98	0.34		
6Mx7Y	-2.28	-0.11	0.18	-1.56	0.04	-0.01	-0.44	0.92	0.38	3.03	6.69	5.54	0.40	5.93	0.75		
1Yx7Y	-2.39	0.01	0.19	-1.30	0.03	-0.01	-0.38	0.93	0.33	3.03	6.50	5.54	0.43	5.97	0.53		
2Yx7Y	-2.17	0.07	0.17	-1.04	0.00	-0.01	-0.36	0.92	0.29	3.10	6.26	5.60	0.30	5.90	0.37		
3Yx7Y	-1.82	0.04	0.14	-0.86	-0.03	-0.01	-0.29	0.91	0.25	3.18	6.08	5.67	0.12	5.79	0.30		
5Yx7Y	-1.20	-0.10	0.10	-0.57	-0.04	-0.01	-0.16	0.88	0.19	3.32	5.82	5.81	-0.26	5.55	0.27		
10Yx7Y	-0.23	-0.42	0.04	-0.22	-0.02	-0.01	0.03	0.83	0.14	3.49	5.22	5.99	-1.11	4.88	0.34		
6Mx10Y	-2.39	-0.14	0.21	-1.24	0.04	0.00	-0.37	0.90	0.36	3.12	6.29	5.62	0.07	5.68	0.61		
1Yx10Y	-2.30	-0.08	0.21	-1.01	0.04	0.00	-0.27	0.91	0.31	3.13	6.19	5.63	0.13	5.76	0.44		
2Yx10Y	-1.94	-0.07	0.18	-0.80	0.02	0.00	-0.21	0.90	0.26	3.19	6.04	5.69	0.03	5.72	0.32		
3Yx10Y	-1.58	-0.12	0.15	-0.65	0.00	-0.01	-0.15	0.89	0.23	3.26	5.90	5.75	-0.14	5.61	0.28		
5Yx10Y	-1.00	-0.22	0.10	-0.45	-0.02	-0.01	-0.05	0.86	0.19	3.37	5.68	5.87	-0.47	5.40	0.28		
10Yx10Y	-0.22	-0.48	0.05	-0.19	0.00	-0.01	0.08	0.86	0.13	3.44	5.08	5.94	-1.20	4.73	0.34		
6Mx30Y	-1.96	-0.42	0.26	-0.77	0.07	0.01	-0.10	0.83	0.40	3.12	5.68	5.62	-0.38	5.23	0.44		
1Yx30Y	-1.85	-0.38	0.25	-0.59	0.08	0.00	0.00	0.85	0.33	3.11	5.60	5.60	-0.33	5.28	0.32		
2Yx30Y	-1.50	-0.38	0.22	-0.42	0.07	0.00	0.11	0.84	0.28	3.10	5.49	5.60	-0.37	5.23	0.26		
3Yx30Y	-1.29	-0.39	0.19	-0.30	0.06	0.00	0.18	0.83	0.25	3.09	5.37	5.59	-0.48	5.11	0.26		
5Yx30Y	-1.02	-0.41	0.14	-0.18	0.06	0.00	0.26	0.81	0.20	3.06	5.22	5.56	-0.67	4.89	0.34		
10Yx30Y	-0.60	-0.52	0.07	-0.04	0.07	0.00	0.32	0.81	0.15	2.85	4.69	5.38	-1.10	4.28	0.41		

Note: Statistics from regressing* deviations of normal bp volatility (in bp/day) from reference volatility** against yields (%), natural log of duration weighted market depth*** (\$bn), 2Y real rates (2Y swap rates minus 2Y inflation swap) (%), intercept shift (a time series of values of 0 before 11/1/2023 and values of 1s after) (%), Fed balance sheet size (\$tn), and forward guidance (in # of months). Fair value is the sum of modeled reference volatility and modeled deviation. Residual is calculated as the current value of implied volatility minus fair value of implied volatility based on spot drivers. For more details, please refer to our Interest Rate Derivatives 2024 Mid-Year Outlook.

* Regression from June 2018 - June 2024, excluding March - June 2020

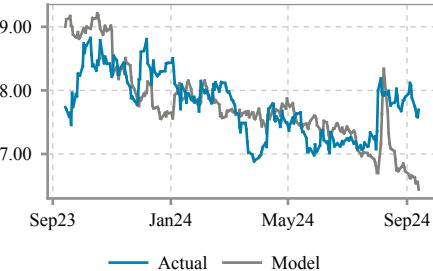
** Reference volatility calculated as yield vol times yields divided by square root of 251. Yield vol is modeled as 24.6 plus 124.9 times exponential of minus 1.1 times yields. The fit is done over 10 years using 3M, 6M, 9M, 1Y, 2Y, 3Y, 5Y, 10Y expiry and 2Y, 3Y, 5Y, 7Y, 10Y and 30Y tails.

*** Market depth is the size of the top 3 bids and offers by queue position, averaged between 8:30 - 10:30am daily. Duration weighted market depth refers to the weighted sum of market depth in 2s, 5s, 10s, and 30s using weights of 0.25, 0.5, 1 and 2, respectively.

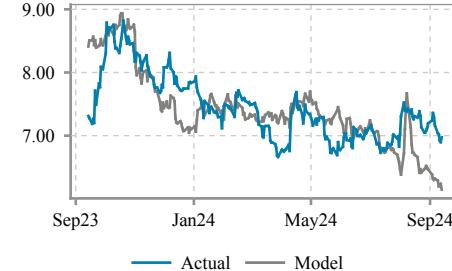
Derivatives Strategy

Volatility Fair Value Model Report

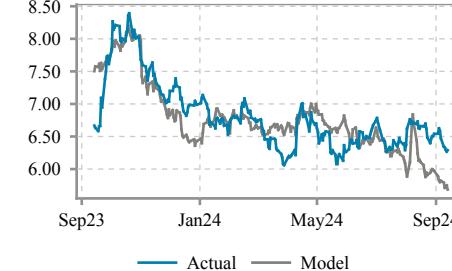
6Mx2Y Vol - Actual vs. Model



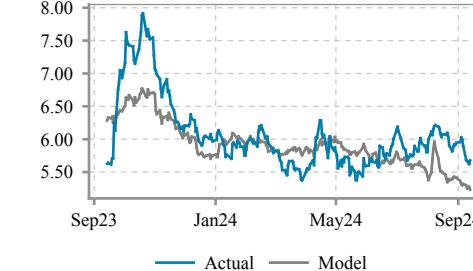
6Mx5Y Vol - Actual vs. Model



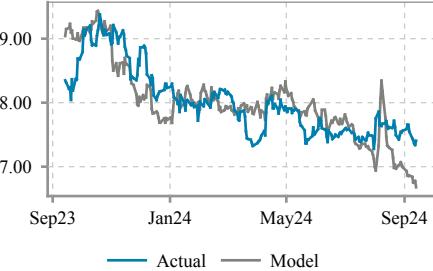
6Mx10Y Vol - Actual vs. Model



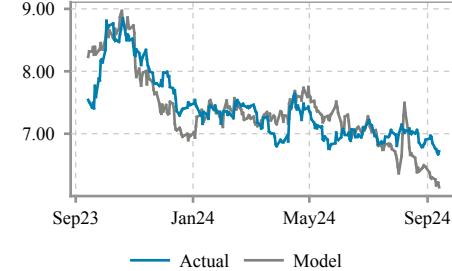
6Mx30Y Vol - Actual vs. Model



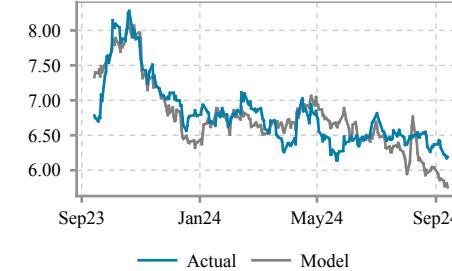
1Yx2Y Vol - Actual vs. Model



1Yx5Y Vol - Actual vs. Model



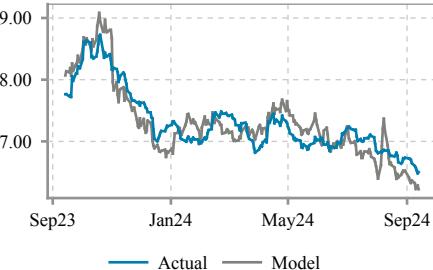
1Yx10Y Vol - Actual vs. Model



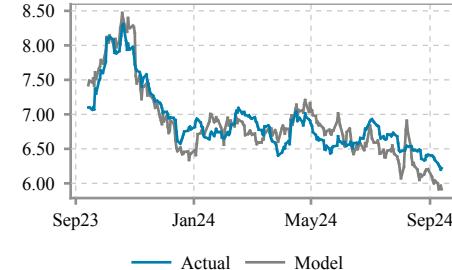
1Yx30Y Vol - Actual vs. Model



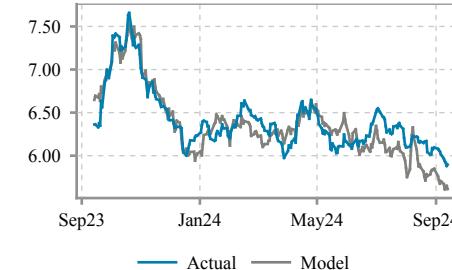
3Yx2Y Vol - Actual vs. Model



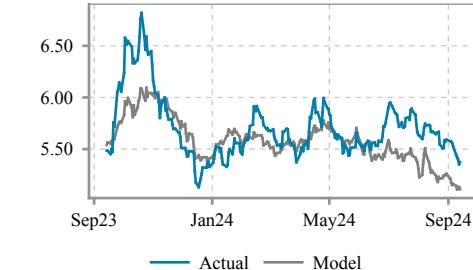
3Yx5Y Vol - Actual vs. Model



3Yx10Y Vol - Actual vs. Model



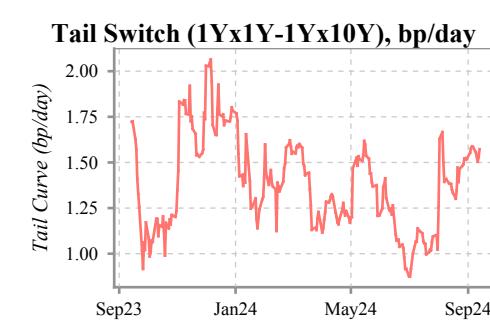
3Yx30Y Vol - Actual vs. Model



Derivatives Strategy

Swaption Volatility Curve Fair Value Model Report

Vol Curve	6M Regression Stats						1Y Regression Stats							
	Expy Crv Beta	Tail Crv Beta	Intcpt	Rsq	Cur. Vol Crv	Fair Value	Residual	Expy Crv Beta	Tail Crv Beta	Intcpt	Rsq	Cur. Vol Crv	Fair Value	Residual
6Mx1Y-1Yx30Y	0.13	2.05	-1.82	67%	2.13	1.68	0.45	-0.04	1.82	-1.17	68%	2.13	1.61	0.52
6Mx1Y-9Mx30Y	0.00	2.06	-1.57	68%	2.09	1.66	0.43	-0.13	1.86	-1.04	67%	2.09	1.62	0.47
6Mx1Y-6Mx30Y	0.20	1.74	-1.52	72%	2.04	1.63	0.41	-0.28	1.95	-0.82	66%	2.04	1.67	0.37
9Mx1Y-5Yx2Y	0.65	0.90	-1.49	68%	1.57	1.26	0.31	0.21	1.03	-0.84	72%	1.57	1.22	0.35
9Mx1Y-5Yx3Y	0.69	0.88	-1.43	70%	1.65	1.36	0.30	0.25	1.03	-0.80	76%	1.65	1.33	0.33
9Mx1Y-5Yx1Y	0.74	0.84	-1.71	66%	1.40	1.11	0.28	0.20	1.05	-0.98	70%	1.40	1.08	0.31
9Mx1Y-3Yx5Y	0.51	1.11	-1.53	72%	1.52	1.24	0.27	-0.02	1.28	-0.76	71%	1.52	1.21	0.31
9Mx1Y-2Yx5Y	0.33	1.20	-1.51	67%	1.31	1.04	0.27	-0.18	1.36	-0.76	67%	1.31	1.01	0.30
9Mx1Y-3Yx7Y	0.51	1.07	-1.33	74%	1.65	1.40	0.26	0.09	1.20	-0.71	77%	1.65	1.37	0.28
6Mx2Y-5Yx7Y	0.53	1.12	-1.16	65%	1.87	1.68	0.20	0.34	0.90	-0.52	66%	1.87	1.59	0.28
9Mx1Y-2Yx7Y	0.33	1.19	-1.32	72%	1.47	1.23	0.25	-0.08	1.31	-0.71	74%	1.47	1.19	0.28
9Mx1Y-5Yx5Y	0.76	0.84	-1.33	75%	1.81	1.54	0.27	0.32	1.03	-0.74	81%	1.81	1.53	0.28
6Mx2Y-3Yx15Y	0.37	1.24	-0.86	68%	2.02	1.84	0.18	0.29	0.97	-0.36	69%	2.02	1.76	0.26
9Mx1Y-5Yx7Y	0.77	0.80	-1.15	77%	1.92	1.67	0.25	0.40	0.95	-0.65	85%	1.92	1.66	0.25
9Mx1Y-2Yx10Y	0.33	1.19	-1.07	77%	1.70	1.48	0.23	0.06	1.25	-0.64	83%	1.70	1.45	0.25
6Mx2Y-2Yx15Y	0.19	1.40	-0.90	70%	1.86	1.69	0.17	0.11	1.13	-0.39	66%	1.86	1.61	0.25
9Mx1Y-3Yx10Y	0.52	1.02	-1.06	76%	1.84	1.61	0.23	0.25	1.10	-0.64	85%	1.84	1.59	0.25
6Mx2Y-5Yx10Y	0.53	1.07	-0.92	67%	2.02	1.85	0.17	0.45	0.79	-0.40	71%	2.02	1.77	0.25
9Mx1Y-1Yx7Y	0.07	1.19	-1.00	72%	1.24	1.02	0.22	-0.20	1.24	-0.55	76%	1.24	1.00	0.24
6Mx2Y-10Yx2Y	0.93	0.58	-0.85	70%	2.08	1.95	0.13	0.80	0.30	-0.26	81%	2.08	1.85	0.23
9Mx1Y-3Yx15Y	0.61	0.92	-0.85	79%	2.06	1.83	0.22	0.35	1.02	-0.50	88%	2.06	1.83	0.23
9Mx1Y-2Yx15Y	0.43	1.08	-0.89	81%	1.90	1.69	0.21	0.17	1.18	-0.52	87%	1.90	1.68	0.23
6Mx3Y-5Yx7Y	0.65	0.79	-1.00	65%	1.70	1.55	0.15	0.44	0.64	-0.42	70%	1.70	1.48	0.22
6Mx2Y-5Yx15Y	0.60	0.99	-0.67	69%	2.25	2.10	0.15	0.54	0.72	-0.20	75%	2.25	2.03	0.22
9Mx1Y-5Yx10Y	0.77	0.75	-0.91	79%	2.06	1.84	0.22	0.51	0.84	-0.53	89%	2.06	1.84	0.22
6Mx3Y-3Yx10Y	0.40	1.01	-0.91	66%	1.63	1.49	0.14	0.28	0.80	-0.41	68%	1.63	1.40	0.22
6Mx2Y-10Yx3Y	0.93	0.58	-0.75	71%	2.18	2.04	0.14	0.81	0.32	-0.19	82%	2.18	1.96	0.22
6Mx2Y-3Yx30Y	0.51	1.08	-0.58	74%	2.32	2.15	0.17	0.48	0.88	-0.26	77%	2.32	2.11	0.21
1Yx2Y-10Yx30Y	1.22	-0.53	1.22	71%	2.72	2.85	-0.13	1.35	-0.45	0.87	96%	2.72	2.92	-0.20
9Mx1Y-10Yx2Y	1.16	0.26	-0.84	84%	2.12	1.94	0.18	0.87	0.35	-0.39	94%	2.12	1.92	0.20
6Mx2Y-10Yx5Y	0.94	0.57	-0.57	71%	2.37	2.23	0.14	0.82	0.36	-0.07	81%	2.37	2.17	0.20
6Mx3Y-3Yx15Y	0.48	0.90	-0.69	69%	1.84	1.72	0.13	0.39	0.71	-0.27	74%	1.84	1.65	0.20
9Mx1Y-5Yx15Y	0.83	0.67	-0.66	82%	2.29	2.09	0.20	0.60	0.77	-0.33	91%	2.29	2.10	0.19
1Yx3Y-10Yx30Y	1.26	-0.71	1.21	71%	2.52	2.64	-0.12	1.37	-0.61	0.89	96%	2.52	2.71	-0.19
6Mx2Y-1Yx15Y	0.03	1.49	-0.82	75%	1.69	1.57	0.12	-0.13	1.29	-0.28	66%	1.69	1.50	0.19



* Fair value is defined as the regression of the swaption volatility curve (which is the difference between two swaption implied volatilities, units in bp/day) regressed against the tail curve and expiry curve. The tail curve is defined as the (1Yx1Y minus 1Yx10Y) swaption implied bp-volatility and the expiry curve is defined as the (1Yx1Y minus 10Yx1Y) swaption implied bp-volatility. Results are sorted by the most mispricing in the residual from the 1Y regression stats.

Derivatives Strategy

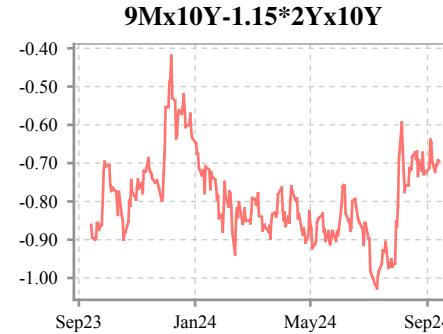
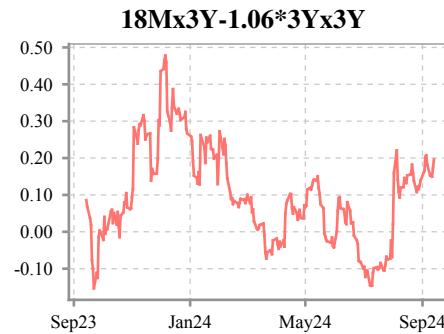
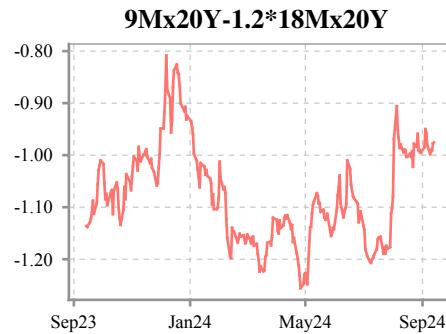
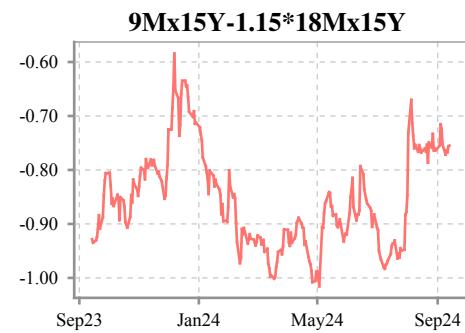
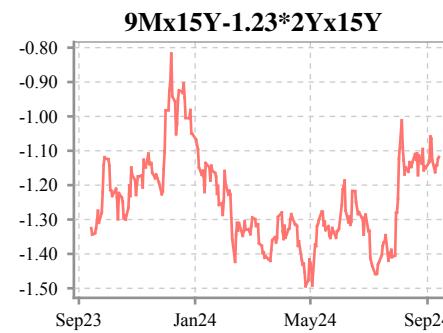
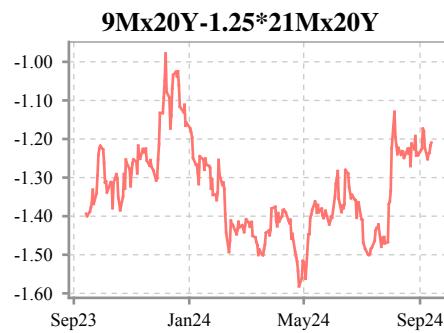
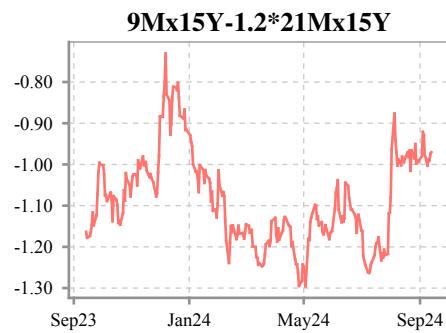
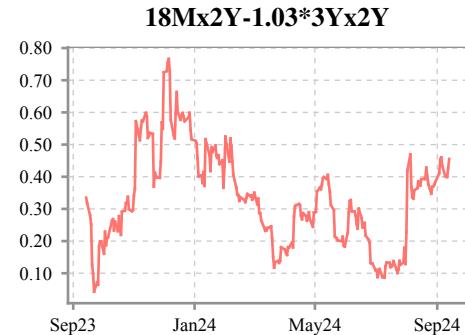
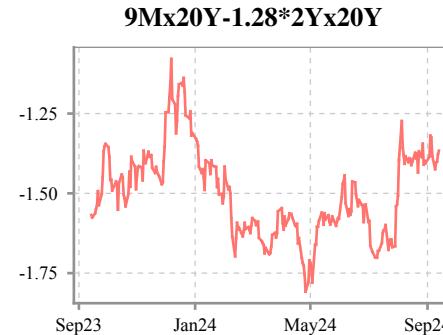
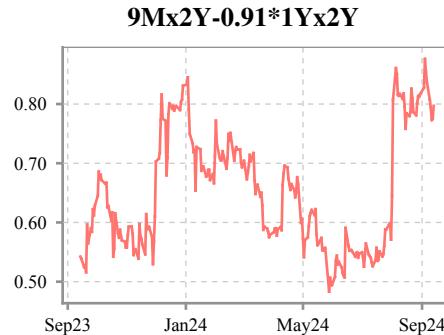
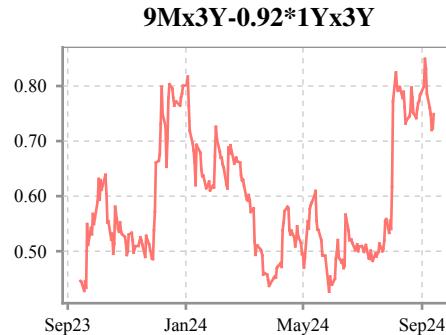
Swaption Volatility Weighted Expiry Switch Report

Expy Switch	Vol1	Vol2	Vol1 Cur	Vol2 Cur	3M Beta	3M Wtd Expy Switch	3M Mean	3M Residual	3M Rsq	6M Beta	6M Wtd Expy Switch	6M Mean	6M Residual	6M Rsq	1Y Beta	1Y Wtd Expy Switch	1Y Mean	1Y Residual	1Y Mean
9Mx3Y-1Yx3Y	9Mx3Y	1Yx3Y	7.36	7.20	1.30	-1.98	-2.15	0.17	53%	0.94	0.61	0.43	0.18	69%	0.92	0.75	0.59	0.16	95%
9Mx2Y-1Yx2Y	9Mx2Y	1Yx2Y	7.52	7.41	1.51	-3.67	-3.87	0.20	68%	1.02	-0.01	-0.20	0.19	78%	0.91	0.80	0.65	0.15	96%
9Mx20Y-2Yx20Y	9Mx20Y	2Yx20Y	5.85	5.62	0.67	2.09	2.14	-0.05	52%	0.90	0.76	0.68	0.08	69%	1.28	-1.37	-1.50	0.13	92%
18Mx2Y-3Yx2Y	18Mx2Y	3Yx2Y	7.13	6.50	0.42	4.39	4.44	-0.05	66%	0.78	2.06	1.99	0.07	74%	1.03	0.46	0.33	0.12	92%
9Mx15Y-21Mx15Y	9Mx15Y	21Mx15Y	6.05	5.87	0.67	2.12	2.17	-0.05	57%	0.91	0.71	0.65	0.06	77%	1.20	-0.97	-1.09	0.12	95%
9Mx20Y-21Mx20Y	9Mx20Y	21Mx20Y	5.85	5.65	0.73	1.72	1.76	-0.04	59%	0.95	0.47	0.39	0.08	75%	1.25	-1.21	-1.33	0.12	94%
9Mx15Y-2Yx15Y	9Mx15Y	2Yx15Y	6.05	5.84	0.61	2.49	2.56	-0.06	50%	0.88	0.93	0.87	0.06	72%	1.23	-1.12	-1.24	0.12	93%
9Mx15Y-18Mx15Y	9Mx15Y	18Mx15Y	6.05	5.92	0.75	1.62	1.65	-0.03	65%	0.94	0.49	0.43	0.06	82%	1.15	-0.75	-0.86	0.10	97%
9Mx20Y-18Mx20Y	9Mx20Y	18Mx20Y	5.85	5.69	0.80	1.27	1.30	-0.02	68%	1.00	0.18	0.11	0.07	82%	1.20	-0.98	-1.08	0.10	96%
18Mx3Y-3Yx3Y	18Mx3Y	3Yx3Y	6.96	6.41	0.50	3.73	3.78	-0.05	75%	0.84	1.59	1.53	0.06	79%	1.06	0.20	0.10	0.10	94%
9Mx10Y-2Yx10Y	9Mx10Y	2Yx10Y	6.23	6.04	0.57	2.80	2.86	-0.06	54%	0.93	0.60	0.53	0.06	81%	1.15	-0.69	-0.79	0.10	95%
21Mx2Y-3Yx2Y	21Mx2Y	3Yx2Y	6.97	6.50	0.67	2.62	2.63	-0.01	93%	0.91	1.02	0.95	0.07	90%	1.07	0.04	-0.06	0.09	96%
9Mx15Y-15Mx15Y	9Mx15Y	15Mx15Y	6.05	5.96	0.81	1.24	1.26	-0.02	73%	0.95	0.37	0.32	0.05	86%	1.11	-0.55	-0.64	0.09	98%
9Mx30Y-2Yx30Y	9Mx30Y	2Yx30Y	5.63	5.49	0.77	1.38	1.41	-0.02	60%	1.04	-0.08	-0.16	0.09	79%	1.31	-1.54	-1.63	0.09	92%
9Mx10Y-21Mx10Y	9Mx10Y	21Mx10Y	6.23	6.07	0.63	2.44	2.49	-0.05	60%	0.97	0.38	0.31	0.06	85%	1.12	-0.59	-0.68	0.09	97%
9Mx7Y-1Yx7Y	9Mx7Y	1Yx7Y	6.59	6.50	0.84	1.12	1.12	0.01	64%	0.94	0.49	0.43	0.07	85%	1.00	0.10	0.02	0.08	98%
9Mx20Y-15Mx20Y	9Mx20Y	15Mx20Y	5.85	5.73	0.85	0.95	0.97	-0.01	76%	1.02	0.03	-0.03	0.07	87%	1.15	-0.75	-0.84	0.08	98%
9Mx30Y-21Mx30Y	9Mx30Y	21Mx30Y	5.63	5.51	0.83	1.07	1.08	-0.01	68%	1.06	-0.22	-0.31	0.08	85%	1.26	-1.33	-1.41	0.08	94%
1Yx20Y-2Yx20Y	1Yx20Y	2Yx20Y	5.76	5.62	0.88	0.83	0.84	-0.01	87%	0.95	0.39	0.35	0.04	88%	1.18	-0.87	-0.94	0.07	96%
9Mx15Y-1Yx15Y	9Mx15Y	1Yx15Y	6.05	6.01	0.86	0.91	0.93	-0.01	79%	0.96	0.32	0.27	0.05	88%	1.07	-0.34	-0.42	0.07	98%
9Mx30Y-18Mx30Y	9Mx30Y	18Mx30Y	5.63	5.54	0.88	0.76	0.76	0.00	77%	1.07	-0.31	-0.38	0.07	90%	1.20	-1.01	-1.08	0.07	97%
9Mx10Y-18Mx10Y	9Mx10Y	18Mx10Y	6.23	6.11	0.70	1.95	1.99	-0.04	67%	1.00	0.14	0.08	0.06	89%	1.09	-0.44	-0.51	0.07	98%
18Mx2Y-2Yx2Y	18Mx2Y	2Yx2Y	7.13	6.85	0.51	3.67	3.72	-0.06	72%	0.81	1.59	1.56	0.03	86%	0.95	0.62	0.55	0.07	98%
2Yx2Y-3Yx2Y	2Yx2Y	3Yx2Y	6.85	6.50	0.86	1.28	1.25	0.02	98%	1.02	0.23	0.16	0.07	96%	1.10	-0.28	-0.36	0.07	98%
21Mx3Y-3Yx3Y	21Mx3Y	3Yx3Y	6.81	6.41	0.72	2.21	2.22	-0.01	94%	0.95	0.74	0.68	0.06	92%	1.08	-0.11	-0.18	0.07	97%
18Mx3Y-2Yx3Y	18Mx3Y	2Yx3Y	6.96	6.71	0.59	3.03	3.08	-0.05	80%	0.85	1.26	1.24	0.03	89%	0.97	0.44	0.39	0.06	98%
1Yx7Y-3Yx7Y	1Yx7Y	3Yx7Y	6.50	6.08	0.55	3.13	3.20	-0.07	62%	0.92	0.90	0.86	0.04	78%	1.17	-0.61	-0.67	0.06	93%
9Mx20Y-1Yx20Y	9Mx20Y	1Yx20Y	5.85	5.76	0.89	0.71	0.72	-0.01	82%	1.02	-0.02	-0.07	0.05	90%	1.11	-0.52	-0.59	0.06	98%
9Mx5Y-1Yx5Y	9Mx5Y	1Yx5Y	6.82	6.72	0.91	0.68	0.64	0.04	66%	1.05	-0.22	-0.31	0.09	91%	0.98	0.26	0.19	0.06	99%
1Yx20Y-21Mx20Y	1Yx20Y	21Mx20Y	5.76	5.65	0.92	0.54	0.54	0.00	92%	0.99	0.18	0.14	0.04	93%	1.14	-0.70	-0.75	0.06	98%
1Yx7Y-2Yx7Y	1Yx7Y	2Yx7Y	6.50	6.26	0.62	2.64	2.69	-0.06	70%	0.90	0.87	0.84	0.03	86%	1.05	-0.10	-0.15	0.06	97%
15Mx3Y-21Mx3Y	15Mx3Y	21Mx3Y	7.08	6.81	0.54	3.41	3.46	-0.05	60%	0.88	1.08	1.03	0.05	87%	0.98	0.42	0.36	0.06	98%
15Mx5Y-3Yx5Y	15Mx5Y	3Yx5Y	6.65	6.22	0.55	3.23	3.30	-0.07	66%	0.91	0.99	0.95	0.04	78%	1.11	-0.24	-0.30	0.06	94%
9Mx10Y-15Mx10Y	9Mx10Y	15Mx10Y	6.23	6.15	0.76	1.55	1.57	-0.02	74%	1.01	0.00	-0.05	0.05	92%	1.06	-0.29	-0.35	0.06	99%
1Yx15Y-2Yx15Y	1Yx15Y	2Yx15Y	6.01	5.84	0.84	1.12	1.14	-0.02	88%	0.97	0.33	0.30	0.03	92%	1.17	-0.81	-0.87	0.06	97%

Note: * Expiry switches (or calendar spreads) are the difference between two points on the swaption implied volatility surface where the tenor is held constant but the expiration is mismatched. In this construction, a time series of one of the points on the surface is regressed against the other using 3M, 6M, and 1Y history. The beta of this regression is used to weight one against the other and the result is the weighted expiry switch. The attractiveness of such a trade is determined by the mispricing between the current weighted expiry switch value against its respect 3M, 6M, or 1Y averages (also known as the mispricing or residual). The ones with the highest absolute residuals are most attractive and this table is sorted as such.

Derivatives Strategy

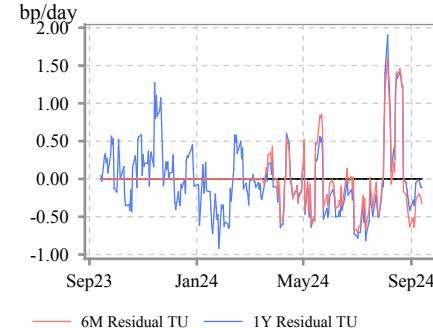
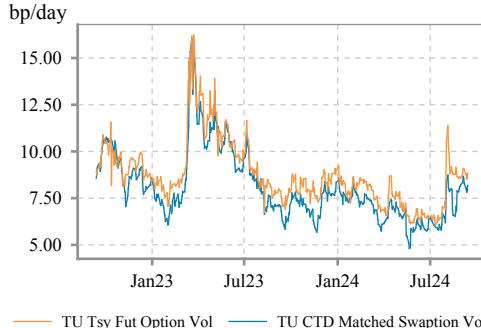
Swaption Volatility Weighted Expiry Switch Report



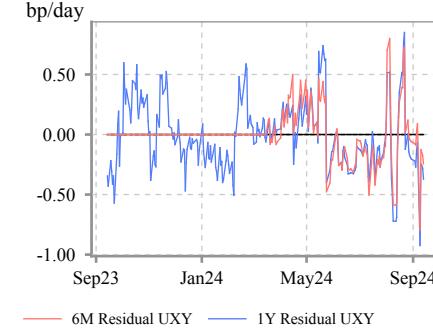
Derivatives Strategy

Treasury Future Options vs. CTD Matched Swaption Report

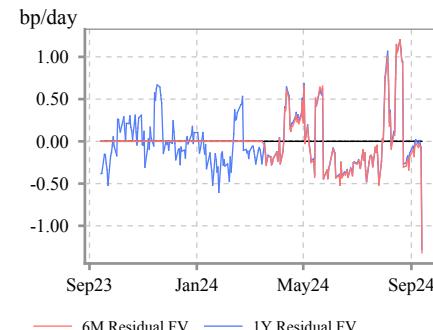
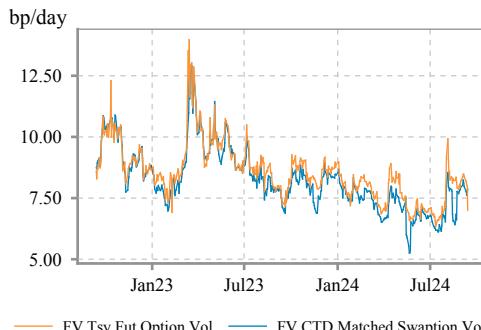
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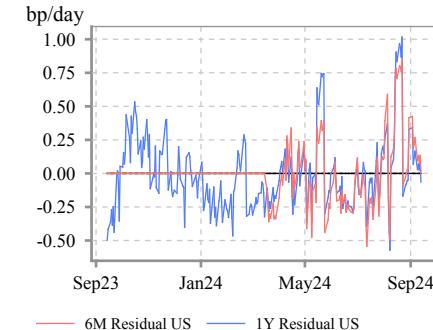
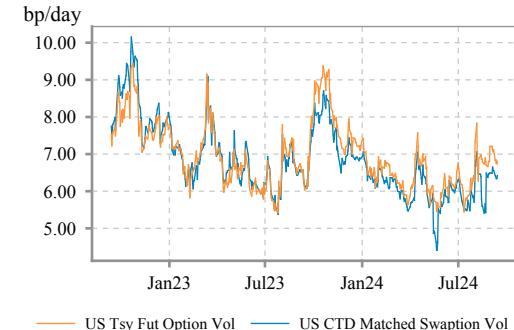
Ultra-10 year note contract (UXY)



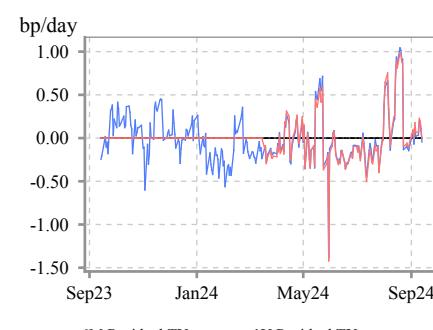
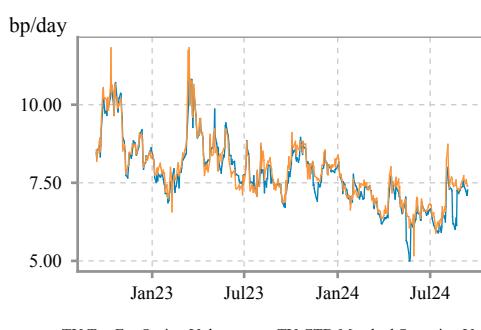
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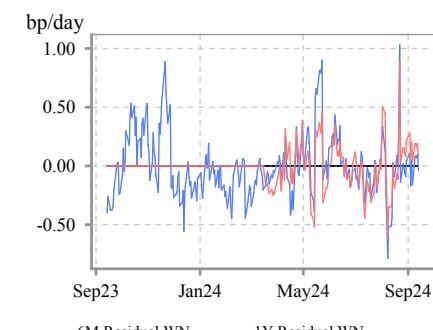
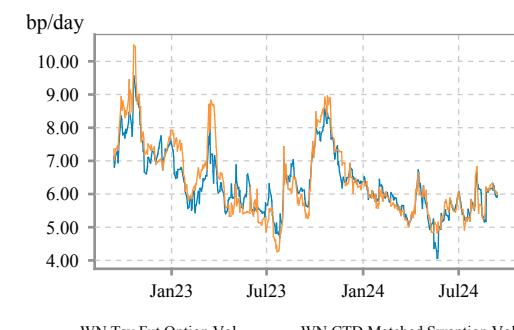
“Classic” Bond contract (US)



10-year note contract (TY)



Ultra-long bond contract (WN)



This report computes rolling implied volatilities of a swaption whose expiration corresponds to the expiration of a Treasury future option and whose tenor corresponds with the Treasury future option's CTD's maturity date. Data included are for the front month TU, FV, TY, UXY, US, and WN contracts. 6M and 1Y regressions are performed by regressing the Treasury future option implied volatilities (Y variable in regression) against the implied volatility of the corresponding CTD matched swaption described above (X variable). These CTD matched swaptions account for any daily changes in the CTD or for roll cycles. Both units of Treasury future option vol and the CTD matched swaption vol are in bp/day. Contracts are assumed to be rolled 10 days before option expiry.

Derivatives Strategy

Treasury Future Options vs. CTD Matched Swaption Report

6M Regression Stats

	Intercept	Beta	Rsq	StdErr	Curr CTD Matched Swpn Vol	Curr Tsy Fut Impl Vol	Fair Val.	Residual
TU	0.04	1.12	0.77	0.53	8.19	8.84	9.17	-0.33
FV	1.31	0.89	0.66	0.42	7.88	7.00	8.32	-1.32
TY	1.74	0.78	0.64	0.34	7.27	7.41	7.42	-0.01
UXY	2.20	0.66	0.61	0.29	6.77	6.44	6.69	-0.24
US	1.62	0.80	0.66	0.29	6.42	6.74	6.73	0.00
WN	1.62	0.72	0.72	0.23	5.98	5.99	5.91	0.08

1Y Regression Stats

	Intercept	Beta	Rsq	StdErr	Curr CTD Matched Swpn Vol	Curr Tsy Fut Impl Vol	Fair Val.	Residual
TU	1.11	0.96	0.73	0.48	8.19	8.84	8.96	-0.11
FV	1.50	0.86	0.77	0.35	7.88	7.00	8.28	-1.28
TY	1.23	0.86	0.83	0.29	7.27	7.41	7.46	-0.05
UXY	0.79	0.89	0.86	0.29	6.77	6.44	6.81	-0.37
US	0.19	1.03	0.90	0.28	6.42	6.74	6.80	-0.06
WN	-0.21	1.04	0.91	0.28	5.98	5.99	6.03	-0.04

6M Treasury Future Option Implied Volatility Stats

	TU	FV	TY	UXY	US	WN
mean	7.4	7.5	6.9	6.3	6.4	5.6
std	1.1	0.7	0.6	0.5	0.5	0.4
min	6.0	6.3	5.2	5.5	5.4	4.8
25%	6.5	6.9	6.5	6.0	5.9	5.3
50%	7.0	7.3	6.8	6.3	6.3	5.6
75%	8.5	8.2	7.4	6.7	6.8	6.0
max	11.4	9.9	8.7	7.9	7.8	6.8
z-score	1.3	-0.7	0.9	0.2	0.8	0.9

1Y Treasury Future Option Implied Volatility Stats

	TU	FV	TY	UXY	US	WN
mean	7.8	7.9	7.3	6.8	6.8	6.1
std	0.9	0.7	0.7	0.8	0.9	0.9
min	6.0	6.3	5.2	5.5	5.4	4.8
25%	6.9	7.2	6.8	6.2	6.2	5.5
50%	7.8	8.0	7.4	6.7	6.7	5.9
75%	8.5	8.4	7.8	7.2	7.2	6.3
max	11.4	9.9	9.1	9.0	9.4	9.0
z-score	1.2	-1.2	0.1	-0.5	-0.1	-0.1

6M CTD Matched Swaption Implied Volatility Stats

	TU	FV	TY	UXY	US	WN
mean	6.6	7.0	6.6	6.3	5.9	5.6
std	0.9	0.7	0.6	0.5	0.5	0.5
min	4.8	5.3	5.0	4.7	4.4	4.1
25%	6.0	6.6	6.2	5.9	5.6	5.3
50%	6.4	6.8	6.6	6.2	5.9	5.5
75%	7.0	7.5	7.2	6.7	6.4	5.9
max	8.7	8.5	8.0	7.4	7.1	6.7
z-score	1.8	1.4	1.1	1.0	0.9	0.8

1Y CTD Matched Swaption Implied Volatility Stats

	TU	FV	TY	UXY	US	WN
mean	6.9	7.4	7.1	6.8	6.4	6.1
std	0.8	0.7	0.8	0.8	0.8	0.9
min	4.8	5.3	5.0	4.7	4.4	4.1
25%	6.3	6.8	6.6	6.2	5.9	5.5
50%	6.9	7.5	7.2	6.7	6.3	5.9
75%	7.6	7.9	7.6	7.3	6.9	6.4
max	8.7	8.9	9.0	8.9	8.7	8.6
z-score	1.5	0.6	0.2	0.0	0.0	-0.1

This report computes rolling implied volatilities of a swaption whose expiration corresponds to the expiration of a Treasury future option and whose tenor corresponds with the Treasury future option's CTD's maturity date. Data included are for the front month TU, FV, TY, UXY, US, and WN contracts. 6M and 1Y regressions are performed by regressing the Treasury future option implied volatilities (Y variable in regression) against the implied volatility of the corresponding CTD matched swaption described above (X variable). These CTD matched swaptions account for any daily changes in the CTD or for roll cycles. Both units of Treasury future option vol and the CTD matched swaption vol are in bp/day. Contracts are assumed to be rolled 10 days before option expiry.

Derivatives Strategy

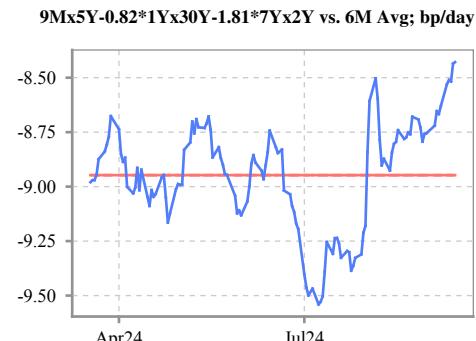
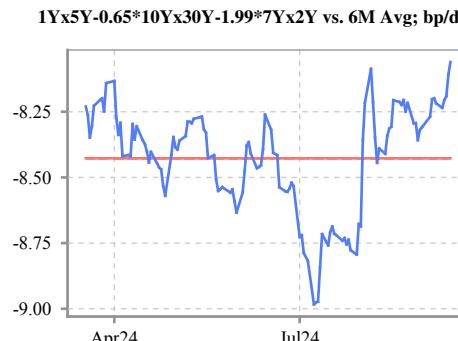
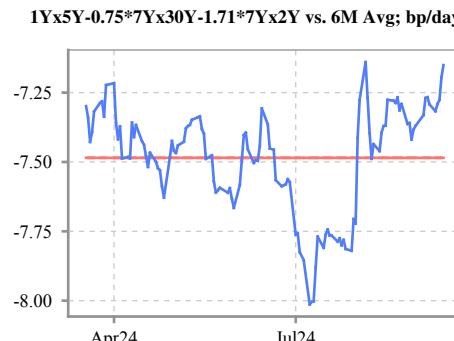
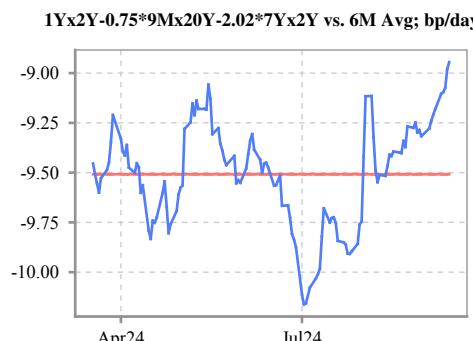
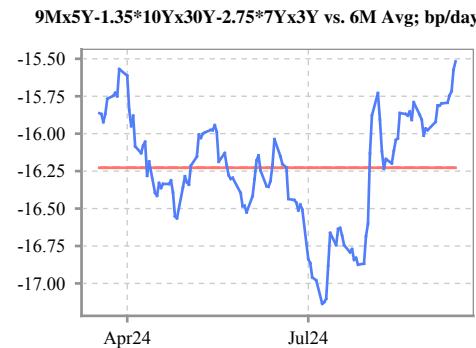
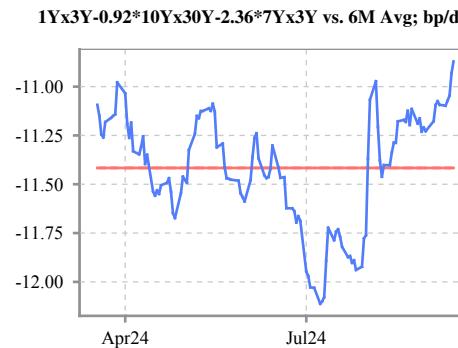
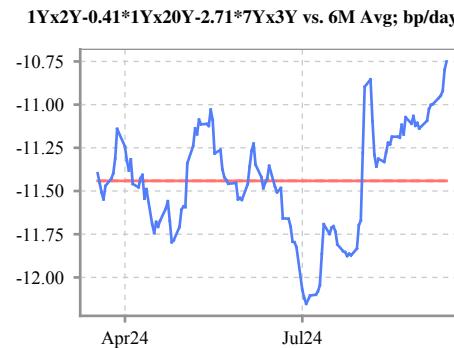
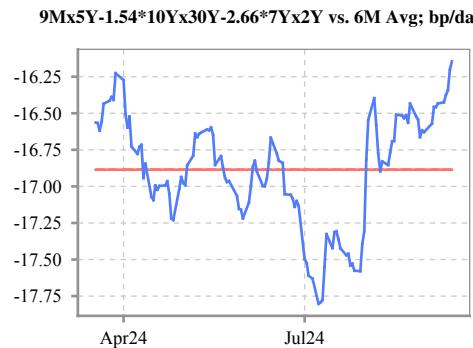
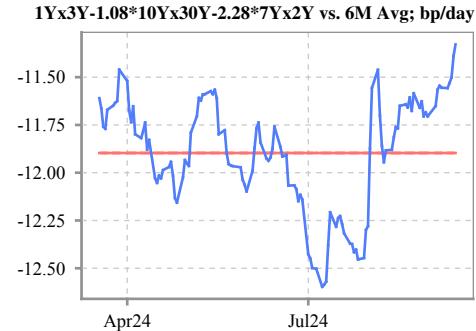
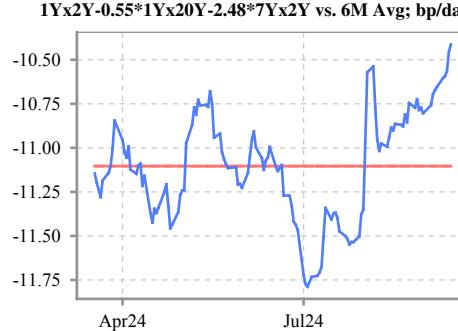
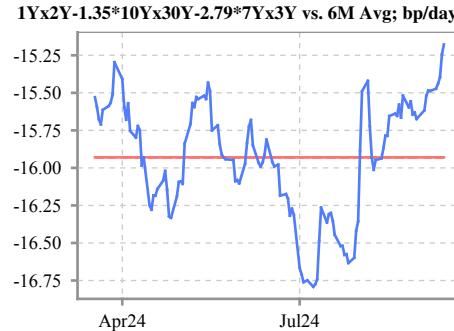
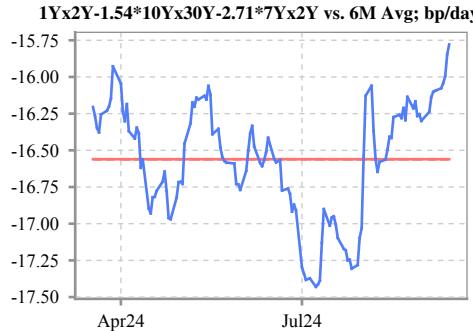
Weighted “Level” and “Curve” Neutral Swaption Butterfly Mispricing Report

Vol Left	Vol Belly	Vol Right	6M Left Wt	6M Right Wt	6M Wtd Vol Fly Cur.	6M Mean	6M Mispricing	50/50 Wtd Fly 6M Rsg	1Y Left Wt	1Y Right Wt	1Y Wtd Vol Fly Cur.	1Y Mean	1Y Mispricing	50/50 Wtd Fly 1Y Rsg
10Yx30Y	1Yx2Y	7Yx2Y	1.54	2.71	-15.78	-16.56	0.78	74%	-0.24	2.92	-8.76	-9.32	0.56	87%
10Yx30Y	1Yx2Y	7Yx3Y	1.35	2.79	-15.18	-15.93	0.75	74%	-0.41	2.97	-8.02	-8.53	0.51	86%
1Yx20Y	1Yx2Y	7Yx2Y	0.55	2.48	-10.41	-11.10	0.69	60%	0.19	2.58	-8.89	-9.39	0.50	68%
10Yx30Y	1Yx3Y	7Yx2Y	1.08	2.28	-11.33	-11.90	0.57	73%	-0.40	2.75	-7.14	-7.61	0.47	88%
10Yx30Y	9Mx5Y	7Yx2Y	1.54	2.66	-16.15	-16.89	0.74	78%	-0.31	2.62	-7.17	-7.62	0.45	87%
1Yx20Y	1Yx2Y	7Yx3Y	0.41	2.71	-10.75	-11.44	0.69	62%	0.26	2.48	-8.55	-8.99	0.44	67%
10Yx30Y	1Yx3Y	7Yx3Y	0.92	2.36	-10.87	-11.42	0.55	73%	-0.58	2.79	-6.36	-6.78	0.42	87%
10Yx30Y	9Mx5Y	7Yx3Y	1.35	2.75	-15.52	-16.23	0.71	77%	-0.49	2.66	-6.39	-6.80	0.41	87%
9Mx20Y	1Yx2Y	7Yx2Y	0.75	2.02	-8.94	-9.51	0.56	62%	0.43	1.95	-6.65	-7.02	0.36	64%
7Yx30Y	1Yx5Y	7Yx2Y	0.75	1.71	-7.15	-7.49	0.33	71%	-0.79	2.75	-5.55	-5.91	0.36	89%
10Yx30Y	1Yx5Y	7Yx2Y	0.65	1.99	-8.06	-8.43	0.37	76%	-0.52	2.53	-5.80	-6.15	0.35	90%
1Yx30Y	9Mx5Y	7Yx2Y	0.82	1.81	-8.43	-8.95	0.52	63%	0.28	2.07	-6.95	-7.30	0.35	65%
10Yx30Y	1Yx3Y	7Yx5Y	0.67	2.48	-10.04	-10.54	0.50	72%	-0.84	2.88	-5.19	-5.53	0.34	86%
10Yx30Y	9Mx10Y	7Yx2Y	0.95	1.83	-9.04	-9.44	0.40	74%	-0.37	2.29	-5.54	-5.88	0.34	89%
10Yx20Y	1Yx5Y	7Yx2Y	0.87	1.85	-8.35	-8.71	0.36	76%	-0.39	2.56	-6.56	-6.89	0.33	89%
10Yx20Y	1Yx3Y	7Yx5Y	1.06	2.26	-10.63	-11.13	0.50	72%	-0.36	2.95	-7.86	-8.19	0.32	84%
10Yx30Y	9Mx5Y	7Yx5Y	1.05	2.86	-14.33	-14.98	0.65	77%	-0.76	2.74	-5.14	-5.46	0.32	86%
7Yx30Y	1Yx5Y	7Yx3Y	0.59	1.84	-7.02	-7.34	0.33	72%	-1.02	2.86	-4.82	-5.15	0.32	90%
9Mx20Y	1Yx2Y	7Yx3Y	0.68	2.16	-9.15	-9.71	0.56	62%	0.45	1.94	-6.58	-6.90	0.32	63%
7Yx30Y	1Yx7Y	7Yx2Y	0.68	1.51	-5.88	-6.15	0.27	70%	-0.74	2.56	-4.93	-5.25	0.32	90%
10Yx30Y	9Mx7Y	7Yx5Y	0.97	1.98	-9.18	-9.60	0.41	70%	-0.72	2.62	-4.91	-5.23	0.31	86%
1Yx30Y	1Yx3Y	7Yx5Y	0.29	2.32	-7.59	-8.05	0.46	61%	0.07	2.80	-9.10	-9.41	0.31	65%
10Yx30Y	1Yx5Y	7Yx3Y	0.51	2.07	-7.72	-8.07	0.35	77%	-0.70	2.58	-5.04	-5.34	0.31	90%
10Yx30Y	1Yx7Y	7Yx2Y	0.57	1.77	-6.60	-6.90	0.30	76%	-0.52	2.35	-4.98	-5.29	0.30	90%
5Yx2Y	9Mx20Y	10Yx3Y	-0.22	2.95	-9.08	-9.28	0.20	84%	0.93	1.33	-7.21	-7.51	0.30	82%
10Yx30Y	9Mx10Y	7Yx3Y	0.80	1.91	-8.65	-9.03	0.38	75%	-0.53	2.33	-4.86	-5.16	0.30	89%
1Yx30Y	9Mx5Y	7Yx3Y	0.74	1.95	-8.69	-9.21	0.52	63%	0.30	2.05	-6.84	-7.14	0.30	64%
1Yx2Y	9Mx30Y	7Yx3Y	0.50	2.18	-10.77	-11.30	0.53	61%	0.35	1.41	-5.13	-5.42	0.30	74%
10Yx20Y	1Yx5Y	7Yx3Y	0.72	1.94	-8.03	-8.37	0.35	76%	-0.59	2.63	-5.78	-6.08	0.29	88%
10Yx30Y	1Yx3Y	5Yx10Y	0.87	1.78	-6.97	-7.32	0.35	63%	-0.71	2.47	-3.51	-3.80	0.29	86%
5Yx2Y	9Mx30Y	7Yx10Y	-0.48	2.81	-6.73	-6.93	0.20	76%	0.79	1.13	-5.43	-5.72	0.29	78%
10Yx20Y	1Yx7Y	7Yx2Y	0.75	1.65	-6.81	-7.10	0.29	75%	-0.44	2.38	-5.50	-5.79	0.29	89%
10Yx15Y	1Yx5Y	7Yx3Y	0.91	1.82	-8.27	-8.61	0.34	76%	-0.50	2.66	-6.33	-6.61	0.29	87%
10Yx15Y	1Yx7Y	7Yx2Y	0.90	1.54	-6.97	-7.26	0.29	75%	-0.38	2.40	-5.84	-6.13	0.29	88%
10Yx30Y	9Mx15Y	7Yx7Y	0.77	1.50	-5.95	-6.18	0.23	66%	-0.97	2.75	-4.76	-5.05	0.29	89%

To calculate the weights, a 6M or 1Y empirical regression is used of the 50/50 weighted volatility fly regressed against the belly vol and the difference in the wing vols so that the weights are constructed to be “level” and “curve” neutral: left weight = $(0.5 \cdot \text{beta_vol_curve}) / (1 - \text{beta_vol_level})$ and right weight = $(0.5 + \text{beta_vol_curve}) / (1 - \text{beta_vol_level})$, where beta_vol_level and beta_vol_curve are calculated from the 6M or 1Y regressions described previously. The residual/mispricing is the difference of the current weighted spread with the 6M or 1Y avg of the weighted spread. The weighted vol spread will be bought if the current weighted volatility is less than the historical average of the weighted vol spread. Structures are sorted by highest absolute 6M mispricing. Units of volatility are in bp/day for each swaption structure.

Derivatives Strategy

Weighted “Level” and “Curve” Neutral Swaption Butterfly Mispricing Report

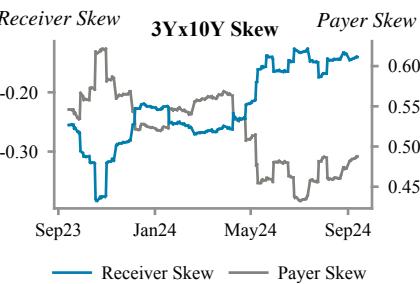
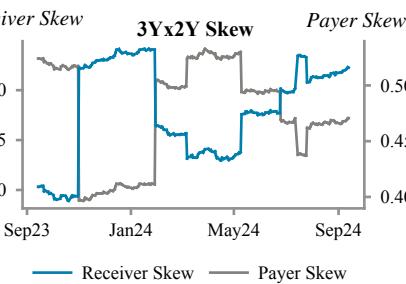
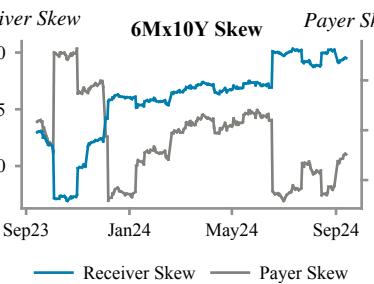
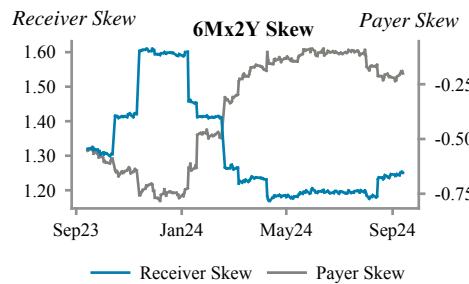


To calculate the weights, a 6M or 1Y empirical regression is used of the 50/50 weighted volatility fly regressed against the belly vol and the difference in the wing vols so that the weights are constructed to be “level” and “curve” neutral: left weight = $(0.5\beta_{vol_curve})/(1-\beta_{vol_level})$ and right weight = $(0.5+\beta_{vol_curve})/(1-\beta_{vol_level})$, where β_{vol_level} and β_{vol_curve} are calculated from the 6M or 1Y regressions described previously. The residual/mispricing is the difference of the current weighted spread with the 6M or 1Y avg of the weighted spread. The weighted vol spread will be bought if the current weighted volatility is less than the historical average of the weighted vol spread. Structures are sorted by highest absolute 6M mispricing. Units of volatility are in bp/day for each swaption structure.

Derivatives Strategy

Skew FV Model Report

Structure	ATM - 100bp ATM+						Expected decrease in implied volatility for -100bp move				Expected increase in implied volatility for +100bp move			
	ATMF rate	ATM bp vol	Vol	100bp vol	Rec. Skew	Pay. Skew	Skew Impl.	Lognormal	Parametrized	Empirical	Skew Impl.	Lognormal	Parametrized	Empirical
3Mx2Y	3.10	8.09	9.88	7.94	1.80	-0.15	3.60	-2.60	-0.87	2.11	-0.30	2.60	1.25	0.00
3Mx5Y	3.02	7.34	8.79	7.75	1.45	0.42	2.91	-2.42	-0.84	1.62	0.83	2.42	1.22	1.54
3Mx10Y	3.14	6.48	7.26	7.58	0.78	1.10	1.55	-2.06	-0.89	1.37	2.20	2.06	1.26	1.00
3Mx30Y	3.13	5.83	6.62	7.06	0.79	1.23	1.57	-1.86	-0.89	1.11	2.45	1.86	1.25	1.65
6Mx2Y	2.95	7.70	8.95	7.50	1.25	-0.20	2.50	-2.61	-0.82	1.11	-0.40	2.61	1.20	-0.12
6Mx5Y	2.97	6.97	7.80	7.35	0.82	0.37	1.65	-2.34	-0.82	0.71	0.74	2.34	1.20	0.79
6Mx10Y	3.12	6.29	6.77	7.14	0.48	0.85	0.95	-2.01	-0.88	0.67	1.70	2.01	1.25	0.51
6Mx30Y	3.12	5.68	6.02	6.68	0.34	1.00	0.68	-1.82	-0.88	0.32	2.01	1.82	1.25	1.51
1Yx2Y	2.86	7.41	8.14	7.35	0.74	-0.05	1.47	-2.59	-0.78	0.35	-0.10	2.59	1.16	-0.10
1Yx5Y	2.96	6.72	7.10	7.06	0.38	0.34	0.76	-2.27	-0.82	0.02	0.68	2.27	1.20	0.71
1Yx10Y	3.13	6.19	6.31	6.86	0.12	0.67	0.23	-1.98	-0.88	-0.23	1.33	1.98	1.25	1.01
1Yx30Y	3.11	5.60	5.65	6.34	0.06	0.75	0.11	-1.80	-0.87	-0.46	1.49	1.80	1.25	1.49
3Yx2Y	2.99	6.50	6.32	6.97	-0.18	0.47	-0.35	-2.17	-0.83	-0.60	0.94	2.17	1.21	0.71
3Yx5Y	3.11	6.22	6.05	6.68	-0.17	0.46	-0.35	-2.00	-0.88	-0.46	0.93	2.00	1.25	0.65
3Yx10Y	3.26	5.90	5.76	6.38	-0.14	0.49	-0.28	-1.81	-0.94	-0.58	0.98	1.81	1.29	0.90
3Yx30Y	3.09	5.37	5.22	5.87	-0.15	0.50	-0.30	-1.74	-0.87	-0.65	1.00	1.74	1.24	1.19
5Yx2Y	3.16	6.17	5.93	6.61	-0.24	0.44	-0.48	-1.95	-0.90	-0.67	0.88	1.95	1.26	0.58
5Yx5Y	3.26	5.93	5.69	6.37	-0.24	0.45	-0.47	-1.82	-0.94	-0.61	0.89	1.82	1.29	0.56
5Yx10Y	3.37	5.68	5.43	6.16	-0.25	0.48	-0.50	-1.68	-0.98	-0.61	0.96	1.68	1.32	0.69
5Yx30Y	3.06	5.22	5.02	5.66	-0.21	0.44	-0.41	-1.71	-0.86	-0.53	0.88	1.71	1.23	0.86



* Receiver skew is defined as A-100 bp vol minus A+0 bp vol. Payer skew is defined as A+100 bp vol minus A+0 bp vol.

**Expected decline in implied volatility (bp/day) under current skew is the implied volatility decrease implied by the skew in -100bp scenario is estimated as A+0/A-100 receiver skew times two. Expected decline in implied volatility (bp/day) under current skew is the implied volatility increase implied by the skew in +100bp scenario is estimated as A+0/A+100 receiver skew times two.

Lognormal assumes a perfect lognormal assumption where the current yield vol is assumed to remain constant, and therefore expected change in implied volatility is calculated as yield vol / sqrt(251).

† Parametrized scenario assumes yield vols follow the form of 26.5 plus 120.73 exp (minus 1.11 times yields) as outlined in our 2023 Mid Year Outlook. From this we recalculate yield vols and then bp vols at a 100bp lower yield for receiver skews (100bp higher yield for payer skews).

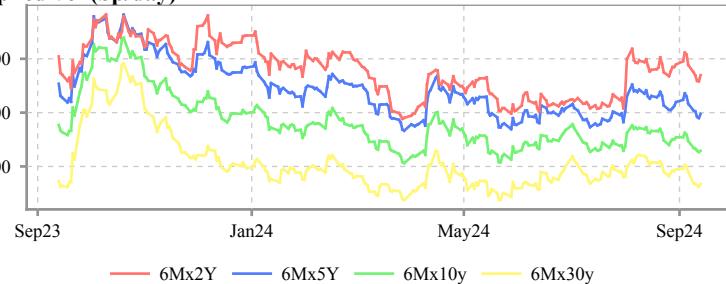
†† Empirical scenario uses the vol-rate relationship from a "down" / "up" beta to determine to rise in implied volatility for -100bp / +100bp move in rates for receiver / payer skews respectively. "Down" / "up" beta is calculated as 3-month beta of rolling weekly changes in implieds versus weekly changes in the underlying forward rate, using only observations where the latter was negative / positive, respectively.

Derivatives Strategy

SOFR Short Gamma Returns Model Report

	Coefficient				1-Month ahead projection (bp/notional)			
	6mx2y	6mx5y	6mx10y	6mx30y	6mx2y	6mx5y	6mx10y	6mx30y
Ex-ante implied vol (bp/day)	25.4	67.4	134.8	246.4	7.7	7.0	6.3	5.7
Monthly chg in market depth (\$mm)	0.1	0.1	0.1	0.6	0.0	0.0	0.0	0.0
Ex-ante 2-yr real yields (%)	28.1	81.8	61.6	-69.9	1.5	1.5	1.5	1.5
Ex-ante Fed expectations (%)	9.3	-14.3	-8.8	88.5	-2.1	-2.1	-2.1	-2.1
const	-242.8	-677.3	-1021.3	-1172.3				
R-squared	83%	82%	82%	74%				
Standard Error	5.1	9.6	15.7	35.9				
Projection					-26.4	-57.0	-63.9	-64.8
Normalized Projection					-5.2	-5.9	-4.1	-1.8

Implied vol (bp/day)



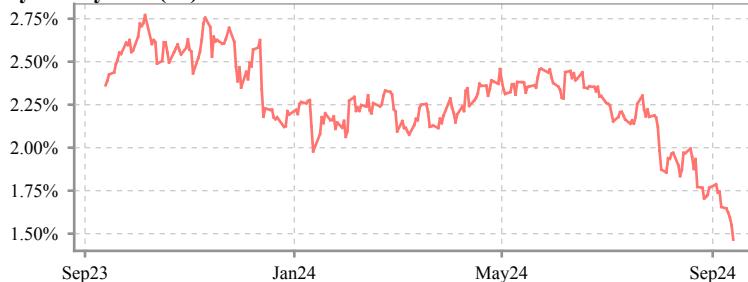
Fed expectations (%)



Duration weighted market depth (\$mm)



2-yr real yields (%)



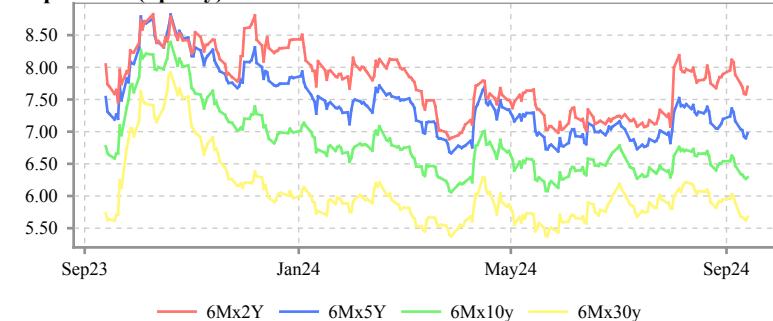
Note: Short gamma returns are short ATMF straddles, initiated daily (i.e., we consider overlapping trades), and held for one month with daily delta rebalancing, assuming zero transaction costs. All variables are ex-ante apart from monthly change in market depth. 2-year real yields are defined as 2Y UST minus 2Y inflation swap. Fed expectations are defined as 12Mx1M OIS minus 1M OIS rate. Market depth is the top 3 bids/offers in a given sector, averaged daily between 8:30am and 10:30am. Duration weighted market depth refers to the weighted sum of market depth in 2s, 5s, 10s, and 30s using weights of 0.25, 0.5, 1 and 2, respectively. Normalized projection is Projection divided by Standard Error. Regression period is six months.

Derivatives Strategy

SOFR Short Gamma Returns with SPX Driver Model Report

	Coefficient				1-Month ahead projection (bp/notional)			
	6mx2y	6mx5y	6mx10y	6mx30y	6mx2y	6mx5y	6mx10y	6mx30y
Ex-ante implied vol (bp/day)	23.9	55.5	123.9	208.4	7.7	7.0	6.3	5.7
Pct chg in SP (%)	1.0	2.3	3.0	7.1	0.0	0.0	0.0	0.0
Ex-ante ATMF (%)	27.6	24.4	12.4	57.2	2.9	3.0	3.1	3.1
Ex-ante 1st/5th OIS curve (%)	-26.6	-28.4	-13.1	-4.4	-1.2	-1.2	-1.2	-1.2
const	-321.8	-520.7	-867.2	-1425.6				
R-squared	78%	81%	84%	68%				
Standard Error	5.7	9.9	14.6	39.3				
Projection					-23.8	-26.1	-33.1	-58.3
Normalized Projection					-4.2	-2.6	-2.3	-1.5

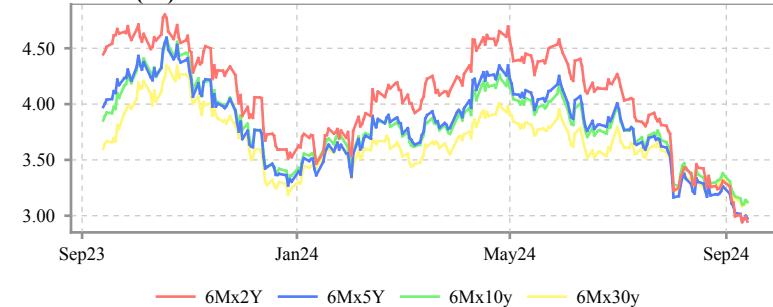
Implied vol (bp/day)



SPX levels and monthly returns



ATMF rate (%)



1st/5th OIS curve (%)



Note: Short gamma returns are rolling monthly returns of short ATM straddles, assuming options are rolled each month with daily delta hedging and no transaction costs. All variables are ex-ante apart from changes in SPX returns, which use current levels. Regression period is six months. The 1st/5th OIS curve is defined as the 15Mx3M minus 3Mx3M OIS rate. Projection assumes SPX is unchanged. Normalized projection is projection divided by the standard error.

Derivatives Strategy

Lognormal Short Gamma Returns Projection Report

Excess return calculations

	Short normal delta-hedged straddle returns* (bp/ notl)	Change in ATMF (%)	Ex-Ante percent yield vol	Ex-Ante bpvol vega	Rate driven return** (bp/ notl)	Residual short gamma return*** adj. for rates (bp/ notl)
6Mx2Y	5.18	-0.21	26.34	16.50	5.68	-0.50
6Mx5Y	23.52	-0.22	28.01	38.93	15.06	8.46
6Mx10Y	52.51	-0.19	26.13	70.84	22.45	30.06
6Mx30Y	119.18	-0.15	24.83	151.28	35.22	83.96

* Assumes daily delta hedging to a normal delta, and no transaction costs.

** Rate driven returns estimated as the change in ATMF rate * the ex-ante implied yield volatility / 15.84 * ATMF vega with respect to a 1 bp/day move in implieds.

*** Excess residual return defined as delta hedged return minus rate driven returns.

Projected excess returns*

	Coefficient				Current drivers			
	6Mx2Y	6Mx5Y	6Mx10Y	6Mx30Y	6Mx2Y	6Mx5Y	6Mx10Y	6Mx30Y
1M chg market depth**	0.7	1.0	1.4	2.3	0.0	0.0	0.0	0.0
Ex-ante percent yield vol (%)	4.7	7.9	14.3	24.9	26.9	27.6	25.1	23.3
Ex-ante constant maturity 1st/5th SOFR curve (bp)	0.3	0.1	0.0	-0.7	-94.5	-94.5	-94.5	-94.5
const	-119.0	-247.2	-424.7	-757.7				
Std. Err.	13.1	26.0	37.0	69.2				
R2	34%	26%	25%	21%				
1 Month Ahead Projection					-19.0	-39.8	-64.7	-110.0
Normalized Projection***					-1.4	-1.5	-1.8	-1.6

* We model excess residual returns calculated from the table above.

** Market depth is the size of the top 3 bids and offers by queue position, averaged between 8:30 - 10:30am daily. Duration weighted market depth refers to the weighted sum of market depth in 2s, 5s, 10s, and 30s using weights of 0.25, 0.5, 1 and 2, respectively.

*** Normalized projection is the 1-month ahead projection divided by the standard error.

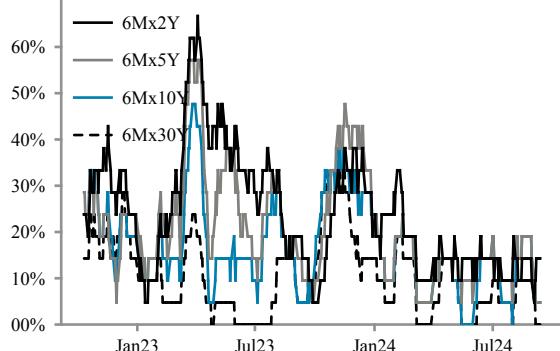
Source: J.P. Morgan, BrokerTec

Derivatives Strategy

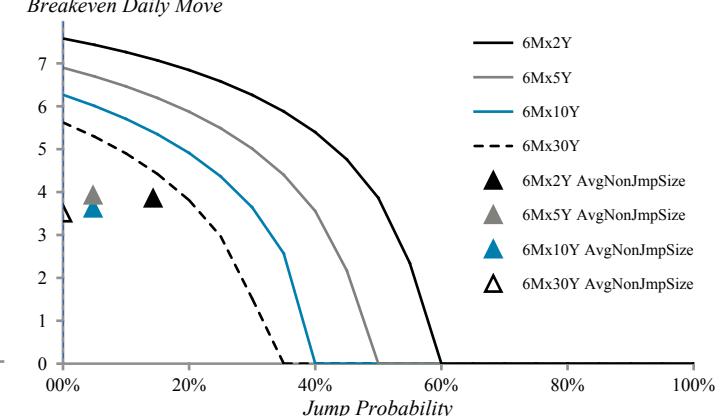
SOFR Jump Risk Report

	6Mx2Y	6Mx5Y	6Mx10Y	6Mx30Y
Current Implied Vol (bp/day)	7.58	6.90	6.27	5.62
Average jump size (bp/day)	14.31	13.45	10.15	-inf
Average jump prob*	0.14	0.05	0.05	0.00
Average non-jump size** (bp/day)	3.85	3.92	3.62	3.51
Average non-jump prob	0.86	0.95	0.95	1.00
Implied vol from jumps (bp/day)	6.48	4.82	4.17	

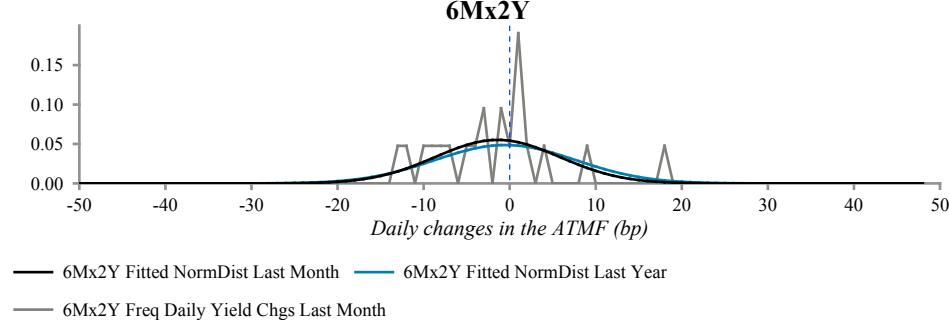
Average Jump Probability



Breakeven Daily Move

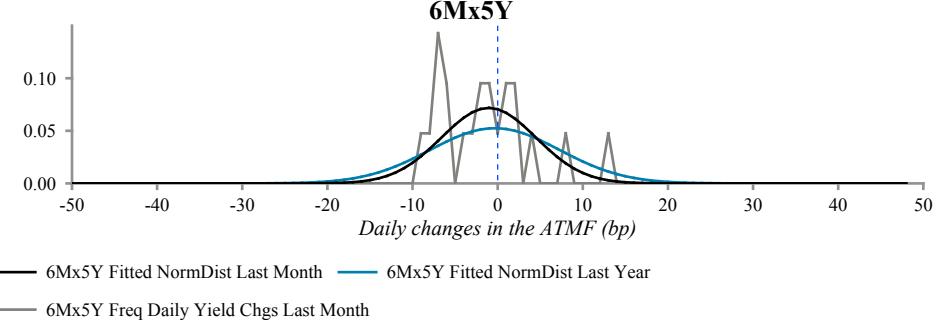


6Mx2Y



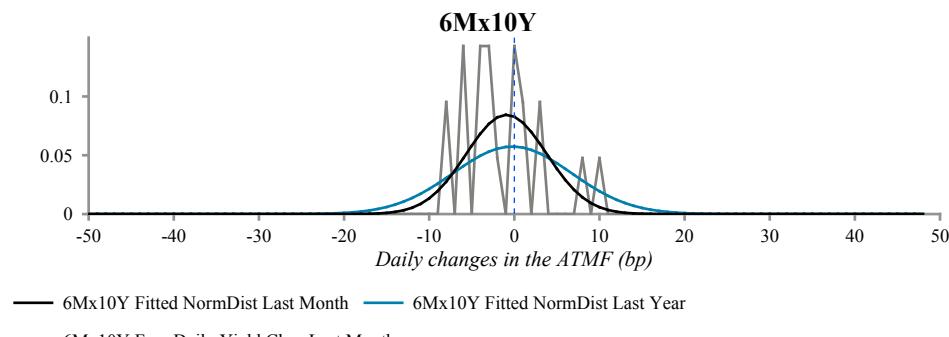
— 6Mx2Y Fitted NormDist Last Month — 6Mx2Y Fitted NormDist Last Year
— 6Mx2Y Freq Daily Yield Chgs Last Month

6Mx5Y



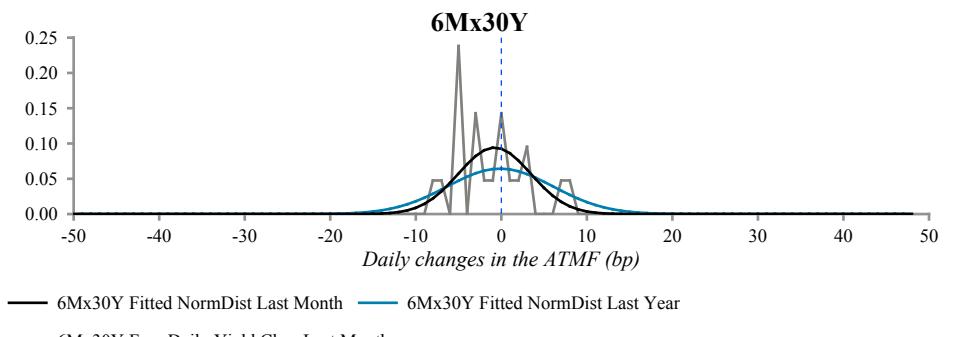
— 6Mx5Y Fitted NormDist Last Month — 6Mx5Y Fitted NormDist Last Year
— 6Mx5Y Freq Daily Yield Chgs Last Month

6Mx10Y



— 6Mx10Y Fitted NormDist Last Month — 6Mx10Y Fitted NormDist Last Year
— 6Mx10Y Freq Daily Yield Chgs Last Month

6Mx30Y



— 6Mx30Y Fitted NormDist Last Month — 6Mx30Y Fitted NormDist Last Year
— 6Mx30Y Freq Daily Yield Chgs Last Month

* Average jump probability is based on a jump size of 10bp. Jump size is calculated on absolute value of yield changes for all.

** Average non-jump size is calculated over the past month, and is shown at the jump probability from the past month.

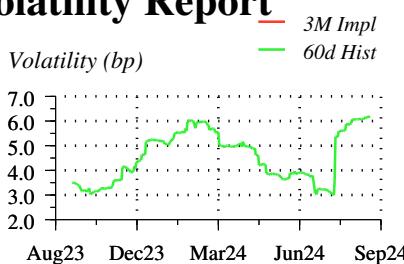
*** Breakeven daily move is calculated using the relationship implied variance = average jump size * average jump size * jump probability + average non-jump size * average non-jump size * (1-jump probability), and solving for the average non-jump size for the current implied volatility level.

† Normal distribution is fitted using the mean and standard deviation of daily changes from the respective time periods.

Short-Dated SOFR Swaption Volatility Report

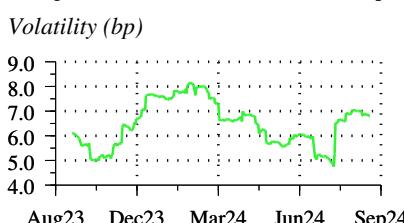
Options on 1yr Swaps

Mat	Implied Vol.		5d		20d		Historical BP Vol.		
	%	bp	Chg	Chg	10d	20d	60d		
1m	33.49	7.82	-0.25	1.33	5.57	5.08	6.20		
3m	36.98	7.87	-0.26	0.62	*1dc	1wc	2wc		
6m	39.97	7.72	-0.21	0.28	5.08	4.02	4.57		
12m	43.21	7.76	-0.14	-0.06					



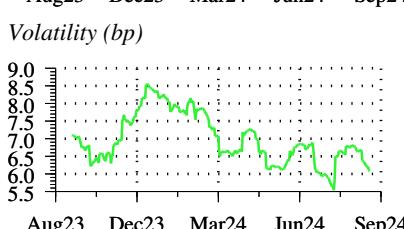
Options on 2yr Swaps

Mat	Implied Vol.		5d		20d		Historical BP Vol.		
	%	bp	Chg	Chg	10d	20d	60d		
1m	39.20	8.10	-0.29	0.36	5.65	5.36	6.79		
3m	41.27	8.09	-0.25	-0.04	*1dc	1wc	2wc		
6m	41.36	7.70	-0.19	-0.07	5.36	4.58	4.71		
12m	41.09	7.41	-0.14	-0.19					



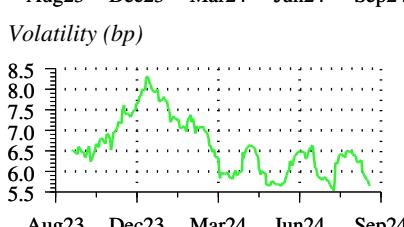
Options on 5yr Swaps

Mat	Implied Vol.		5d		20d		Historical BP Vol.		
	%	bp	Chg	Chg	10d	20d	60d		
1m	36.41	7.11	-0.36	-0.11	4.30	4.44	6.07		
3m	38.38	7.34	-0.28	-0.36	*1dc	1wc	2wc		
6m	37.13	6.97	-0.19	-0.29	4.44	3.74	3.45		
12m	35.92	6.72	-0.13	-0.28					



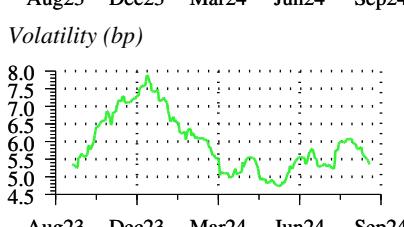
Options on 10yr Swaps

Mat	Implied Vol.		5d		20d		Historical BP Vol.		
	%	bp	Chg	Chg	10d	20d	60d		
1m	30.14	6.03	-0.38	-0.35	3.83	3.98	5.65		
3m	32.67	6.48	-0.28	-0.47	*1dc	1wc	2wc		
6m	31.92	6.29	-0.18	-0.33	3.98	3.48	2.93		
12m	31.33	6.19	-0.13	-0.28					



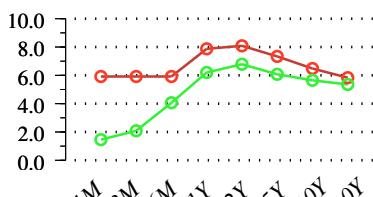
Options on 30yr Swaps

Mat	Implied Vol.		5d		20d		Historical BP Vol.		
	%	bp	Chg	Chg	10d	20d	60d		
1m	26.79	5.33	-0.34	-0.34	3.76	3.77	5.36		
3m	29.47	5.83	-0.28	-0.44	*1dc	1wc	2wc		
6m	28.84	5.68	-0.22	-0.36	3.77	3.55	2.63		
12m	28.54	5.60	-0.18	-0.33					

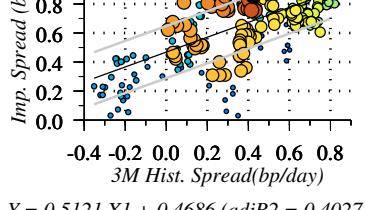
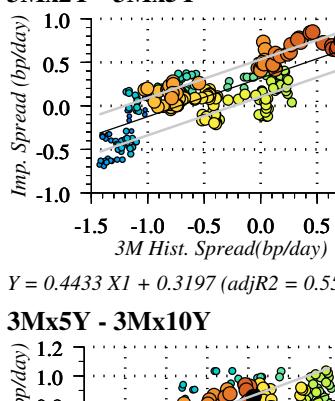


Maturity Structure of 3M Vol.

Volatility (bp)



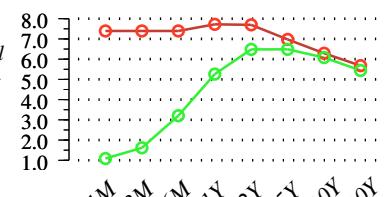
3Mx2Y - 3Mx5Y



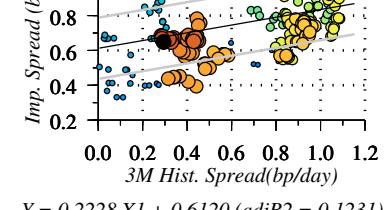
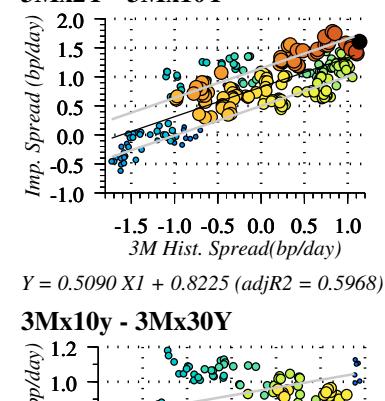
Hist Vol.		Implied Vol.		
	hold	curr	hold	curr
3mx1y	3.62	6.20	4.61	7.87
3mx2y	4.78	6.79	5.33	8.09
3mx5y	5.55	6.07	5.65	7.34
3mx10y	5.58	5.65	5.55	6.48
3mx30y	5.20	5.36	5.19	5.83

Maturity Structure of 6M Vol.

Volatility (bp)



3Mx2Y - 3Mx10Y



SOFR Receiver Swaption 3M Carry Report

CCY	Mat	3M Carry A+0 (bp of yield)										3M Carry A+25 (bp of yield)										3M Carry A-25 (bp of yield)										3M Carry A+0 (prct of inv. premium)									
		1y	2y	3y	4y	5y	6y	10y	20y	30y	1y	2y	3y	4y	5y	6y	10y	20y	30y	1y	2y	3y	4y	5y	6y	10y	20y	30y	1y	2y	3y	4y	5y	6y	10y	20y	30y				
USD	6m	-0.7	-0.5	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	-1.0	-0.7	-0.5	-0.4	-0.2	-0.1	0.0	0.0	0.0	-0.4	-0.2	-0.1	-0.1	0.0	0.0	-0.1	0.1	0.0	-113.7	-96.3	-90.3	-87.7	-86.9	-98.0	-63.6	-85.4	-81.4				
	9m	-1.1	-0.8	-0.6	-0.4	-0.2	-0.1	0.0	0.0	0.0	-1.5	-1.0	-0.8	-0.6	-0.4	-0.3	-0.1	0.0	0.0	-0.8	-0.5	-0.3	-0.2	-0.1	0.0	-0.3	0.1	0.1	-65.6	-61.2	-60.7	-61.7	-63.8	-72.2	-190.9	-55.9	-42.2				
	1y	-1.2	-0.8	-0.6	-0.4	-0.3	-0.2	0.0	0.0	0.0	-1.5	-1.1	-0.8	-0.6	-0.5	-0.3	-0.2	-0.1	-0.1	-0.9	-0.6	-0.4	-0.2	-0.1	0.0	-0.3	0.1	0.1	-40.1	-39.9	-38.3	-39.2	-42.5	-47.5	-81.7	-32.5	88.9				
	2y	0.1	0.0	0.0	-0.1	-0.2	-0.1	-0.1	0.0	-0.1	0.1	0.0	-0.1	-0.2	-0.3	-0.3	-0.2	-0.2	0.2	0.1	0.1	0.0	0.0	-0.3	0.1	0.0	3.6	1.7	-0.9	-5.4	-10.2	-14.8	-27.8	97.1	-39.8						
	3y	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	0.1	0.0	0.0	0.0	-0.2	0.0	-0.1	-0.1	-0.4	-2.7	-2.9	-3.3	-3.6	-5.7	-11.5	-36.4	-23.1					
	4y	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	-0.1	-0.1	0.0	-0.2	0.0	-0.1	-4.3	-4.4	-5.0	-5.5	-5.8	-5.7	-5.9	-16.2	-13.4						
	5y	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	-0.1	0.0	-0.2	-0.2	-0.1	-0.2	-2.9	-2.7	-3.1	-3.3	-3.7	-3.5	-4.1	-11.1	-9.7						
GBP	6m	-17.8	-13.9	-12.1	-11.1	-10.3	-9.3	-8.3	-7.6	-7.2	-22.2	-16.2	-13.5	-12.1	-11.0	-9.4	-7.9	-6.9	-6.6	-13.4	-11.1	-9.8	-9.1	-8.5	-7.8	-9.4	-6.5	-6.2	-59.6	-45.2	-40.5	-38.2	-36.8	-34.6	-33.4	-31.6	-31.2				
	9m	-12.8	-9.8	-8.4	-7.9	-7.4	-6.7	-6.1	-5.8	-5.7	-15.0	-10.9	-9.2	-8.4	-7.8	-6.7	-5.8	-5.4	-5.3	-10.5	-8.4	-7.3	-6.9	-6.6	-6.0	-6.7	-5.4	-5.2	-35.1	-26.4	-23.6	-22.5	-21.8	-20.5	-20.0	-19.7	-19.8				
	1y	-9.0	-7.1	-6.3	-6.1	-5.8	-5.1	-4.7	-4.6	-4.5	-9.9	-7.7	-6.7	-6.4	-5.9	-5.0	-4.3	-4.2	-4.2	-7.8	-6.2	-5.6	-5.5	-5.3	-4.8	-5.0	-4.4	-4.3	-21.3	-16.7	-15.5	-15.2	-14.8	-13.7	-13.2	-13.3	-13.7				
	2y	-3.6	-3.3	-3.0	-2.9	-2.7	-2.3	-2.1	-2.3	-2.5	-3.7	-3.4	-3.0	-2.9	-2.6	-2.1	-1.9	-2.1	-2.3	-3.3	-3.1	-2.8	-2.8	-2.6	-2.3	-2.1	-2.3	-2.5	-6.3	-5.9	-5.5	-5.4	-5.0	-4.5	-4.3	-4.9	-5.5				
	3y	-2.3	-2.2	-1.9	-1.6	-1.4	-1.1	-1.2	-1.5	-1.7	-2.3	-2.1	-1.9	-1.5	-1.2	-0.9	-1.0	-1.3	-1.6	-2.2	-2.1	-1.9	-1.6	-1.5	-1.2	-0.9	-1.6	-1.8	-3.4	-3.3	-3.0	-2.6	-2.3	-2.1	-2.8	-3.3					
	4y	-1.1	-0.7	-0.3	-0.3	-0.3	-0.4	-0.4	-1.0	-1.1	-1.0	-0.6	-0.2	-0.2	-0.1	-0.1	-0.2	-0.8	-1.0	-1.1	-0.7	-0.4	-0.5	-0.5	-0.5	-0.1	-1.1	-1.2	-1.5	-0.9	-0.5	-0.5	-0.5	-0.7	-1.6	-1.9					
	5y	-0.1	0.2	0.3	0.4	0.4	0.1	-0.2	-0.6	-0.7	0.0	0.3	0.4	0.6	0.6	0.3	0.0	-0.5	-0.6	-0.2	0.1	0.1	0.2	0.2	0.0	0.3	-0.7	-0.8	-0.1	0.3	0.4	0.5	0.5	0.2	-1.0	-1.2					
EUR	6m	-14.9	-11.1	-9.1	-8.2	-7.8	-7.1	-6.4	-6.2	-6.1	-21.3	-13.6	-10.2	-8.7	-7.9	-6.7	-5.8	-5.5	-5.4	-9.2	-7.7	-6.7	-6.1	-6.0	-5.5	-6.7	-4.8	-4.7	-72.1	-51.2	-42.8	-39.2	-37.1	-34.6	-33.1	-32.8	-32.7				
	9m	-10.5	-7.5	-6.3	-5.7	-5.5	-5.1	-4.8	-4.8	-4.8	-12.8	-8.2	-6.5	-5.6	-5.2	-4.7	-4.3	-4.4	-4.4	-7.8	-6.1	-5.3	-4.9	-4.8	-4.5	-4.7	-4.2	-4.1	-39.9	-27.7	-23.7	-22.0	-21.1	-20.1	-19.8	-20.6	-20.6				
	1y	-6.8	-4.9	-4.3	-3.9	-3.8	-3.6	-3.5	-4.1	-4.2	-7.4	-4.9	-4.1	-3.6	-3.4	-3.2	-3.1	-3.8	-3.9	-5.7	-4.4	-3.9	-3.6	-3.6	-3.5	-3.2	-3.7	-3.8	-21.7	-15.5	-13.9	-13.0	-12.5	-12.3	-12.4	-14.9	-15.4				
	2y	-1.6	-1.4	-1.4	-1.3	-1.5	-1.5	-1.7	-2.4	-2.5	-1.4	-1.2	-1.1	-1.1	-1.2	-1.1	-1.4	-2.2	-2.4	-1.6	-1.4	-1.4	-1.4	-1.6	-1.6	-1.1	-2.4	-2.4	-3.7	-3.2	-3.2	-3.3	-3.5	-3.5	-4.2	-6.2	-6.6				
	3y	-0.6	-0.8	-0.8	-0.9	-1.0	-1.0	-1.2	-1.9	-2.0	-0.4	-0.5	-0.6	-0.6	-0.7	-0.8	-1.0	-1.8	-1.9	-0.8	-0.9	-1.0	-1.0	-1.1	-1.2	-0.8	-1.9	-1.9	-1.2	-1.5	-1.7	-1.8	-1.9	-2.1	-2.5	-4.4					
	4y	-0.5	-0.5	-0.5	-0.5	-0.6	-0.7	-1.0	-1.5	-1.6	-0.3	-0.3	-0.3	-0.4	-0.5	-0.8	-1.5	-1.5	-0.7	-0.6	-0.6	-0.7	-0.7	-0.9	-0.5	-1.5	-1.6	-0.9	-0.8	-0.9	-1.0	-1.1	-1.3	-1.8	-3.1						
	5y	-0.2	-0.3	-0.3	-0.3	-0.5	-0.8	-1.3	-1.3	0.0	-0.1	-0.1	-0.1	-0.2	-0.3	-0.6	-1.2	-1.2	-0.3	-0.4	-0.4	-0.4	-0.5	-0.6	-0.3	-1.3	-1.3	-0.2	-0.5	-0.5	-0.6	-0.7	-1.3	-2.3	-2.3						

SOFR Swap and Swaption Receiver 3M Carry Report

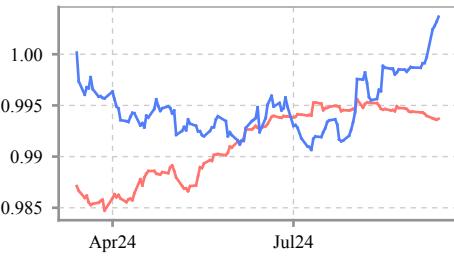
CCY	Mat	Swap 3M Carry A+0 (bp of yield)										ATMF Swap Rate										ATMF Swaption Vol (abp)									
		1y	2y	3y	4y	5y	6y	10y	20y	30y	1y	2y	3y	4y	5y	6y	10y	20y	30y	1y	2y	3y	4y	5y	6y	10y	20y	30y			
USD	6m	-31.1	-15.6	-10.0	-7.0	-5.2	-3.4	-2.1	-1.6	-1.7	3.06	2.95	2.93	2.94	2.97	3.03	3.12	3.25	3.12	122	122	119	115	110	106	100	94	90			
	9m	-15.4	-7.1	-4.2	-2.6	-1.7	-0.8	-0.1	-0.5	-0.8	2.91	2.88	2.89	2.92	2.95	3.02	3.12	3.24	3.11	123	119	117	112	108	104	99	93	89			
	1y	-6.1	-2.1	-0.9	0.0	0.4	0.7	0.9	0.1	-0.4	2.85	2.86	2.89	2.92	2.96	3.03	3.13	3.24	3.11	123	117	114	110	106	103	98	91	89			
	2y	2.0	1.8	2.1	2.1	2.0	2.0	1.7	0.5	-0.1	2.87	2.90	2.94	2.99	3.03	3.10	3.19	3.26	3.10	112	109	106	104	102	99	96	89	87			
	3y	1.7	2.2	2.2	2.1	2.0	1.9	1.7	0.3	-0.3	2.94	2.99	3.03	3.07	3.11	3.18	3.26	3.27	3.09	106	103	101	100	99	96	93	87	85			
	4y	2.7	2.4	2.2	2.0	2.0	1.8	1.5	0.1	-0.4	3.04	3.08	3.12	3.16	3.19	3.25	3.32	3.28	3.08	103	100	99	97	96	92	86	84				
	5y	2.1	1.9	1.8	1.8	1.7	1.5	1.1	-0.2	-0.6	3.13	3.16	3.20	3.23	3.26	3.32	3.37	3.28	3.06	100	98	96	95	94	92	80	78	83			
GBP	6m	-27.7	-15.4	-10.7	-8.1	-6.4	-4.1	-2.2	-1.3	-1.3	3.56	3.40	3.33	3.29	3.28	3.29	3.38	3.58	3.57	112	115	111	107	103	98	91	88	85			
	9m	-17.0	-9.4	-6.5	-4.9	-3.8	-2.1	-0.7	-0.5	-0.6	3.39	3.30	3.26	3.24	3.24	3.27	3.37	3.58	3.57	112	114	110	106	103	98	93	90	87			
	1y	-8.9	-5.2	-3.5	-2.6	-1.8</																									

Derivatives Strategy

Swaption Triad Correlation Report

Structures	dep	Y vol	X1 vol	X2 vol	Beta X1	Beta X2	Standard Error	Implied corr from relationship	Realized Correlation			Fair Value			Mispicing			w1	w2	Notl wt 1	Notl wt 2
									Current Realized	Past 1Y min	Past 1Y max	Fair value using current realized	Fair value using Past 1y min	Fair value using Past 1y max	Mispicing using current realized	Mispicing using Past 1Y min	Mispicing using Past 1Y max				
6Mx2Y/6Mx5Y/6Mx10Y	10Y	6.27	7.58	6.90	-0.49	1.45	0.66	1.01	0.96	0.92	0.98	6.59	6.81	6.46	0.32	0.54	0.19	0.50	-1.45	2.23	-2.69
6Mx2Y/6Mx10Y/6Mx5Y	5Y	6.90	7.58	6.27	0.36	0.65	0.44	1.03	0.88	0.78	0.94	6.65	6.47	6.75	0.25	0.43	0.15	-0.37	-0.65	-0.88	-0.35
6Mx5Y/6Mx10Y/6Mx2Y	2Y	7.58	6.90	6.27	2.47	-1.49	1.16	1.01	0.98	0.95	0.99	8.27	8.68	8.03	0.69	1.10	0.45	-2.48	1.55	-1.04	0.35
6Mx2Y/6Mx5Y/6Mx30Y	30Y	5.62	7.58	6.90	-0.81	1.70	1.33	1.01	0.96	0.92	0.98	6.29	6.73	6.03	0.67	1.11	0.40	0.83	-1.68	8.23	-6.98
6Mx2Y/6Mx30Y/6Mx5Y	5Y	6.90	7.58	5.62	0.52	0.50	0.72	1.05	0.78	0.57	0.88	6.45	6.07	6.61	0.45	0.83	0.29	-0.52	-0.51	-1.25	-0.12
6Mx5Y/6Mx30Y/6Mx2Y	2Y	7.58	6.90	5.62	1.77	-0.80	1.33	1.03	0.92	0.80	0.95	8.37	9.10	8.14	0.79	1.52	0.56	-1.76	0.85	-0.74	0.09
6Mx2Y/6Mx10Y/6Mx30Y	30Y	5.62	7.58	6.27	-0.26	1.21	0.66	1.02	0.88	0.78	0.94	5.97	6.22	5.81	0.34	0.59	0.19	0.26	-1.20	2.62	-2.70
6Mx2Y/6Mx30Y/6Mx10Y	10Y	6.27	7.58	5.62	0.23	0.80	0.54	1.02	0.78	0.57	0.88	5.97	5.68	6.09	0.30	0.58	0.18	-0.23	-0.79	-1.03	-0.35
6Mx10Y/6Mx30Y/6Mx2Y	2Y	7.58	6.27	5.62	3.52	-2.60	2.10	1.00	0.98	0.94	0.99	8.60	10.10	8.33	1.02	2.52	0.75	-3.44	2.59	-0.78	0.26
6Mx5Y/6Mx10Y/6Mx30Y	30Y	5.62	6.90	6.27	-0.74	1.70	0.50	1.00	0.98	0.95	0.99	5.82	6.02	5.70	0.19	0.39	0.08	0.73	-1.69	3.02	-3.79
6Mx5Y/6Mx30Y/6Mx10Y	10Y	6.27	6.90	5.62	0.46	0.56	0.29	0.98	0.92	0.80	0.95	6.17	5.98	6.22	0.10	0.29	0.05	-0.45	-0.55	-0.84	-0.25
6Mx10Y/6Mx30Y/6Mx5Y	5Y	6.90	6.27	5.62	2.07	-1.09	0.61	0.99	0.98	0.94	0.99	7.07	7.55	6.99	0.18	0.65	0.10	-2.05	1.07	-1.11	0.26

imp corr 6Mx15Y/6Mx30Y/6Mx2Y vs corr 6Mx15Y/6Mx30Y/6Mx2Y

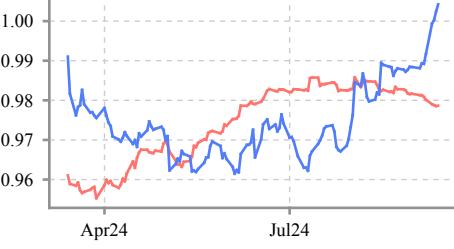


imp corr 6Mx7Y/6Mx30Y/6Mx2Y vs corr 6Mx7Y/6Mx30Y/6Mx2Y



Implied correlation
Realized correlation

imp corr 6Mx10Y/6Mx30Y/6Mx2Y vs corr 6Mx10Y/6Mx30Y/6Mx2Y



imp corr 6Mx7Y/6Mx15Y/6Mx2Y vs corr 6Mx7Y/6Mx15Y/6Mx2Y



imp corr 6Mx7Y/6Mx10Y/6Mx2Y vs corr 6Mx7Y/6Mx10Y/6Mx2Y



For each structure, the dependent leg refers to the last leg of the trade, for which we refer to its vol as 'Yvol'. For the first two legs in each structure, we refer to them as X1 and X2 and their vols as 'X1 Vol' and 'X2 Vol', respectively. Betas are calculated by regressing the past three months of daily changes in the sofr rate of the dependent leg against the past three months of daily changes of the sofr rate in two other legs of the triad.

Implied correlation is defined as dep. leg implied vol squared, minus beta of the first leg squared x first leg implied vol squared, minus beta of second leg squared x second leg implied vol squared, minus the standard error of the regression squared, all divided by 2 x beta of first leg x implied vol of first leg x beta of second leg x implied vol of second leg.

Fair value is defined as sqrt(first leg implied vol squared x beta of first leg squared, plus second leg implied vol squared x beta of second leg squared, plus standard error of regression squared, plus 2 x first leg implied vol squared x beta of first leg x second leg implied vol x beta of second leg x correlation of past three months daily changes in sofr rate between first and second leg).

Derivatives Strategy

Vol-Rate Correlation Report

	Current Rate	Aged Rate	Swaption Premium	Aged Swaption Premium	bpvega	Emp. Beta	Log Beta	Avg Beta	Swap Overlay (\$mn)	1m Carry Swaption notional (\$)	1m carry swap overlay (\$)
3Mx2Y	3.10	3.18	96.94	106.90	11.99	0.00	2.60	1.30	7.94		
3Mx3Y	3.03	3.08	140.89	155.09	17.73	1.01	2.62	1.82	11.08		
3Mx5Y	3.02	3.05	210.76	232.31	28.72	1.54	2.42	1.98	12.66		
3Mx7Y	3.07	3.08	272.40	301.14	39.04	0.89	2.27	1.58	9.99		
3Mx10Y	3.14	3.15	345.50	383.75	53.31	1.00	2.06	1.53	9.65		
3Mx15Y	3.24	3.25	464.67	516.22	74.01	1.44	1.93	1.69	10.62		
3Mx30Y	3.13	3.14	696.93	774.89	119.49	1.65	1.86	1.75	11.05		
6Mx2Y	2.95	2.99	128.54	136.19	16.70	-0.12	2.61	1.25	10.69		
6Mx3Y	2.93	2.96	185.94	197.30	24.72	0.34	2.56	1.45	12.45		
6Mx5Y	2.97	2.98	279.14	295.80	40.02	0.79	2.34	1.57	14.07		
6Mx7Y	3.03	3.04	363.62	386.36	54.37	0.19	2.20	1.20	10.63		
6Mx10Y	3.12	3.12	466.91	496.99	74.22	0.51	2.01	1.26	11.20		
6Mx15Y	3.23	3.23	628.29	668.99	103.02	1.09	1.89	1.49	13.20		
6Mx30Y	3.12	3.12	944.37	1005.47	166.33	1.51	1.82	1.66	14.73		
1Yx2Y	2.86	2.86	174.16	177.99	23.52	-0.10	2.59	1.25	15.29		
1Yx3Y	2.88	2.88	250.93	256.54	34.83	0.48	2.49	1.49	18.23		
1Yx5Y	2.96	2.96	378.23	387.40	56.30	0.71	2.27	1.49	18.95		
1Yx7Y	3.03	3.03	496.92	509.24	76.49	0.94	2.14	1.54	19.58		
1Yx10Y	3.13	3.12	645.84	662.40	104.32	1.01	1.98	1.49	18.94		
1Yx15Y	3.23	3.23	869.25	891.24	144.75	1.02	1.86	1.44	18.24		
1Yx30Y	3.11	3.11	1309.20	1343.36	233.94	1.49	1.80	1.65	20.88		
3Yx2Y	2.99	2.98	250.36	251.27	38.50	0.71	2.17	1.44	33.23		
3Yx3Y	3.03	3.03	363.54	364.88	56.76	0.75	2.11	1.43	32.34		
3Yx5Y	3.11	3.10	570.01	572.15	91.65	0.65	2.00	1.32	29.51		
3Yx7Y	3.18	3.17	756.18	759.11	124.29	0.75	1.91	1.33	29.46		
3Yx10Y	3.26	3.25	998.16	1002.13	169.26	0.90	1.81	1.36	29.83		
3Yx15Y	3.32	3.32	1331.42	1336.57	234.47	0.99	1.71	1.35	29.56		
3Yx30Y	3.09	3.09	2045.09	2053.97	380.53	1.19	1.74	1.46	32.10		
5Yx2Y	3.16	3.16	287.43	287.57	46.59	0.58	1.95	1.26	35.51		
5Yx3Y	3.20	3.19	418.92	419.13	68.84	0.58	1.90	1.24	34.91		
5Yx5Y	3.26	3.25	658.56	658.87	111.11	0.56	1.82	1.19	33.33		
5Yx7Y	3.32	3.31	876.37	876.78	150.51	0.69	1.75	1.22	34.19		
5Yx10Y	3.37	3.37	1162.71	1163.27	204.74	0.69	1.68	1.19	33.14		
5Yx15Y	3.37	3.37	1544.25	1545.01	283.58	0.77	1.62	1.19	33.29		
5Yx30Y	3.06	3.06	2417.11	2418.43	462.69	0.86	1.71	1.28	36.25		

Notes: "swap overlay" is calculated as the average of the up-beta (beta of weekly changes in swaption bpvol versus the swaption bpvol multiplied by the weekly change in sofr rate, restricted to the days where the change in the sofr rate was positive) and yield volatility, multiplied by the swaption bpvega, divided by the swap PVBP.

"Im carry swaption notional" is calculated as -1 times the difference between the aged ATMF swaption premium and ATMF swaption premium, multiplied by 100mn, divided by 100. Swaption carry is shown for a short swaption position.

"Im carry swap overlay" is calculated as the difference between the aged rate and current rate, multiplied by the average of the up-beta and yield volatility, multiplied by the swaption bpvega times 10, divided by the swap PVBP times 100, multiplied by the swap PVBP, multiplied by 100mn, divided by 100. Swap carry is shown for a short swap position.

Derivatives Strategy

Long PC1 trades (expiry 6M)

6M Implied Principal Components

	2Y	3Y	5Y	7Y	10Y	20Y	30Y
PC1	7.04	7.07	6.87	6.51	6.10	5.27	4.87
PC2	2.80	1.70	0.25	-0.56	-1.30	-2.37	-2.77

6M Implied PC1 Volatility Time Series (bp/day)



Long PC1 trades (expiry 6M)

Tenor 1	Tenor 2	Vega Weight 1	Vega Weight 2	Notional 1 (\$ millions)	Notional 2 (\$ millions)	Theta 1(% of notional)	Theta 2(% of notional)	Carry 1 (\$ thousands)	Carry 2 (\$ thousands)	Net Carry (\$ thousands)	Multiplier	Adj. Notional 1 (\$ millions)	Adj. Notional 2 (\$ millions)	Adj. Net Carry (\$ thousands)	Vol Spread (bp/day)	Vol Spread 6M Z-Score
2Y	20Y	1	-1.09	100	-14	-0.11	-0.65	-107	93	-14	4.479	448	-64	-64	1.16	1.58
2Y	30Y	1	-0.76	100	-8	-0.11	-0.81	-107	62	-45	1.892	189	-14	-86	3.31	1.23
2Y	5Y	-1	115.35	-100	4823	-0.11	-0.23	107	-11047	-10939	0.008	-1	39	-88	788.20	-0.74
2Y	7Y	-1	21.89	-100	673	-0.11	-0.31	107	-2057	-1949	0.047	-5	32	-92	137.65	-0.94
2Y	3Y	-1	2.67	-100	180	-0.11	-0.15	107	-275	-167	0.552	-55	100	-92	12.21	-0.06
2Y	10Y	-1	3.84	-100	87	-0.11	-0.40	107	-349	-241	0.387	-39	33	-93	16.47	-1.60
3Y	5Y	-1	43.25	-100	2673	-0.15	-0.23	152	-6122	-5969	0.022	-2	58	-130	290.94	-0.75
3Y	20Y	1	-0.41	100	-8	-0.15	-0.65	-152	52	-101	1.310	131	-10	-132	5.01	0.56
3Y	30Y	1	-0.28	100	-4	-0.15	-0.81	-152	34	-118	1.139	114	-5	-134	5.82	0.43
3Y	7Y	-1	8.21	-100	373	-0.15	-0.31	152	-1140	-988	0.138	-14	51	-136	47.03	-1.02
3Y	10Y	-1	1.44	-100	48	-0.15	-0.40	152	-193	-41	3.459	-346	166	-142	1.60	-1.79
5Y	7Y	1	-0.19	100	-14	-0.23	-0.31	-229	43	-186	1.120	112	-16	-209	5.64	-0.70
5Y	10Y	1	-0.03	100	-2	-0.23	-0.40	-229	7	-222	0.949	95	-2	-210	6.69	-0.71
5Y	30Y	1	-0.01	100	0	-0.23	-0.81	-229	1	-228	0.925	93	0	-211	6.86	-0.72
5Y	20Y	1	-0.01	100	0	-0.23	-0.65	-229	2	-227	0.927	93	0	-211	6.84	-0.72
7Y	20Y	1	-0.05	100	-2	-0.31	-0.65	-305	14	-292	1.023	102	-2	-298	6.34	-0.84
7Y	30Y	1	-0.03	100	-1	-0.31	-0.81	-305	9	-296	1.009	101	-1	-299	6.44	-0.84
7Y	10Y	1	-0.18	100	-13	-0.31	-0.40	-305	52	-254	1.178	118	-15	-299	5.53	-0.81
10Y	20Y	1	-0.28	100	-17	-0.40	-0.65	-403	108	-295	1.367	137	-23	-403	4.59	-1.04
10Y	30Y	1	-0.20	100	-9	-0.40	-0.81	-403	72	-331	1.233	123	-11	-408	5.16	-1.03
20Y	30Y	1	-0.70	100	-53	-0.65	-0.81	-650	433	-217	3.569	357	-190	-776	1.98	-0.95

Footnotes:

*Vega weights chosen to create a long exposure to PC1 volatility while hedging out PC2 volatility

**Carries are calculated over a 1 month period

***Multiplier is calculated as root-mean-square of the PC1 loadings divided by PC1 exposure

†Adjusted notional is calculated as notional times multiplier; similar for adjusted carry

††For details on our methodology for trading Principal Factor Volatility, see [Trading Principal Factor Volatility](#).

Derivatives Strategy

Long PC1 trades (expiry 1Y)

1Y Implied Principal Components

	2Y	3Y	5Y	7Y	10Y	20Y	30Y
PC1	6.82	6.76	6.61	6.32	6.00	5.19	4.81
PC2	2.65	1.64	0.37	-0.47	-1.28	-2.28	-2.66

1Y Implied PC1 Volatility Time Series (bp/day)



Long PC1 trades (expiry 1Y)

Tenor 1	Tenor 2	Vega Weight 1	Vega Weight 2	Notional 1 (\$ millions)	Notional 2 (\$ millions)	Theta 1(% of notional)	Theta 2(% of notional)	Carry 1 (\$ thousands)	Carry 2 (\$ thousands)	Net Carry (\$ thousands)	Multiplier	Adj. Notional 1 (\$ millions)	Adj. Notional 2 (\$ millions)	Adj. Net Carry (\$ thousands)	Vol Spread (bp/day)	Vol Spread 6M Z-Score
2Y	30Y	1	-0.74	100	-7	-0.07	-0.53	-68	40	-28	1.891	189	-14	-53	3.22	-0.26
2Y	5Y	-1	45.87	-100	1916	-0.07	-0.15	68	-2792	-2724	0.021	-2	40	-57	298.67	-1.87
2Y	3Y	-1	2.54	-100	171	-0.07	-0.09	68	-162	-94	0.619	-62	106	-58	10.78	-1.71
2Y	20Y	1	-1.05	100	-14	-0.07	-0.39	-68	54	-14	4.331	433	-60	-59	1.36	0.17
2Y	7Y	-1	27.31	-100	840	-0.07	-0.19	68	-1624	-1556	0.038	-4	32	-59	169.14	-1.86
2Y	10Y	-1	3.57	-100	80	-0.07	-0.26	68	-212	-144	0.422	-42	34	-61	14.69	-1.66
3Y	30Y	1	-0.29	100	-4	-0.09	-0.53	-95	23	-71	1.183	118	-5	-84	5.52	-1.30
3Y	5Y	-1	18.09	-100	1120	-0.09	-0.15	95	-1632	-1537	0.055	-5	61	-84	113.52	-1.87
3Y	20Y	1	-0.41	100	-8	-0.09	-0.39	-95	32	-63	1.374	137	-11	-87	4.79	-1.19
3Y	7Y	-1	10.77	-100	491	-0.09	-0.19	95	-949	-855	0.102	-10	50	-87	62.45	-1.86
3Y	10Y	-1	1.41	-100	47	-0.09	-0.26	95	-124	-29	3.366	-337	158	-97	1.54	-0.99
5Y	7Y	1	-0.60	100	-44	-0.15	-0.19	-146	85	-61	2.139	214	-94	-130	2.82	-1.81
5Y	10Y	1	-0.08	100	-4	-0.15	-0.26	-146	11	-135	1.005	100	-4	-135	6.19	-1.86
5Y	30Y	1	-0.02	100	0	-0.15	-0.53	-146	2	-144	0.945	94	0	-136	6.58	-1.86
5Y	20Y	1	-0.02	100	-1	-0.15	-0.39	-146	3	-143	0.951	95	-1	-136	6.54	-1.86
7Y	30Y	1	-0.03	100	-1	-0.19	-0.53	-193	5	-189	1.008	101	-1	-190	6.31	-1.85
7Y	20Y	1	-0.04	100	-2	-0.19	-0.39	-193	6	-187	1.019	102	-2	-190	6.24	-1.85
7Y	10Y	1	-0.13	100	-10	-0.19	-0.26	-193	25	-168	1.129	113	-11	-190	5.65	-1.86
10Y	30Y	1	-0.21	100	-9	-0.26	-0.53	-263	49	-213	1.232	123	-11	-263	5.02	-1.71
10Y	20Y	1	-0.29	100	-17	-0.26	-0.39	-263	67	-196	1.374	137	-23	-269	4.50	-1.72
20Y	30Y	1	-0.71	100	-54	-0.39	-0.53	-393	289	-103	3.510	351	-191	-362	1.78	-1.53

Footnotes:

*Vega weights chosen to create a long exposure to PC1 volatility while hedging out PC2 volatility

**Carries are calculated over a 1 month period

***Multiplier is calculated as root-mean-square of the PC1 loadings divided by PC1 exposure

†Adjusted notional is calculated as notional times multiplier; similar for adjusted carry

††For details on our methodology for trading Principal Factor Volatility, see [Trading Principal Factor Volatility](#).

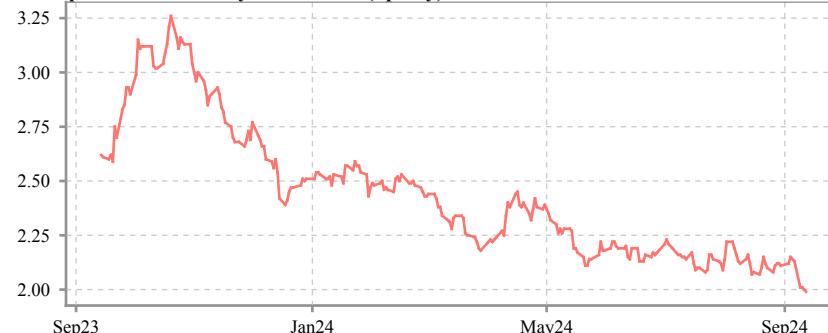
Derivatives Strategy

Long PC2 trades (expiry 6M)

6M Implied Principal Components

	2Y	3Y	5Y	7Y	10Y	20Y	30Y
PC1	7.04	7.07	6.87	6.51	6.10	5.27	4.87
PC2	2.80	1.70	0.25	-0.56	-1.30	-2.37	-2.77

6M Implied PC2 Volatility Time Series (bp/day)



Long PC2 trades (expiry 6M)

Tenor 1	Tenor 2	Vega Weight 1	Vega Weight 2	Notional 1 (\$ millions)	Notional 2 (\$ millions)	Theta 1(% of notional)	Theta 2(% of notional)	Carry 1 (\$ thousands)	Carry 2 (\$ thousands)	Net Carry (\$ thousands)	Multiplier	Adj. Notional 1 (\$ millions)	Adj. Notional 2 (\$ millions)	Adj. Net Carry (\$ thousands)	Vol Spread (bp/day)	Vol Spread 6M Z-Score

Footnotes:

*Vega weights chosen to create a long exposure to PC2 volatility while hedging out PC1 volatility

**Carries are calculated over a 1 month period

***Multiplier is calculated as root-mean-square of the PC2 loadings divided by PC2 exposure

†Adjusted notional is calculated as notional times multiplier; similar for adjusted carry

††For details on our methodology for trading Principal Factor Volatility, see [Trading Principal Factor Volatility](#).

Derivatives Strategy

Long PC2 trades (expiry 1Y)

1Y Implied Principal Components

	2Y	3Y	5Y	7Y	10Y	20Y	30Y
PC1	6.82	6.76	6.61	6.32	6.00	5.19	4.81
PC2	2.65	1.64	0.37	-0.47	-1.28	-2.28	-2.66

1Y Implied PC2 Volatility Time Series (bp/day)



Long PC2 trades (expiry 1Y)

Tenor 1	Tenor 2	Vega Weight 1	Vega Weight 2	Notional 1 (\$ millions)	Notional 2 (\$ millions)	Theta 1(% of notional)	Theta 2(% of notional)	Carry 1 (\$ thousands)	Carry 2 (\$ thousands)	Net Carry (\$ thousands)	Multiplier	Adj. Notional 1 (\$ millions)	Adj. Notional 2 (\$ millions)	Adj. Net Carry (\$ thousands)	Vol Spread (bp/day)	Vol Spread 6M Z-Score
3Y	10Y	1	-1.10	100	-37	-0.09	-0.26	-95	96	2	22.260	2226	-816	36	0.38	0.42
2Y	10Y	1	-1.09	100	-25	-0.07	-0.26	-68	64	-3	2.792	279	-68	-9	0.63	0.53
2Y	20Y	-1	1.35	-100	18	-0.07	-0.39	68	-69	-2	6.777	-678	120	-12	0.35	-0.58
2Y	7Y	1	-1.03	100	-32	-0.07	-0.19	-68	61	-7	2.018	202	-64	-14	0.71	0.69
2Y	3Y	1	-0.99	100	-67	-0.07	-0.09	-68	63	-4	3.189	319	-213	-14	0.26	0.88
2Y	5Y	1	-0.97	100	-40	-0.07	-0.15	-68	59	-9	1.984	198	-80	-17	0.87	0.81
3Y	7Y	1	-1.03	100	-47	-0.09	-0.19	-95	91	-4	5.449	545	-257	-19	0.46	0.61
3Y	20Y	-1	1.36	-100	26	-0.09	-0.39	95	-104	-9	2.150	-215	57	-20	0.61	-0.50
2Y	30Y	-1	1.52	-100	15	-0.07	-0.53	68	-81	-14	1.865	-187	29	-25	1.07	-0.80
3Y	30Y	-1	1.53	-100	23	-0.09	-0.53	95	-122	-27	1.167	-117	27	-31	1.34	-0.74
3Y	5Y	1	-0.98	100	-61	-0.09	-0.15	-95	88	-6	5.207	521	-315	-34	0.62	0.77
5Y	20Y	-1	1.39	-100	44	-0.15	-0.39	146	-172	-26	1.488	-149	65	-39	1.26	-0.28
7Y	20Y	-1	1.31	-100	56	-0.19	-0.39	193	-220	-27	1.595	-159	90	-43	1.04	-0.31
10Y	20Y	-1	1.24	-100	72	-0.26	-0.39	263	-284	-21	2.150	-215	155	-45	0.90	-0.40
5Y	30Y	-1	1.57	-100	38	-0.15	-0.53	146	-201	-55	0.932	-93	35	-51	2.00	-0.61
7Y	30Y	-1	1.48	-100	48	-0.19	-0.53	193	-258	-64	0.994	-99	48	-64	1.74	-0.67
7Y	10Y	-1	1.06	-100	78	-0.19	-0.26	193	-204	-11	7.462	-746	580	-81	0.08	-0.02
10Y	30Y	-1	1.40	-100	62	-0.26	-0.53	263	-332	-69	1.216	-122	76	-84	1.56	0.79
5Y	10Y	-1	1.12	-100	61	-0.15	-0.26	146	-159	-13	6.644	-664	402	-88	0.25	-0.06
20Y	30Y	-1	1.13	-100	86	-0.39	-0.53	393	-459	-67	3.462	-346	299	-231	0.53	-1.24
5Y	7Y	-1	1.06	-100	78	-0.15	-0.19	146	-151	-5	114.679	-11468	8932	-559	0.16	-0.12

Footnotes:

*Vega weights chosen to create a long exposure to PC2 volatility while hedging out PC1 volatility

**Carries are calculated over a 1 month period

***Multiplier is calculated as root-mean-square of the PC2 loadings divided by PC2 exposure

†Adjusted notional is calculated as notional times multiplier; similar for adjusted carry

‡For details on our methodology for trading Principal Factor Volatility, see [Trading Principal Factor Volatility](#).

Derivatives Strategy

Top long PC1 relative value trades, expiry 6M

Tenor Pair 1	Vega Weight 1	Vega Weight 2	Vol Spread 1 (bp/day)	Tenor Pair 2	Vega Weight 3	Vega Weight 4	Vol Spread 2 (bp/day)	3M Slope	3M Intercept	3M R^2 (%)	3M Residual (bp/day)	3M Std. Error	6M Slope	6M Intercept	6M R^2 (%)	6M Residual (bp/day)	6M Std. Error	Beta 1 Stdev	Average R^2 (%)
2Y / 20Y	1.00	-1.09	1.16	3Y / 30Y	1.00	-0.28	5.82	0.99	-4.91	81	0.30	0.06	0.72	-3.33	58	0.30	0.06	0.08	70
3Y / 30Y	1.00	-0.28	5.82	7Y / 30Y	1.00	-0.03	6.44	1.29	-2.81	61	0.33	0.13	0.97	-0.68	67	0.28	0.06	0.13	64
3Y / 30Y	1.00	-0.28	5.82	7Y / 20Y	1.00	-0.05	6.34	1.31	-2.82	61	0.33	0.13	0.98	-0.69	67	0.28	0.06	0.13	64
3Y / 30Y	1.00	-0.28	5.82	7Y / 10Y	1.00	-0.18	5.53	1.51	-2.85	65	0.32	0.14	1.14	-0.75	70	0.28	0.07	0.15	67
3Y / 20Y	1.00	-0.41	5.01	7Y / 30Y	1.00	-0.03	6.44	1.19	-2.95	55	0.33	0.14	0.85	-0.73	59	0.28	0.06	0.14	57
3Y / 20Y	1.00	-0.41	5.01	7Y / 20Y	1.00	-0.05	6.34	1.20	-2.96	55	0.33	0.14	0.86	-0.74	60	0.28	0.06	0.14	58
3Y / 20Y	1.00	-0.41	5.01	7Y / 10Y	1.00	-0.18	5.53	1.39	-3.03	60	0.33	0.15	1.00	-0.82	62	0.28	0.07	0.16	61
3Y / 5Y	-0.02	1.00	6.73	3Y / 20Y	1.00	-0.41	5.01	0.60	3.95	69	-0.24	0.05	0.82	2.91	68	-0.28	0.05	0.07	69
2Y / 7Y	-0.05	1.00	6.29	3Y / 20Y	1.00	-0.41	5.01	0.41	4.47	48	-0.25	0.06	0.65	3.29	55	-0.28	0.05	0.07	51
2Y / 5Y	-0.01	1.00	6.83	3Y / 20Y	1.00	-0.41	5.01	0.62	3.99	69	-0.25	0.05	0.83	2.93	69	-0.28	0.05	0.07	69
3Y / 20Y	1.00	-0.41	5.01	5Y / 30Y	1.00	-0.01	6.86	1.12	-2.98	70	0.30	0.09	0.83	-0.92	70	0.27	0.05	0.12	70
3Y / 20Y	1.00	-0.41	5.01	5Y / 20Y	1.00	-0.01	6.84	1.12	-2.98	70	0.30	0.09	0.83	-0.92	70	0.27	0.05	0.12	70
3Y / 20Y	1.00	-0.41	5.01	5Y / 10Y	1.00	-0.03	6.69	1.15	-2.96	71	0.30	0.09	0.85	-0.93	70	0.27	0.05	0.12	71
3Y / 20Y	1.00	-0.41	5.01	5Y / 7Y	1.00	-0.19	5.64	1.35	-2.91	73	0.29	0.11	1.01	-0.93	71	0.27	0.06	0.14	72
2Y / 20Y	1.00	-1.09	1.16	3Y / 20Y	1.00	-0.41	5.01	1.05	-4.38	85	0.27	0.06	0.82	-3.22	65	0.27	0.05	0.06	75
3Y / 30Y	1.00	-0.28	5.82	5Y / 30Y	1.00	-0.01	6.86	1.20	-2.71	75	0.29	0.09	0.93	-0.81	76	0.26	0.05	0.11	76
3Y / 30Y	1.00	-0.28	5.82	5Y / 20Y	1.00	-0.01	6.84	1.20	-2.71	75	0.29	0.09	0.93	-0.81	76	0.26	0.05	0.11	76
3Y / 30Y	1.00	-0.28	5.82	5Y / 10Y	1.00	-0.03	6.69	1.23	-2.68	76	0.29	0.09	0.95	-0.81	77	0.26	0.05	0.11	76
3Y / 30Y	1.00	-0.28	5.82	5Y / 7Y	1.00	-0.19	5.64	1.44	-2.61	77	0.28	0.10	1.13	-0.80	78	0.26	0.05	0.13	78
3Y / 5Y	-0.02	1.00	6.73	3Y / 30Y	1.00	-0.28	5.82	0.60	3.45	74	-0.23	0.05	0.80	2.33	75	-0.26	0.04	0.07	74
2Y / 7Y	-0.05	1.00	6.29	3Y / 30Y	1.00	-0.28	5.82	0.42	4.08	53	-0.24	0.05	0.65	2.77	62	-0.26	0.05	0.07	58
2Y / 5Y	-0.01	1.00	6.83	3Y / 30Y	1.00	-0.28	5.82	0.62	3.48	74	-0.23	0.05	0.81	2.35	76	-0.26	0.04	0.07	75
3Y / 7Y	-0.12	1.00	5.73	3Y / 30Y	1.00	-0.28	5.82	0.35	3.93	46	-0.23	0.05	0.57	2.67	58	-0.25	0.04	0.07	52
2Y / 30Y	1.00	-0.76	3.31	3Y / 30Y	1.00	-0.28	5.82	1.09	-3.24	91	0.23	0.04	0.91	-2.19	82	0.21	0.04	0.05	87
2Y / 30Y	1.00	-0.76	3.31	3Y / 20Y	1.00	-0.41	5.01	1.14	-2.61	94	0.19	0.04	1.01	-1.91	87	0.18	0.04	0.04	90
2Y / 10Y	-0.26	1.00	4.29	5Y / 30Y	1.00	-0.01	6.86	0.22	3.00	12	-0.22	0.08	0.48	1.15	53	-0.17	0.04	0.09	32
2Y / 10Y	-0.26	1.00	4.29	5Y / 20Y	1.00	-0.01	6.84	0.22	3.01	12	-0.23	0.08	0.48	1.15	53	-0.17	0.04	0.09	32
2Y / 10Y	-0.26	1.00	4.29	5Y / 10Y	1.00	-0.03	6.69	0.22	3.06	12	-0.23	0.08	0.49	1.19	52	-0.17	0.04	0.10	32
2Y / 3Y	-0.37	1.00	4.58	2Y / 30Y	1.00	-0.76	3.31	0.46	3.22	76	-0.18	0.03	0.52	3.01	61	-0.17	0.04	0.01	68
2Y / 10Y	-0.26	1.00	4.29	3Y / 5Y	-0.02	1.00	6.73	0.24	2.93	13	-0.22	0.08	0.50	1.10	54	-0.16	0.04	0.09	33

Footnotes:

*Vega weights chosen to create a long exposure to PC1 volatility while hedging out PC2 volatility

**Regression statistics obtained by regressing historical time series of vol spreads of trade 1 onto those of trade 2, with vega weights fixed

***Beta 1 Stdev calculated as standard deviation of set of daily betas obtained from regressions ranging from 3M to 6M lookback window

†Average R^2 calculated as average of 3M R^2 and 6M R^2

††For details on our methodology for trading Principal Factor Volatility, see [Trading Principal Factor Volatility](#).

Derivatives Strategy

Top long PC1 relative value trades, expiry 1Y

Tenor Pair 1	Vega Weight 1	Vega Weight 2	Vol Spread 1 (bp/day)	Tenor Pair 2	Vega Weight 3	Vega Weight 4	Vol Spread 2 (bp/day)	3M Slope	3M Intercept	3M R^2 (%)	3M Residual (bp/day)	3M Std. Error	6M Slope	6M Intercept	6M R^2 (%)	6M Residual (bp/day)	6M Std. Error	Beta 1 Stdev	Average R^2 (%)
2Y / 20Y	1.00	-1.05	1.36	3Y / 20Y	1.00	-0.41	4.79	0.98	-3.54	36	0.24	0.17	0.82	-2.76	52	0.18	0.07	0.17	44
2Y / 7Y	-0.04	1.00	6.19	3Y / 20Y	1.00	-0.41	4.79	0.50	4.04	11	-0.24	0.18	0.83	2.39	51	-0.18	0.07	0.20	31
2Y / 5Y	-0.02	1.00	6.51	3Y / 20Y	1.00	-0.41	4.79	0.76	3.08	27	-0.21	0.16	0.99	1.92	66	-0.17	0.06	0.17	46
3Y / 5Y	-0.06	1.00	6.28	3Y / 20Y	1.00	-0.41	4.79	0.73	3.00	26	-0.21	0.16	0.96	1.86	65	-0.16	0.06	0.17	46
2Y / 7Y	-0.04	1.00	6.19	3Y / 30Y	1.00	-0.29	5.52	0.71	2.49	25	-0.20	0.16	0.85	1.65	61	-0.15	0.06	0.16	43
3Y / 7Y	-0.09	1.00	5.80	3Y / 30Y	1.00	-0.29	5.52	0.64	2.43	22	-0.19	0.16	0.79	1.58	59	-0.14	0.06	0.15	41
3Y / 5Y	-0.06	1.00	6.28	3Y / 30Y	1.00	-0.29	5.52	0.89	1.53	42	-0.17	0.14	0.96	1.14	74	-0.14	0.05	0.13	58
2Y / 30Y	1.00	-0.74	3.22	3Y / 30Y	1.00	-0.29	5.52	0.85	-1.65	41	0.18	0.13	0.87	-1.70	69	0.14	0.05	0.12	55
2Y / 5Y	-0.02	1.00	6.51	3Y / 30Y	1.00	-0.29	5.52	0.93	1.57	43	-0.17	0.14	0.99	1.18	74	-0.14	0.05	0.13	58
2Y / 30Y	1.00	-0.74	3.22	3Y / 20Y	1.00	-0.41	4.79	1.02	-1.85	56	0.17	0.12	0.97	-1.56	76	0.13	0.05	0.12	66
2Y / 10Y	-0.28	1.00	4.12	3Y / 10Y	-1.00	1.41	1.54	0.77	3.02	87	-0.10	0.04	0.82	2.97	72	-0.12	0.05	0.04	79
5Y / 30Y	1.00	-0.02	6.58	20Y / 30Y	1.00	-0.71	1.78	2.59	2.07	67	-0.10	0.23	3.40	0.64	69	-0.11	0.20	0.47	68
5Y / 20Y	1.00	-0.02	6.54	20Y / 30Y	1.00	-0.71	1.78	2.57	2.07	67	-0.10	0.23	3.38	0.64	69	-0.11	0.20	0.47	68
5Y / 10Y	1.00	-0.08	6.19	20Y / 30Y	1.00	-0.71	1.78	2.37	2.07	64	-0.10	0.23	3.17	0.67	68	-0.11	0.20	0.46	66
3Y / 5Y	-0.06	1.00	6.28	20Y / 30Y	1.00	-0.71	1.78	2.56	1.82	69	-0.10	0.22	3.29	0.52	71	-0.11	0.19	0.44	70
2Y / 5Y	-0.02	1.00	6.51	20Y / 30Y	1.00	-0.71	1.78	2.62	1.95	69	-0.10	0.23	3.40	0.58	70	-0.11	0.20	0.46	69
2Y / 20Y	1.00	-1.05	1.36	3Y / 10Y	-1.00	1.41	1.54	-0.82	2.64	89	-0.02	0.04	-0.87	2.81	59	-0.10	0.07	0.07	74
2Y / 5Y	-0.02	1.00	6.51	2Y / 10Y	-0.28	1.00	4.12	0.73	3.63	59	-0.11	0.08	1.03	2.36	67	-0.10	0.07	0.16	63
7Y / 30Y	1.00	-0.03	6.31	20Y / 30Y	1.00	-0.71	1.78	2.88	1.27	84	-0.08	0.16	3.47	0.23	80	-0.09	0.16	0.35	82
7Y / 20Y	1.00	-0.04	6.24	20Y / 30Y	1.00	-0.71	1.78	2.84	1.27	83	-0.08	0.16	3.43	0.23	80	-0.09	0.16	0.35	81
2Y / 7Y	-0.04	1.00	6.19	20Y / 30Y	1.00	-0.71	1.78	2.92	1.07	85	-0.08	0.16	3.46	0.12	81	-0.09	0.15	0.33	83
7Y / 10Y	1.00	-0.13	5.65	20Y / 30Y	1.00	-0.71	1.78	2.51	1.27	81	-0.08	0.16	3.07	0.28	78	-0.08	0.15	0.33	80
3Y / 7Y	-0.09	1.00	5.80	20Y / 30Y	1.00	-0.71	1.78	2.82	0.85	86	-0.07	0.15	3.29	0.03	82	-0.08	0.14	0.30	84
3Y / 20Y	1.00	-0.41	4.79	5Y / 7Y	1.00	-0.60	2.82	1.10	1.65	51	0.03	0.14	1.62	0.15	81	0.07	0.07	0.22	66
2Y / 20Y	1.00	-1.05	1.36	2Y / 30Y	1.00	-0.74	3.22	1.15	-2.40	93	0.06	0.04	0.98	-1.88	92	0.07	0.03	0.05	92
2Y / 7Y	-0.04	1.00	6.19	2Y / 10Y	-0.28	1.00	4.12	0.85	2.78	80	-0.08	0.05	1.08	1.82	81	-0.07	0.05	0.12	81
2Y / 3Y	-0.39	1.00	4.25	3Y / 20Y	1.00	-0.41	4.79	0.62	1.40	59	-0.09	0.07	0.68	1.09	83	-0.07	0.03	0.07	71
5Y / 7Y	1.00	-0.60	2.82	20Y / 30Y	1.00	-0.71	1.78	0.88	1.31	39	-0.05	0.14	1.34	0.50	53	-0.06	0.11	0.26	46
3Y / 30Y	1.00	-0.29	5.52	5Y / 7Y	1.00	-0.60	2.82	1.29	1.86	65	0.02	0.12	1.78	0.43	86	0.06	0.06	0.20	76
2Y / 3Y	-0.39	1.00	4.25	20Y / 30Y	1.00	-0.71	1.78	1.11	2.35	41	-0.07	0.17	1.87	0.99	58	-0.06	0.14	0.35	50

Footnotes:

*Vega weights chosen to create a long exposure to PC1 volatility while hedging out PC2 volatility

**Regression statistics obtained by regressing historical time series of vol spreads of trade 1 onto those of trade 2, with vega weights fixed

***Beta 1 Stdev calculated as standard deviation of set of daily betas obtained from regressions ranging from 3M to 6M lookback window

†Average R^2 calculated as average of 3M R^2 and 6M R^2

††For details on our methodology for trading Principal Factor Volatility, see [Trading Principal Factor Volatility](#).

Derivatives Strategy

Top long PC2 relative value trades, expiry 6M

Tenor Pair 1	Vega Weight 1	Vega Weight 2	Vol Spread 1 (bp/day)	Tenor Pair 2	Vega Weight 3	Vega Weight 4	Vol Spread 2 (bp/day)	3M Slope	3M Intercept	3M R^2 (%)	3M Residual (bp/day)	3M Std. Error	6M Slope	6M Intercept	6M R^2 (%)	6M Residual (bp/day)	6M Std. Error	Beta 1 Stdev	Average R^2 (%)
2Y / 30Y	-1.00	1.55	1.13	5Y / 30Y	-1.00	1.62	2.22	1.59	-2.33	58	-0.06	0.17	0.85	-0.41	54	-0.35	0.07	0.18	56
2Y / 30Y	-1.00	1.55	1.13	7Y / 20Y	-1.00	1.36	1.37	3.08	-3.07	62	-0.04	0.31	1.63	-0.77	56	-0.34	0.13	0.36	59
2Y / 30Y	-1.00	1.55	1.13	5Y / 20Y	-1.00	1.45	1.67	2.41	-2.87	78	-0.03	0.16	1.37	-0.84	66	-0.32	0.09	0.31	72
2Y / 30Y	-1.00	1.55	1.13	7Y / 10Y	-1.00	1.07	0.10	4.43	0.96	76	-0.30	0.32	4.34	0.97	74	-0.29	0.23	0.04	75
2Y / 30Y	-1.00	1.55	1.13	5Y / 10Y	-1.00	1.15	0.31	2.59	0.60	76	-0.29	0.19	2.51	0.63	75	-0.29	0.13	0.02	75
2Y / 20Y	-1.00	1.39	0.60	7Y / 10Y	-1.00	1.07	0.10	4.53	0.34	83	-0.21	0.26	3.86	0.49	74	-0.29	0.21	0.23	78
2Y / 20Y	-1.00	1.39	0.60	5Y / 10Y	-1.00	1.15	0.31	2.64	-0.02	83	-0.20	0.15	2.22	0.20	74	-0.29	0.12	0.15	79
2Y / 30Y	-1.00	1.55	1.13	5Y / 7Y	-1.00	1.07	0.20	6.89	0.01	77	-0.26	0.49	6.54	0.10	76	-0.28	0.34	0.08	76
2Y / 20Y	-1.00	1.39	0.60	5Y / 7Y	-1.00	1.07	0.20	7.02	-0.63	84	-0.17	0.40	5.72	-0.26	73	-0.28	0.32	0.45	78
2Y / 10Y	1.00	-1.10	0.69	7Y / 10Y	-1.00	1.07	0.10	-4.74	1.10	86	0.09	0.24	-3.31	0.76	55	0.28	0.27	0.55	70
2Y / 10Y	1.00	-1.10	0.69	5Y / 10Y	-1.00	1.15	0.31	-2.76	1.48	86	0.08	0.14	-1.87	1.00	53	0.28	0.16	0.34	69
3Y / 30Y	-1.00	1.60	1.55	7Y / 30Y	-1.00	1.52	1.89	1.46	-1.09	51	-0.11	0.19	1.03	-0.13	67	-0.25	0.07	0.08	59
3Y / 20Y	-1.00	1.43	1.01	7Y / 20Y	-1.00	1.36	1.37	2.23	-2.03	56	-0.02	0.25	1.15	-0.32	51	-0.24	0.10	0.25	53
3Y / 30Y	-1.00	1.60	1.55	7Y / 20Y	-1.00	1.36	1.37	2.70	-2.13	74	-0.03	0.20	1.74	-0.61	77	-0.23	0.09	0.24	76
3Y / 30Y	-1.00	1.60	1.55	5Y / 30Y	-1.00	1.62	2.22	1.40	-1.52	71	-0.04	0.11	0.92	-0.25	76	-0.23	0.05	0.12	73
3Y / 20Y	-1.00	1.43	1.01	5Y / 20Y	-1.00	1.45	1.67	1.80	-1.99	77	0.00	0.13	0.99	-0.41	63	-0.22	0.07	0.23	70
3Y / 30Y	-1.00	1.60	1.55	7Y / 10Y	-1.00	1.07	0.10	3.41	1.48	71	-0.28	0.28	3.86	1.35	71	-0.20	0.23	0.23	71
3Y / 30Y	-1.00	1.60	1.55	5Y / 20Y	-1.00	1.45	1.67	2.03	-1.80	87	-0.03	0.10	1.41	-0.59	84	-0.20	0.05	0.19	86
3Y / 30Y	-1.00	1.60	1.55	5Y / 10Y	-1.00	1.15	0.31	2.00	1.20	72	-0.27	0.16	2.25	1.05	73	-0.20	0.13	0.13	72
3Y / 20Y	-1.00	1.43	1.01	7Y / 10Y	-1.00	1.07	0.10	3.52	0.83	84	-0.19	0.20	3.37	0.86	81	-0.20	0.15	0.03	82
3Y / 30Y	-1.00	1.60	1.55	5Y / 7Y	-1.00	1.07	0.20	5.35	0.73	73	-0.25	0.42	5.91	0.56	75	-0.19	0.31	0.29	74
3Y / 20Y	-1.00	1.43	1.01	5Y / 10Y	-1.00	1.15	0.31	2.06	0.55	84	-0.18	0.11	1.95	0.60	82	-0.19	0.08	0.03	83
3Y / 20Y	-1.00	1.43	1.01	5Y / 7Y	-1.00	1.07	0.20	5.48	0.08	85	-0.16	0.30	5.06	0.19	83	-0.19	0.21	0.12	84
3Y / 10Y	1.00	-1.13	0.32	7Y / 10Y	-1.00	1.07	0.10	-3.73	0.65	90	0.06	0.16	-2.80	0.43	67	0.19	0.18	0.36	78
3Y / 10Y	1.00	-1.13	0.32	5Y / 10Y	-1.00	1.15	0.31	-2.17	0.95	90	0.05	0.10	-1.59	0.63	65	0.18	0.11	0.22	77
3Y / 10Y	1.00	-1.13	0.32	5Y / 7Y	-1.00	1.07	0.20	-5.74	1.44	89	0.04	0.26	-4.01	0.94	62	0.18	0.29	0.65	75
2Y / 20Y	-1.00	1.39	0.60	3Y / 30Y	-1.00	1.60	1.55	1.17	-1.29	91	0.09	0.05	0.86	-0.59	76	-0.14	0.04	0.10	84
2Y / 7Y	1.00	-1.02	0.80	3Y / 20Y	-1.00	1.43	1.01	-1.03	1.94	89	-0.10	0.05	-0.72	1.41	51	0.13	0.06	0.12	70
2Y / 30Y	-1.00	1.55	1.13	3Y / 10Y	1.00	-1.13	0.32	-1.20	1.74	86	-0.22	0.06	-1.20	1.62	67	-0.11	0.08	0.04	77
2Y / 30Y	-1.00	1.55	1.13	3Y / 7Y	1.00	-1.05	0.43	-1.60	2.02	86	-0.21	0.08	-1.37	1.83	52	-0.11	0.12	0.05	69

Footnotes:

*Vega weights chosen to create a long exposure to PC1 volatility while hedging out PC2 volatility

**Regression statistics obtained by regressing historical time series of vol spreads of trade 1 onto those of trade 2, with vega weights fixed

***Beta 1 Stdev calculated as standard deviation of set of daily betas obtained from regressions ranging from 3M to 6M lookback window

†Average R^2 calculated as average of 3M R^2 and 6M R^2

††For details on our methodology for trading Principal Factor Volatility, see [Trading Principal Factor Volatility](#).

Derivatives Strategy

Top long PC2 relative value trades, expiry 1Y

Tenor Pair 1	Vega Weight 1	Vega Weight 2	Vol Spread 1 (bp/day)	Tenor Pair 2	Vega Weight 3	Vega Weight 4	Vol Spread 2 (bp/day)	3M Slope	3M Intercept	3M R^2 (%)	3M Residual (bp/day)	3M Std. Error	6M Slope	6M Intercept	6M R^2 (%)	6M Residual (bp/day)	6M Std. Error	Beta 1 Stdev	Average R^2 (%)
2Y / 30Y	-1.00	1.52	1.07	7Y / 10Y	-1.00	1.06	0.08	3.23	1.08	50	-0.27	0.42	4.55	0.89	69	-0.19	0.28	0.42	59
2Y / 30Y	-1.00	1.52	1.07	5Y / 10Y	-1.00	1.12	0.25	1.87	0.86	51	-0.26	0.24	2.61	0.60	70	-0.18	0.15	0.23	61
2Y / 30Y	-1.00	1.52	1.07	5Y / 7Y	-1.00	1.06	0.16	4.81	0.52	53	-0.25	0.58	6.57	0.15	71	-0.17	0.38	0.54	62
3Y / 30Y	-1.00	1.53	1.34	7Y / 10Y	-1.00	1.06	0.08	2.80	1.36	46	-0.24	0.39	4.13	1.17	67	-0.16	0.26	0.41	57
3Y / 30Y	-1.00	1.53	1.34	5Y / 10Y	-1.00	1.12	0.25	1.62	1.17	48	-0.24	0.22	2.37	0.90	68	-0.15	0.15	0.23	58
3Y / 30Y	-1.00	1.53	1.34	5Y / 7Y	-1.00	1.06	0.16	4.19	0.87	50	-0.23	0.55	5.97	0.49	70	-0.14	0.35	0.53	60
2Y / 30Y	-1.00	1.52	1.07	5Y / 20Y	-1.00	1.39	1.26	1.73	-1.05	84	-0.07	0.10	1.52	-0.72	86	-0.13	0.06	0.06	85
5Y / 30Y	-1.00	1.57	2.00	7Y / 10Y	-1.00	1.06	0.08	1.99	2.06	30	-0.21	0.39	3.36	1.85	57	-0.12	0.26	0.41	44
2Y / 30Y	-1.00	1.52	1.07	10Y / 20Y	-1.00	1.24	0.90	2.12	-0.71	40	-0.13	0.33	2.27	-0.87	60	-0.12	0.17	0.24	50
2Y / 30Y	-1.00	1.52	1.07	7Y / 20Y	-1.00	1.31	1.04	2.24	-1.21	80	-0.05	0.15	1.89	-0.76	81	-0.12	0.08	0.10	80
2Y / 20Y	-1.00	1.35	0.35	7Y / 10Y	-1.00	1.06	0.08	3.10	0.27	66	-0.17	0.29	4.01	0.15	77	-0.11	0.20	0.33	72
3Y / 30Y	-1.00	1.53	1.34	7Y / 20Y	-1.00	1.31	1.04	2.15	-0.86	90	-0.04	0.09	1.80	-0.44	88	-0.10	0.06	0.10	89
3Y / 30Y	-1.00	1.53	1.34	5Y / 20Y	-1.00	1.39	1.26	1.62	-0.66	91	-0.06	0.07	1.44	-0.38	91	-0.10	0.04	0.07	91
2Y / 30Y	-1.00	1.52	1.07	3Y / 10Y	-1.00	-1.10	0.38	-1.25	1.76	60	-0.22	0.13	-1.67	1.80	73	-0.10	0.09	0.15	67
2Y / 20Y	-1.00	1.35	0.35	5Y / 10Y	-1.00	1.12	0.25	1.79	0.07	67	-0.16	0.16	2.29	-0.11	78	-0.10	0.11	0.18	73
3Y / 30Y	-1.00	1.53	1.34	10Y / 20Y	-1.00	1.24	0.90	2.17	-0.53	52	-0.10	0.27	2.23	-0.59	68	-0.09	0.14	0.19	60
2Y / 20Y	-1.00	1.35	0.35	5Y / 7Y	-1.00	1.06	0.16	4.58	-0.25	69	-0.15	0.39	5.73	-0.50	78	-0.09	0.27	0.41	74
5Y / 30Y	-1.00	1.57	2.00	20Y / 30Y	-1.00	1.13	0.53	2.99	0.44	77	-0.03	0.21	3.62	-0.01	70	0.08	0.21	0.23	74
3Y / 20Y	-1.00	1.36	0.61	7Y / 10Y	-1.00	1.06	0.08	2.68	0.55	69	-0.15	0.23	3.59	0.41	78	-0.08	0.17	0.32	74
3Y / 20Y	-1.00	1.36	0.61	5Y / 10Y	-1.00	1.12	0.25	1.54	0.37	70	-0.14	0.13	2.04	0.18	79	-0.08	0.10	0.17	74
2Y / 10Y	1.00	-1.09	0.63	7Y / 10Y	-1.00	1.06	0.08	-3.00	0.81	73	0.06	0.24	-3.01	0.79	75	0.08	0.16	0.05	74
2Y / 7Y	1.00	-1.03	0.71	7Y / 10Y	-1.00	1.06	0.08	-1.97	0.81	53	0.06	0.24	-1.98	0.79	57	0.08	0.16	0.05	55
7Y / 30Y	-1.00	1.48	1.74	20Y / 30Y	-1.00	1.13	0.53	2.76	0.29	90	-0.02	0.12	3.14	0.00	76	0.07	0.16	0.15	83
7Y / 20Y	-1.00	1.31	1.04	20Y / 30Y	-1.00	1.13	0.53	1.45	0.29	71	-0.02	0.12	1.83	0.00	52	0.07	0.16	0.15	61
3Y / 20Y	-1.00	1.36	0.61	5Y / 7Y	-1.00	1.06	0.16	3.95	0.09	72	-0.13	0.32	5.12	-0.16	79	-0.07	0.24	0.40	76
2Y / 30Y	-1.00	1.52	1.07	3Y / 20Y	-1.00	1.36	0.61	1.39	0.27	96	-0.05	0.04	1.33	0.33	96	-0.07	0.02	0.04	96
2Y / 30Y	-1.00	1.52	1.07	3Y / 7Y	1.00	-1.03	0.46	-1.77	2.09	57	-0.21	0.20	-2.33	2.21	65	-0.07	0.15	0.25	61
2Y / 10Y	1.00	-1.09	0.63	5Y / 10Y	-1.00	1.12	0.25	-1.72	1.00	73	0.06	0.13	-1.71	0.98	76	0.07	0.09	0.03	74
2Y / 7Y	1.00	-1.03	0.71	5Y / 10Y	-1.00	1.12	0.25	-1.13	0.94	54	0.06	0.13	-1.13	0.92	57	0.07	0.09	0.03	56
2Y / 7Y	1.00	-1.03	0.71	5Y / 7Y	-1.00	1.06	0.16	-2.88	1.13	55	0.05	0.34	-2.83	1.11	58	0.07	0.22	0.08	56

Footnotes:

*Vega weights chosen to create a long exposure to PC1 volatility while hedging out PC2 volatility

**Regression statistics obtained by regressing historical time series of vol spreads of trade 1 onto those of trade 2, with vega weights fixed

***Beta 1 Stdev calculated as standard deviation of set of daily betas obtained from regressions ranging from 3M to 6M lookback window

†Average R^2 calculated as average of 3M R^2 and 6M R^2

††For details on our methodology for trading Principal Factor Volatility, see [Trading Principal Factor Volatility](#).

Derivatives Strategy

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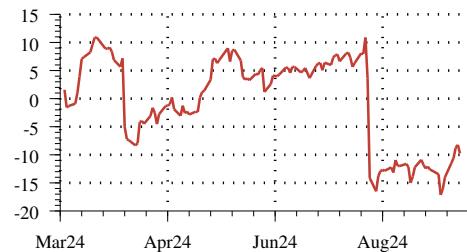
Volatility Total Return Report

Returns from short straddle positions

Returns	1-day	1-wk	1-mo	Monthly return stats								
				Sharp	Imp	6M Avg	Vol	I. vol	Beta	Rsqr(%)		
Theta	Ret	Ret	Ret	Avg	Min	Max	Stdev	Ratio				
6M2Y	-26.4	-1.5	4.2	2.2	-1.0	-24.5	20.9	11.6	-0.1	N/A	N/A	
6M5Y	-57.3	-2.1	10.5	18.3	1.4	-39.5	40.3	21.7	0.1	N/A	N/A	
6M10Y	-95.9	-0.1	18.4	39.0	3.8	-67.7	64.2	35.4	0.1	N/A	N/A	
6M30Y	-194.0	-5.2	45.3	88.1	3.4	-106.4	117.3	65.5	0.1	N/A	N/A	
3Y10Y	-33.5	-2.9	21.1	37.5	4.2	-104.5	90.8	45.2	0.1	N/A	N/A	
Back ED	N/A	N/A	N/A	N/A	0.0	0.0	0.0	0.0	N/A	N/A	N/A	
Back E1	N/A	N/A	N/A	N/A	0.0	0.0	0.0	0.0	N/A	N/A	N/A	
Back E2	N/A	N/A	0.0	0.0	0.0	0.0	0.0	0.0	N/A	N/A	N/A	
FRNT FV	-67.2	-3.4	6.7	30.0	10.1	-34.7	47.2	23.8	0.4	7.0	7.5	
FRNT TY	-96.1	-1.2	11.9	38.3	10.7	-50.9	75.2	33.8	0.3	7.2	6.6	

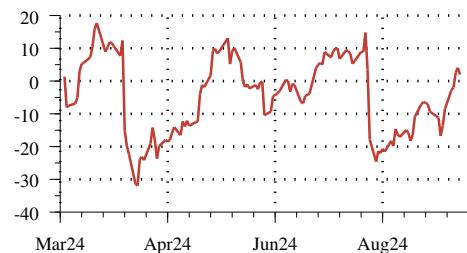
6Mx2Y

Cumulative total return; bp of notional



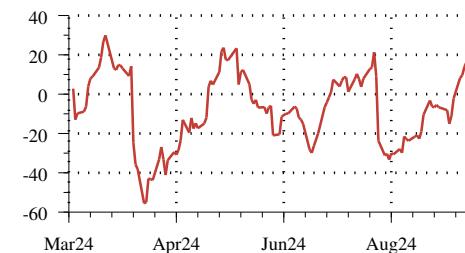
6Mx5Y

Cumulative total return; bp of notional



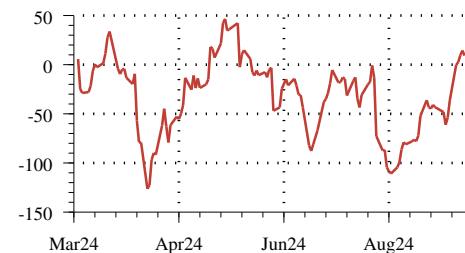
6Mx10Y

Cumulative total return; bp of notional



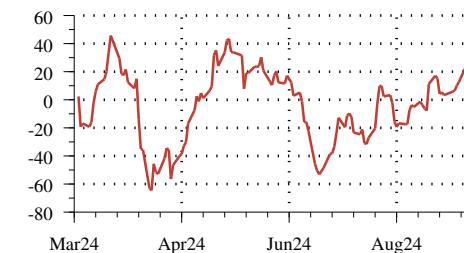
6Mx30Y

Cumulative total return; bp of notional



3Yx10Y

Cumulative total return; bp of notional



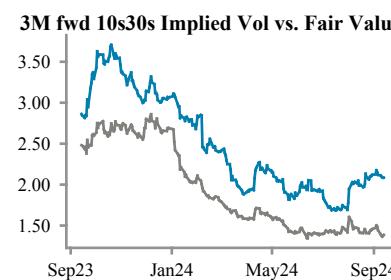
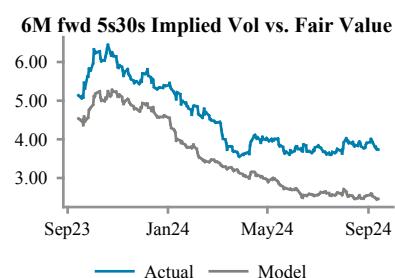
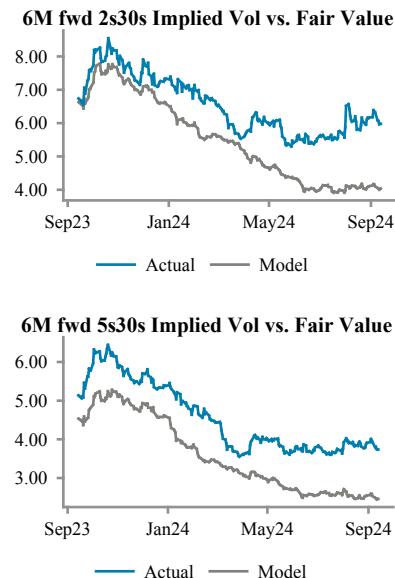
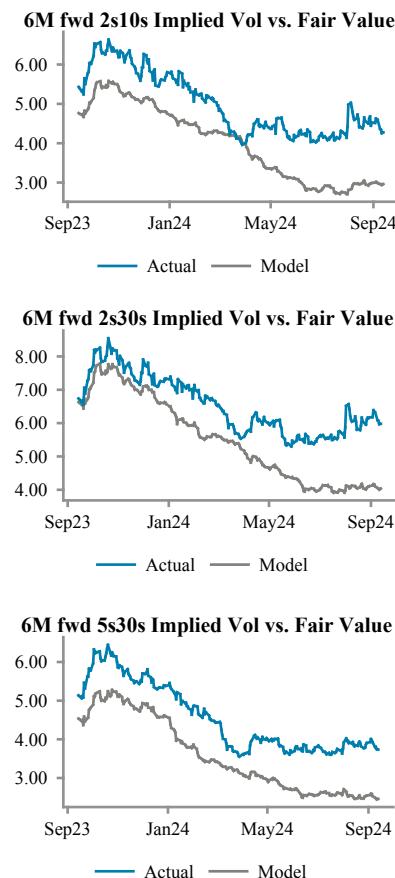
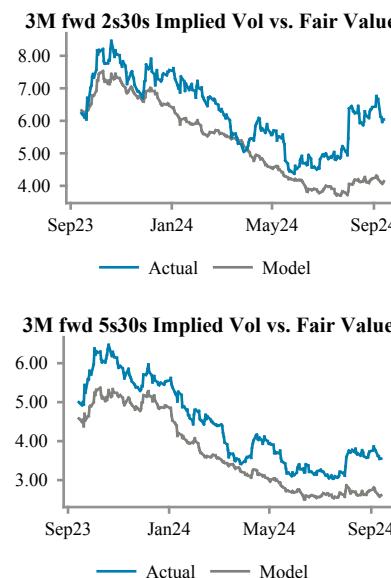
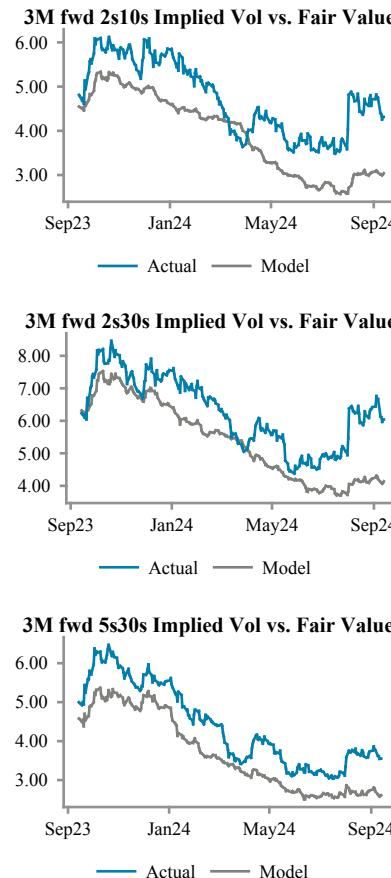
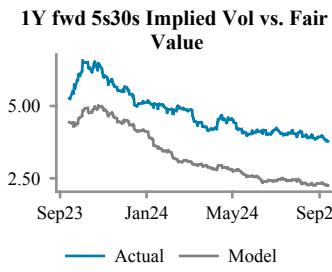
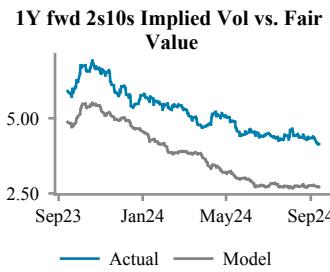
Derivatives Strategy

YCSO Vol Relative Value Report

Curve	Curve-yield beta	Std. Err.	Actual YCSO Vol	Fair Value	Residual	Rsq	Curve-yield beta stddev
3M fwd 2s5s	-0.12	3.68	2.78	1.92	0.86	23 %	0.03
3M fwd 2s10s	-0.24	5.20	4.31	3.04	1.27	37 %	0.03
3M fwd 2s30s	-0.39	6.10	6.04	4.14	1.90	51 %	0.02
3M fwd 5s10s	-0.12	1.93	1.86	1.30	0.56	50 %	0.00
3M fwd 5s30s	-0.26	3.42	3.55	2.61	0.94	61 %	0.02
3M fwd 10s30s	-0.14	1.73	2.08	1.39	0.70	64 %	0.01
6M fwd 2s5s	-0.15	3.34	2.73	1.87	0.86	36 %	0.02
6M fwd 2s10s	-0.26	4.83	4.28	2.96	1.31	46 %	0.02
6M fwd 2s30s	-0.40	5.81	5.98	4.04	1.94	58 %	0.01
6M fwd 5s10s	-0.12	1.84	1.97	1.22	0.75	54 %	0.00
6M fwd 5s30s	-0.26	3.29	3.74	2.46	1.28	64 %	0.01
6M fwd 10s30s	-0.14	1.65	2.18	1.30	0.88	67 %	0.01
9M fwd 2s5s	-0.15	3.08	2.70	1.79	0.91	42 %	0.02
9M fwd 2s10s	-0.27	4.57	4.22	2.86	1.36	50 %	0.02
9M fwd 2s30s	-0.40	5.59	5.84	3.92	1.92	61 %	0.01
9M fwd 5s10s	-0.11	1.76	2.04	1.17	0.88	56 %	0.00
9M fwd 5s30s	-0.25	3.17	3.80	2.35	1.45	65 %	0.01
9M fwd 10s30s	-0.14	1.58	2.20	1.24	0.96	68 %	0.01
1Y fwd 2s5s	-0.15	2.84	2.68	1.68	1.00	44 %	0.02
1Y fwd 2s10s	-0.26	4.30	4.14	2.71	1.43	51 %	0.02
1Y fwd 2s30s	-0.39	5.35	5.69	3.75	1.93	61 %	0.02
1Y fwd 5s10s	-0.11	1.68	2.07	1.11	0.97	55 %	0.00
1Y fwd 5s30s	-0.24	3.05	3.78	2.25	1.53	65 %	0.01
1Y fwd 10s30s	-0.13	1.52	2.21	1.19	1.02	69 %	0.01

Front end bp vol (bp/day)

	2024-09-13
3Mx2Y bpvol	8.09
6Mx2Y bpvol	7.70
9Mx2Y bpvol	7.52
1Yx2Y bpvol	7.41



* Curve-yield beta is defined as the beta of weekly changes of curve against weekly changes in the front end yield (we use 2Y swap rates) for a 6M regression period. For example, for a 6M fwd 2s/10s structure, we would regress weekly changes of the 6M fwd 2s10s curve against weekly changes in 6Mx2Y swap yields. Std. Err. is the standard error of this regression. Curve-yield beta stddev is the 6M standard deviation of the beta to gauge the stability of the regression beta.

** Front end bp vol is the implied vol of a 2Y tenor swaption, where the expiry of the swaption corresponds with the expiry of the YCSO. For example, for a 1Y fwd 5s30s structure, the front end yield bp vol would be the 1Yx2Y swaption vol (bp/day).

*** Fair value is calculated as square root of square of the beta times the squared volatility of 2-year yields, plus the square of the 1-day standard error of the regression.

Derivatives Strategy

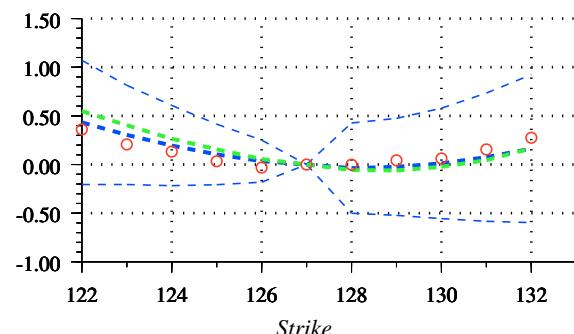
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December 2024 Treasury Bond

Strike	Actual	Model	Avg.	Vega	Act.-Mod.	Act.-Avg.	Z-Score
122 P	0.36	0.43	0.55	10.9	-0.07	-0.19	-0.23
123 P	0.21	0.30	0.40	11.9	-0.10	-0.20	-0.38
124 P	0.13	0.20	0.26	12.8	-0.06	-0.13	-0.30
125 P	0.03	0.10	0.16	13.5	-0.07	-0.12	-0.45
126 P	-0.03	0.03	0.06	13.9	-0.07	-0.09	-0.61
128 C	-0.00	-0.04	-0.06	13.9	0.04	0.05	0.15
129 C	0.04	-0.02	-0.06	13.4	0.07	0.10	0.27
130 C	0.06	0.01	-0.02	12.7	0.05	0.09	0.18
131 C	0.15	0.08	0.04	11.9	0.08	0.11	0.24
132 C	0.28	0.16	0.17	10.9	0.11	0.11	0.29

Dec 24 Bond futures @ 126-23; ATM imp. vol. = 12.37%; Vol. beta = -0.0344;

Skew (price vol above ATM)



1. Our model takes into account the following factors over the last 3 years to explain the skew:

- The number of business days to option expiration.
- The level of the J.P. Morgan Emerging Markets Bond Index (EMBI).
- The price of the underlying future.
- The 'volatility beta', which represents how much at-the-money implied volatility changes with changes in the level of the underlying futures. It is computed using the last 20 business days of data.
- Volatility of implied volatility over the last 60 business days.

2. The average skew is computed using the last 125 business days of data.

3. The model rolls to the next contract 5 business days before option expiration.

4. Vega is the change in the option price (in ticks) due to a 1% change in implied volatility.

○ Actual
- - Model
- - - Model +/- 2s.d.

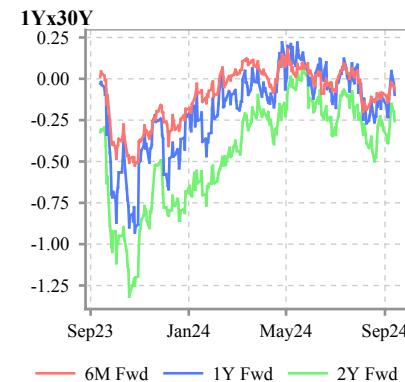
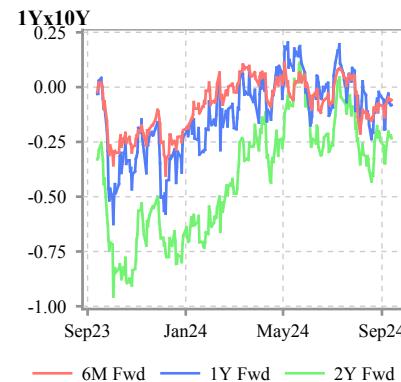
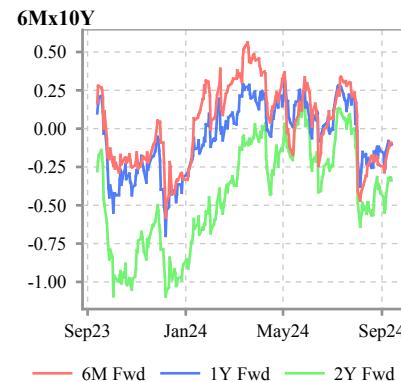
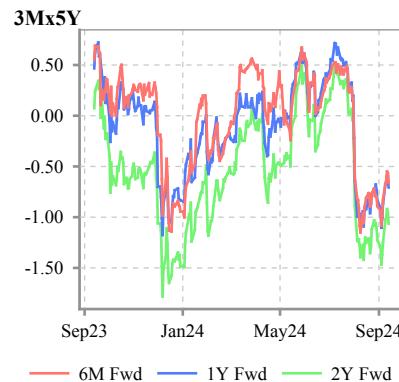
— Average

— Model +/- 2s.d.

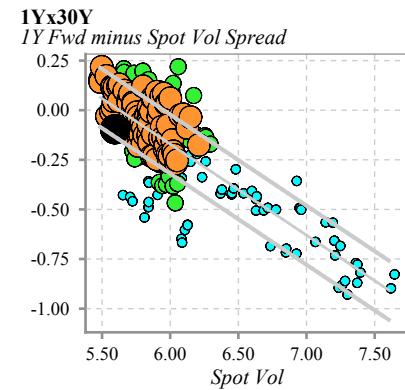
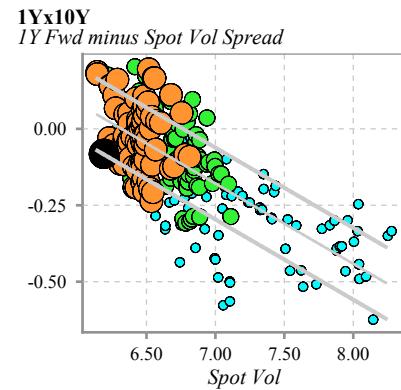
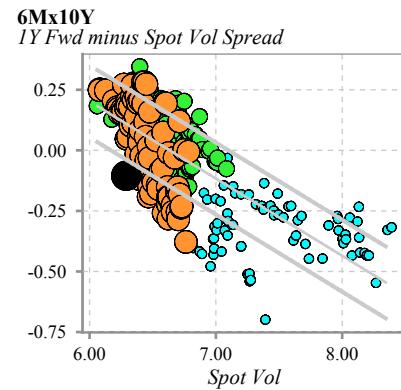
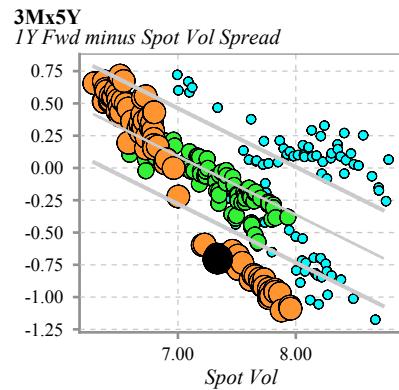
Derivatives Strategy

Long Dated Forward Volatility Report

Forward minus Spot Volatility Spreads



1Y Forward minus Spot Volatility Spread vs. Spot Vol



Richness/Cheapness of Forward Vol					
Forward	Spot	2Y Beta (Fwd vs. Spot)	Fwd/Spot Sprd *(dbp)	2Y Avg (dbp)	2Y Z-score
1Yx5Yx30Y	5Yx30Y	0.96	0.1	-0.1	1.3
6Mx6Mx10Y	6Mx10Y	0.60	2.4	2.7	-1.1
1Yx6Mx10Y	6Mx10Y	0.55	2.7	2.9	-1.1
6Mx5Yx10Y	5Yx10Y	0.86	0.7	0.7	0.8
1Yx5Yx5Y	5Yx5Y	0.75	1.4	1.3	0.6
6Mx1Yx10Y	1Yx10Y	0.75	1.5	1.5	-0.6
1Yx1Yx10Y	1Yx10Y	0.62	2.3	2.4	-0.6
6Mx5Yx5Y	5Yx5Y	0.83	1.0	1.0	0.2

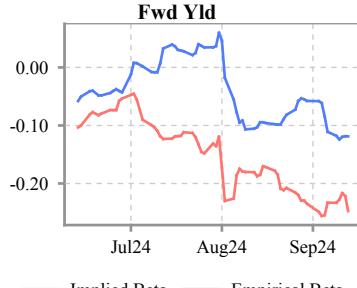
*Beta Weighted, vols are in dbp

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Derivatives Strategy

Synthetic Conditional Curve Trade Report

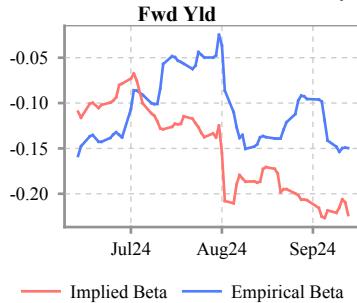
Beta of 3m Fwd 2s/10s Crv vs. 3mx10y



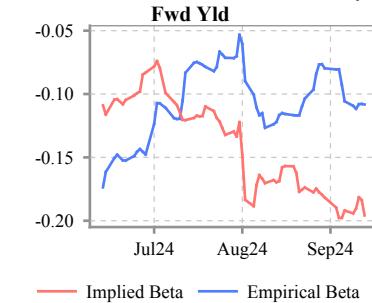
Beta of 3m Fwd 3s/10s Crv vs. 3mx10y



Beta of 6m Fwd 2s/10s Crv vs. 6mx10y



Beta of 6m Fwd 3s/10s Crv vs. 6mx10y



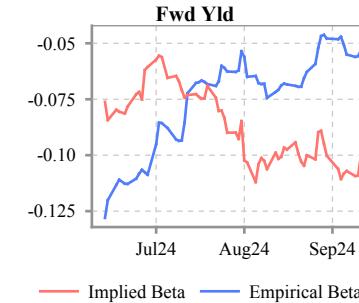
Beta of 3m Fwd 5s/10s Crv vs. 3mx10y



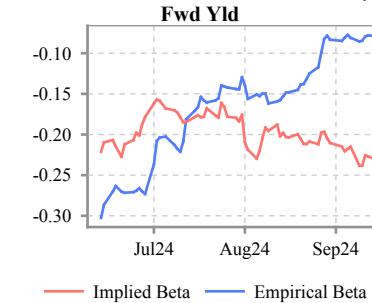
Beta of 3m Fwd 5s/30s Crv vs. 3mx10y



Beta of 6m Fwd 5s/10s Crv vs. 6mx10y



Beta of 6m Fwd 5s/30s Crv vs. 6mx10y



Desired Trade							Replacement for Left Leg				Net Premium						
Expiry	Left	Right	Type	Bpvol(L)	Bpvol (R)	Left Notl	Right Notl	Net Premium	Expiry	YCSO	Imp Vol	Beta (Left)	Notional	Type	Premium	Modified trade	Fwd Sprd Eq (bp)
3m	2y	5Y	REC	8.09	7.34	-100	43.7	\$-23793	3m	10s/30s	2.1	-0.14	-1381	Cap	5.5	\$(296391)	-14.9
3m	2y	7Y	REC	8.09	6.98	-100	31.7	\$-52557	3m	10s/30s	2.1	-0.14	-1381	Cap	5.5	\$(325155)	-16.3
3m	2y	10Y	REC	8.09	6.48	-100	23.2	\$-83546	3m	10s/30s	2.1	-0.14	-1381	Cap	5.5	\$(356144)	-17.9
3m	2y	30Y	REC	8.09	5.83	-100	10.4	\$-123783	3m	10s/30s	2.1	-0.14	-1381	Cap	5.5	\$(396381)	-19.9
3m	3y	10Y	REC	7.95	6.48	-100	34.3	\$-111401	3m	10s/30s	2.1	-0.15	-2005	Cap	5.5	\$(506175)	-17.2
3m	5y	10Y	REC	7.34	6.48	-100	53.1	\$-136619	3m	10s/30s	2.1	-0.15	-3047	Cap	5.5	\$(753830)	-16.6
3m	5y	30Y	REC	7.34	5.83	-100	23.7	\$-228615	3m	10s/30s	2.1	-0.15	-3047	Cap	5.5	\$(845825)	-18.6
6m	2y	5Y	REC	7.70	6.97	-100	43.7	\$-32783	6m	10s/30s	2.2	-0.14	-1424	Cap	8.4	\$(587889)	-29.5
6m	2y	7Y	REC	7.70	6.69	-100	31.7	\$-65584	6m	10s/30s	2.2	-0.14	-1424	Cap	8.4	\$(620690)	-31.2
6m	2y	10Y	REC	7.70	6.29	-100	23.2	\$-100349	6m	10s/30s	2.2	-0.14	-1424	Cap	8.4	\$(655455)	-32.9
6m	2y	30Y	REC	7.70	5.68	-100	10.4	\$-153422	6m	10s/30s	2.2	-0.14	-1424	Cap	8.4	\$(708528)	-35.6
6m	3y	10Y	REC	7.52	6.29	-100	34.4	\$-127105	6m	10s/30s	2.2	-0.14	-2033	Cap	8.4	\$(907613)	-30.8
6m	5y	10Y	REC	6.97	6.29	-100	53.2	\$-154618	6m	10s/30s	2.2	-0.15	-3047	Cap	8.4	\$(1322946)	-29.0
6m	5y	30Y	REC	6.97	5.68	-100	23.7	\$-276070	6m	10s/30s	2.2	-0.15	-3047	Cap	8.4	\$(1444397)	-31.7

+Conditional trades in which the short end receiver swaption leg in a bull flattener is replaced with 1-look matched expiry caps on the 10s/30s curve. Seeks to take advantage of the richness of curve options as well as the fact that the 10s/30s curve is well correlated (with a negative beta) to front end swap yields.

*Implied beta is calculated as 1-(3mx2y/3mx10y) implied bpvol ratio for 3m fwd 2s/10s plot.

*Empirical beta is calculated as 3m beta between 3m fwd 2s/10s curve v.s 3mx10y fwd swap yield for 3m fwd 2s/10s plot.

** Beta(Left) is calculated as 6m beta between weekly change of the YCSO underlying's forward spread v.s weekly change of desired trade's left leg forward rate.

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