J.P.Morgan

US Fixed Income Strategy
J.P. Morgan Securities LLC
New York, Nov 27, 2024

Contacts:

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US Interest Rate Derivatives Analytics Package

For Business: November 29, 2024

Contents:

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US Fixed Income Derivatives Strategy

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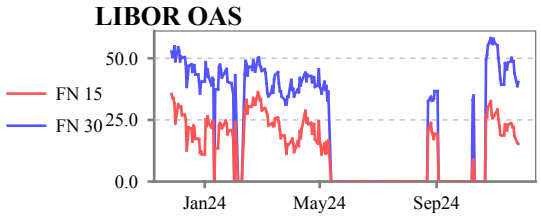
Derivatives Strategy

Cross Market Asset Swap Report

MBS Passthroughs

Mat	Lib OAS	High	Low	Avg	Z
FN 30	40.3	58.2	0.0	22.5	0.8
GN 30	73.5	95.1	0.0	40.4	0.9
FN 15	15.3	36.2	0.0	11.6	0.3
GN 10	66.3	89.4	0.0	26.8	1.4

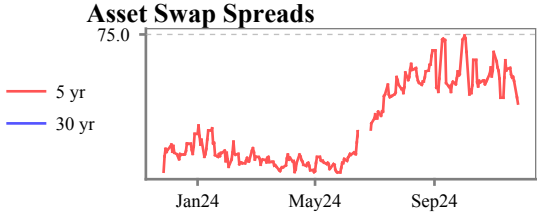
LIBOR OAS



Agency Bullet Benchmarks

Mat	ASP	High	Low	Avg	Z
2.0		-16.5	-16.5	-16.5	
5.0		7.9	7.9	7.9	
10.0	46.3	54.6	36.0	42.7	0.8
30.0	65.8	74.9	56.7	63.3	0.5

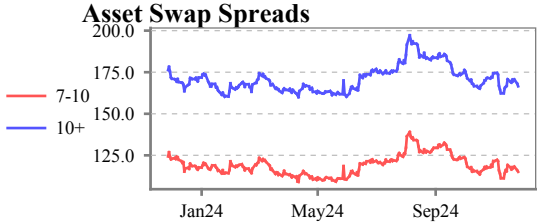
Asset Swap Spreads



Industrial A

Mat	ASP	High	Low	Avg	Z
1-3	54.7	73.6	43.4	57.1	-0.3
3-5	79.8	101.2	71.3	83.9	-0.6
5-7	96.2	115.8	90.9	100.9	-0.9
7-10	115.1	139.0	109.0	118.9	-0.6
10+	166.5	197.2	160.0	170.9	-0.6

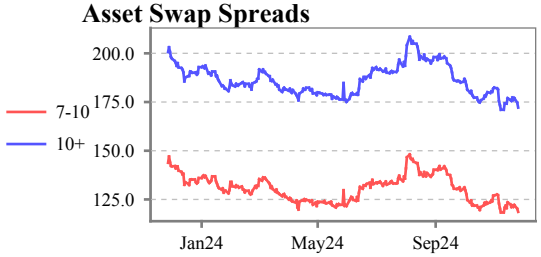
Asset Swap Spreads



Utilities

Mat	ASP	High	Low	Avg	Z
1-3	60.4	81.3	54.2	67.1	-1.0
3-5	81.9	108.4	80.1	90.8	-1.3
5-7	97.8	130.5	97.8	112.2	-2.0
7-10	118.6	148.1	118.3	130.1	-1.8
10+	172.1	208.5	171.0	185.8	-1.8

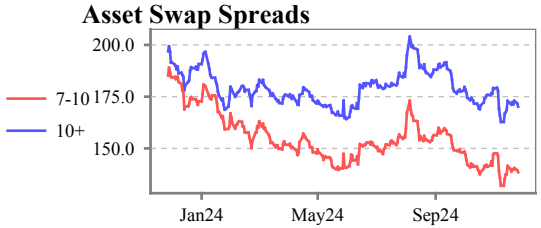
Asset Swap Spreads



Financials

Mat	ASP	High	Low	Avg	Z
1-3	74.9	115.2	72.4	87.6	-1.3
3-5	103.3	148.6	98.0	117.6	-1.3
5-7	124.5	168.2	118.3	138.2	-1.2
7-10	138.5	180.8	132.0	153.5	-1.5
10+	170.2	203.9	162.8	178.6	-1.1

Asset Swap Spreads

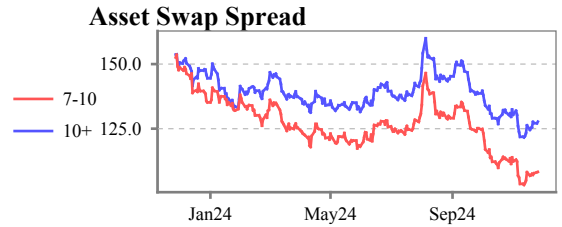


1.The High, Low, Average and Z-Scores are based on 1 Year history of historical data.
2.ASP on Agencies refers to the matched-maturity swap spreads of benchmarks.
3.Libor OAS refers to OAS to Libor Curve. ASP refers to Asset Swap Spread
4.We use the interpolated swap spreads and last valid data for corporates.

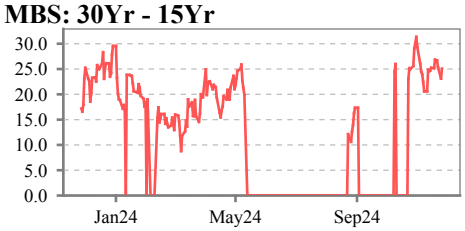
Industrials BBB (ex-auto)

Mat	ASP	High	Low	Avg	Z
1-3	68.2	106.1	64.8	82.3	-1.7
3-5	83.7	126.6	78.7	99.9	-1.7
5-7	99.9	138.2	93.6	113.4	-1.6
7-10	108.3	146.5	103.2	126.0	-2.0
10+	127.7	160.0	121.6	138.5	-1.6

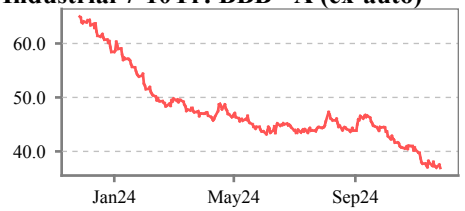
Asset Swap Spread



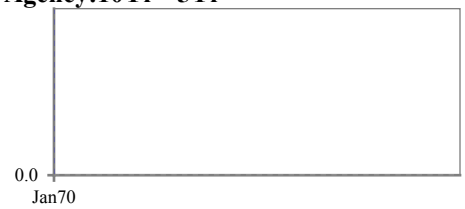
MBS: 30Yr - 15Yr



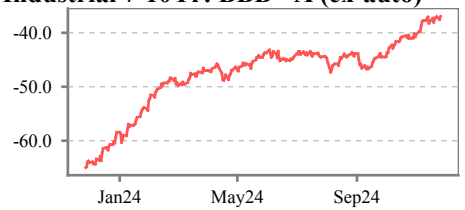
Industrial 7-10Yr: BBB - A (ex-auto)



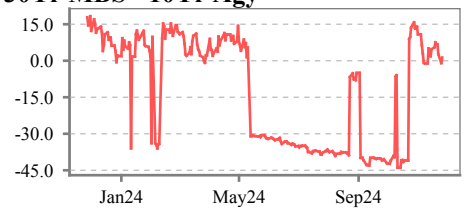
Agency:10Yr - 5Yr



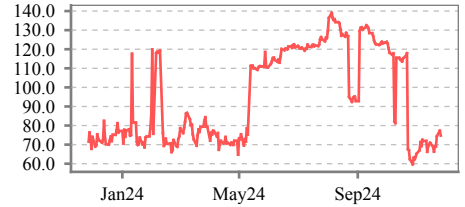
Industrial 7-10Yr: BBB - A (ex-auto)



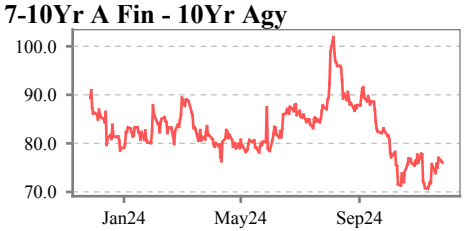
30Yr MBS - 10Yr Agy



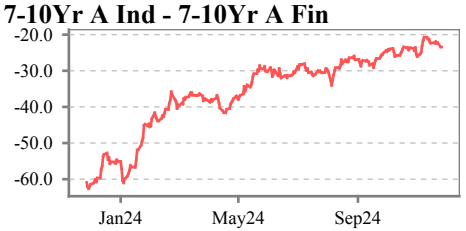
7-10Yr A Industrial - 30Yr MBS



7-10Yr A Fin - 10Yr Agy



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



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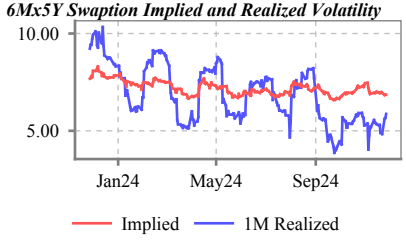
Cross Market Volatility Report

Short Dated Swaptions

		Implied (bps/day)					Realized Vol	
			6M					
Mat/Und	Current	Chg	Min	Avg	Max		1M	3M
3Mx1Y	6.02	1.05	4.86	6.55	8.48		4.45	6.29
3Mx2Y	6.84	0.23	6.47	7.41	8.72		4.91	6.11
6Mx1Y	6.79	0.37	6.31	7.08	8.20		5.15	6.72
6Mx2Y	7.12	-0.03	7.02	7.41	8.19		5.32	6.24
6Mx5Y	6.85	-0.04	6.59	7.02	7.52		5.87	5.53
6Mx7Y	6.65	-0.02	6.40	6.80	7.28		6.12	5.40
6Mx10Y	6.37	0.00	6.15	6.50	7.01		6.28	5.30
6Mx30Y	5.81	0.10	5.57	5.93	6.50		6.30	5.07

6Mx5Y Swaption Implied and Realized Volatility



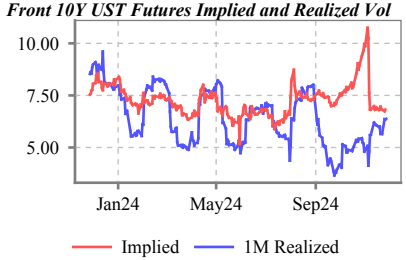
Other Vols (% per year)

		6M			
Mat/Und	Current	Chg	Min	Avg	Max
VIX	14.1	-0.2	11.9	16.8	38.6
3M Gold vol	14.8	1.2	13.2	15.0	16.9
3M EUR/USD vol	7.8	2.4	5.2	6.3	7.8
3M USD/JPY vol	11.2	2.3	8.6	10.6	12.6

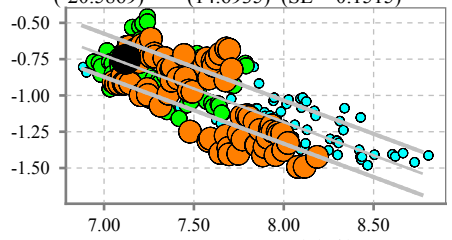
Exchange Traded Options

		Implied (bps/day)					Realized Vol	
			6M					
Mat/Und	Current	Chg	Min	Avg	Max		1M	3M
Front TU	7.3	1.1	6.0	7.8	10.1		5.3	5.6
Front FV	7.16	0.40	6.35	7.75	10.64		5.70	5.40
Front TY			5.17	7.29	10.74		6.38	5.39
Front TN	6.4	0.4	5.5	6.7	10.4		6.7	5.4
Front US			5.45	6.81	10.36		6.63	5.31
Front WN			4.92	6.16	9.69		6.82	5.19

Front 10Y UST Futures Implied and Realized Vol



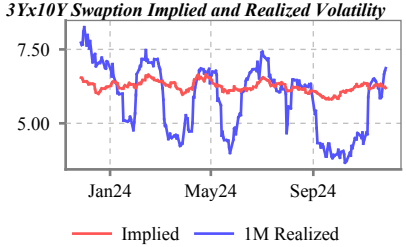
6Mx10Y - 6Mx2Y Vol Spread
Y = - 0.4599 X1 + 2.4962 (adjR2 = 0.6275)
(-20.5869) (14.6935) (SE = 0.1515)



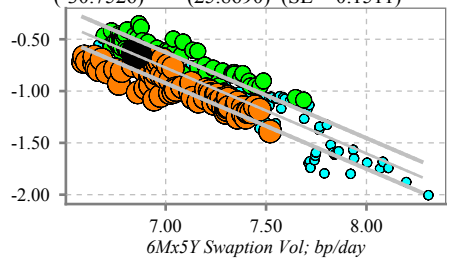
Long Dated Swaptions

		Implied (bps/day)					Realized Vol	
			6M					
Mat/Und	Current	Chg	Min	Avg	Max		1M	3M
2Yx2Y	7.01	-0.33	6.58	7.08	7.47		6.12	5.40
2Yx5Y	6.66	-0.20	6.23	6.69	7.11		6.64	5.37
5Yx5Y	6.21	-0.11	5.84	6.19	6.56		7.21	5.46
1Yx10Y	6.40	-0.08	6.06	6.44	6.81		6.48	5.22
2Yx10Y	6.32	-0.05	5.92	6.31	6.70		6.70	5.24
3Yx10Y	6.19	-0.05	5.82	6.17	6.55		6.87	5.29
5Yx10Y	5.98	0.01	5.61	5.92	6.23		6.99	5.30
10Yx10Y	5.34	0.10	5.05	5.27	5.43		6.72	5.15

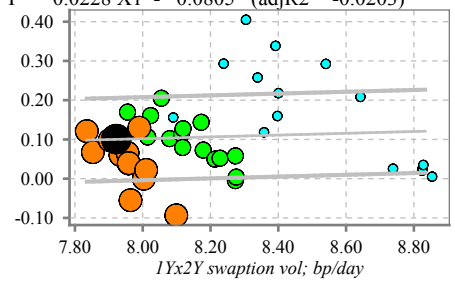
3Yx10Y Swaption Implied and Realized Volatility



5Yx5Y-6Mx5Y Vol Spread
Y = - 0.8282 X1 + 5.0226 (adjR2 = 0.7901)
(-30.7526) (25.8690) (SE = 0.1511)



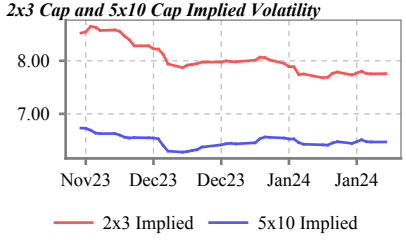
1x3 cap - 1Yx2Y Swaption Vol Spread
Y = 0.0228 X1 - 0.0805 (adjR2 = -0.0203)



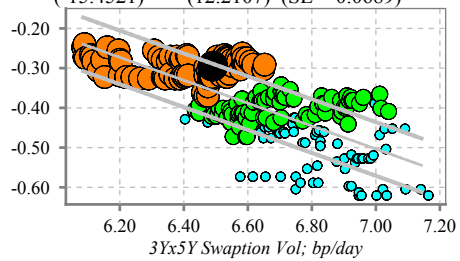
SOFR Cap Volatility

		Implied (bps/day)			
			6M		
Mat/Und	Current	Chg	Min	Avg	Max
1x2	7.27	-0.35	7.03	7.50	7.76
2x3	7.23	-0.40	6.85	7.32	7.70
3x5	6.89	-0.43	6.57	6.98	7.40
5x7	6.61	-0.24	6.34	6.64	6.94
5x10	6.43	-0.12	6.17	6.42	6.66
7x10	6.32	-0.05	6.06	6.28	6.49
10x20	5.53	0.16	5.29	5.44	5.61

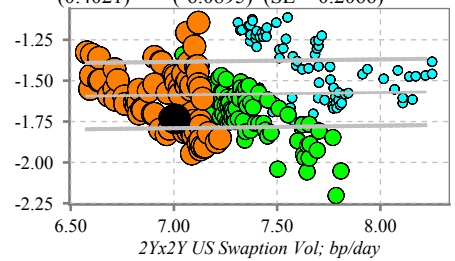
2x3 Cap and 5x10 Cap Implied Volatility



3Yx10Y-3Yx5Y Vol Spread
Y = - 0.2881 X1 + 1.5134 (adjR2 = 0.4865)
(-15.4521) (12.2107) (SE = 0.0689)



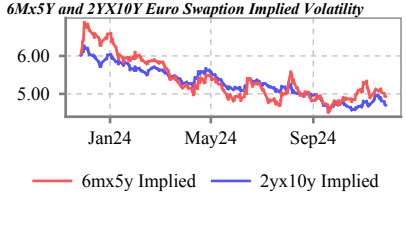
2Yx2Y EUR - 2Yx2Y US Vol Spread
Y = 0.0153 X1 - 1.6945 (adjR2 = -0.0034)
(0.4021) (-6.0895) (SE = 0.2066)



EUR Swaption Volatility

		Implied (bps/day)					Realized Vol	
			6M					
Mat/Und	Current	Chg	Min	Avg	Max		1M	3M
6Mx2Y	5.36	0.58	4.71	5.17	5.96		8.59	10.08
6Mx5Y	4.93	0.09	4.52	4.98	5.58		7.34	7.33
2Yx2Y	5.27	-0.32	5.04	5.44	5.97		7.04	7.03
2Yx10Y	4.70	-0.43	4.54	4.96	5.39		6.87	6.54

6Mx5Y and 2YX10Y Euro Swaption Implied Volatility



Note:
1. All regressions use a 1 year historical window.

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CC MBS/Swap Basis Model

	Level	1-day Chg	1-wk Chg	3-mo Avg	1-yr Avg
CC MBS/7y swaps	179.4	-1.71	-9.19	179.1	180.0
CC MBS/10y swaps	179.4	-2.04	-8.65	175.9	181.0
CC SOFR-OAS	64.4	-2.08	-10.46	65.8	65.8
2yx5y swap ylds	3.64	-0.08	-0.17	3.45	3.56
3yx10y (bp/day)	6.19	-0.03	-0.09	6.10	6.24
6mx5y (bp/day)	6.85	-0.00	-0.12	6.98	7.20

	Coeff	T-stat
Intercept	30.03	4.70
2yx5y swap ylds	25.67	17.75
3yx10y (bp/day)	-8.60	-4.80
6mx5y (bp/day)	15.69	20.83

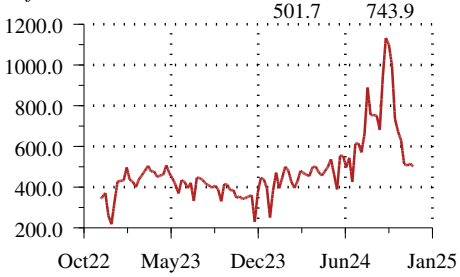
Observations	500
Adjusted R2	65.5%
Std Error	7.54
Residual	1.62
Z-Score	0.21

Other Drivers of MBS/Swap Basis

MBS Refi Index

Refi Index

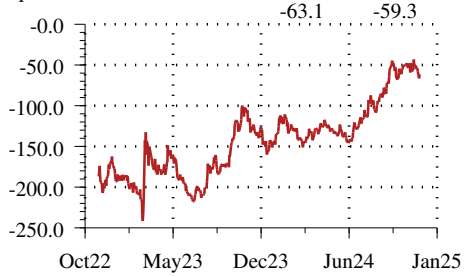
Level 501.7, 3-mo Avg 743.9



1s/30s swap curve

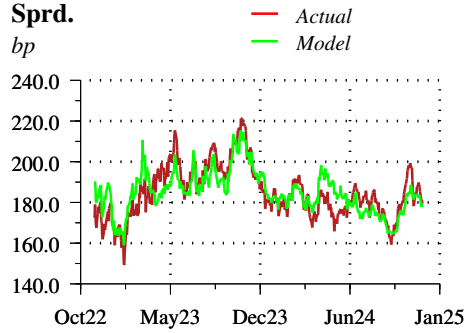
bp

Level -63.1, 3-mo Avg -59.3



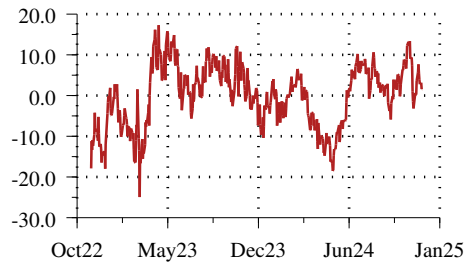
Sprd.

bp



Model Residual

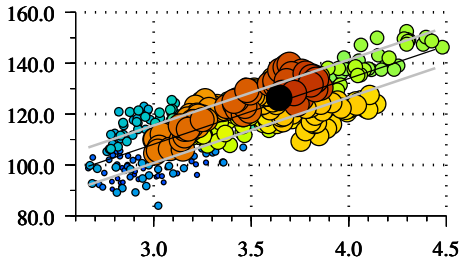
bp



Model Independent Variables

Sprd.

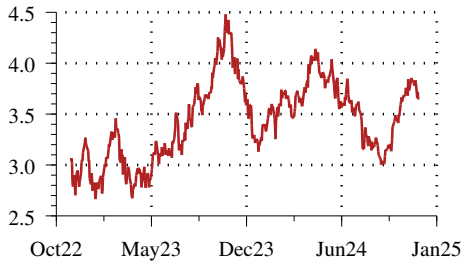
(bp) adjusted for long-dated and short-dated Vol



2yx5y swap ylds(%)

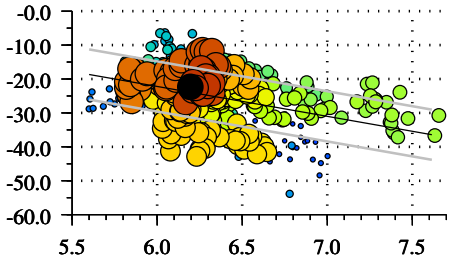
2yx5y swap ylds

(%)



Sprd.

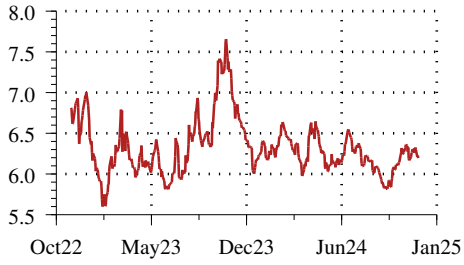
(bp) adjusted for 2yx5y swap ylds and short-dated Vol



3yx10y swaption vol(bp/day)

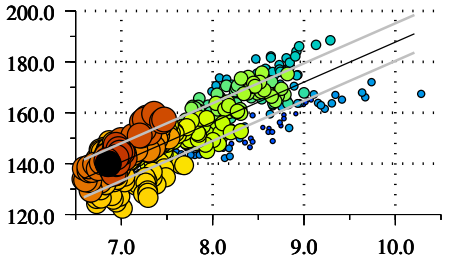
Long-dated vol

(bp/day)



Sprd.

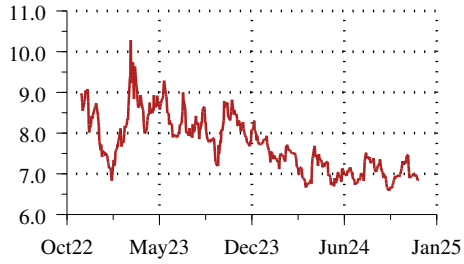
(bp) adjusted for 2yx5y swap ylds and long-dated Vol



6mx5y swaption vol(bp/day)

Short-dated vol

(bp/day)



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.

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US Fixed Income Derivatives Strategy

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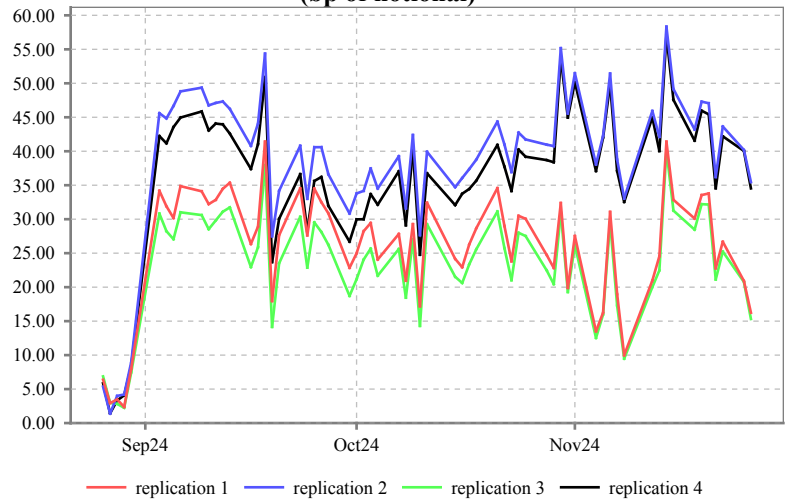
Benchmark and Bond Index Replication with Futures

	Hedge Ratio (# of contracts)					
// shock	FV	TU	TY	TN	US	WN
Replication 1	161	184	193	na	250	na
Replication 2	161	184	193	na	na	158
Replication 3	161	184	96	71	250	na
Replication 4	161	184	96	71	na	158
Beta-adjusted	**TU**	**FV**	**TY**	**TN**	**US**	**WN**
Replication 1	160	178	181	na	223	na
Replication 2	160	178	181	na	na	156
Replication 3	160	178	90	71	223	na
Replication 4	160	178	90	71	na	156

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



	Hedge Ratio (// shock, # of contracts)			Hedge Ratio (Beta-adj, # of contracts)		
Tenor	1 contract	2 contracts(L)	2 contracts(R)	1 contract	2 contracts(L)	2 contracts(R)
2Y	51	na	na	51	na	na
3Y(TU)	75	na	na	75	na	na
3Y(FV)	67	29	45	65	28	43
5Y	108	84	14	105	81	25
7Y	92	na	na	87	na	na
10Y(TY)	125	64	27	117	60	25
10Y(TN)	92	na	na	92	na	na
30Y(US)	128	na	na	114	na	na
30Y(WN)	81	na	na	80	na	na

December 2024 Futures

		BPV ($/contract)		BNOC	Repo rate (bp)	
Contract	Price	// shock	beta-adj	(32nds)	Implied	Term
TU	102.69	36.8	37.0	-0.1	502	469
FV	106.95	41.3	42.6	0.2	422	469
TY	110.33	64.4	68.5	0.4	373	469
TN	113.48	87.4	87.4	0.7	321	469
US	117.88	128.6	143.7	0.4	384	469
WN	125.12	203.6	205.5	6.3	-1071	469

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 necesary) or, a TU/FV, FV/TY or TY/US blend for 3Y, 5Y and 10Y OTRs, respectively. When using a single contract we assume pvbp-neutral hedge ratios matching the pvbp of the current note to the futures DV01 (based on parallel or beta-adjusted shocks to the curve), rebalanced monthy 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.

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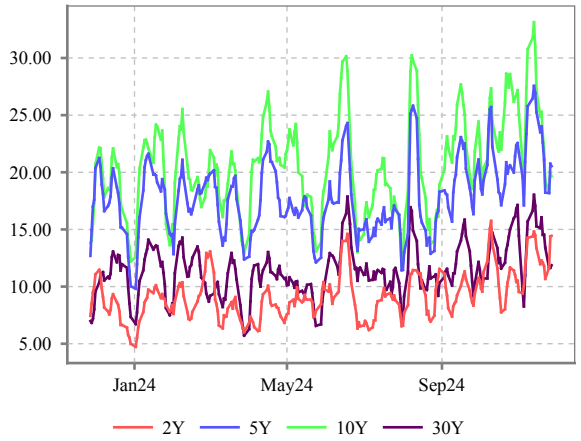
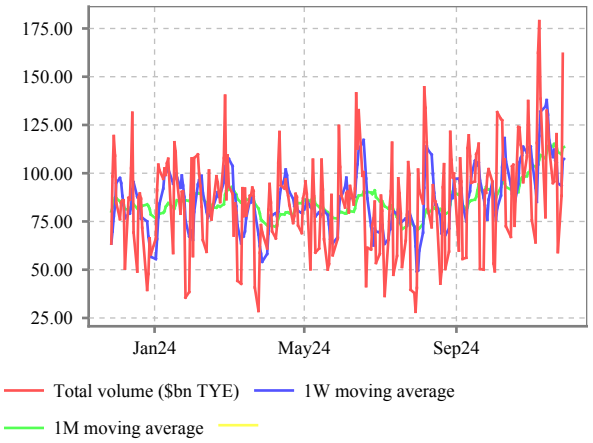
USD Swap Trading Volume

		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**	4.1	20.7	18.0	28.8	29.0	25.2	25.2	5.3	2.7	15.1	0.1	155.3
	one week avg	3.2	11.3	11.7	18.3	15.3	19.5	19.5	3.4	3.9	12.7	0.1	105.3
	one month avg	3.2	9.8	10.5	18.7	15.4	22.3	22.3	3.4	3.2	13.2	0.2	105.6
6m-1Y	**notional**	0.6	0.1	0.1	0.4	0.0	0.5	0.5	0.1	0.1	0.2	0.0	2.2
	one week avg	0.4	0.2	0.1	0.3	0.0	0.3	0.3	0.0	0.0	0.3	0.0	1.6
	one month avg	0.6	0.3	0.2	0.3	0.1	0.3	0.3	0.0	0.0	0.3	0.0	2.1
1Y-2Y	**notional**	0.5	0.6	0.0	1.1	0.0	0.7	0.7	0.3	0.6	0.1	0.4	4.3
	one week avg	0.8	0.6	0.1	0.6	0.1	0.6	0.6	0.3	0.1	0.5	0.1	3.9
	one month avg	0.9	0.8	0.2	0.6	0.1	0.6	0.6	0.2	0.3	0.4	0.0	4.5
2Y-5Y	**notional**	0.5	2.1	0.1	0.5	0.2	1.1	1.1	0.1	0.1	0.1	0.0	4.8
	one week avg	0.6	1.3	0.1	0.8	0.1	0.5	0.5	0.0	0.0	0.1	0.0	3.5
	one month avg	0.7	1.7	0.1	1.0	0.1	0.5	0.5	0.0	0.0	0.2	0.0	4.3
5-10Y	**notional**	0.1	0.8	0.1	1.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	2.2
	one week avg	0.2	0.3	0.1	1.5	0.0	0.2	0.2	0.1	0.0	0.0	0.0	2.5
	one month avg	0.3	0.4	0.1	1.3	0.0	0.3	0.3	0.2	0.0	0.0	0.0	2.7
total	**notional**	5.7	24.5	18.4	32.0	29.2	29.1	29.1	6.0	3.4	15.5	0.4	170.8
	one week avg	5.1	13.9	12.1	22.2	15.5	21.7	21.7	4.0	4.1	13.6	0.2	118.5
	one month avg	5.6	13.1	11.2	23.0	15.7	24.8	24.8	4.1	3.6	14.2	0.2	121.9





*Notional amount in $bn

** 10-yr equivalents

Source: J.P. Morgan, DTCC

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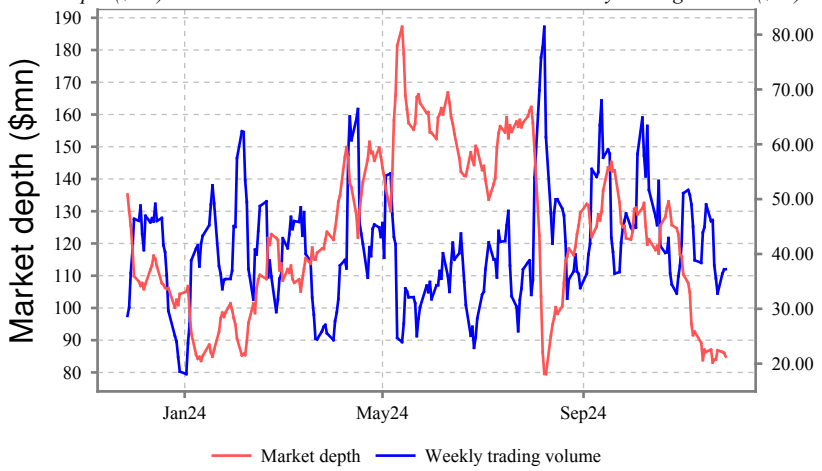
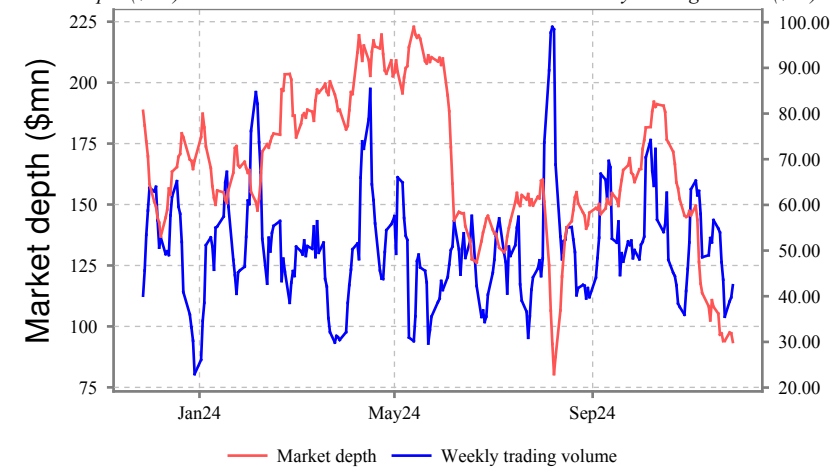
Cash Treasury Market Liquidity Summary

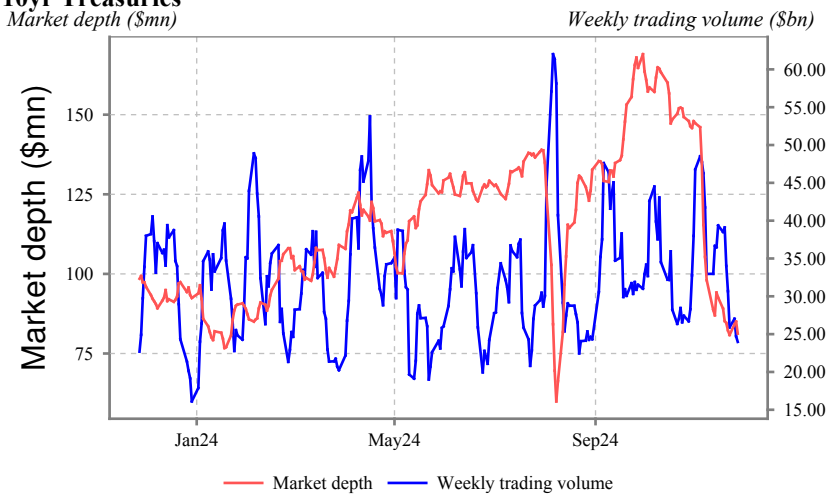
2-3yr Treasuries



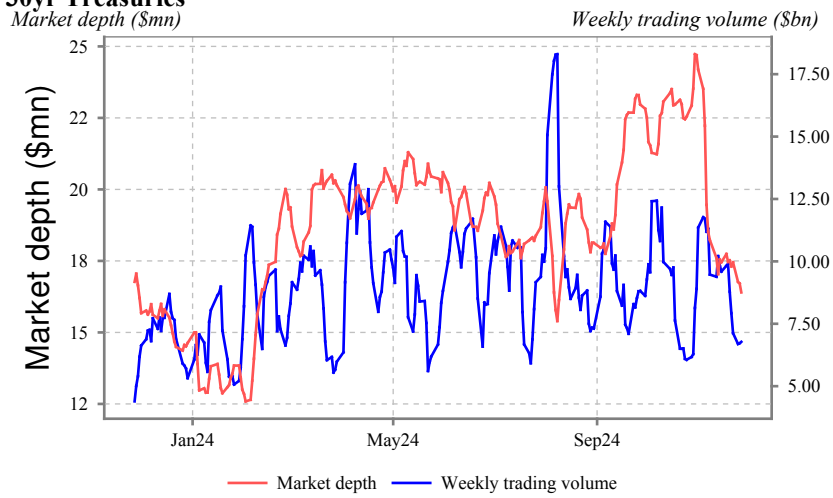
5-7yr Treasuries



10yr Treasuries



30yr Treasuries



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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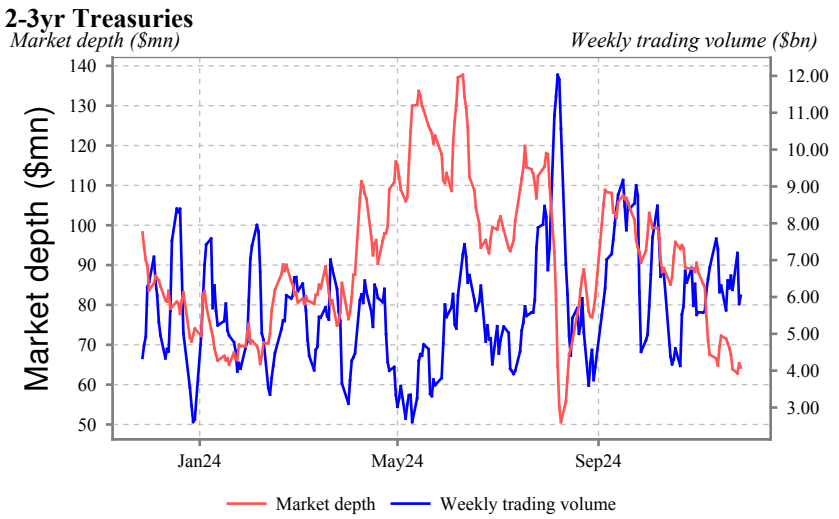
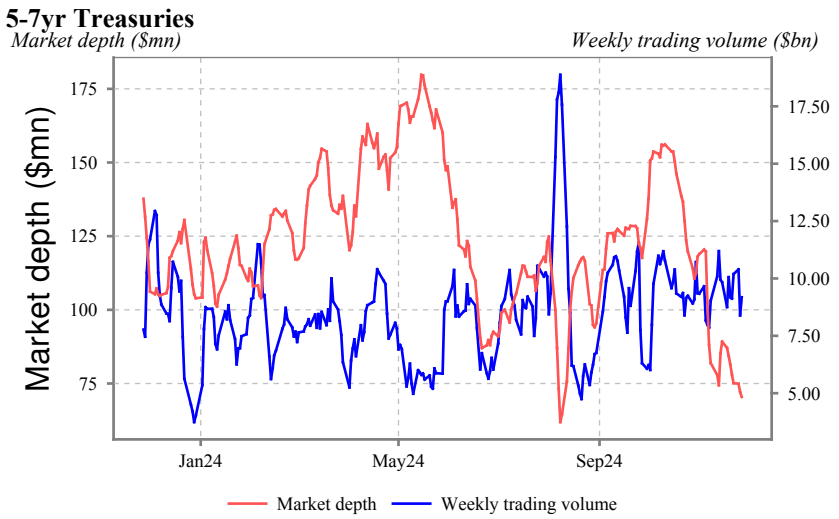
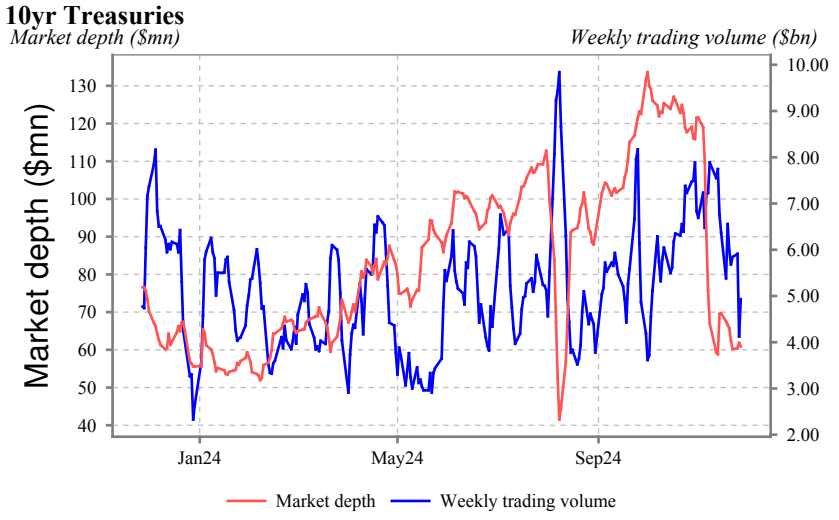
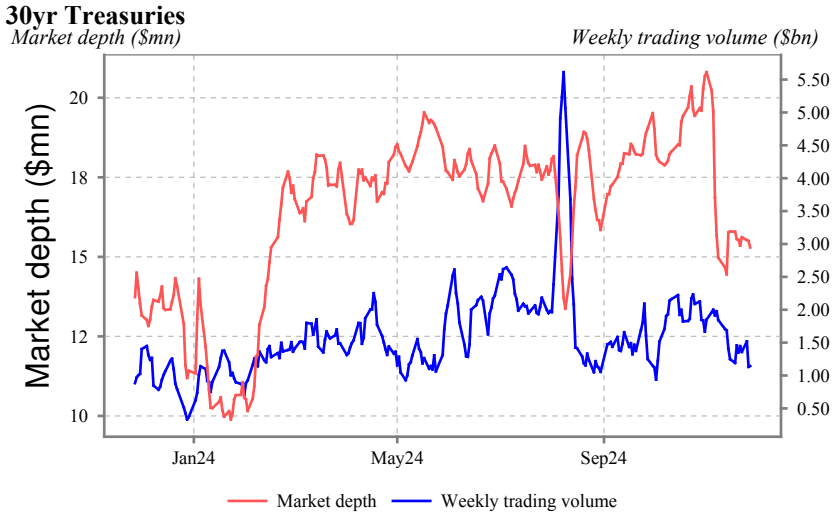
Cash Treasury Market Liquidity Summary - London time









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Source: J.P. Morgan, BrokerTec

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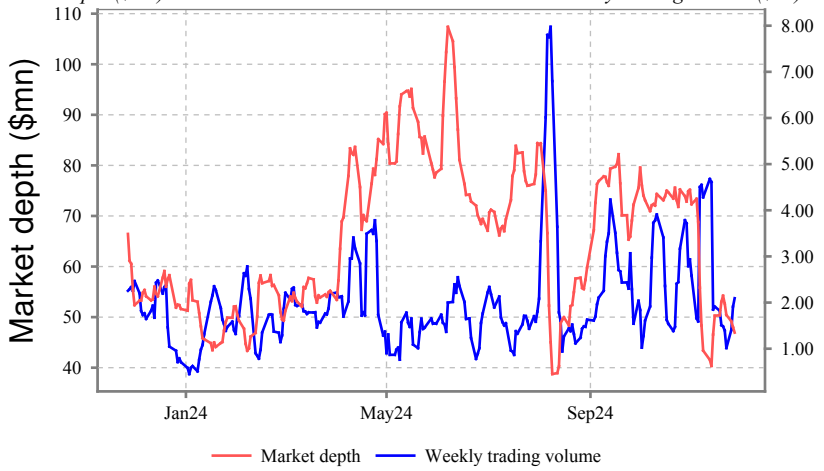
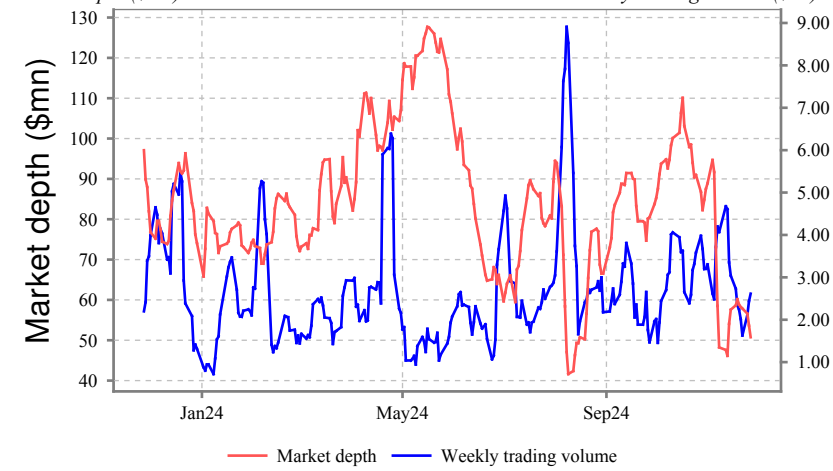
Cash Treasury Market Liquidity Summary - Tokyo time

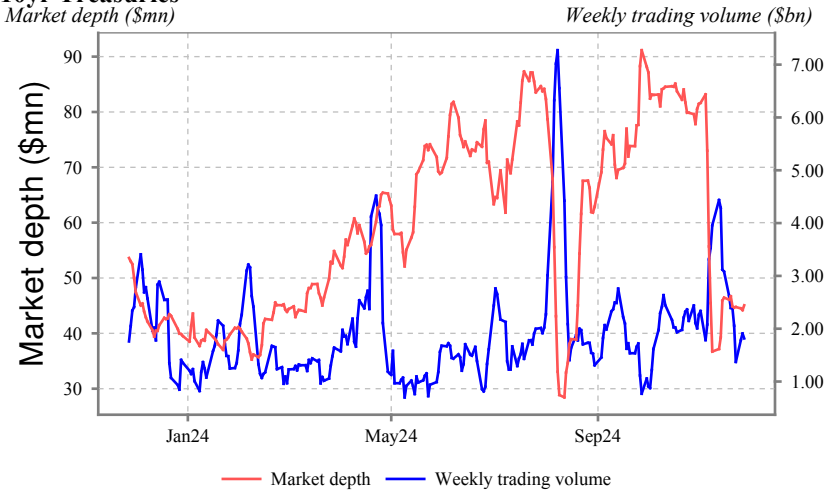
2-3yr Treasuries



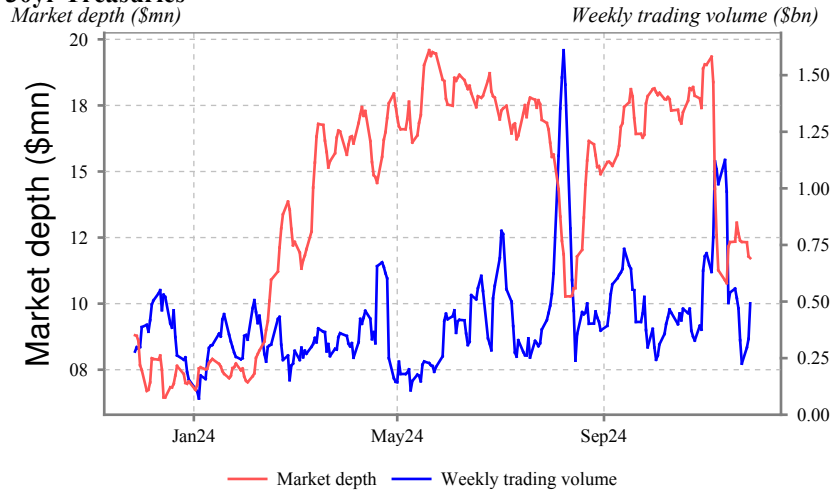
5-7yr Treasuries



10yr Treasuries



30yr Treasuries



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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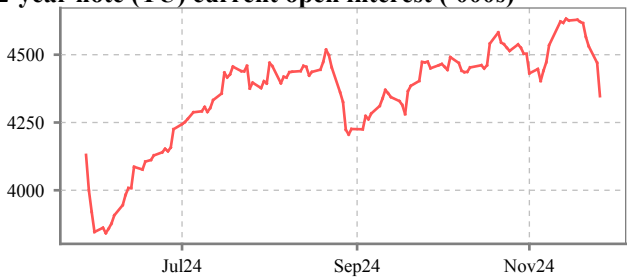
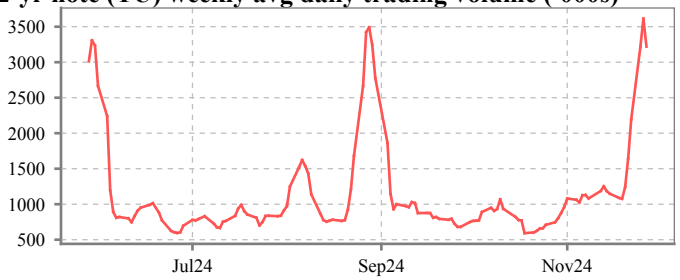
Treasury Futures Liquidity Report

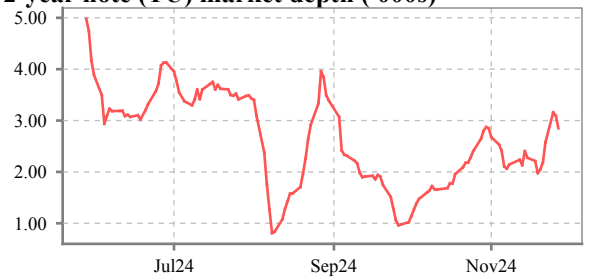
2-year note (TU) current open interest ('000s)



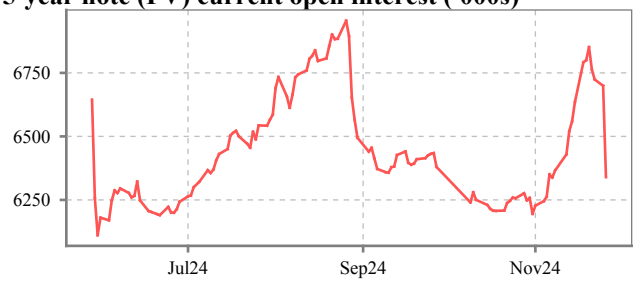
2-yr note (TU) weekly avg daily trading volume ('000s)



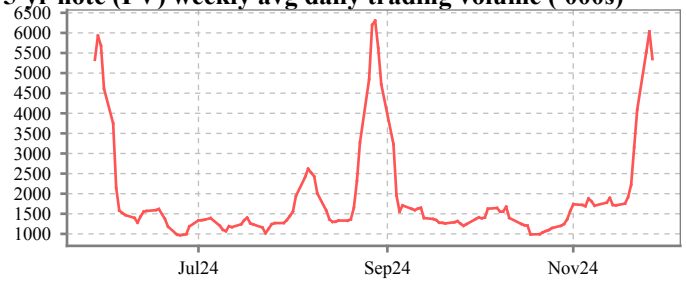
2-year note (TU) market depth ('000s)



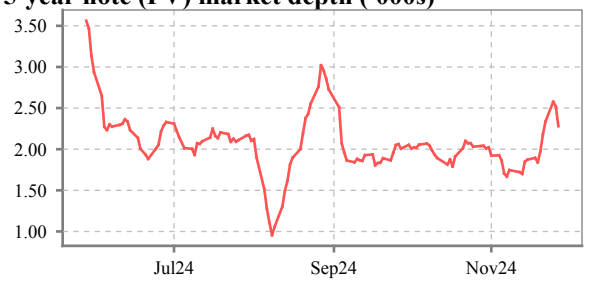
5-year note (FV) current open interest ('000s)



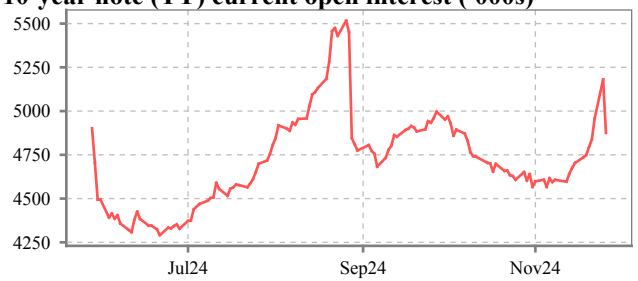
5-yr note (FV) weekly avg daily trading volume ('000s)



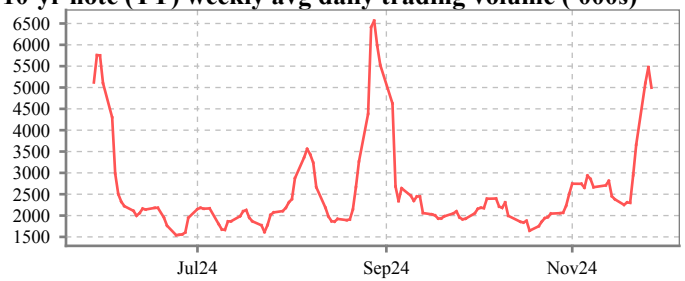
5-year note (FV) market depth ('000s)



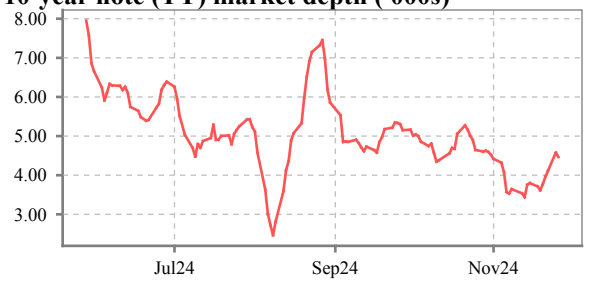
10-year note (TY) current open interest ('000s)



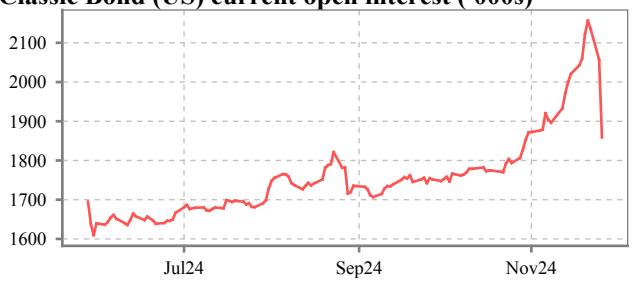
10-yr note (TY) weekly avg daily trading volume ('000s)



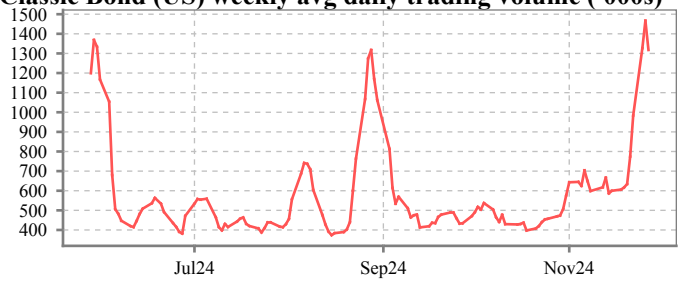
10-year note (TY) market depth ('000s)



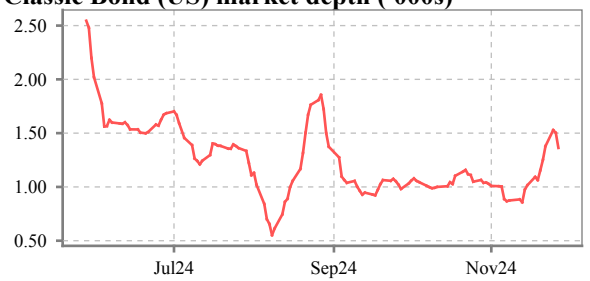
Classic Bond (US) current open interest ('000s)



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



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



Note: Market depth is the average of the top 3 bids and offers on the front and back contract, averaged between 8:30am and 10:30am daily. Source: J.P. Morgan, CME

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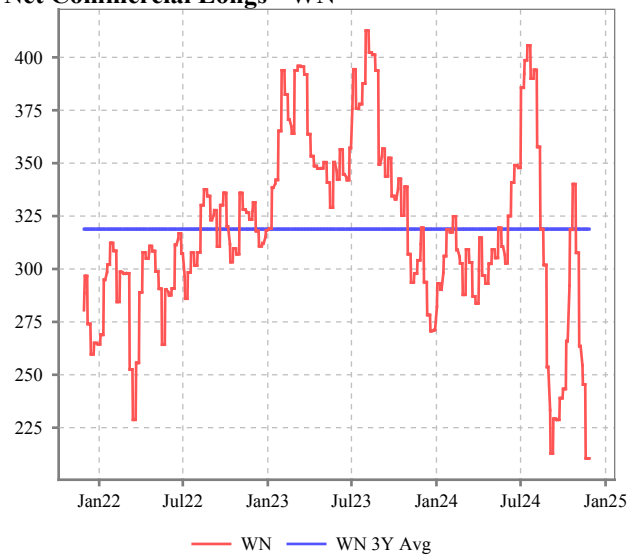
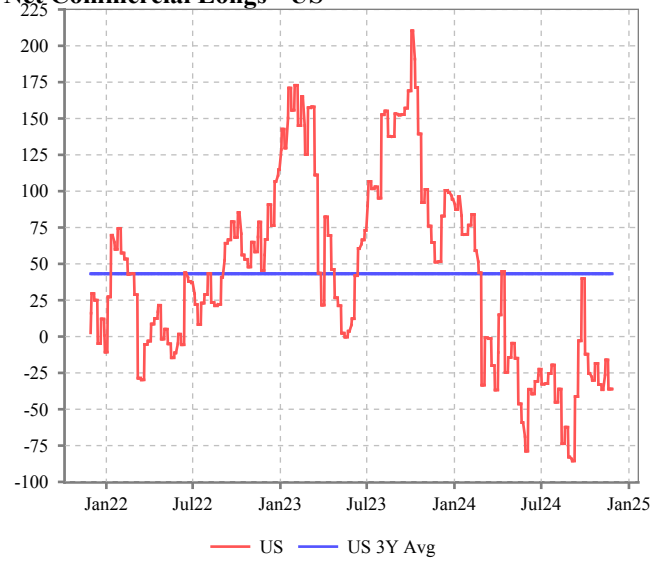
Treasury Future Net Commercial Longs Report

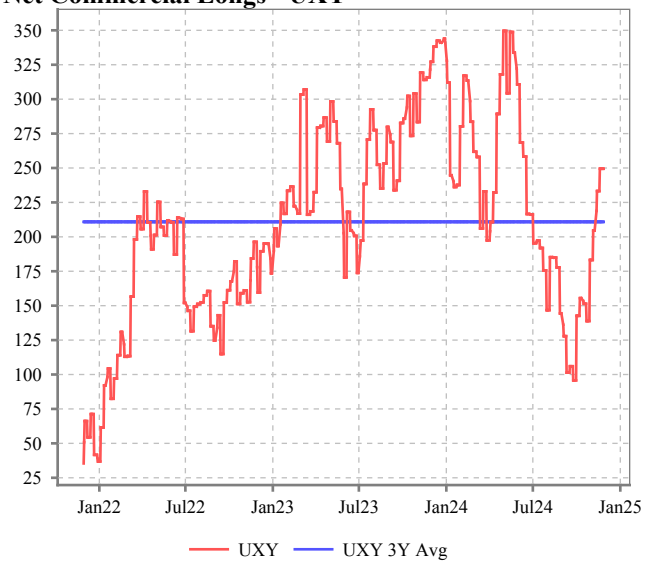
Net Commercial Longs - WN



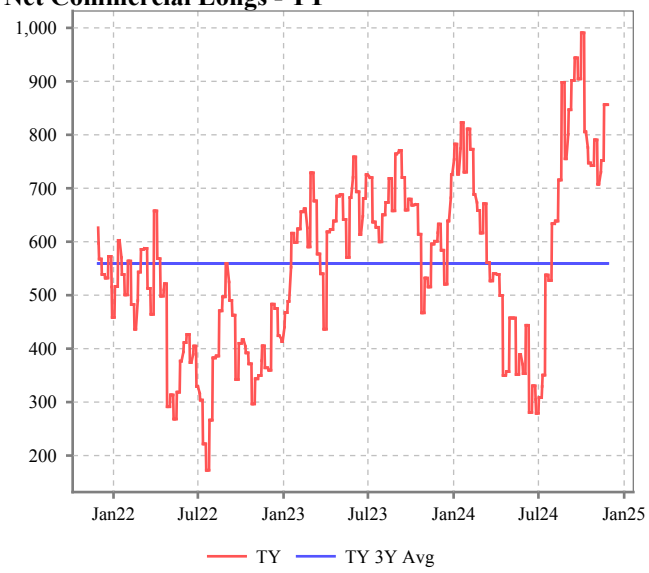
Net Commercial Longs - US



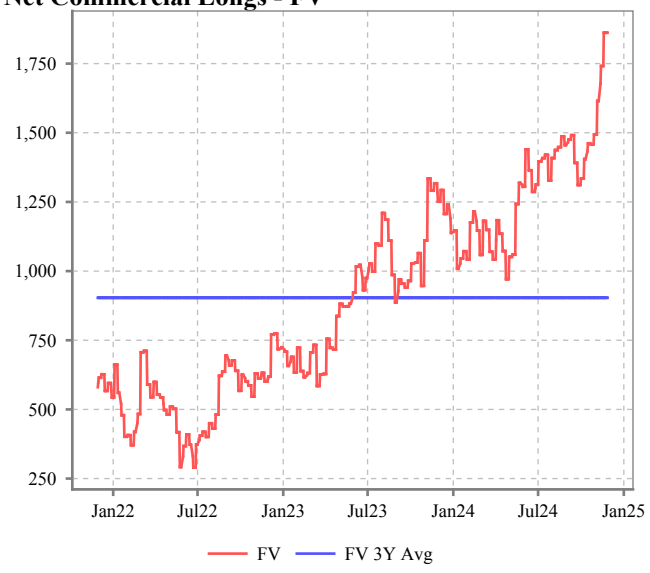
Net Commercial Longs - UXY



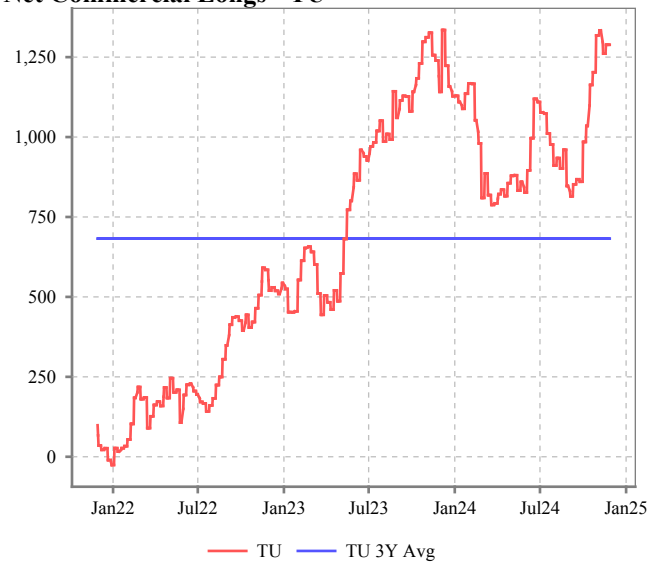
Net Commercial Longs - TY



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

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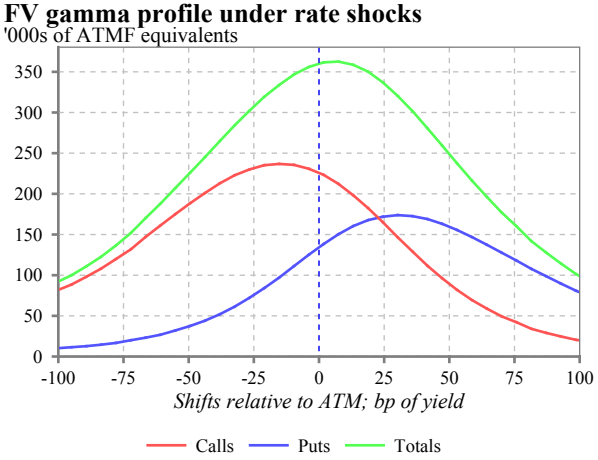
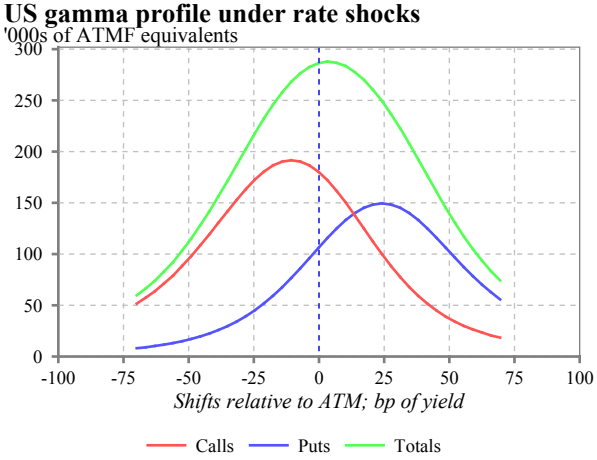
Options on Treasury Futures Strike Concentration Report

FV gamma profile under rate shocks

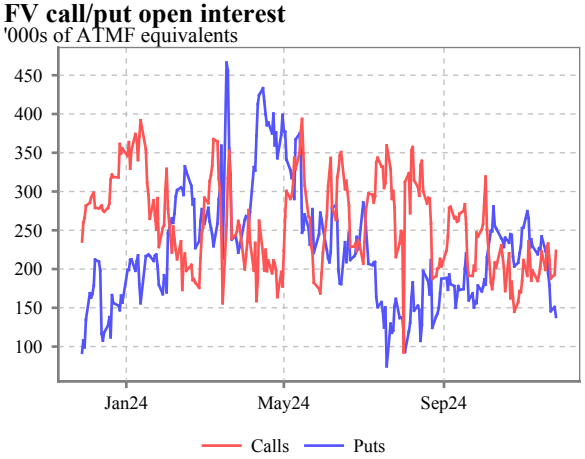


TY gamma profile under rate shocks

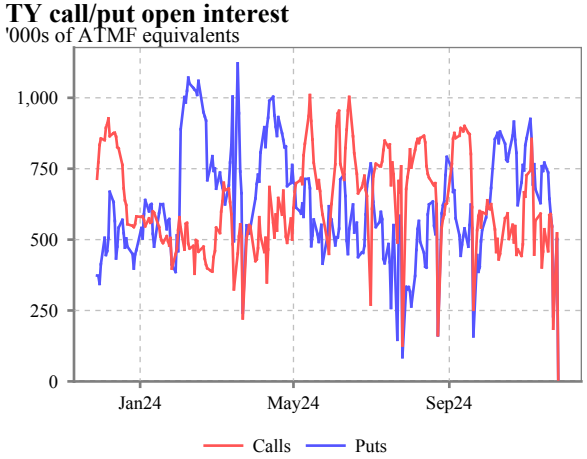
US gamma profile under rate shocks



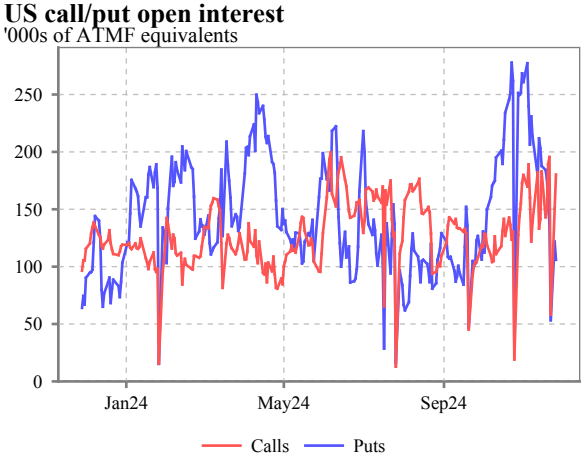
FV call/put open interest



TY call/put open interest



US call/put open interest



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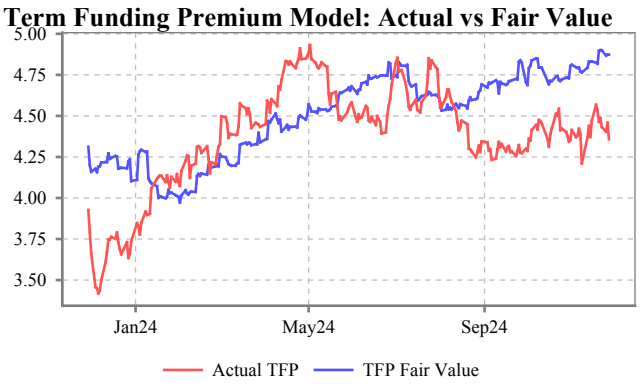
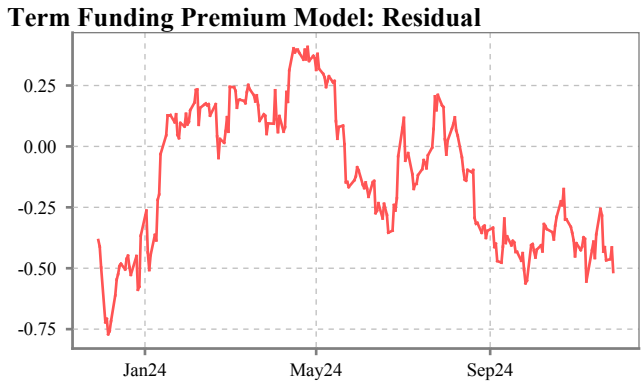
Swap Spread Fair Value Model Report – Term Funding Premium and Zero Duration Swap Spreads

Term Funding Premium Model

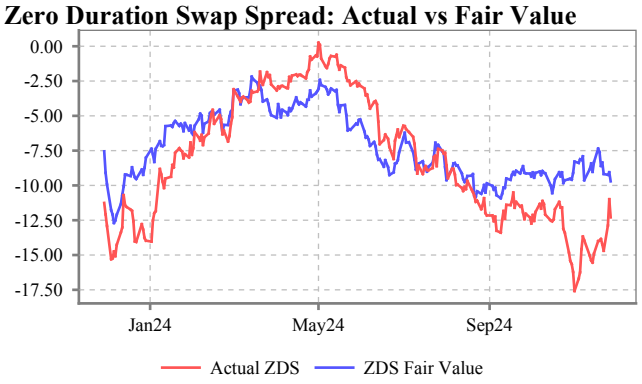
	Coeff	T-Stat	Current Value
Fed balance sheet size ($Tn)	-1.4	-21.23	6.98
AUM at top 20 core bond funds ($bn)	-0.01	-19.92	432.00
Monthly UST supply ($bn 10s)	0.01	7.76	232.54
RRP ($Tn)	0.82	16.05	0.57
Intercept	18.75	58.18	
R-squared	0.89		
Std. error	0.3		
Actual TFP	4.36		
TFP Fair value	4.87		

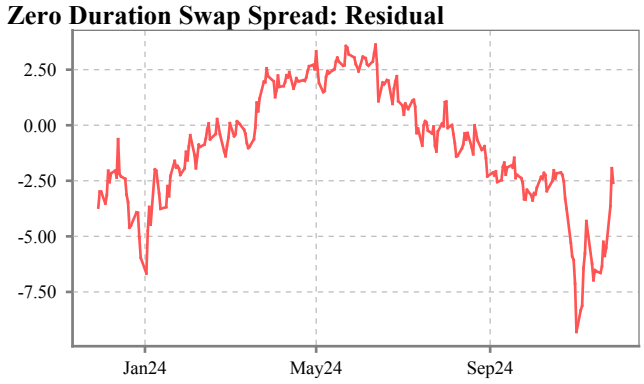


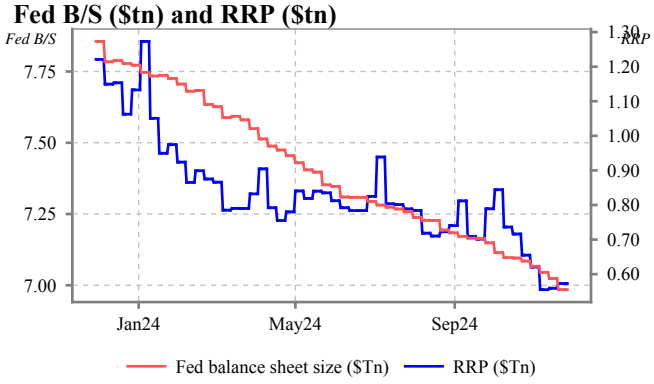


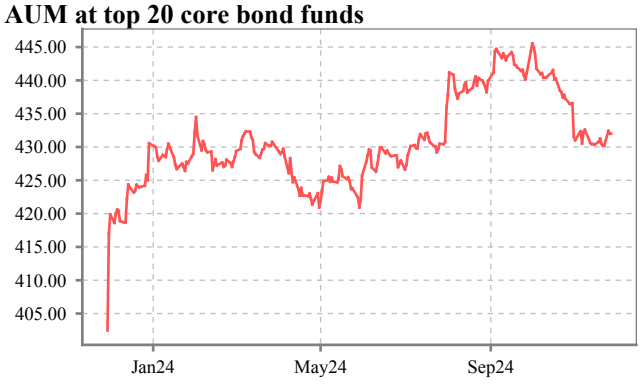
Zero Duration Swap Spread Model

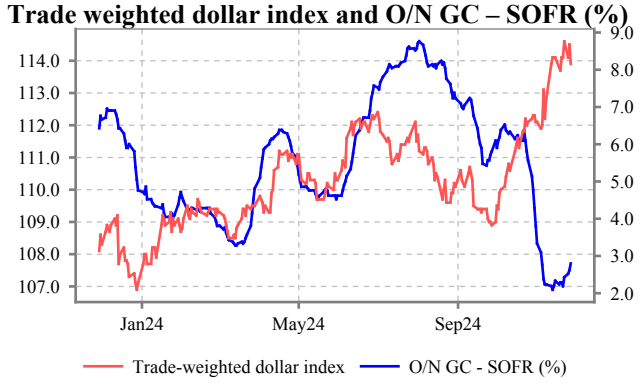
	Coeff	T-Stat	Current Value
Trade-weighted dollar index	-0.46	-9.3	113.90
O/N GC - SOFR (%)	-0.68	-10.1	2.80
TFP (bp/year)	7.99	40.1	4.36
Fed balance sheet size ($tn)	6.23	24.2	6.98
Intercept	-34.26	-5.9	
R-squared	0.8		
Std. error	2.24		
Actual ZDS	-12.29		
ZDS Fair value	-9.71		











* 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 for TFP model is from Apr 2021 - Jun 2024, ZDS model is from March 2022 - Sep 2024.

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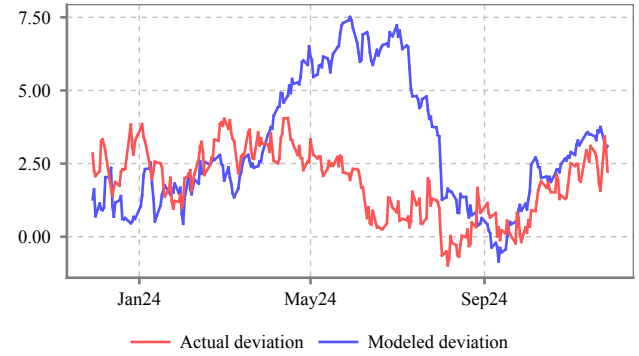
Swap Spread Fair Value Model Report – Swap Spread Deviation from Term Structure

2Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
RRP ($Tn)	4.09	19.87	0.57
1Yx1Y imp. Vol (bp/day)	-0.74	-7.18	7.34
T-bill stock 3M pct chg	-0.3	-19.75	4.39
2Y UST yield (%)	3.09	15.85	4.21
1st/5th 3M SOFR futures curve %	2.78	15.67	-0.50
Intercept	-4.1	-13.1	
R-squared	0.67		
Std. error	2.53		
2Y Swap spread actual deviation	2.22		
2Y Swap spread modeled deviation	3.1		

2Y deviation: Actual vs Fair Value

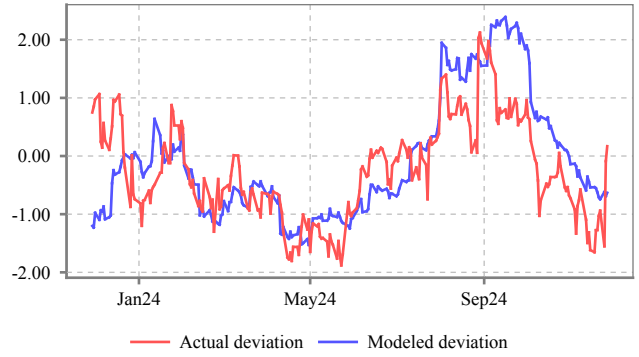


2Y deviation: Residual

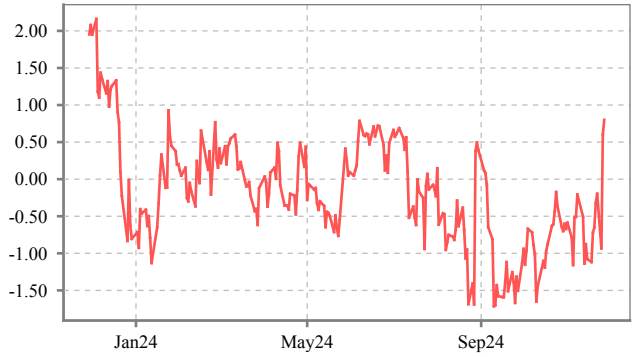
5Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
2Yx2Y implied vol (bp/day)	-0.56	-17.09	7.01
6Mx1M - 1M OIS rate (%)	-2.57	-32.59	-0.40
Intercept	2.24	9.55	
R-squared	0.7		
Std. error	1.48		
5Y Swap spread actual deviation	0.17		
5Y Swap spread modeled deviation	-0.63		

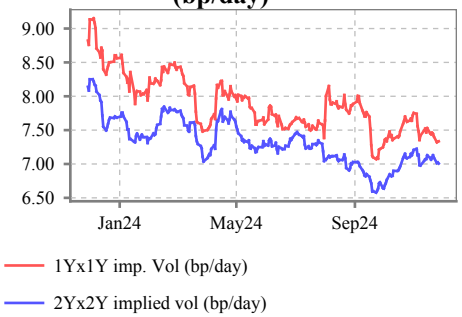
5Y deviation: Actual vs Fair Value



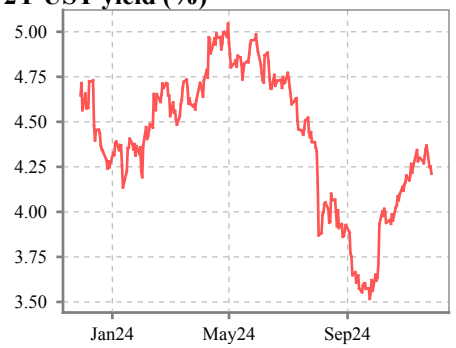
5Y deviation: Residual



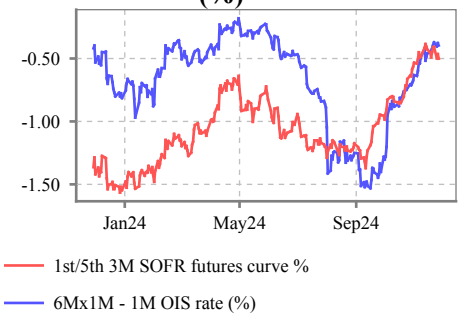
1Yx1Y and 2Yx2Y implied volatility (bp/day)



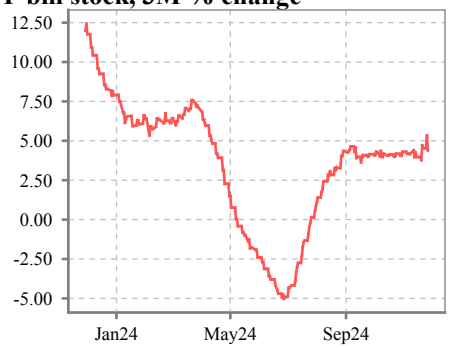
2Y UST yield (%)



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

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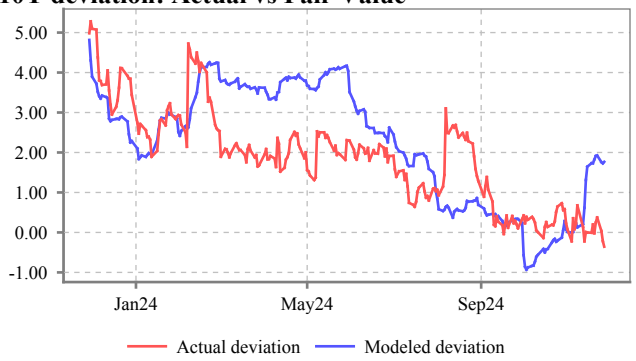
Swap Spread Fair Value Model Report – Swap Spread Deviation from Term Structure

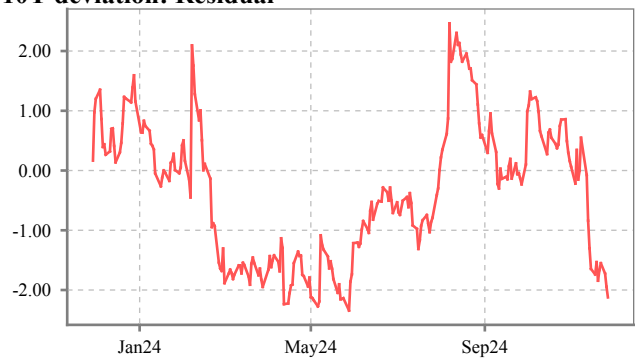
10Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
Monthly UST supply	-0.04	-8.73	232.54
10Y yields	0.91	7.51	4.24
sofr-ioer (6w avg)	-0.98	-17.82	-6.86
Intercept	-0.35	-0.22	
R-squared	0.62		
Std. error	2.03		
10Y Swap spread actual deviation	-0.36		
10Y Swap spread modeled deviation	1.77		

10Y deviation: Actual vs Fair Value



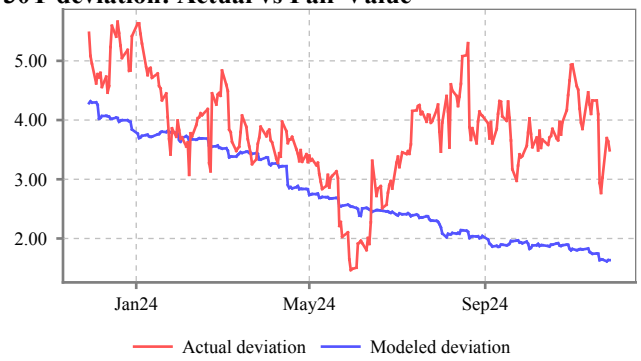
10Y deviation: Residual



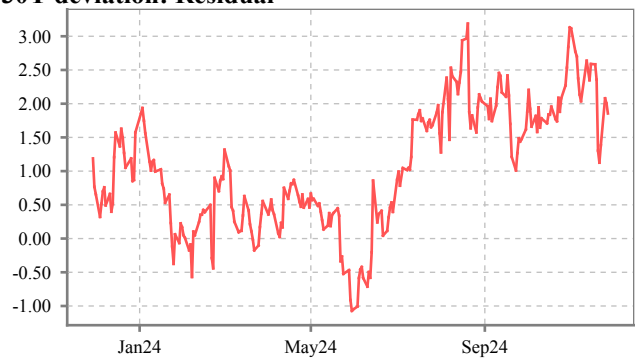
30Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
Fed balance sheet size ($tn)	2.93	34.44	6.98
VA hedging needs ($bn20s)	-0.02	-16.08	62.44
Intercept	-17.34	-21.72	
R-squared	0.82		
Std. error	1.26		
30Y Swap spread actual deviation	3.49		
30Y Swap spread modeled deviation	1.63		

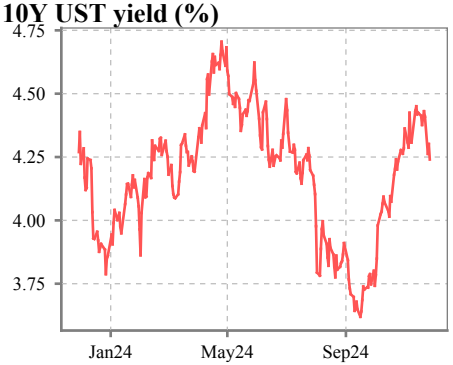
30Y deviation: Actual vs Fair Value



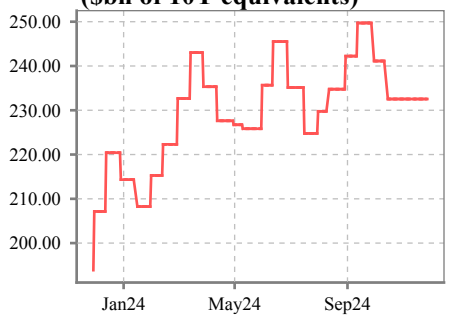
30Y deviation: Residual



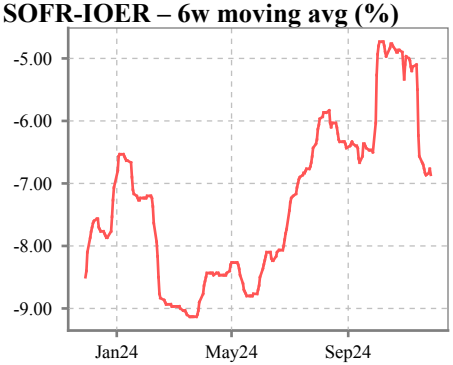
10Y UST yield (%)



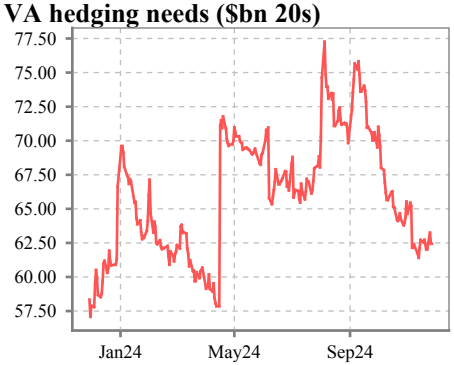
Monthly UST supply – 6w moving avg ($bn of 10Y equivalents)



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.

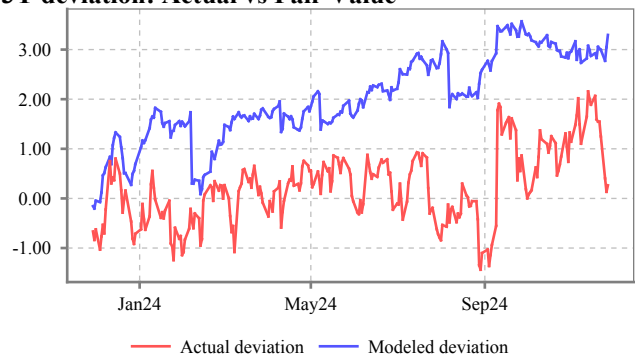
Derivatives Strategy

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

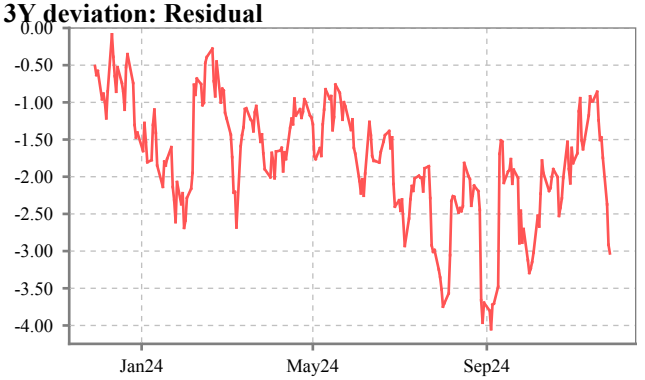
3Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
2-year spreads deviation from fitted structure	-0.23	-19.16	2.22
10-year spreads deviation from fitted structure	-0.62	-38.22	-0.36
Intercept	3.59	35.97	
R-squared	0.76		
Std. error	1.41		
3Y Swap spread actual deviation	0.26		
3Y Swap spread modeled deviation	3.3		

3Y deviation: Actual vs Fair Value



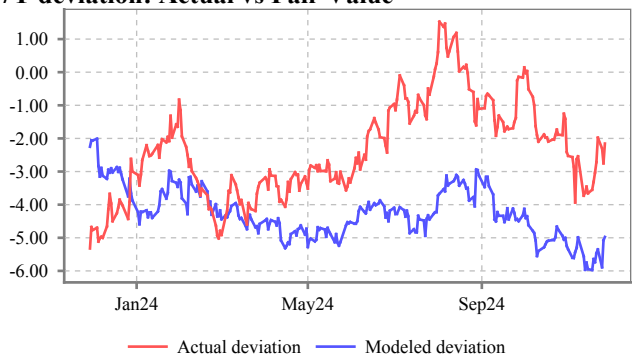
3Y deviation: Residual



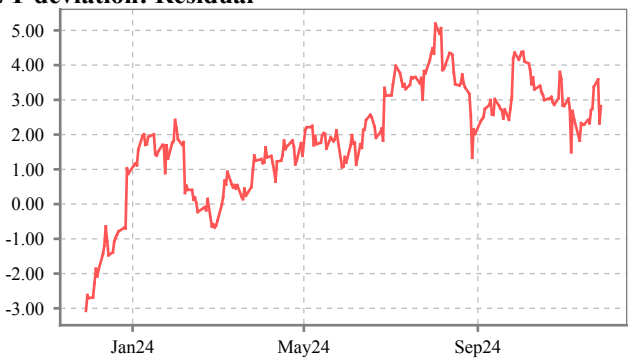
7Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
5-year spreads deviation from fitted structure	0.63	40.25	0.17
10-year spreads deviation from fitted structure	0.44	33.93	-0.36
Intercept	-4.92	-74.19	
R-squared	0.72		
Std. error	1.05		
7Y Swap spread actual deviation	-2.15		
7Y Swap spread modeled deviation	-4.97		

7Y deviation: Actual vs Fair Value



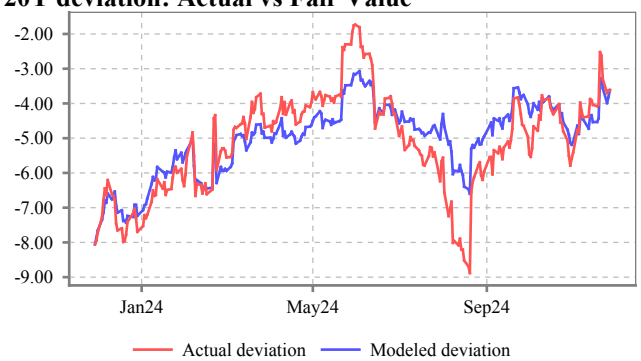
7Y deviation: Residual



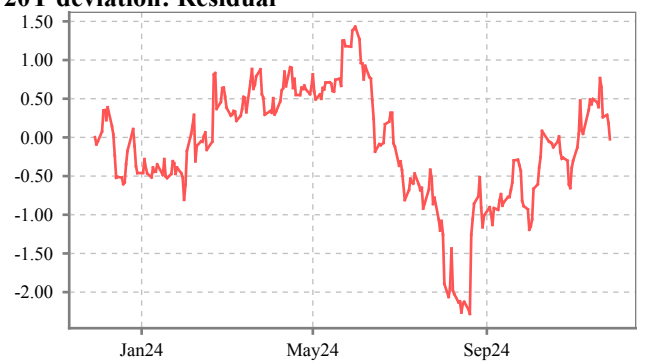
20Y modeled deviation from term structure

	Coeff	T-Stat	Current Value
30-year spreads deviation from fitted structure	-0.89	-43.23	3.49
10-year spreads deviation from fitted structure	-0.5	-51.16	-0.36
Intercept	-0.69	-5.67	
R-squared	0.87		
Std. error	0.87		
20Y Swap spread actual deviation	-3.63		
20Y Swap spread modeled deviation	-3.61		

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

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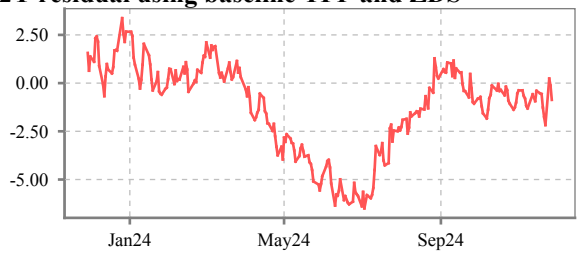
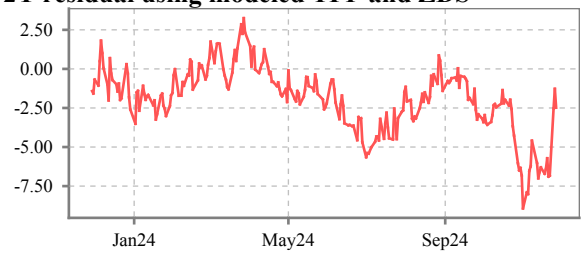
Swap Spread Fair Value Model Report – Swap Spread Fair Value Summary

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	-19.6	-19.0	-13.1	-0.6	-6.4
3Y	-25.0	-23.7	-18.1	-1.2	-6.8
5Y	-35.3	-34.6	-29.4	-0.7	-5.9
7Y	-44.3	-46.6	-42.0	2.3	-2.4
10Y	-50.3	-48.8	-44.7	-1.5	-5.6
20Y	-76.9	-77.3	-74.6	0.4	-2.2
30Y	-83.7	-86.1	-84.4	2.4	0.7

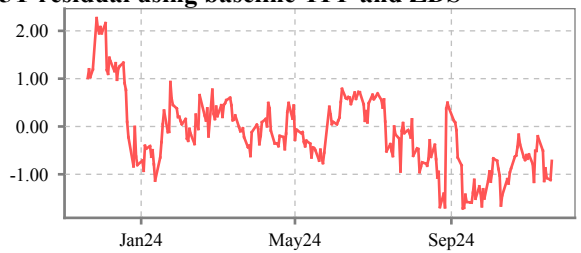
2Y residual using baseline TFP and ZDS



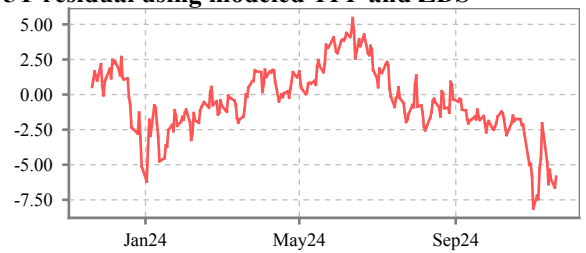
2Y residual using modeled TFP and ZDS



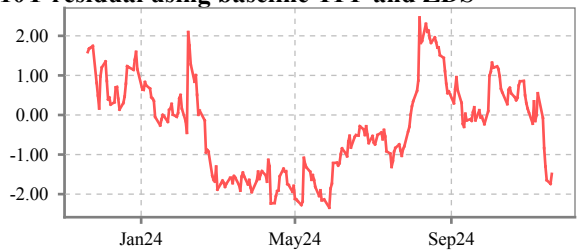
5Y residual using baseline TFP and ZDS



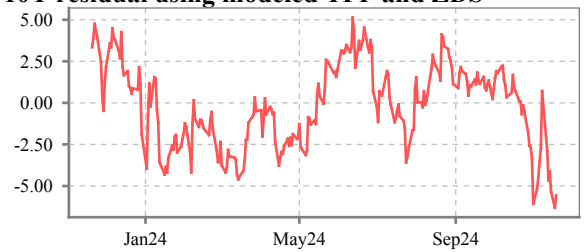
5Y residual using modeled TFP and ZDS



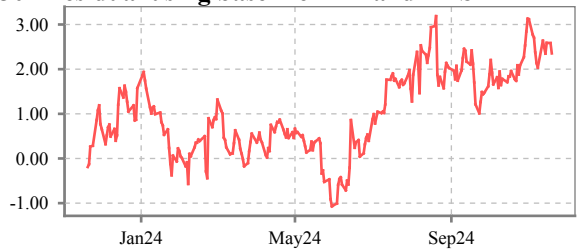
10Y residual using baseline TFP and ZDS



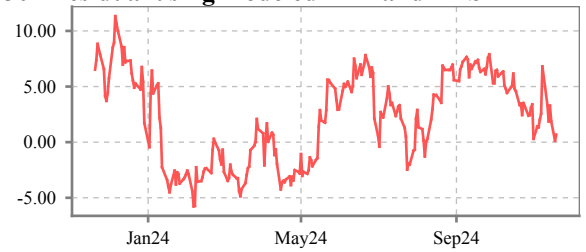
10Y residual using modeled TFP and ZDS



30Y residual using baseline TFP and ZDS



30Y residual using modeled TFP and ZDS



* 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.

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Off-the-run SOFR Swap Spread

Spreads

	Spot	1-day Chg	1-wk Chg	1-mo Chg	3-month Repo	3-month Carry	3-month Slide	Total	6M Avg
1 Year	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	3.0
2 Year	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	-2.2
3 Year	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	-2.3
5 Year	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	-1.5
7 Year	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	-1.5
10 Year	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.4
20 Year	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	-1.7
30 Year	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	-0.7

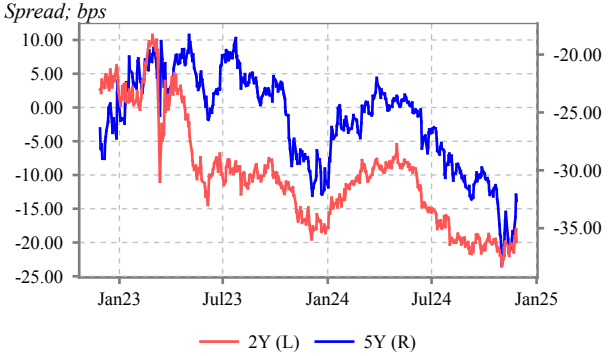
Curves

	Spot	1-day Chg	1-wk Chg	1-mo Chg	2-Year High	2-Year Low	2-Year Avg	2-Year Z
2s/3s	0.0	0.0	0.0	0.0	-0.1	-19.6	-6.3	0.0
2s/5s	0.0	0.0	0.0	0.0	-8.6	-31.0	-15.1	0.0
2s/10s	0.0	0.0	0.0	0.0	-12.7	-39.2	-25.6	0.0
2s/30s	0.0	0.0	0.0	0.0	-47.9	-80.6	-62.1	0.0
3s/5s	0.0	0.0	0.0	0.0	-2.3	-18.1	-8.8	0.0
3s/10s	0.0	0.0	0.0	0.0	-6.9	-27.1	-19.3	0.0
5s/10s	0.0	0.0	0.0	0.0	-1.5	-16.8	-10.5	0.0
5s/20s	0.0	0.0	0.0	0.0	-36.0	-48.7	-42.3	0.0
5s/30s	0.0	0.0	0.0	0.0	-35.4	-54.0	-47.0	0.0
7s/10s	0.0	0.0	0.0	0.0	3.7	-9.3	-2.1	0.0
10s/30s	0.0	0.0	0.0	0.0	-27.4	-46.0	-36.5	0.0
20s/30s	0.0	0.0	0.0	0.0	3.0	-10.3	-4.8	0.0

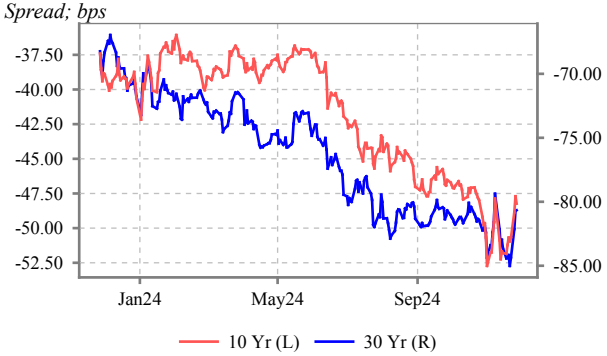
Butterflies

	Spot	1-day Chg	1-wk Chg	1-mo Chg	2-Year High	2-Year Low	2-Year Avg	2-Year Z
2s/3s/5s	0.0	0.0	0.0	0.0	5.1	-5.4	1.2	0.0
2s/5s/10s	0.0	0.0	0.0	0.0	3.8	-11.9	-2.3	0.0
2s/5s/30s	0.0	0.0	0.0	0.0	21.6	7.2	16.0	0.0
2s/10s/30s	0.0	0.0	0.0	0.0	14.5	-0.9	5.4	0.0
3s/5s/10s	0.0	0.0	0.0	0.0	5.9	-4.8	0.9	0.0
5s/7s/10s	0.0	0.0	0.0	0.0	1.8	-7.7	-3.1	0.0
5s/10s/20s	0.0	0.0	0.0	0.0	17.9	4.1	10.6	0.0
5s/10s/30s	0.0	0.0	0.0	0.0	20.1	8.0	13.0	0.0
10s/20s/30s	0.0	0.0	0.0	0.0	-7.8	-21.1	-13.5	0.0
10s/25s/30s	0.0	0.0	0.0	0.0	-18.1	-28.3	-23.2	0.0
20s/25s/30s	0.0	0.0	0.0	0.0	-2.6	-11.4	-7.3	0.0

2 Yr and 5 Yr
Spread; bps

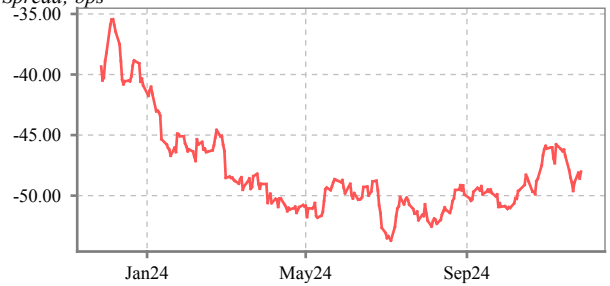


10 Yr and 30 Yr
Spread; bps

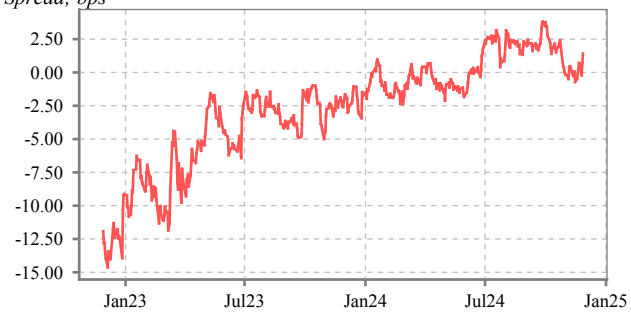


2s/5s Spread Curve
Spread; bps

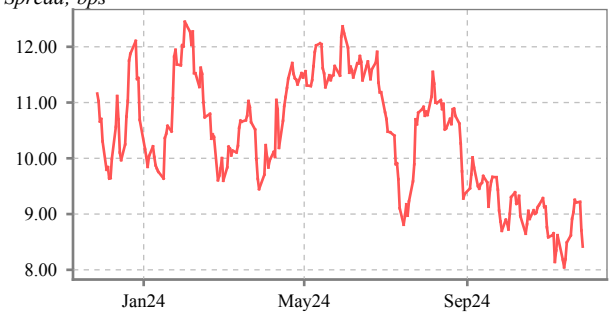
5s/30s Spread Curve
Spread; bps



2s/5s/10s Spread Bfly
Spread; bps



5s/10s/30s Spread Bfly
Spread; bps



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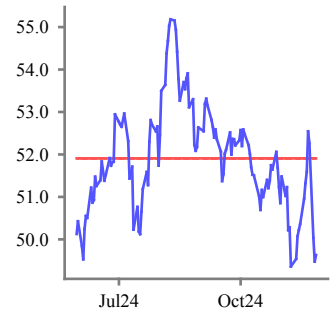
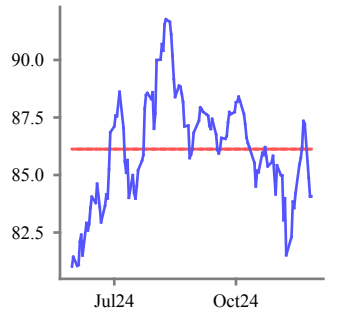
SOFR Swap Spread Butterfly Report

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	1.18	0.24	0.68	0.31	0.55	0.40	0.58	0.38	-1.7	-0.8	-0.9	13%	3.9
2Ys3Ys7Ys	1.12	0.29	0.74	0.25	0.61	0.34	0.60	0.38	-0.1	0.6	-0.7	26%	3.8
2Ys3Ys10Ys	1.01	0.45	0.62	0.33	0.48	0.40	0.88	-0.02	2.9	3.4	-0.5	13%	2.9
2Ys3Ys20Ys	0.86	0.56	0.77	0.20	0.60	0.28	0.86	0.00	4.3	5.8	-1.5	23%	4.8
2Ys3Ys30Ys	0.83	1.10	0.59	0.56	0.55	0.46	0.89	-0.05	31.7	33.1	-1.4	20%	5.4
2Ys5Ys7Ys	0.37	0.95	0.24	0.80	0.22	0.80	0.24	0.79	5.2	4.7	0.5	48%	2.3
2Ys5Ys10Ys	0.03	1.37	-0.09	1.00	-0.14	1.01	0.45	0.41	14.3	13.3	1.0	44%	5.1
2Ys5Ys20Ys	1.95	0.81	1.18	0.03	0.45	0.42	0.55	0.32	-7.7	-7.1	-0.7	23%	12.2
2Ys5Ys30Ys	0.67	2.27	0.28	1.23	0.11	1.11	0.71	0.20	72.3	73.6	-1.2	42%	9.9
2Ys7Ys10Ys	-0.05	1.36	-0.27	1.18	-0.39	1.21	0.49	0.38	10.5	9.8	0.6	49%	6.0
2Ys7Ys20Ys	1.82	0.92	1.49	-0.16	0.38	0.50	0.61	0.27	-24.7	-23.7	-1.0	32%	17.5
2Ys7Ys30Ys	0.60	2.33	0.20	1.51	-0.15	1.49	0.75	0.17	84.1	86.1	-2.1	46%	12.8
2Ys10Ys20Ys	1.28	0.63	1.07	0.18	0.51	0.49	0.16	0.95	-15.1	-13.1	-2.0	30%	14.2
2Ys10Ys30Ys	0.43	1.59	0.41	1.12	0.28	1.03	0.54	0.62	49.6	51.9	-2.3	65%	8.8
2Ys20Ys30Ys	0.79	1.10	0.29	1.27	0.09	1.30	0.57	0.56	35.0	33.6	1.3	71%	6.0
3Ys5Ys7Ys	0.28	0.95	0.30	0.75	0.31	0.75	0.28	0.79	6.1	5.4	0.7	36%	2.6
3Ys5Ys10Ys	0.06	1.34	0.05	0.89	-0.05	0.90	0.57	0.37	12.1	11.2	0.9	24%	3.9
3Ys5Ys20Ys	1.51	0.77	1.46	-0.20	0.96	0.02	0.70	0.28	-11.4	-12.8	1.4	45%	8.2
3Ys5Ys30Ys	0.64	2.10	0.60	0.83	0.48	0.65	0.82	0.23	49.2	49.5	-0.4	41%	7.1
3Ys7Ys10Ys	0.09	1.28	-0.07	1.03	-0.17	0.97	0.68	0.26	6.7	6.4	0.3	28%	4.3
3Ys7Ys20Ys	1.42	0.78	1.80	-0.46	1.11	-0.15	0.83	0.14	-30.4	-32.0	1.6	55%	11.6
3Ys7Ys30Ys	0.64	2.05	0.61	0.96	0.42	0.71	0.87	0.16	51.2	52.3	-1.1	43%	9.1
3Ys10Ys20Ys	1.00	0.62	1.29	0.01	0.92	0.21	0.20	0.95	-15.6	-15.4	-0.2	49%	9.8
3Ys10Ys30Ys	0.41	1.50	0.62	0.88	0.57	0.73	0.63	0.66	37.5	38.9	-1.4	69%	6.9
3Ys20Ys30Ys	0.62	1.18	0.30	1.28	0.29	1.08	0.67	0.60	37.6	35.9	1.7	72%	6.5
5Ys7Ys10Ys	-0.04	1.39	0.98	0.07	1.16	-0.18	1.19	-0.18	-6.2	-5.6	-0.6	21%	3.2
5Ys7Ys20Ys	0.90	0.22	1.17	-0.13	1.11	-0.15	1.14	-0.16	-13.1	-12.8	-0.4	82%	3.3
5Ys7Ys30Ys	0.78	0.64	1.08	-0.03	1.07	-0.15	1.04	-0.09	-8.9	-8.2	-0.6	66%	3.4
5Ys10Ys20Ys	0.68	0.16	0.88	0.26	0.89	0.27	0.57	0.65	-1.0	0.5	-1.6	63%	4.5
5Ys10Ys30Ys	0.59	0.45	0.73	0.59	0.79	0.49	0.79	0.50	22.9	24.4	-1.5	81%	4.2
5Ys20Ys30Ys	-0.25	2.65	-0.13	1.79	0.02	1.41	0.80	0.51	67.5	66.5	1.0	79%	11.0
7Ys10Ys20Ys	0.70	0.19	0.75	0.38	0.77	0.44	0.48	0.78	10.2	11.6	-1.3	61%	4.0
7Ys10Ys30Ys	0.58	0.55	0.63	0.72	0.66	0.72	0.76	0.60	36.0	37.2	-1.2	84%	4.4
7Ys20Ys30Ys	-0.16	2.46	-0.16	1.81	0.03	1.40	0.78	0.62	66.9	66.1	0.8	84%	11.2
10Ys20Ys30Ys	-0.23	2.52	-0.25	2.00	-0.04	1.50	0.92	0.12	75.9	75.4	0.5	74%	11.9

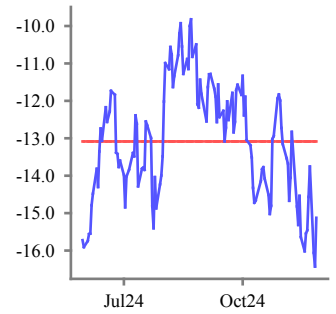
(10Y SSS - 0.41*2Y SSS- 1.12*30Y SSS) vs. 6M Avg; bp



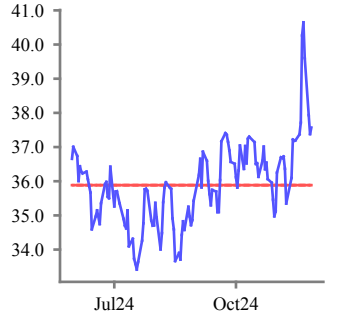
(7Y SSS - 0.2*2Y SSS- 1.51*30Y SSS) vs. 6M Avg; bp



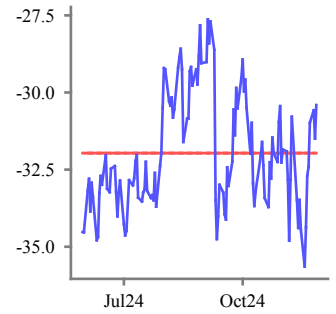
(10Y SSS - 1.07*2Y SSS- 0.18*20Y SSS) vs. 6M Avg; bp



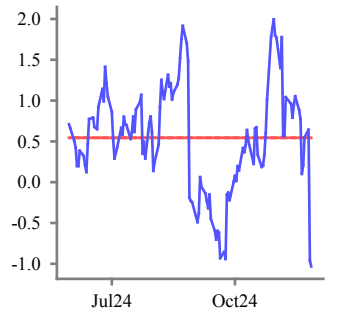
(20Y SSS - 0.3*3Y SSS- 1.28*30Y SSS) vs. 6M Avg; bp



(7Y SSS - 1.8*3Y SSS- -0.46*20Y SSS) vs. 6M Avg; bp



(10Y SSS - 0.88*5Y SSS- 0.26*20Y SSS) vs. 6M Avg; bp



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-beta_curve)/(1-beta_level) and right weight = (0.5+beta_curve)/(1-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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SOFR Swap Spreads Auction Cycle Report

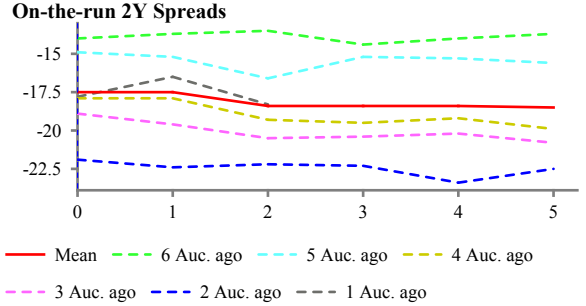
On-the-run 2Y Spreads	0	1	2	3	4	5
Mean	-17.5	-17.5	-18.4	-18.4	-18.4	-18.5
6. Auc Day 2024-06-25: T 4.625% Jun 20 2026	-14.0	-13.7	-13.5	-14.4	-14.0	-13.7
5. Auc Day 2024-07-23: T 4.375% Jul 20 2026	-14.9	-15.2	-16.6	-15.2	-15.3	-15.6
4. Auc Day 2024-08-27: T 3.75% Aug 20 2026	-17.9	-17.9	-19.3	-19.5	-19.2	-19.9
3. Auc Day 2024-09-24: T 3.5% Sep 20 2026	-18.9	-19.6	-20.5	-20.4	-20.2	-20.8
2. Auc Day 2024-10-28: T 4.125% Oct 20 2026	-21.9	-22.4	-22.2	-22.3	-23.4	-22.5
1. Auc Day 2024-11-25: T 4.25% Nov 20 2026	-17.8	-16.5	-18.3			

Off-the-run 2Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-17.5	-17.4	-18.0	-18.3	-18.7	-18.5	-18.6	-19.4	-18.9	-19.2	-19.2
6. Auc Day 2024-06-25: T 4.875% May 20 2026	-14.6	-14.2	-14.6	-15.0	-15.6	-15.4	-15.2	-14.9	-15.3	-15.5	-15.0
5. Auc Day 2024-07-23: T 4.625% Jun 20 2026	-16.0	-15.7	-16.7	-16.9	-16.6	-16.1	-16.1	-17.7	-16.0	-16.2	-16.3
4. Auc Day 2024-08-27: T 4.375% Jul 20 2026	-18.4	-19.0	-19.3	-18.4	-19.1	-19.3	-19.3	-20.6	-20.3	-19.9	-20.9
3. Auc Day 2024-09-24: T 3.75% Aug 20 2026	-18.6	-18.3	-19.5	-19.1	-19.6	-20.2	-20.7	-21.6	-20.6	-20.6	-21.1
2. Auc Day 2024-10-28: T 3.5% Sep 20 2026	-18.0	-17.8	-18.0	-20.0	-20.1	-21.1	-21.9	-21.8	-22.0	-23.5	-22.4
1. Auc Day 2024-11-25: T 4.125% Oct 20 2026	-19.5	-19.6	-19.7	-20.7	-21.2	-18.8	-18.0	-19.9			

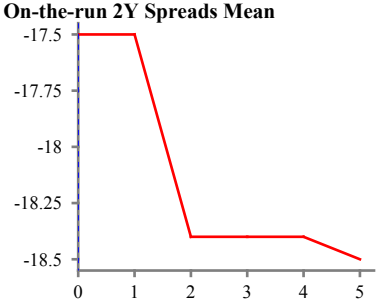
Double Olds 2Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-18.3	-18.3	-18.8	-18.9	-19.0	-18.8	-18.9	-19.6	-19.1	-19.2	-19.3
6. Auc Day 2024-06-25: T 4.875% Apr 20 2026	-14.7	-14.1	-14.4	-14.7	-15.2	-15.0	-14.7	-14.4	-14.9	-14.9	-14.6
5. Auc Day 2024-07-23: T 4.875% May 20 2026	-17.1	-16.7	-17.8	-17.9	-17.4	-16.9	-17.2	-18.3	-16.6	-16.8	-16.7
4. Auc Day 2024-08-27: T 4.625% Jun 20 2026	-19.3	-19.7	-20.3	-19.4	-20.0	-20.2	-20.1	-21.5	-20.9	-20.6	-21.5
3. Auc Day 2024-09-24: T 4.375% Jul 20 2026	-18.9	-18.8	-19.4	-18.9	-19.4	-20.0	-20.5	-21.3	-20.7	-20.2	-20.6
2. Auc Day 2024-10-28: T 3.75% Aug 20 2026	-19.5	-20.0	-20.6	-21.3	-20.7	-22.0	-22.8	-22.2	-22.3	-23.7	-23.1
1. Auc Day 2024-11-25: T 3.5% Sep 20 2026	-20.2	-20.4	-20.4	-21.2	-21.4	-19.0	-17.9	-19.6			

Triple Olds 2Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-18.4	-18.2	-18.8	-18.8	-18.9	-18.8	-18.6	-19.3	-18.9	-19.2	-19.1
6. Auc Day 2024-06-25: T 4.5% Mar 20 2026	-14.4	-13.8	-14.3	-14.9	-15.0	-14.8	-14.3	-14.1	-14.8	-15.3	-14.7
5. Auc Day 2024-07-23: T 4.875% Apr 20 2026	-17.3	-16.6	-17.6	-17.7	-16.8	-16.3	-16.3	-17.5	-15.9	-16.3	-16.4
4. Auc Day 2024-08-27: T 4.875% May 20 2026	-19.2	-19.9	-20.4	-19.6	-20.3	-20.6	-20.4	-21.2	-21.1	-20.6	-21.2
3. Auc Day 2024-09-24: T 4.625% Jun 20 2026	-19.1	-18.5	-19.5	-18.9	-19.4	-19.9	-20.4	-21.2	-20.4	-20.2	-20.7
2. Auc Day 2024-10-28: T 4.375% Jul 20 2026	-19.2	-19.8	-19.9	-20.6	-20.2	-21.5	-22.1	-21.9	-22.3	-23.7	-22.7
1. Auc Day 2024-11-25: T 3.75% Aug 20 2026	-21.1	-20.7	-21.0	-21.4	-21.5	-19.6	-18.3	-19.7			

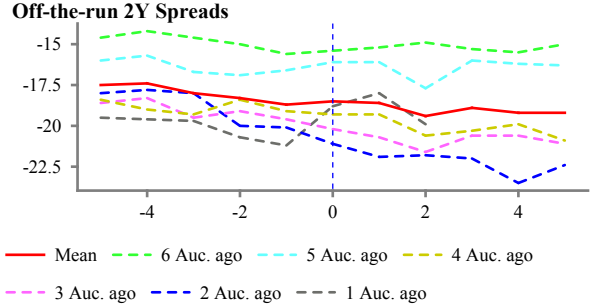
On-the-run 2Y Spreads



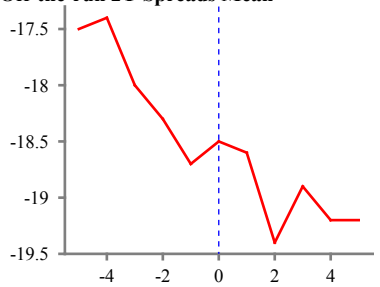
On-the-run 2Y Spreads Mean



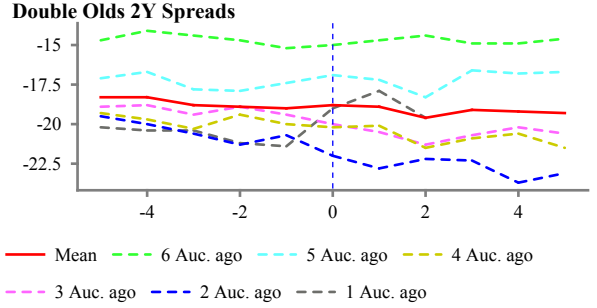
Off-the-run 2Y Spreads



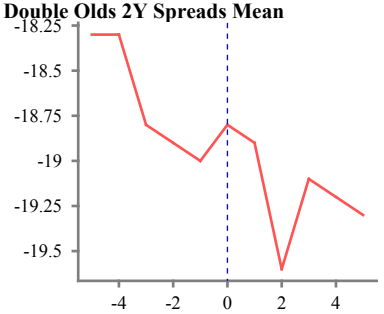
Off-the-run 2Y Spreads Mean



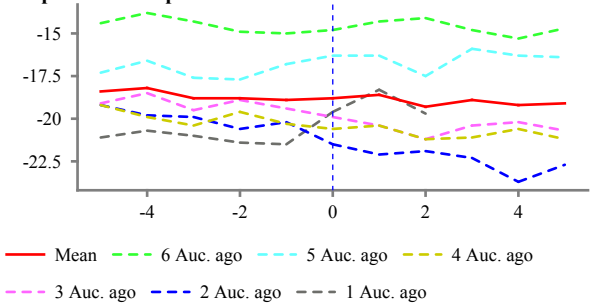
Double Olds 2Y Spreads



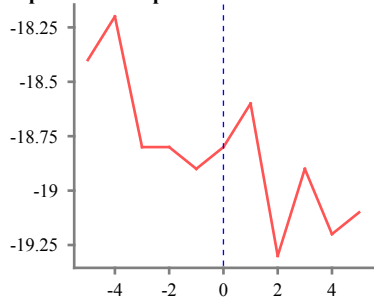
Double Olds 2Y Spreads Mean



Triple Olds 2Y Spreads



Triple Olds 2Y Spreads Mean



* SOFR Swap Spreads are cycled around auction days, while holding the bond fixed after the auction. The data (and mean of the data) are from the most recent 6 auctions, and are cycled 5 business days around auction day. On the run, off the run, double old, and triple old refer to the issue after the auction has already been cleared. Therefore, the on the run SOFR swap spread cycled around auction will use the latest on the run issue and check behavior on and the days after the auction (nothing before auction as it has not been issued yet). The off the run SOFR swap spread will hold the current off the run fixed after the most recent auction. The same logic applies to the current double old and triple old. The analysis is run on the 2Y, 3Y, 5Y, 7Y, 10Y, 20Y and 30Y sectors. The legend indicates both the date of the auction that spread was cycled around and the issue that was used to get the swap spread.

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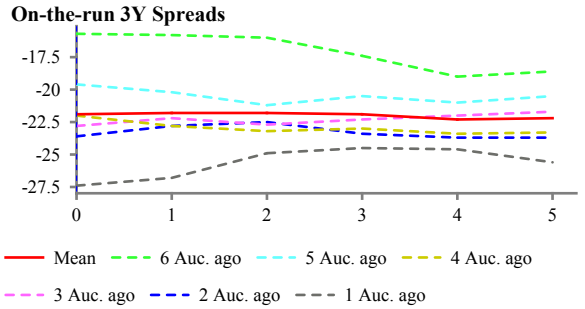
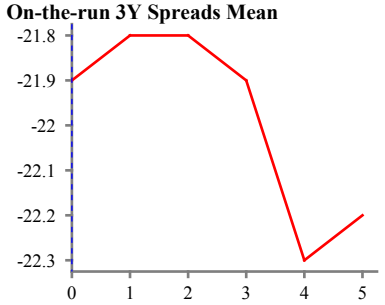
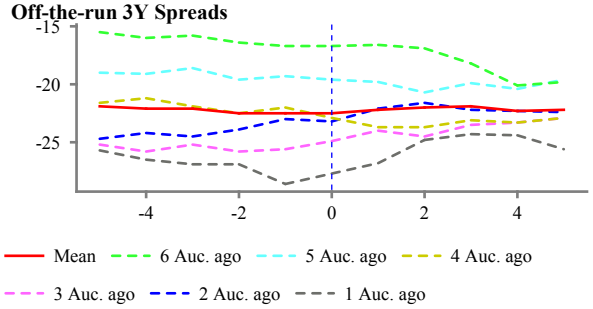
SOFR Swap Spreads Auction Cycle Report

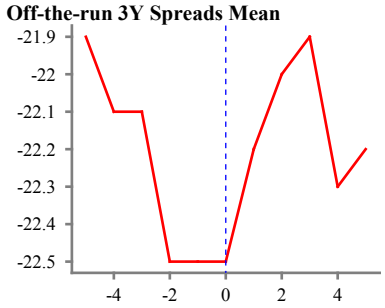
On-the-run 3Y Spreads	0	1	2	3	4	5
Mean	-21.9	-21.8	-21.8	-21.9	-22.3	-22.2
6. Auc Day 2024-06-10: T 4.625% Jun 20 2027	-15.7	-15.8	-16.0	-17.4	-19.0	-18.6
5. Auc Day 2024-07-09: T 4.375% Jul 20 2027	-19.6	-20.2	-21.2	-20.5	-21.0	-20.5
4. Auc Day 2024-08-06: T 3.75% Aug 20 2027	-22.0	-22.8	-23.2	-23.0	-23.4	-23.3
3. Auc Day 2024-09-10: T 3.375% Sep 20 2027	-22.8	-22.2	-22.7	-22.3	-22.0	-21.7
2. Auc Day 2024-10-08: T 3.875% Oct 20 2027	-23.6	-22.8	-22.5	-23.4	-23.7	-23.7
1. Auc Day 2024-11-04: T 4.125% Nov 20 2027	-27.4	-26.8	-24.9	-24.5	-24.6	-25.6



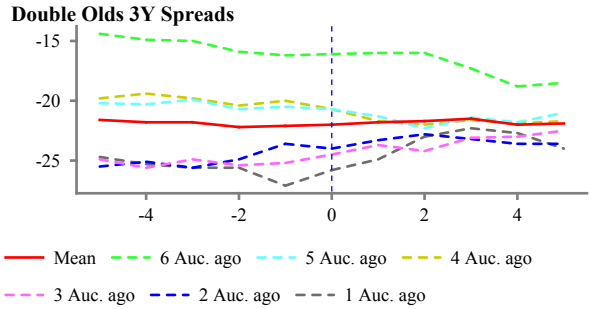


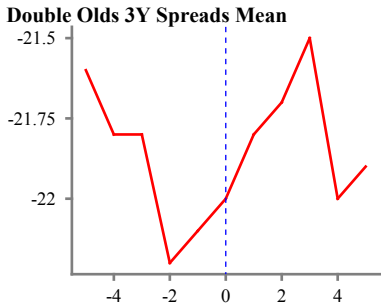
Off-the-run 3Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-21.9	-22.1	-22.1	-22.5	-22.5	-22.5	-22.2	-22.0	-21.9	-22.3	-22.2
6. Auc Day 2024-06-10: T 4.5% May 20 2027	-15.5	-16.0	-15.8	-16.4	-16.7	-16.7	-16.6	-16.9	-18.2	-20.1	-19.8
5. Auc Day 2024-07-09: T 4.625% Jun 20 2027	-19.0	-19.1	-18.6	-19.6	-19.3	-19.6	-19.8	-20.7	-19.9	-20.4	-19.6
4. Auc Day 2024-08-06: T 4.375% Jul 20 2027	-21.6	-21.2	-21.9	-22.5	-22.0	-22.9	-23.7	-23.7	-23.1	-23.3	-22.9
3. Auc Day 2024-09-10: T 3.75% Aug 20 2027	-25.2	-25.8	-25.2	-25.8	-25.6	-24.9	-24.0	-24.5	-23.5	-23.3	-22.9
2. Auc Day 2024-10-08: T 3.375% Sep 20 2027	-24.7	-24.2	-24.5	-23.9	-23.0	-23.2	-22.1	-21.6	-22.2	-22.3	-22.4
1. Auc Day 2024-11-04: T 3.875% Oct 20 2027	-25.7	-26.5	-26.9	-26.9	-28.6	-27.7	-26.8	-24.8	-24.3	-24.4	-25.6



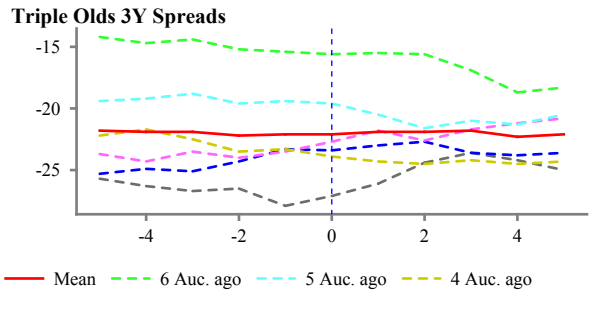


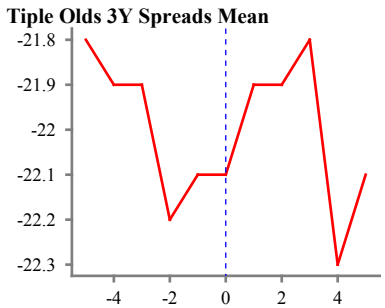
Double Olds 3Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-21.6	-21.8	-21.8	-22.2	-22.1	-22.0	-21.8	-21.7	-21.5	-22.0	-21.9
6. Auc Day 2024-06-10: T 4.5% Apr 20 2027	-14.4	-14.9	-15.0	-15.9	-16.2	-16.1	-16.0	-16.0	-17.3	-18.8	-18.5
5. Auc Day 2024-07-09: T 4.5% May 20 2027	-20.2	-20.3	-19.9	-20.7	-20.5	-20.7	-21.3	-22.3	-21.4	-21.8	-21.0
4. Auc Day 2024-08-06: T 4.625% Jun 20 2027	-19.8	-19.4	-19.8	-20.4	-20.0	-20.7	-21.7	-22.0	-21.6	-21.9	-21.7
3. Auc Day 2024-09-10: T 4.375% Jul 20 2027	-24.9	-25.6	-24.9	-25.4	-25.2	-24.5	-23.7	-24.2	-23.1	-23.0	-22.5
2. Auc Day 2024-10-08: T 3.75% Aug 20 2027	-25.5	-25.1	-25.6	-24.9	-23.6	-24.0	-23.3	-22.8	-23.2	-23.6	-23.6
1. Auc Day 2024-11-04: T 3.375% Sep 20 2027	-24.7	-25.3	-25.6	-25.6	-27.1	-25.8	-24.9	-23.0	-22.3	-22.7	-24.0





Triple Olds 3Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-21.8	-21.9	-21.9	-22.2	-22.1	-22.1	-21.9	-21.9	-21.8	-22.3	-22.1
6. Auc Day 2024-06-10: T 4.25% Mar 20 2027	-14.2	-14.7	-14.4	-15.2	-15.4	-15.6	-15.5	-15.6	-16.9	-18.7	-18.3
5. Auc Day 2024-07-09: T 4.5% Apr 20 2027	-19.4	-19.2	-18.8	-19.6	-19.4	-19.6	-20.5	-21.6	-21.0	-21.3	-20.5
4. Auc Day 2024-08-06: T 4.5% May 20 2027	-22.2	-21.7	-22.5	-23.5	-23.3	-23.9	-24.3	-24.5	-24.2	-24.5	-24.3
3. Auc Day 2024-09-10: T 4.625% Jun 20 2027	-23.7	-24.3	-23.5	-24.0	-23.5	-22.7	-21.8	-22.6	-21.7	-21.2	-20.8
2. Auc Day 2024-10-08: T 4.375% Jul 20 2027	-25.3	-24.9	-25.1	-24.3	-23.3	-23.4	-23.0	-22.7	-23.6	-23.8	-23.6
1. Auc Day 2024-11-04: T 3.75% Aug 20 2027	-25.7	-26.3	-26.7	-26.5	-27.9	-27.1	-26.1	-24.4	-23.6	-24.2	-25.0





* SOFR Swap Spreads are cycled around auction days, while holding the bond fixed after the auction. The data (and mean of the data) are from the most recent 6 auctions, and are cycled 5 business days around auction day. On the run, off the run, double old, and triple old refer to the issue after the auction has already been cleared. Therefore, the on the run SOFR swap spread cycled around auction will use the latest on the run issue and check behavior on and the days after the auction (nothing before auction as it has not been issued yet). The off the run SOFR swap spread will hold the current off the run fixed after the most recent auction. The same logic applies to the current double old and triple old. The analysis is run on the 2Y, 3Y, 5Y, 7Y, 10Y, 20Y and 30Y sectors. The legend indicates both the date of the auction that spread was cycled around and the issue that was used to get the swap spread.

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Derivatives Strategy

SOFR Swap Spreads Auction Cycle Report

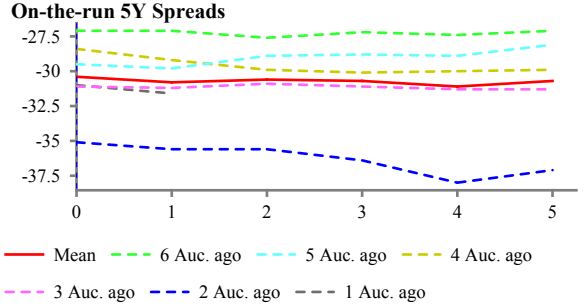
On-the-run 5Y Spreads	0	1	2	3	4	5
Mean	-30.4	-30.8	-30.6	-30.7	-31.1	-30.7
6. Auc Day 2024-06-26: T 4.25% Jun 20 2029	-27.1	-27.1	-27.6	-27.2	-27.4	-27.1
5. Auc Day 2024-07-24: T 4.0% Jul 20 2029	-29.5	-29.8	-28.9	-28.8	-28.9	-28.1
4. Auc Day 2024-08-28: T 3.625% Aug 20 2029	-28.4	-29.2	-29.9	-30.1	-30.0	-29.9
3. Auc Day 2024-09-25: T 3.5% Sep 20 2029	-31.1	-31.2	-30.9	-31.1	-31.3	-31.3
2. Auc Day 2024-10-28: T 4.125% Oct 20 2029	-35.1	-35.6	-35.6	-36.4	-38.0	-37.1
1. Auc Day 2024-11-26: T 4.125% Nov 20 2029	-31.0	-31.6				

Off-the-run 5Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-30.1	-30.2	-30.4	-30.7	-30.6	-30.8	-31.2	-30.7	-30.8	-31.3	-30.8
6. Auc Day 2024-06-26: T 4.5% May 20 2029	-26.0	-26.1	-26.4	-27.4	-27.0	-26.8	-26.5	-26.8	-26.5	-26.7	-26.4
5. Auc Day 2024-07-24: T 4.25% Jun 20 2029	-29.0	-28.6	-29.1	-29.3	-29.4	-30.3	-30.6	-29.6	-29.4	-29.5	-28.7
4. Auc Day 2024-08-28: T 4.0% Jul 20 2029	-29.3	-29.7	-30.0	-30.3	-30.3	-30.5	-31.2	-31.4	-31.6	-31.5	-31.4
3. Auc Day 2024-09-25: T 3.625% Aug 20 2029	-29.2	-29.8	-29.7	-29.6	-29.7	-30.4	-30.5	-29.8	-30.2	-30.3	-30.3
2. Auc Day 2024-10-28: T 3.5% Sep 20 2029	-31.7	-32.1	-32.2	-32.8	-33.3	-34.7	-35.6	-35.7	-36.5	-38.3	-37.4
1. Auc Day 2024-11-26: T 4.125% Oct 20 2029	-35.3	-34.8	-35.1	-35.1	-33.8	-32.1	-32.6				

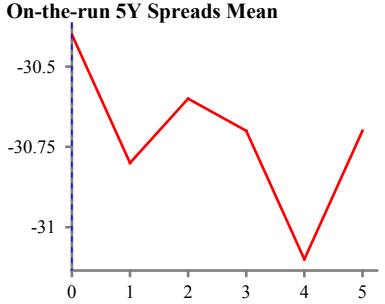
Double Olds 5Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-30.4	-30.5	-30.7	-31.0	-30.8	-31.0	-31.3	-30.8	-31.0	-31.3	-30.9
6. Auc Day 2024-06-26: T 4.625% Apr 20 2029	-27.1	-27.0	-27.5	-28.5	-28.0	-27.6	-27.4	-27.7	-27.5	-27.5	-27.1
5. Auc Day 2024-07-24: T 4.5% May 20 2029	-28.0	-27.7	-28.1	-28.2	-28.4	-29.4	-29.5	-28.3	-28.2	-28.3	-27.6
4. Auc Day 2024-08-28: T 4.25% Jun 20 2029	-30.1	-30.3	-30.6	-30.9	-31.0	-31.2	-32.0	-32.2	-32.3	-32.1	-31.8
3. Auc Day 2024-09-25: T 4.0% Jul 20 2029	-30.2	-30.9	-30.8	-30.4	-30.6	-31.3	-31.4	-31.0	-31.3	-31.4	-31.5
2. Auc Day 2024-10-28: T 3.625% Aug 20 2029	-31.3	-31.5	-31.7	-32.5	-32.8	-34.3	-34.6	-34.8	-35.7	-37.2	-36.5
1. Auc Day 2024-11-26: T 3.5% Sep 20 2029	-35.9	-35.3	-35.4	-35.5	-34.0	-32.5	-33.0				

Triple Olds 5Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-30.3	-30.4	-30.6	-31.0	-30.9	-31.1	-31.4	-31.0	-31.2	-31.4	-31.0
6. Auc Day 2024-06-26: T 4.125% Mar 20 2029	-26.8	-26.9	-27.2	-28.3	-27.9	-27.5	-27.3	-27.6	-27.5	-27.4	-27.1
5. Auc Day 2024-07-24: T 4.625% Apr 20 2029	-28.9	-28.5	-29.0	-29.1	-29.3	-30.2	-30.5	-29.3	-29.1	-29.0	-28.4
4. Auc Day 2024-08-28: T 4.5% May 20 2029	-28.5	-28.8	-29.1	-29.5	-29.6	-29.7	-30.7	-31.1	-30.9	-30.7	-30.4
3. Auc Day 2024-09-25: T 4.25% Jun 20 2029	-30.6	-31.2	-31.2	-31.0	-31.1	-31.9	-31.9	-31.6	-31.9	-31.8	-31.7
2. Auc Day 2024-10-28: T 4.0% Jul 20 2029	-32.3	-32.6	-32.8	-33.5	-33.8	-35.2	-35.6	-35.8	-36.5	-38.3	-37.3
1. Auc Day 2024-11-26: T 3.625% Aug 20 2029	-34.5	-34.1	-34.5	-34.6	-33.4	-31.8	-32.2				

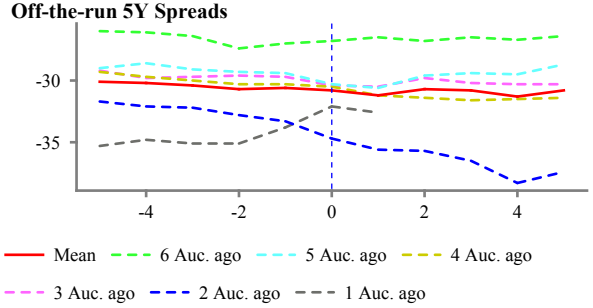
On-the-run 5Y Spreads



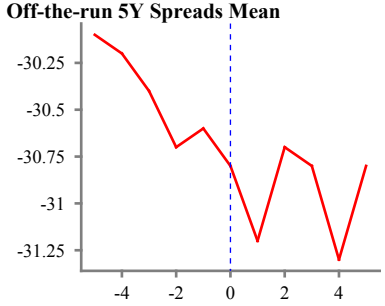
On-the-run 5Y Spreads Mean



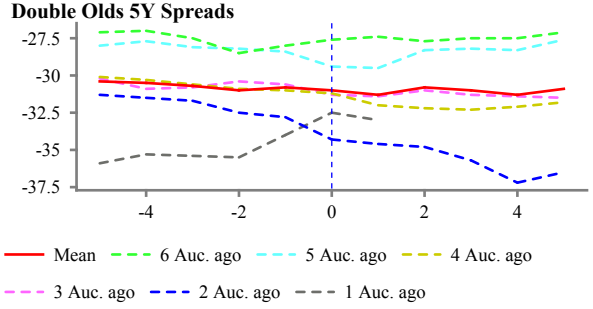
Off-the-run 5Y Spreads



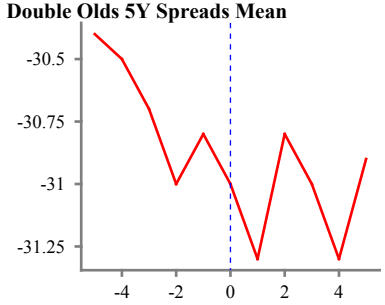
Off-the-run 5Y Spreads Mean



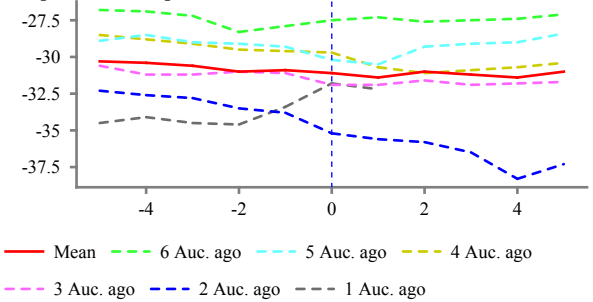
Double Olds 5Y Spreads



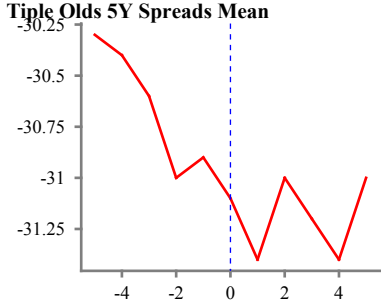
Double Olds 5Y Spreads Mean



Triple Olds 5Y Spreads



Tiple Olds 5Y Spreads Mean



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SOFR Swap Spreads Auction Cycle Report

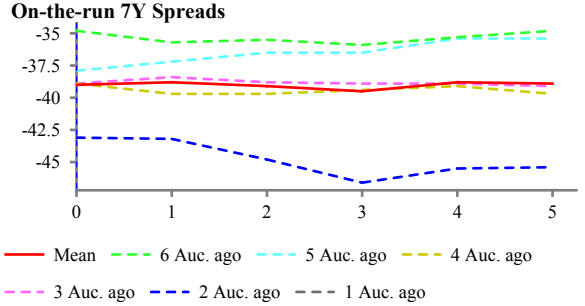
On-the-run 7Y Spreads	0	1	2	3	4	5
Mean	-39.0	-38.8	-39.1	-39.5	-38.8	-38.9
6. Auc Day 2024-06-27: T 4.25% Jun 20 2031	-34.8	-35.7	-35.5	-35.9	-35.3	-34.8
5. Auc Day 2024-07-25: T 4.125% Jul 20 2031	-37.9	-37.2	-36.5	-36.5	-35.4	-35.4
4. Auc Day 2024-08-29: T 3.75% Aug 20 2031	-38.9	-39.7	-39.7	-39.4	-39.1	-39.7
3. Auc Day 2024-09-26: T 3.625% Sep 20 2031	-38.9	-38.4	-38.8	-38.9	-38.9	-39.1
2. Auc Day 2024-10-29: T 4.125% Oct 20 2031	-43.1	-43.2	-44.8	-46.6	-45.5	-45.4
1. Auc Day 2024-11-27: T 4.125% Nov 20 2031	-40.7					

Off-the-run 7Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-38.6	-38.8	-39.1	-38.9	-39.2	-39.5	-39.1	-39.4	-39.7	-39.1	-39.2
6. Auc Day 2024-06-27: T 4.625% May 20 2031	-34.7	-35.0	-35.9	-35.5	-35.6	-35.5	-36.1	-36.0	-36.3	-35.6	-35.2
5. Auc Day 2024-07-25: T 4.25% Jun 20 2031	-36.5	-37.0	-37.2	-37.2	-38.1	-38.0	-37.2	-36.5	-36.4	-35.3	-35.3
4. Auc Day 2024-08-29: T 4.125% Jul 20 2031	-36.9	-37.2	-37.7	-38.5	-38.3	-39.2	-39.7	-39.5	-39.3	-38.9	-39.6
3. Auc Day 2024-09-26: T 3.75% Aug 20 2031	-39.2	-38.8	-39.0	-38.9	-39.4	-39.6	-38.9	-39.5	-39.5	-39.6	-39.9
2. Auc Day 2024-10-29: T 3.625% Sep 20 2031	-40.8	-40.9	-41.5	-41.9	-43.2	-43.7	-43.8	-45.4	-47.2	-46.2	-45.9
1. Auc Day 2024-11-27: T 4.125% Oct 20 2031	-43.5	-43.7	-43.0	-41.4	-40.3	-40.8					

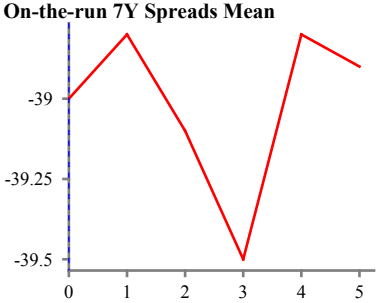
Double Olds 7Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-38.6	-38.8	-39.1	-38.9	-39.2	-39.4	-39.1	-39.3	-39.8	-39.0	-39.2
6. Auc Day 2024-06-27: T 4.625% Apr 20 2031	-34.4	-34.7	-35.5	-35.1	-35.3	-35.0	-35.7	-35.7	-36.1	-35.2	-34.8
5. Auc Day 2024-07-25: T 4.625% May 20 2031	-36.9	-37.4	-37.6	-37.6	-38.5	-38.3	-37.5	-36.8	-36.9	-35.7	-35.9
4. Auc Day 2024-08-29: T 4.25% Jun 20 2031	-36.6	-36.9	-37.4	-38.3	-38.1	-38.9	-39.3	-39.2	-39.0	-38.6	-39.3
3. Auc Day 2024-09-26: T 4.125% Jul 20 2031	-38.9	-38.5	-38.6	-38.6	-39.1	-39.4	-38.7	-39.1	-39.4	-39.2	-39.6
2. Auc Day 2024-10-29: T 3.75% Aug 20 2031	-41.1	-41.1	-41.8	-42.3	-43.6	-43.9	-44.2	-45.7	-47.5	-46.4	-46.3
1. Auc Day 2024-11-27: T 3.625% Sep 20 2031	-43.7	-44.0	-43.4	-41.7	-40.5	-41.0					

Triple Olds 7Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-38.7	-38.8	-39.1	-39.0	-39.2	-39.5	-39.0	-39.3	-39.7	-39.1	-39.1
6. Auc Day 2024-06-27: T 4.125% Mar 20 2031	-34.2	-34.7	-35.7	-35.3	-35.3	-35.2	-35.6	-35.7	-36.1	-35.4	-34.9
5. Auc Day 2024-07-25: T 4.625% Apr 20 2031	-36.4	-36.9	-37.1	-37.1	-38.1	-38.0	-37.1	-36.4	-36.3	-35.3	-35.4
4. Auc Day 2024-08-29: T 4.625% May 20 2031	-37.8	-38.1	-38.5	-39.4	-39.0	-39.8	-40.1	-39.9	-39.6	-39.3	-40.0
3. Auc Day 2024-09-26: T 4.25% Jun 20 2031	-38.6	-38.1	-38.1	-38.1	-38.8	-38.9	-38.4	-39.0	-38.9	-38.9	-39.4
2. Auc Day 2024-10-29: T 4.125% Jul 20 2031	-40.9	-40.9	-41.7	-42.0	-43.4	-43.9	-43.9	-45.5	-47.4	-46.3	-45.8
1. Auc Day 2024-11-27: T 3.75% Aug 20 2031	-44.1	-44.2	-43.6	-42.0	-40.8	-41.3					

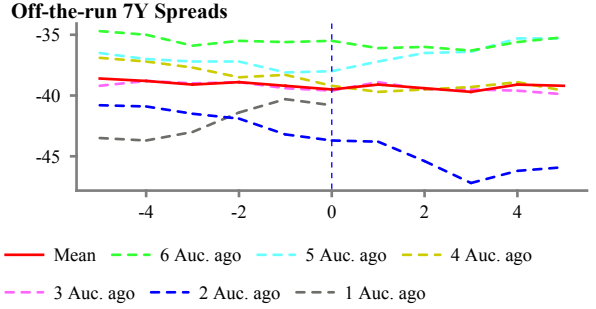
On-the-run 7Y Spreads



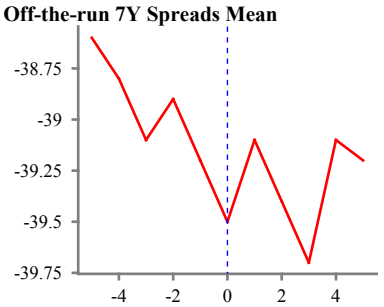
On-the-run 7Y Spreads Mean



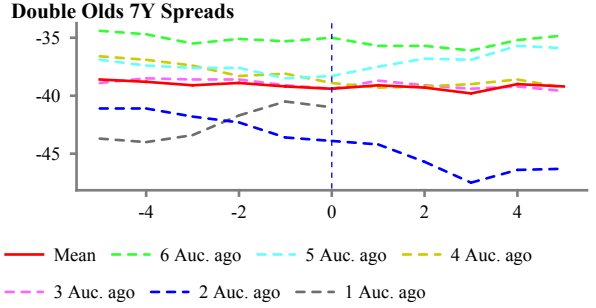
Off-the-run 7Y Spreads



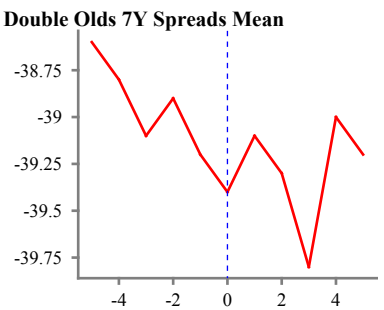
Off-the-run 7Y Spreads Mean



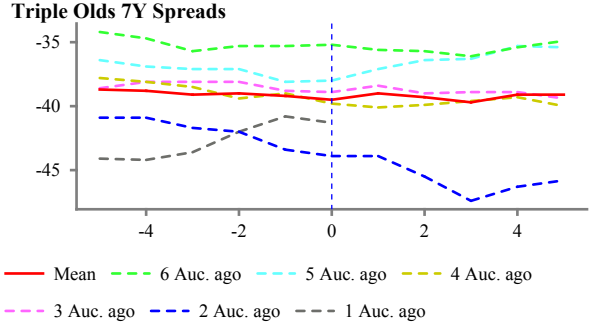
Double Olds 7Y Spreads



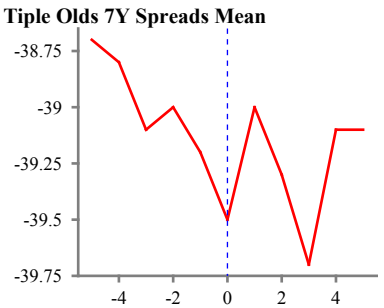
Double Olds 7Y Spreads Mean



Triple Olds 7Y Spreads



Tiple Olds 7Y Spreads Mean



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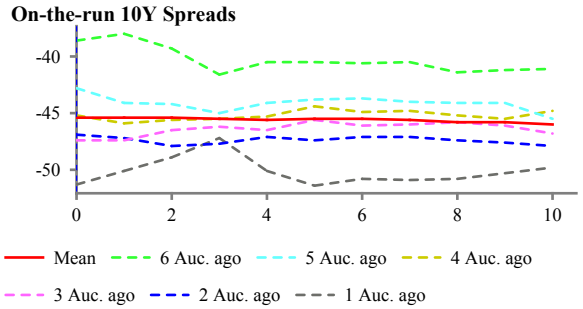
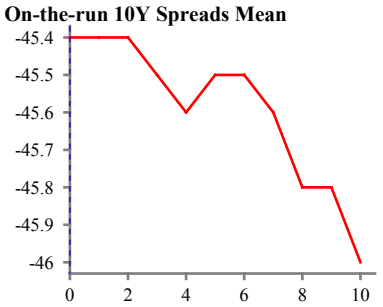
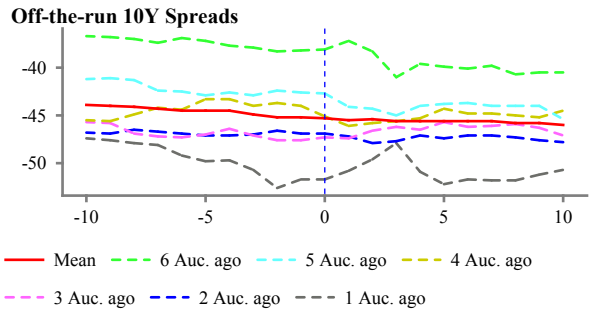
SOFR Swap Spreads Auction Cycle Report

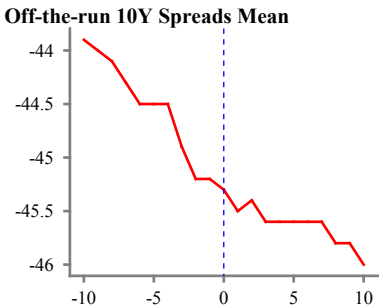
On-the-run 10Y Spreads	0	1	2	3	4	5
Mean	-45.4	-45.4	-45.4	-45.5	-45.6	-45.5
6. Auc Day 2024-06-11: T 3.875% Aug 20 2033	-38.6	-38.0	-39.3	-41.6	-40.5	-40.5
5. Auc Day 2024-07-10: T 4.5% Nov 20 2033	-42.8	-44.1	-44.2	-45.0	-44.1	-43.8
4. Auc Day 2024-08-07: T 4.0% Feb 20 2034	-45.2	-45.9	-45.6	-45.5	-45.3	-44.4
3. Auc Day 2024-09-11: T 4.375% May 20 2034	-47.4	-47.4	-46.5	-46.2	-46.5	-45.6
2. Auc Day 2024-10-09: T 3.875% Aug 20 2034	-46.9	-47.2	-47.9	-47.7	-47.1	-47.4
1. Auc Day 2024-11-05: T 4.25% Nov 20 2034	-51.3	-50.1	-48.9	-47.2	-50.1	-51.4



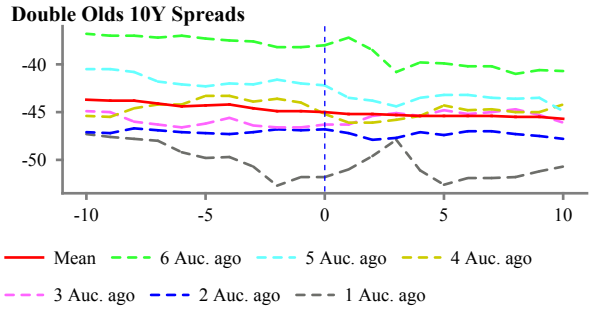


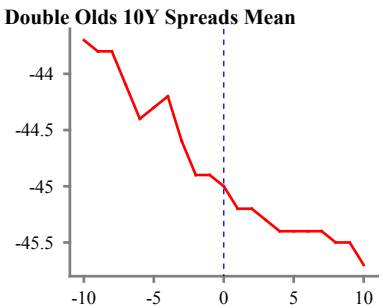
Off-the-run 10Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-44.5	-44.5	-44.9	-45.2	-45.2	-45.3	-45.5	-45.4	-45.6	-45.6	-45.6
6. Auc Day 2024-06-11: T 3.375% May 20 2033	-37.2	-37.7	-37.9	-38.3	-38.2	-38.1	-37.2	-38.3	-41.0	-39.6	-39.9
5. Auc Day 2024-07-10: T 3.875% Aug 20 2033	-42.9	-42.6	-42.9	-42.4	-42.6	-42.7	-44.1	-44.3	-45.0	-44.0	-43.8
4. Auc Day 2024-08-07: T 4.5% Nov 20 2033	-43.3	-43.3	-44.0	-43.7	-44.0	-45.1	-46.1	-45.8	-45.6	-45.3	-44.3
3. Auc Day 2024-09-11: T 4.0% Feb 20 2034	-47.0	-46.4	-47.1	-47.6	-47.6	-47.3	-47.4	-46.6	-46.2	-46.5	-45.7
2. Auc Day 2024-10-09: T 4.375% May 20 2034	-47.1	-47.1	-47.0	-46.6	-46.9	-46.9	-47.2	-47.9	-47.7	-47.1	-47.4
1. Auc Day 2024-11-05: T 3.875% Aug 20 2034	-49.8	-49.7	-50.7	-52.6	-51.7	-51.7	-50.8	-49.6	-47.9	-50.9	-52.2



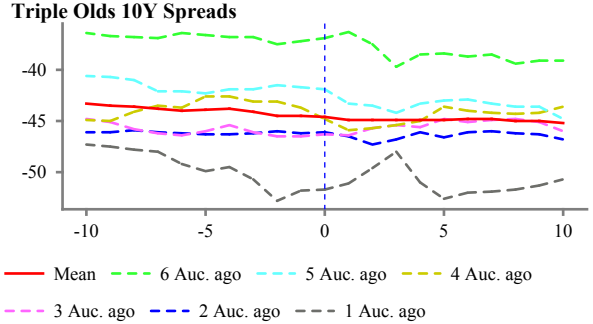


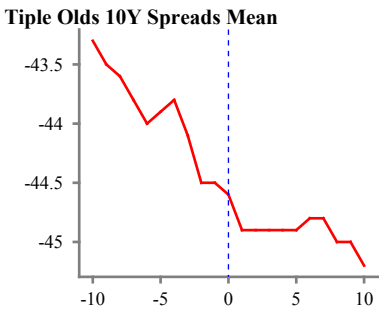
Double Olds 10Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-44.3	-44.2	-44.6	-44.9	-44.9	-45.0	-45.2	-45.2	-45.3	-45.4	-45.4
6. Auc Day 2024-06-11: T 3.5% Feb 20 2033	-37.3	-37.5	-37.6	-38.2	-38.2	-38.0	-37.2	-38.5	-40.8	-39.8	-39.9
5. Auc Day 2024-07-10: T 3.375% May 20 2033	-42.3	-42.0	-42.1	-41.6	-42.0	-42.2	-43.5	-43.8	-44.4	-43.5	-43.2
4. Auc Day 2024-08-07: T 3.875% Aug 20 2033	-43.3	-43.3	-43.9	-43.6	-44.0	-45.2	-46.1	-46.1	-45.8	-45.4	-44.3
3. Auc Day 2024-09-11: T 4.5% Nov 20 2033	-46.2	-45.6	-46.4	-46.6	-46.6	-46.3	-46.3	-45.4	-45.1	-45.4	-44.8
2. Auc Day 2024-10-09: T 4.0% Feb 20 2034	-47.2	-47.3	-47.1	-46.8	-46.9	-46.8	-47.2	-47.9	-47.7	-47.1	-47.4
1. Auc Day 2024-11-05: T 4.375% May 20 2034	-49.8	-49.7	-50.7	-52.7	-51.8	-51.8	-51.0	-49.6	-47.9	-51.1	-52.6





Triple Olds 10Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-43.9	-43.8	-44.1	-44.5	-44.5	-44.6	-44.9	-44.9	-44.9	-44.9	-44.9
6. Auc Day 2024-06-11: T 4.125% Nov 20 2032	-36.6	-36.8	-36.8	-37.5	-37.2	-36.9	-36.3	-37.5	-39.7	-38.5	-38.4
5. Auc Day 2024-07-10: T 3.5% Feb 20 2033	-42.3	-41.9	-41.9	-41.5	-41.7	-41.9	-43.3	-43.5	-44.2	-43.3	-43.0
4. Auc Day 2024-08-07: T 3.375% May 20 2033	-42.6	-42.6	-43.1	-43.1	-43.7	-44.8	-45.9	-45.7	-45.4	-45.0	-43.6
3. Auc Day 2024-09-11: T 3.875% Aug 20 2033	-46.0	-45.4	-46.1	-46.5	-46.5	-46.3	-46.4	-45.7	-45.4	-45.6	-44.8
2. Auc Day 2024-10-09: T 4.5% Nov 20 2033	-46.3	-46.3	-46.2	-46.0	-46.2	-46.1	-46.5	-47.3	-46.8	-46.1	-46.6
1. Auc Day 2024-11-05: T 4.0% Feb 20 2034	-49.9	-49.5	-50.7	-52.8	-51.8	-51.7	-51.1	-49.6	-48.0	-51.0	-52.6





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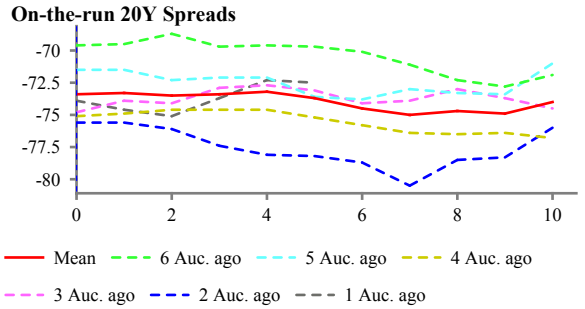
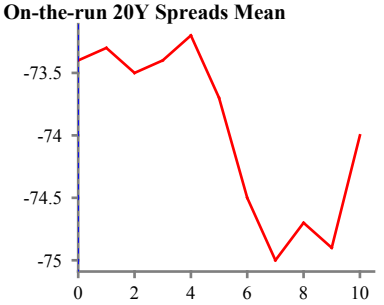
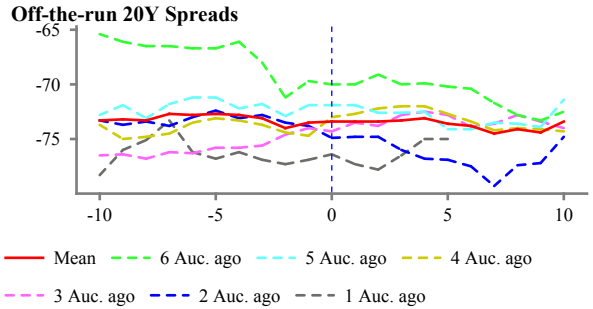
SOFR Swap Spreads Auction Cycle Report

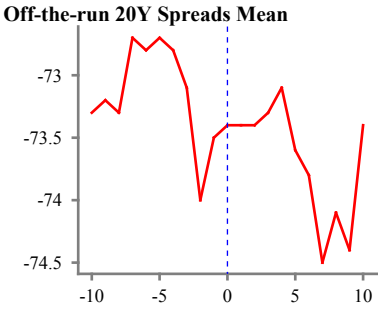
On-the-run 20Y Spreads	0	1	2	3	4	5
Mean	-73.4	-73.3	-73.5	-73.4	-73.2	-73.7
6. Auc Day 2024-06-18: T 4.375% Aug 20 2043	-69.6	-69.5	-68.7	-69.7	-69.6	-69.7
5. Auc Day 2024-07-17: T 4.75% Nov 20 2043	-71.5	-71.5	-72.3	-72.1	-72.1	-73.6
4. Auc Day 2024-08-21: T 4.5% Feb 20 2044	-75.1	-74.9	-74.6	-74.6	-74.6	-75.2
3. Auc Day 2024-09-17: T 4.625% May 20 2044	-74.8	-73.9	-74.1	-72.9	-72.7	-73.1
2. Auc Day 2024-10-23: T 4.125% Aug 20 2044	-75.6	-75.6	-76.1	-77.4	-78.1	-78.2
1. Auc Day 2024-11-20: T 4.625% Nov 20 2044	-73.9	-74.6	-75.1	-73.7	-72.3	-72.5



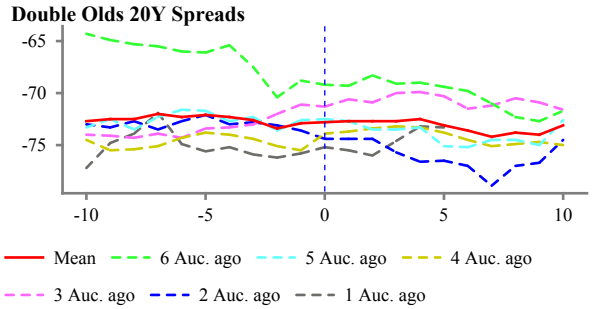


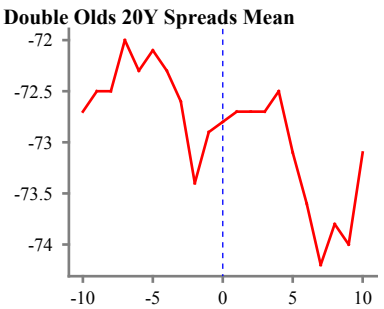
Off-the-run 20Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-72.7	-72.8	-73.1	-74.0	-73.5	-73.4	-73.4	-73.4	-73.3	-73.1	-73.6
6. Auc Day 2024-06-18: T 3.875% May 20 2043	-66.7	-66.1	-68.0	-71.2	-69.7	-70.0	-70.0	-69.1	-70.0	-69.9	-70.2
5. Auc Day 2024-07-17: T 4.375% Aug 20 2043	-71.2	-72.2	-71.8	-72.9	-71.9	-71.9	-71.9	-72.6	-72.6	-72.5	-74.1
4. Auc Day 2024-08-21: T 4.75% Nov 20 2043	-73.1	-73.3	-73.7	-74.4	-74.7	-73.0	-72.7	-72.2	-72.0	-72.0	-72.7
3. Auc Day 2024-09-17: T 4.5% Feb 20 2044	-75.8	-75.8	-75.6	-74.6	-74.0	-74.3	-73.5	-73.8	-72.8	-72.5	-72.8
2. Auc Day 2024-10-23: T 4.625% May 20 2044	-72.4	-73.1	-72.8	-73.5	-73.8	-74.9	-74.8	-74.8	-76.0	-76.8	-76.9
1. Auc Day 2024-11-20: T 4.125% Aug 20 2044	-76.8	-76.2	-76.9	-77.3	-76.9	-76.4	-77.3	-77.8	-76.5	-75.0	-75.0



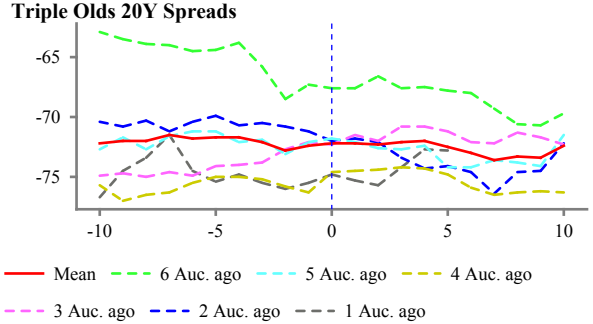


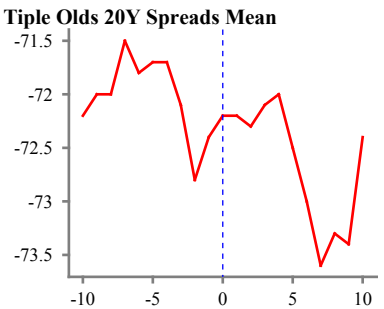
Double Olds 20Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-72.1	-72.3	-72.6	-73.4	-72.9	-72.8	-72.7	-72.7	-72.7	-72.5	-73.1
6. Auc Day 2024-06-18: T 3.875% Feb 20 2043	-66.1	-65.4	-67.5	-70.4	-68.8	-69.2	-69.3	-68.3	-69.1	-69.0	-69.4
5. Auc Day 2024-07-17: T 3.875% May 20 2043	-71.7	-72.7	-72.3	-73.6	-72.6	-72.5	-72.7	-73.5	-73.5	-73.3	-75.1
4. Auc Day 2024-08-21: T 4.375% Aug 20 2043	-73.8	-74.0	-74.4	-75.1	-75.5	-73.9	-73.7	-73.4	-73.2	-73.3	-73.8
3. Auc Day 2024-09-17: T 4.75% Nov 20 2043	-73.4	-73.3	-73.0	-72.0	-71.1	-71.3	-70.6	-70.9	-70.0	-69.9	-70.3
2. Auc Day 2024-10-23: T 4.5% Feb 20 2044	-72.1	-73.0	-72.8	-73.1	-73.6	-74.4	-74.4	-74.4	-75.7	-76.6	-76.5
1. Auc Day 2024-11-20: T 4.625% May 20 2044	-75.6	-75.2	-75.9	-76.2	-75.8	-75.2	-75.5	-76.0	-74.6	-73.2	-73.3





Triple Olds 20Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-71.7	-71.7	-72.1	-72.8	-72.4	-72.2	-72.2	-72.3	-72.1	-72.0	-72.5
6. Auc Day 2024-06-18: T 4.0% Nov 20 2042	-64.4	-63.8	-65.8	-68.5	-67.3	-67.6	-67.6	-66.6	-67.6	-67.5	-67.8
5. Auc Day 2024-07-17: T 3.875% Feb 20 2043	-71.2	-72.1	-71.9	-73.1	-72.1	-71.8	-72.1	-72.6	-72.7	-72.4	-74.2
4. Auc Day 2024-08-21: T 3.875% May 20 2043	-75.0	-75.0	-75.2	-75.8	-76.3	-74.6	-74.5	-74.4	-74.2	-74.3	-74.8
3. Auc Day 2024-09-17: T 4.375% Aug 20 2043	-74.1	-74.0	-73.8	-72.7	-72.1	-72.3	-71.5	-72.0	-70.8	-70.8	-71.2
2. Auc Day 2024-10-23: T 4.75% Nov 20 2043	-69.9	-70.7	-70.5	-70.8	-71.2	-72.0	-71.8	-72.1	-73.4	-74.3	-74.1
1. Auc Day 2024-11-20: T 4.5% Feb 20 2044	-75.4	-74.8	-75.5	-76.0	-75.5	-74.8	-75.3	-75.7	-74.2	-72.7	-72.8





* SOFR Swap Spreads are cycled around auction days, while holding the bond fixed after the auction. The data (and mean of the data) are from the most recent 6 auctions, and are cycled 5 business days around auction day. On the run, off the run, double old, and triple old refer to the issue after the auction has already been cleared. Therefore, the on the run SOFR swap spread cycled around auction will use the latest on the run issue and check behavior on and the days after the auction (nothing before auction as it has not been issued yet). The off the run SOFR swap spread will hold the current off the run fixed after the most recent auction. The same logic applies to the current double old and triple old. The analysis is run on the 2Y, 3Y, 5Y, 7Y, 10Y, 20Y and 30Y sectors. The legend indicates both the date of the auction that spread was cycled around and the issue that was used to get the swap spread.

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Derivatives Strategy

SOFR Swap Spreads Auction Cycle Report

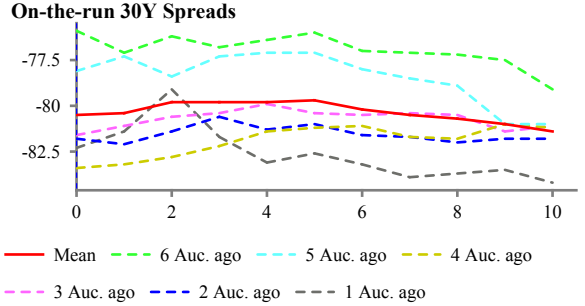
On-the-run 30Y Spreads	0	1	2	3	4	5
Mean	-80.5	-80.4	-79.8	-79.8	-79.8	-79.7
6. Auc Day 2024-06-13: T 4.125% Aug 20 2053	-75.9	-77.1	-76.2	-76.8	-76.4	-76.0
5. Auc Day 2024-07-11: T 4.75% Nov 20 2053	-78.1	-77.3	-78.4	-77.3	-77.1	-77.1
4. Auc Day 2024-08-08: T 4.25% Feb 20 2054	-83.4	-83.2	-82.8	-82.2	-81.4	-81.2
3. Auc Day 2024-09-12: T 4.625% May 20 2054	-81.6	-81.1	-80.6	-80.4	-79.9	-80.4
2. Auc Day 2024-10-10: T 4.25% Aug 20 2054	-81.8	-82.1	-81.4	-80.6	-81.3	-81.0
1. Auc Day 2024-11-06: T 4.5% Nov 20 2054	-82.3	-81.4	-79.1	-81.7	-83.1	-82.6

Off-the-run 30Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-79.8	-80.2	-80.3	-80.1	-80.1	-80.4	-80.3	-79.7	-79.8	-79.8	-79.7
6. Auc Day 2024-06-13: T 3.625% May 20 2053	-75.0	-75.0	-75.5	-75.3	-74.9	-76.1	-77.4	-76.5	-77.0	-76.6	-76.3
5. Auc Day 2024-07-11: T 4.125% Aug 20 2053	-79.5	-79.8	-78.7	-78.1	-77.9	-78.9	-78.3	-79.3	-78.3	-78.0	-78.1
4. Auc Day 2024-08-08: T 4.75% Nov 20 2053	-78.5	-79.7	-79.6	-80.1	-80.7	-81.6	-81.3	-80.9	-80.1	-79.6	-79.4
3. Auc Day 2024-09-12: T 4.25% Feb 20 2054	-82.3	-82.4	-82.4	-82.4	-82.3	-82.1	-81.7	-81.2	-80.9	-80.5	-81.0
2. Auc Day 2024-10-10: T 4.625% May 20 2054	-81.6	-81.8	-81.3	-81.2	-81.2	-81.4	-81.7	-80.9	-80.1	-80.8	-80.4
1. Auc Day 2024-11-06: T 4.25% Aug 20 2054	-82.2	-82.7	-84.5	-83.6	-83.6	-82.4	-81.6	-79.4	-82.2	-83.5	-83.0

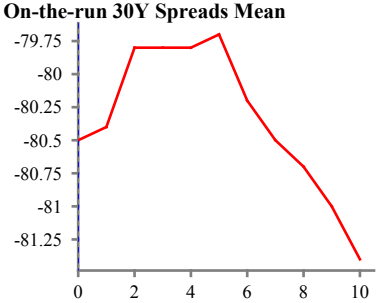
Double Olds 30Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-79.9	-80.3	-80.6	-80.3	-80.3	-80.6	-80.5	-79.9	-80.0	-79.9	-79.8
6. Auc Day 2024-06-13: T 3.625% Feb 20 2053	-75.0	-75.0	-75.6	-75.4	-74.8	-76.1	-77.3	-76.5	-77.2	-76.6	-76.4
5. Auc Day 2024-07-11: T 3.625% May 20 2053	-79.6	-79.9	-78.9	-78.2	-78.1	-79.1	-78.5	-79.6	-78.5	-78.5	-78.4
4. Auc Day 2024-08-08: T 4.125% Aug 20 2053	-79.8	-81.3	-81.4	-81.8	-82.4	-83.4	-83.0	-82.5	-82.0	-81.0	-80.9
3. Auc Day 2024-09-12: T 4.75% Nov 20 2053	-80.9	-81.1	-81.2	-81.3	-81.2	-80.7	-80.5	-80.1	-79.7	-79.1	-79.7
2. Auc Day 2024-10-10: T 4.25% Feb 20 2054	-82.3	-82.3	-82.0	-81.9	-81.8	-81.8	-82.3	-81.5	-80.6	-81.2	-80.8
1. Auc Day 2024-11-06: T 4.625% May 20 2054	-81.9	-82.4	-84.4	-83.4	-83.4	-82.3	-81.3	-79.0	-81.8	-83.1	-82.8

Triple Olds 30Y Spreads	-5	-4	-3	-2	-1	0	1	2	3	4	5
Mean	-79.9	-80.4	-80.6	-80.3	-80.2	-80.7	-80.6	-79.8	-80.0	-80.1	-80.0
6. Auc Day 2024-06-13: T 4.0% Nov 20 2052	-74.1	-74.1	-74.6	-74.4	-74.0	-75.1	-76.4	-75.5	-76.2	-75.9	-75.6
5. Auc Day 2024-07-11: T 3.625% Feb 20 2053	-79.7	-80.2	-79.1	-78.5	-78.4	-79.4	-78.6	-79.6	-78.6	-78.5	-78.5
4. Auc Day 2024-08-08: T 3.625% May 20 2053	-80.5	-82.1	-82.2	-82.7	-83.3	-84.4	-84.2	-83.7	-83.3	-82.4	-82.2
3. Auc Day 2024-09-12: T 4.125% Aug 20 2053	-82.0	-82.3	-82.5	-82.4	-82.2	-82.1	-81.7	-81.2	-80.9	-80.5	-81.1
2. Auc Day 2024-10-10: T 4.75% Nov 20 2053	-81.1	-81.1	-80.9	-80.2	-80.2	-80.5	-80.8	-79.7	-79.2	-79.9	-79.6
1. Auc Day 2024-11-06: T 4.25% Feb 20 2054	-82.0	-82.5	-84.4	-83.5	-83.4	-82.5	-81.7	-79.3	-82.0	-83.4	-83.0

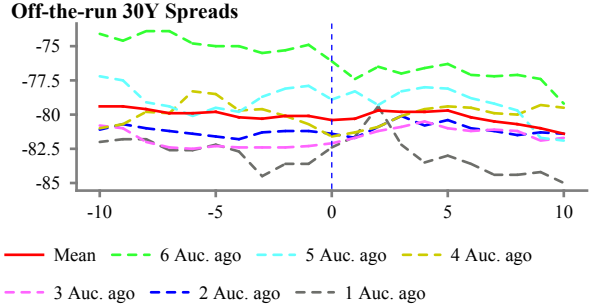
On-the-run 30Y Spreads



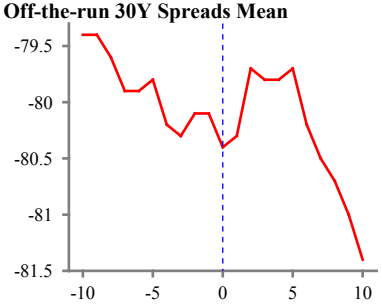
On-the-run 30Y Spreads Mean



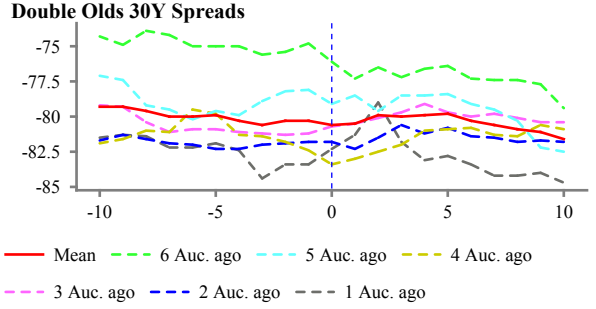
Off-the-run 30Y Spreads



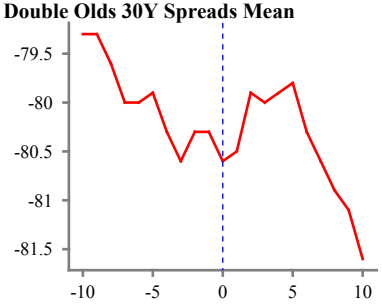
Off-the-run 30Y Spreads Mean



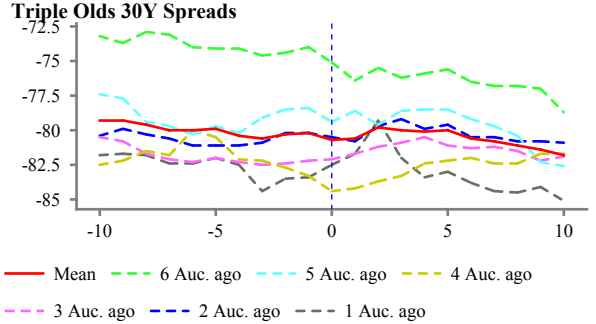
Double Olds 30Y Spreads



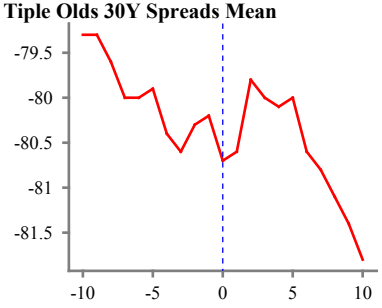
Double Olds 30Y Spreads Mean



Triple Olds 30Y Spreads



Tiple Olds 30Y Spreads Mean



* SOFR Swap Spreads are cycled around auction days, while holding the bond fixed after the auction. The data (and mean of the data) are from the most recent 6 auctions, and are cycled 5 business days around auction day. On the run, off the run, double old, and triple old refer to the issue after the auction has already been cleared. Therefore, the on the run SOFR swap spread cycled around auction will use the latest on the run issue and check behavior on and the days after the auction (nothing before auction as it has not been issued yet). The off the run SOFR swap spread will hold the current off the run fixed after the most recent auction. The same logic applies to the current double old and triple old. The analysis is run on the 2Y, 3Y, 5Y, 7Y, 10Y, 20Y and 30Y sectors. The legend indicates both the date of the auction that spread was cycled around and the issue that was used to get the swap spread.

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SOFR Swap Spread Carry and Slide Report

Most Attractive to Receive in Spreads:

				3 Month					
Coupon	Maturity	Orig Issue	Current	Repo	Carry	Slide	Total	6M Avg	6M Z
6.500	Nov 15 2026	30	11.2	4.62	3.2	-0.1	3.1	3.1	0.0
6.625	Feb 15 2027	30	1.7	4.62	3.8	-2.1	1.7	0.9	0.6
4.375	May 15 2034	10	-48.4	4.59	-1.1	1.0	-0.1	0.4	-1.7
4.000	Feb 15 2034	10	-48.1	4.62	-0.8	0.6	-0.2	0.6	-1.7
3.875	Aug 15 2034	10	-48.2	4.55	-1.1	0.9	-0.3	0.1	-1.1
4.500	Nov 15 2033	10	-47.1	4.62	-1.3	0.9	-0.4	0.7	-1.8
1.875	Nov 15 2051	30	-84.2	4.62	-1.1	0.6	-0.5	-0.8	1.8
2.000	Aug 15 2051	30	-84.4	4.62	-1.0	0.4	-0.6	-0.9	1.9
2.250	Feb 15 2052	30	-83.9	4.62	-0.9	0.3	-0.6	-0.8	1.5
1.875	Feb 15 2051	30	-84.6	4.62	-0.9	0.3	-0.6	-0.9	2.2

Most Attractive to Pay in Spreads:

				3 Month					
Coupon	Maturity	Orig Issue	Current	Repo	Carry	Slide	Total	6M Avg	6M Z
0.750	Jan 31 2028	7	-28.2	4.62	-0.9	-2.1	-3.0	-2.9	-0.2
4.125	Oct 31 2026	2	-19.9	4.55	-2.8	-0.1	-3.0	-3.6	0.6
4.125	Nov 15 2027	3	-24.0	4.57	-2.0	-0.9	-2.9	-3.4	1.1
1.125	Feb 29 2028	7	-28.3	4.62	-1.0	-2.0	-2.9	-2.8	-0.4
0.625	Dec 31 2027	7	-26.4	4.62	-1.4	-1.5	-2.9	-3.0	0.1
3.875	Oct 15 2027	3	-24.1	4.58	-1.6	-1.2	-2.8	-3.0	0.2
1.250	Mar 31 2028	7	-29.2	4.62	-0.9	-1.9	-2.8	-2.6	-0.5
0.625	Nov 30 2027	7	-25.3	4.62	-1.7	-1.2	-2.8	-3.0	0.3
0.500	Oct 31 2027	7	-24.8	4.62	-1.8	-1.0	-2.8	-3.1	0.6
1.250	Apr 30 2028	7	-29.4	4.62	-1.2	-1.5	-2.7	-2.5	-0.6

True Asset Swap Spread Carry-Slides

Most Attractive to Receive in Spreads:

				3 Month					
Coupon	Maturity	Orig Issue	Current	Repo	Carry	Slide	Total	6M Avg	6M Z
6.500	Nov 15 2026	30	14.6	4.61	3.5	12.2	15.7	18.8	-0.4
4.000	Nov 15 2042	20	-67.6	4.61	-0.2	8.4	8.3	6.6	1.8
4.000	Nov 15 2052	30	-81.3	4.61	0.0	7.7	7.7	7.7	-0.1
3.875	Feb 15 2043	20	-69.5	4.61	-1.7	8.8	7.1	5.5	1.6
4.750	Nov 15 2043	20	-67.1	4.61	-0.2	6.9	6.7	6.2	0.6
4.625	May 15 2044	20	-70.4	4.61	-0.3	6.4	6.2	5.8	0.7
5.250	Feb 15 2029	30	-18.2	4.61	-0.6	6.6	6.1	3.5	0.9
2.875	May 15 2052	30	-91.7	4.61	0.0	5.9	5.9	5.4	1.3
2.375	May 15 2051	30	-97.4	4.61	-0.1	5.2	5.2	5.0	0.4
4.125	Aug 15 2044	20	-73.1	4.61	-1.9	6.5	4.5	4.6	-0.1

Most Attractive to Pay in Spreads:

				3 Month					
Coupon	Maturity	Orig Issue	Current	Repo	Carry	Slide	Total	6M Avg	6M Z
2.375	Feb 15 2042	20	-77.4	4.61	-1.5	-9.9	-11.4	-10.5	-0.3
6.375	Aug 15 2027	30	-13.5	4.61	-0.6	-9.7	-10.2	-8.0	-2.2
5.250	Nov 15 2028	30	-25.0	4.61	-0.5	-8.9	-9.4	-7.7	-1.0
1.250	May 15 2050	30	-111.1	4.61	-0.1	-8.3	-8.4	-9.5	1.6
1.625	May 15 2031	10	-42.0	4.61	-0.3	-7.4	-7.8	-5.7	-2.1
1.750	Aug 15 2041	20	-79.3	4.61	-1.3	-6.2	-7.4	-6.1	-1.6
2.250	Aug 15 2049	30	-100.1	4.61	-1.8	-5.4	-7.2	-6.2	-2.0
1.500	Feb 15 2030	10	-36.6	4.61	-0.6	-6.5	-7.0	-7.2	0.1
6.625	Feb 15 2027	30	6.0	4.61	2.2	-8.4	-6.2	-10.8	0.6
2.500	Feb 15 2046	30	-90.0	4.61	-1.8	-4.4	-6.2	-5.6	-1.5

J.P. Morgan Securities LLC
US Fixed Income Derivatives Strategy

Srini Ramaswamy (415)-315-8117
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Issue Specific SOFR Swap Spread Detailed Report

				Yield		Interpolated Swap Yield		Matched Maturity Swap Spread				Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %
Cpn	Mat	Orig Issue	Issue Size *	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	May 31 2025	7	35.2	4.440	4.162	4.390	4.271	-5.0	10.9	15.8	16.1	-5.1	11.1	16.2	-21.6	-6.3	10.2	16.4	17.2	4.65	4.62	2.31	10.29	36.1
0.250	May 31 2025	5	49.7	4.428	4.139	4.390	4.271	-3.8	13.2	17.0	17.3	-8.3	13.5	21.8	-30.3	-5.1	12.5	17.6	18.4	4.65	4.62	2.31	10.29	17.6
4.250	May 31 2025	2	49.9	4.440	4.164	4.390	4.271	-5.1	10.7	15.8	16.0	-2.9	11.0	13.8	-17.0	-6.3	10.0	16.4	17.1	4.65	4.62	2.31	10.29	15.8
2.875	Jun 15 2025	3	46.6	4.372	4.073	4.378	4.262	0.6	19.0	18.3	17.8	5.2	27.7	22.5	-21.7	-0.6	18.3	18.9	18.7	4.65	4.62	2.11	8.85	5.6
2.750	Jun 30 2025	7	33.7	4.358	4.089	4.365	4.247	0.8	15.8	15.0	14.0	1.2	18.4	17.2	-20.5	-0.4	15.1	15.5	14.8	4.65	4.62	1.94	7.74	48.5
4.625	Jun 30 2025	2	42.0	4.421	4.198	4.365	4.245	-5.6	4.7	10.3	9.2	-2.5	7.2	9.8	-17.6	-6.8	4.0	10.8	9.9	4.65	4.62	1.96	7.76	0.0
0.250	Jun 30 2025	5	53.4	4.393	4.151	4.365	4.246	-2.8	9.5	12.3	11.2	-5.9	12.1	18.0	-25.9	-4.0	8.8	12.7	12.0	4.65	4.62	1.92	7.70	18.7
3.000	Jul 15 2025	3	48.5	4.353	4.104	4.351	4.232	-0.2	12.8	12.9	12.1	0.8	15.3	14.5	-20.8	-1.3	12.0	13.4	12.8	4.65	4.62	1.80	6.91	11.3
2.875	Jul 31 2025	7	31.6	4.422	4.234	4.339	4.219	-8.3	-1.6	6.7	5.9	-7.3	0.9	8.3	-16.5	-9.4	-2.3	7.1	6.5	4.65	4.62	1.66	6.20	32.9
4.750	Jul 31 2025	2	41.9	4.434	4.252	4.339	4.218	-9.4	-3.3	6.1	5.2	-6.1	-0.8	5.3	-12.3	-10.6	-4.1	6.5	5.9	4.65	4.62	1.67	6.24	0.0
0.250	Jul 31 2025	5	54.6	4.429	4.248	4.339	4.218	-9.0	-2.9	6.1	5.4	-11.5	-0.4	11.1	-17.8	-10.2	-3.7	6.5	6.0	4.65	4.62	1.64	6.15	17.4
6.875	Aug 15 2025	30	12.6	3.881	3.409	4.327	4.216	44.5	80.7	36.1	35.8	49.6	83.2	33.6	-57.3	43.4	79.9	36.5	36.3	4.65	4.62	1.57	5.74	70.0
2.000	Aug 15 2025	10	66.5	4.430	4.260	4.327	4.206	-10.3	-5.4	4.9	4.3	-10.3	-2.9	7.4	-14.3	-11.5	-6.2	5.3	4.9	4.65	4.62	1.54	5.65	17.6
3.125	Aug 15 2025	3	68.6	4.426	4.253	4.327	4.206	-9.9	-4.7	5.2	4.6	-8.5	-2.2	6.3	-11.5	-11.1	-5.5	5.6	5.1	4.65	4.62	1.55	5.67	41.5
2.750	Aug 31 2025	7	33.2	4.460	4.352	4.317	4.197	-14.3	-15.6	-1.2	3.7	-14.3	-10.7	3.6	-12.6	-15.5	-16.4	-0.9	4.1	4.65	4.62	1.46	5.27	34.0
5.000	Aug 31 2025	2	49.7	4.459	4.349	4.317	4.197	-14.2	-15.2	-1.0	3.9	-11.5	-10.4	1.1	-9.6	-15.4	-16.1	-0.7	4.3	4.65	4.62	1.47	5.33	9.4
0.250	Aug 31 2025	5	55.4	4.466	4.362	4.317	4.197	-14.9	-16.6	-1.7	3.3	-17.9	-11.8	6.2	-15.6	-16.1	-17.4	-1.3	3.8	4.65	4.62	1.44	5.21	18.1
3.500	Sep 15 2025	3	41.0	4.396	4.266	4.307	4.188	-8.9	-7.8	1.2	5.0	-5.3	1.0	6.3	-16.6	-10.1	-8.7	1.5	5.4	4.65	4.62	1.37	4.88	0.0
3.000	Sep 30 2025	7	31.0	4.382	4.245	4.296	4.178	-8.6	-6.8	1.9	3.8	-6.7	-0.6	6.0	-13.7	-9.9	-7.7	2.2	4.0	4.65	4.62	1.29	4.49	28.6
5.000	Sep 30 2025	2	48.0	4.408	4.281	4.296	4.177	-11.2	-10.3	0.9	2.7	-7.1	-4.1	3.1	-7.6	-12.4	-11.3	1.1	3.0	4.65	4.62	1.30	4.53	0.0
0.250	Sep 30 2025	5	60.3	4.422	4.304	4.296	4.177	-12.7	-12.7	0.0	1.9	-13.7	-6.6	7.1	-14.7	-13.9	-13.7	0.2	2.1	4.65	4.62	1.28	4.44	13.3
4.250	Oct 15 2025	3	40.0	4.378	4.248	4.285	4.168	-9.3	-8.0	1.3	2.9	-6.4	-2.3	4.1	-11.2	-10.5	-9.0	1.5	3.0	4.65	4.62	1.23	4.21	0.0
3.000	Oct 31 2025	7	31.0	4.386	4.277	4.275	4.159	-11.0	-11.8	-0.8	1.6	-9.6	-5.4	4.2	-6.4	-12.3	-12.9	-0.6	1.7	4.65	4.62	1.16	3.92	37.6
5.000	Oct 31 2025	2	51.0	4.400	4.296	4.275	4.159	-12.5	-13.8	-1.3	1.1	-9.2	-7.3	1.9	-4.9	-13.8	-14.8	-1.0	1.2	4.65	4.62	1.17	3.95	0.0
0.250	Oct 31 2025	5	60.8	4.402	4.300	4.275	4.158	-12.6	-14.1	-1.5	0.9	-14.0	-7.8	6.1	-8.6	-13.9	-15.2	-1.3	1.0	4.65	4.62	1.15	3.88	12.1
4.500	Nov 15 2025	3	54.0	4.393	4.293	4.263	4.147	-13.0	-14.6	-1.6	0.3	-8.2	-5.6	2.7	-2.4	-14.3	-15.8	-1.4	0.3	4.65	4.62	1.11	3.71	26.0
2.250	Nov 15 2025	10	66.1	4.401	4.304	4.263	4.147	-13.7	-15.7	-2.0	0.0	-11.1	-6.7	4.3	-5.0	-15.1	-16.9	-1.8	0.0	4.65	4.62	1.10	3.68	11.7
2.875	Nov 30 2025	7	34.8	4.406	4.308	4.256	4.141	-15.0	-16.8	-1.8	-0.8	-17.1	-15.6	1.6	-4.4	-16.4	-18.0	-1.6	-0.9	4.65	4.62	1.05	3.48	32.5
4.875	Nov 30 2025	2	54.6	4.388	4.283	4.256	4.141	-13.2	-14.2	-1.1	-0.1	-13.5	-12.9	0.6	-2.5	-14.6	-15.5	-0.9	-0.2	4.65	4.62	1.06	3.50	1.1
0.375	Nov 30 2025	5	64.9	4.398	4.298	4.256	4.141	-14.1	-15.7	-1.6	-0.6	-18.6	-14.7	3.9	-4.6	-15.5	-16.9	-1.4	-0.6	4.65	4.62	1.04	3.45	21.2
4.000	Dec 15 2025	3	40.0	4.366	4.258	4.239	4.132	-12.7	-12.6	0.1	-0.3	-10.7	-8.7	2.0	-7.3	-14.2	-14.0	0.2	-0.4	4.65	4.62	1.02	3.31	0.0
2.625	Dec 31 2025	7	32.0	4.362	4.259	4.223	4.122	-13.9	-13.7	0.1	-0.9	-12.7	-9.9	2.8	-8.6	-15.4	-15.2	0.2	-1.1	4.65	4.62	0.97	3.13	32.6
4.250	Dec 31 2025	2	57.0	4.373	4.274	4.223	4.122	-15.1	-15.2	-0.1	-1.2	-12.4	-11.3	1.1	-6.8	-16.6	-16.7	0.0	-1.4	4.65	4.62	0.98	3.16	0.0
0.375	Dec 31 2025	5	68.0	4.373	4.275	4.223	4.122	-15.0	-15.3	-0.3	-1.3	-15.8	-11.6	4.2	-6.4	-16.5	-16.8	-0.2	-1.5	4.65	4.62	0.96	3.10	19.2
3.875	Jan 15 2026	3	40.0	4.329	4.217	4.208	4.115	-12.0	-10.3	1.7	-0.4	-9.4	-7.0	2.4	-5.2	-13.7	-11.8	1.8	-0.7	4.65	4.62	0.94	3.01	0.0
2.625	Jan 31 2026	7	32.0	4.342	4.237	4.195	4.107	-14.7	-12.9	1.8	-1.3	-13.7	-11.5	2.2	-6.2	-16.4	-14.6	1.8	-1.6	4.65	4.62	0.90	2.85	19.7
4.250	Jan 31 2026	2	60.0	4.353	4.249	4.195	4.107	-15.8	-14.2	1.6	-1.5	-13.4	-12.7	0.7	-4.4	-17.5	-15.8	1.6	-1.8	4.65	4.62	0.91	2.88	0.0

* 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

				Yield		Interpolated Swap Yield		Matched Maturity Swap Spread				Asset Swap Spread				OIS Matched Maturity Swap Spread				Repo		Repo Beta		Soma %
Cpn	Mat	Orig Issue	Issue Size *	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	
0.375	Jan 31 2026	5	69.2	4.361	4.262	4.195	4.107	-16.6	-15.5	1.1	-1.9	-17.6	-14.2	3.4	-6.9	-18.3	-17.2	1.2	-2.2	4.65	4.62	0.88	2.81	13.9
6.000	Feb 15 2026	30	12.9	4.177	4.027	4.179	4.100	0.1	7.3	7.1	3.1	6.8	11.7	4.9	8.5	-1.6	5.5	7.2	2.7	4.65	4.62	0.88	2.79	51.7
4.000	Feb 15 2026	3	55.6	4.318	4.207	4.179	4.099	-14.0	-10.8	3.1	-0.9	-8.5	-6.3	2.2	-2.4	-15.7	-12.6	3.1	-1.3	4.65	4.62	0.87	2.76	28.1
1.625	Feb 15 2026	10	64.9	4.331	4.225	4.179	4.099	-15.3	-12.7	2.6	-1.3	-11.7	-8.2	3.5	-4.1	-17.0	-14.4	2.6	-1.7	4.65	4.62	0.86	2.71	20.2
2.500	Feb 28 2026	7	33.5	4.317	4.226	4.171	4.094	-14.6	-13.1	1.5	-1.5	-14.5	-12.6	1.9	0.8	-16.4	-14.9	1.4	-1.9	4.65	4.62	0.83	2.63	21.8
4.625	Feb 28 2026	2	65.7	4.348	4.263	4.171	4.094	-17.7	-16.9	0.8	-2.2	-15.8	-16.2	-0.4	-2.0	-19.5	-18.7	0.8	-2.6	4.65	4.62	0.84	2.67	4.1
0.500	Feb 28 2026	5	74.2	4.343	4.260	4.171	4.094	-17.2	-16.6	0.6	-2.3	-18.9	-16.3	2.6	-2.9	-19.1	-18.4	0.6	-2.7	4.65	4.62	0.82	2.60	19.1
4.625	Mar 15 2026	3	40.0	4.311	4.221	4.158	4.081	-15.3	-14.0	1.3	-1.5	-11.6	-10.6	1.0	-1.8	-17.2	-16.0	1.2	-1.9	4.65	4.62	0.81	2.57	0.1
2.250	Mar 31 2026	7	32.0	4.307	4.216	4.147	4.069	-16.0	-14.7	1.3	-1.6	-14.5	-12.5	2.1	-4.0	-17.9	-16.7	1.3	-2.0	4.65	4.62	0.77	2.42	19.9
4.500	Mar 31 2026	2	66.0	4.319	4.229	4.147	4.069	-17.2	-16.1	1.1	-1.7	-14.0	-13.5	0.5	-2.1	-19.1	-18.0	1.1	-2.2	4.65	4.62	0.78	2.46	0.0
0.750	Mar 31 2026	5	72.0	4.327	4.241	4.147	4.069	-18.0	-17.3	0.7	-2.1	-17.8	-15.3	2.5	-4.5	-19.9	-19.3	0.7	-2.5	4.65	4.62	0.77	2.39	22.0
3.750	Apr 15 2026	3	42.5	4.304	4.214	4.137	4.057	-16.7	-15.7	1.0	-1.6	-14.1	-13.1	1.0	-5.7	-18.7	-17.7	1.0	-2.1	4.65	4.62	0.76	2.35	6.1
2.375	Apr 30 2026	7	32.4	4.295	4.213	4.127	4.047	-16.7	-16.6	0.2	-1.9	-15.9	-14.3	1.6	-3.8	-18.8	-18.7	0.1	-2.3	4.65	4.62	0.72	2.25	40.5
4.875	Apr 30 2026	2	69.3	4.301	4.218	4.127	4.047	-17.3	-17.2	0.2	-1.9	-14.6	-14.5	0.1	-1.3	-19.4	-19.3	0.1	-2.3	4.65	4.62	0.73	2.28	0.5
0.750	Apr 30 2026	5	72.6	4.306	4.227	4.127	4.046	-17.8	-18.0	-0.2	-2.2	-18.3	-16.0	2.3	-3.0	-19.9	-20.1	-0.2	-2.6	4.65	4.62	0.72	2.22	22.6
3.625	May 15 2026	3	50.9	4.287	4.205	4.118	4.036	-16.9	-16.9	0.0	-1.5	-15.2	-14.4	0.8	-7.6	-19.0	-19.1	0.0	-1.9	4.65	4.62	0.71	2.18	21.7
1.625	May 15 2026	10	69.5	4.293	4.213	4.118	4.036	-17.5	-17.7	-0.2	-1.7	-17.3	-15.5	1.8	-7.4	-19.6	-19.8	-0.3	-2.1	4.65	4.62	0.70	2.16	27.1
2.125	May 31 2026	7	35.4	4.289	4.206	4.109	4.027	-18.0	-18.0	0.0	-2.1	-18.3	-17.1	1.2	-5.0	-20.1	-20.1	0.0	-2.4	4.65	4.62	0.68	2.09	31.9
0.750	May 31 2026	5	72.8	4.297	4.217	4.109	4.027	-18.8	-19.0	-0.2	-2.3	-20.2	-18.4	1.8	-3.1	-20.9	-21.2	-0.3	-2.7	4.65	4.62	0.68	2.07	19.4
4.875	May 31 2026	2	73.1	4.300	4.218	4.109	4.027	-19.1	-19.1	-0.1	-2.2	-17.4	-17.9	-0.4	-1.2	-21.2	-21.3	-0.1	-2.5	4.65	4.62	0.69	2.12	5.6
4.125	Jun 15 2026	3	40.0	4.280	4.196	4.100	4.017	-18.0	-17.9	0.1	-1.9	-15.0	-14.8	0.2	-3.6	-20.2	-20.1	0.0	-2.2	4.65	4.62	0.67	2.05	0.0
1.875	Jun 30 2026	7	33.8	4.259	4.176	4.092	4.008	-16.8	-16.7	0.0	-1.8	-16.2	-14.6	1.6	-3.2	-19.0	-19.0	0.0	-2.1	4.65	4.62	0.65	1.96	30.0
0.875	Jun 30 2026	5	70.3	4.282	4.203	4.092	4.008	-19.0	-19.5	-0.5	-2.3	-19.2	-17.5	1.7	-6.3	-21.2	-21.7	-0.5	-2.6	4.65	4.62	0.64	1.94	26.2
4.625	Jun 30 2026	2	71.4	4.275	4.193	4.092	4.008	-18.4	-18.5	-0.1	-2.0	-15.7	-16.0	-0.3	-1.4	-20.6	-20.8	-0.2	-2.3	4.65	4.62	0.66	2.00	3.4
4.500	Jul 15 2026	3	40.0	4.269	4.186	4.084	4.000	-18.5	-18.5	0.0	-1.9	-15.9	-16.1	-0.2	-1.6	-20.7	-20.8	-0.1	-2.3	4.65	4.62	0.64	1.94	0.0
1.875	Jul 31 2026	7	33.3	4.255	4.171	4.076	3.993	-17.9	-17.9	0.0	-1.9	-17.2	-15.9	1.3	-2.6	-20.1	-20.2	-0.1	-2.3	4.65	4.62	0.61	1.84	28.3
0.625	Jul 31 2026	5	66.8	4.271	4.191	4.076	3.993	-19.5	-19.9	-0.4	-2.3	-19.9	-18.2	1.7	-3.3	-21.8	-22.2	-0.5	-2.6	4.65	4.62	0.60	1.82	16.8
4.375	Jul 31 2026	2	72.8	4.262	4.177	4.076	3.993	-18.5	-18.5	0.1	-1.9	-16.0	-16.2	-0.1	-1.2	-20.8	-20.8	0.0	-2.3	4.65	4.62	0.63	1.88	5.2
6.750	Aug 15 2026	30	10.9	4.096	3.981	4.068	3.986	-2.8	0.5	3.3	1.2	2.1	4.2	2.0	-4.3	-5.1	-2.0	3.2	0.8	4.65	4.62	0.62	1.87	58.3
4.375	Aug 15 2026	3	57.7	4.247	4.161	4.068	3.985	-17.9	-17.6	0.3	-1.7	-14.0	-13.8	0.2	1.0	-20.2	-20.0	0.2	-2.1	4.65	4.62	0.61	1.83	27.2
1.500	Aug 15 2026	10	65.4	4.253	4.170	4.068	3.985	-18.5	-18.5	0.0	-2.0	-16.7	-15.2	1.6	-1.0	-20.8	-20.9	-0.1	-2.3	4.65	4.62	0.59	1.79	16.6
1.375	Aug 31 2026	7	36.2	4.242	4.169	4.062	3.979	-18.0	-19.1	-1.0	-1.6	-16.8	-15.2	1.6	-0.1	-20.4	-21.5	-1.1	-2.0	4.65	4.62	0.58	1.74	35.4
0.750	Aug 31 2026	5	68.7	4.264	4.195	4.062	3.979	-20.2	-21.6	-1.5	-2.0	-19.5	-17.9	1.6	-2.7	-22.5	-24.1	-1.6	-2.4	4.65	4.62	0.58	1.73	12.2
3.750	Aug 31 2026	2	74.5	4.259	4.194	4.062	3.979	-19.7	-21.6	-1.9	-2.5	-16.7	-17.3	-0.6	1.3	-22.1	-24.0	-2.0	-2.9	4.62	4.58	0.58	1.79	7.4
4.625	Sep 15 2026	3	44.0	4.249	4.177	4.056	3.972	-19.3	-20.5	-1.2	-1.6	-15.9	-15.8	0.1	-1.0	-21.7	-23.0	-1.3	-2.0	4.65	4.62	0.58	1.75	0.0
1.625	Sep 30 2026	7	35.3	4.231	4.156	4.050	3.966	-18.1	-18.9	-0.9	-1.6	-17.3	-15.8	1.5	-2.6	-20.5	-21.5	-1.0	-2.0	4.65	4.62	0.55	1.65	49.5
0.875	Sep 30 2026	5	68.3	4.254	4.184	4.050	3.966	-20.4	-21.7	-1.3	-2.0	-20.3	-18.8	1.4	-5.4	-22.9	-24.3	-1.4	-2.4	4.65	4.62	0.55	1.64	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	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	
3.500	**Sep 30 2026**	**2**	**70.4**	4.246	4.179	4.050	3.966	-19.6	-21.3	-1.7	-2.5	-17.5	-17.8	-0.2	-1.5	-22.1	-23.9	-1.8	-2.8	4.62	4.58	0.55	1.69	2.0
4.625	Oct 15 2026	3	46.0	4.236	4.162	4.044	3.961	-19.2	-20.2	-1.0	-1.6	-16.5	-16.5	0.0	-0.7	-21.7	-22.8	-1.1	-2.0	4.65	4.62	0.55	1.65	0.0
1.625	Oct 31 2026	7	35.3	4.215	4.145	4.039	3.955	-17.6	-19.0	-1.4	-1.5	-17.7	-16.4	1.3	-1.8	-20.2	-21.6	-1.5	-1.8	4.65	4.62	0.53	1.57	34.1
1.125	Oct 31 2026	5	67.2	4.242	4.176	4.039	3.955	-20.3	-22.1	-1.8	-1.9	-20.8	-19.6	1.2	-4.7	-22.8	-24.7	-1.9	-2.3	4.65	4.62	0.52	1.56	14.8
4.125	**Oct 31 2026**	**2**	**70.2**	4.238	4.181	4.039	3.955	-19.9	-22.6	-2.7	-2.8	-18.3	-19.4	-1.1	-1.1	-22.4	-25.2	-2.8	-3.2	4.57	4.55	0.53	1.62	1.7
6.500	Nov 15 2026	30	11.5	3.921	3.805	4.033	3.951	11.2	14.6	3.4	3.4	14.6	18.1	3.5	8.8	8.6	11.9	3.3	3.0	4.65	4.62	0.53	1.59	60.7
4.625	Nov 15 2026	3	48.9	4.231	4.164	4.033	3.950	-19.8	-21.4	-1.6	-1.6	-16.9	-17.0	0.0	-2.8	-22.4	-24.1	-1.7	-2.0	4.65	4.62	0.53	1.57	1.9
2.000	Nov 15 2026	10	69.1	4.219	4.152	4.033	3.950	-18.6	-20.2	-1.6	-1.6	-17.6	-16.4	1.1	-1.9	-21.2	-22.9	-1.7	-1.9	4.65	4.62	0.52	1.54	25.9
1.625	Nov 30 2026	7	34.5	4.210	4.140	4.029	3.946	-18.2	-19.4	-1.2	-1.5	-18.2	-17.0	1.2	-2.7	-20.8	-22.1	-1.3	-1.9	4.65	4.62	0.50	1.49	37.6
1.250	Nov 30 2026	5	63.9	4.229	4.162	4.029	3.946	-20.1	-21.6	-1.5	-1.8	-20.4	-19.3	1.1	-4.7	-22.7	-24.4	-1.6	-2.2	4.65	4.62	0.50	1.49	7.8
4.250	Nov 30 2026	2	73.7	4.212	4.142	4.029	3.946	-18.3	-19.6	-1.3	-1.4	-16.7	-16.6	0.0	0.1	-20.9	-22.4	-1.4	-1.8	4.65	4.62	0.47	1.48	0.0
4.375	Dec 15 2026	3	50.0	4.225	4.156	4.020	3.941	-20.5	-21.5	-1.0	-1.6	-18.0	-18.5	-0.5	-1.7	-23.1	-24.2	-1.1	-2.0	4.65	4.62	0.51	1.50	0.0
1.750	Dec 31 2026	7	35.0	4.192	4.121	4.013	3.937	-17.9	-18.4	-0.6	-1.4	-17.2	-16.1	1.1	-1.0	-20.6	-21.3	-0.7	-1.8	4.65	4.62	0.49	1.43	34.2
1.250	Dec 31 2026	5	64.7	4.207	4.139	4.013	3.937	-19.4	-20.2	-0.8	-1.6	-19.1	-18.0	1.1	-2.9	-22.1	-23.0	-0.9	-2.0	4.65	4.62	0.48	1.42	12.0
4.000	Jan 15 2027	3	52.0	4.213	4.144	4.005	3.933	-20.8	-21.1	-0.3	-1.6	-18.3	-18.6	-0.3	-1.4	-23.5	-24.0	-0.5	-2.0	4.65	4.62	0.49	1.43	0.0
1.500	Jan 31 2027	7	98.5	4.211	4.143	3.999	3.930	-21.2	-21.3	-0.1	-1.7	-21.4	-20.8	0.6	-4.2	-24.0	-24.3	-0.3	-2.1	4.65	4.62	0.46	1.36	22.4
6.625	Feb 15 2027	30	10.5	3.974	3.870	3.991	3.927	1.7	5.6	4.0	1.9	6.0	8.2	2.2	-10.7	-1.2	2.6	3.8	1.5	4.65	4.62	0.48	1.41	70.0
4.125	Feb 15 2027	3	58.0	4.214	4.145	3.991	3.926	-22.3	-21.9	0.4	-1.6	-18.8	-19.2	-0.5	-1.3	-25.2	-24.9	0.3	-2.0	4.65	4.62	0.47	1.38	6.9
2.250	Feb 15 2027	10	65.8	4.204	4.135	3.991	3.926	-21.4	-20.9	0.4	-1.6	-19.2	-18.7	0.4	-2.0	-24.2	-23.9	0.3	-2.0	4.65	4.62	0.46	1.35	30.9
1.125	Feb 28 2027	7	36.8	4.200	4.140	3.987	3.924	-21.4	-21.7	-0.3	-1.6	-22.4	-21.7	0.6	-4.8	-24.3	-24.7	-0.4	-2.0	4.65	4.62	0.45	1.31	62.9
1.875	Feb 28 2027	5	62.1	4.207	4.148	3.987	3.924	-22.1	-22.4	-0.3	-1.6	-22.5	-22.3	0.2	-4.4	-25.0	-25.4	-0.5	-2.0	4.65	4.62	0.45	1.32	14.6
4.250	Mar 15 2027	3	56.0	4.198	4.136	3.980	3.917	-21.8	-21.9	-0.2	-1.5	-19.3	-19.5	-0.2	-1.1	-24.7	-25.0	-0.3	-1.9	4.65	4.62	0.45	1.33	0.0
0.625	Mar 31 2027	7	36.3	4.182	4.119	3.975	3.911	-20.7	-20.8	-0.1	-1.5	-20.7	-19.6	1.2	-4.7	-23.7	-23.9	-0.2	-2.0	4.65	4.62	0.43	1.25	37.9
2.500	Mar 31 2027	5	60.5	4.181	4.117	3.975	3.911	-20.6	-20.5	0.1	-1.4	-19.2	-18.7	0.5	-2.5	-23.6	-23.7	-0.1	-1.8	4.65	4.62	0.43	1.27	15.7
4.500	Apr 15 2027	3	59.0	4.195	4.133	3.969	3.906	-22.6	-22.8	-0.1	-1.6	-19.8	-20.1	-0.3	-1.3	-25.6	-25.9	-0.3	-2.0	4.65	4.62	0.44	1.28	1.6
0.500	Apr 30 2027	7	38.0	4.193	4.138	3.964	3.900	-22.9	-23.7	-0.8	-2.0	-23.5	-22.7	0.9	-3.0	-26.0	-26.9	-1.0	-2.4	4.65	4.62	0.41	1.20	15.7
2.750	Apr 30 2027	5	55.8	4.182	4.124	3.964	3.900	-21.8	-22.3	-0.5	-1.7	-20.6	-20.4	0.3	0.5	-24.8	-25.5	-0.7	-2.1	4.65	4.62	0.42	1.23	12.2
4.500	May 15 2027	3	65.3	4.190	4.132	3.959	3.895	-23.1	-23.7	-0.6	-1.6	-19.9	-20.2	-0.3	-0.8	-26.2	-27.0	-0.8	-2.0	4.65	4.62	0.42	1.23	11.2
2.375	May 15 2027	10	71.0	4.184	4.127	3.959	3.895	-22.6	-23.3	-0.7	-1.7	-20.8	-20.4	0.4	-2.1	-25.7	-26.5	-0.9	-2.1	4.65	4.62	0.41	1.20	22.5
0.500	May 31 2027	7	42.0	4.198	4.142	3.955	3.891	-24.3	-25.2	-0.9	-2.2	-26.0	-25.4	0.6	-4.2	-27.4	-28.4	-1.0	-2.6	4.65	4.62	0.40	1.15	25.5
2.625	May 31 2027	5	55.2	4.186	4.127	3.955	3.891	-23.0	-23.6	-0.6	-1.9	-23.1	-23.0	0.1	-0.7	-26.2	-26.9	-0.7	-2.3	4.65	4.62	0.40	1.18	13.1
4.625	Jun 15 2027	3	59.9	4.174	4.113	3.950	3.885	-22.4	-22.8	-0.4	-1.7	-19.2	-19.9	-0.7	0.8	-25.5	-26.1	-0.5	-2.1	4.65	4.62	0.41	1.18	3.1
0.500	Jun 30 2027	7	46.6	4.179	4.123	3.946	3.881	-23.3	-24.2	-0.9	-2.2	-24.0	-23.2	0.7	-3.9	-26.5	-27.5	-1.0	-2.5	4.65	4.62	0.38	1.11	20.6
3.250	Jun 30 2027	5	50.6	4.167	4.108	3.946	3.881	-22.2	-22.7	-0.5	-1.9	-20.5	-20.7	-0.2	-1.1	-25.3	-26.0	-0.7	-2.2	4.65	4.62	0.40	1.15	7.1
4.375	Jul 15 2027	3	67.4	4.174	4.115	3.942	3.877	-23.3	-23.8	-0.5	-2.0	-20.7	-21.4	-0.7	-0.2	-26.5	-27.1	-0.7	-2.3	4.65	4.62	0.40	1.15	14.0
0.375	Jul 31 2027	7	49.0	4.177	4.120	3.938	3.873	-23.9	-24.7	-0.8	-2.4	-25.1	-24.4	0.7	-2.2	-27.1	-28.1	-1.0	-2.7	4.65	4.62	0.37	1.07	11.1
2.750	Jul 31 2027	5	50.0	4.179	4.121	3.938	3.873	-24.1	-24.8	-0.7	-2.3	-23.3	-23.6	-0.3	-2.3	-27.4	-28.2	-0.8	-2.6	4.65	4.62	0.38	1.10	8.0

* 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	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	
6.375	Aug 15 2027	30	10.7	4.110	4.041	3.934	3.869	-17.6	-17.2	0.4	-1.3	-13.5	-14.0	-0.6	-9.1	-20.8	-20.6	0.3	-1.6	4.65	4.62	0.39	1.14	60.5
3.750	Aug 15 2027	3	69.0	4.169	4.108	3.934	3.869	-23.5	-24.0	-0.4	-2.1	-21.0	-21.5	-0.5	0.3	-26.8	-27.4	-0.6	-2.5	4.65	4.62	0.38	1.10	16.0
2.250	Aug 15 2027	10	69.9	4.161	4.101	3.934	3.869	-22.7	-23.2	-0.5	-2.2	-21.4	-21.2	0.1	-0.7	-26.0	-26.6	-0.6	-2.5	4.65	4.62	0.37	1.08	37.7
3.125	Aug 31 2027	5	50.9	4.173	4.120	3.930	3.865	-24.3	-25.5	-1.2	-2.4	-22.2	-22.5	-0.3	1.2	-27.5	-28.9	-1.4	-2.7	4.65	4.62	0.37	1.08	11.5
0.500	Aug 31 2027	7	51.1	4.172	4.122	3.930	3.865	-24.2	-25.6	-1.4	-2.6	-24.3	-23.6	0.7	1.0	-27.5	-29.0	-1.6	-2.9	4.65	4.62	0.36	1.04	26.8
3.375	**Sep 15 2027**	**3**	**58.6**	4.156	4.106	3.927	3.862	-22.9	-24.5	-1.6	-2.6	-20.7	-21.1	-0.3	-1.1	-26.2	-27.9	-1.7	-2.9	4.62	4.58	0.36	1.07	0.9
4.125	Sep 30 2027	5	44.0	4.159	4.104	3.924	3.859	-23.6	-24.5	-1.0	-2.2	-21.2	-21.4	-0.2	-0.5	-26.9	-28.0	-1.1	-2.5	4.65	4.62	0.37	1.06	0.0
0.375	Sep 30 2027	7	56.8	4.170	4.119	3.924	3.859	-24.7	-26.1	-1.4	-2.6	-25.3	-24.6	0.7	-2.1	-28.0	-29.5	-1.5	-2.9	4.65	4.62	0.35	1.00	15.7
3.875	**Oct 15 2027**	**3**	**58.8**	4.162	4.112	3.920	3.855	-24.1	-25.6	-1.5	-2.7	-22.1	-22.6	-0.6	-0.7	-27.5	-29.1	-1.7	-3.0	4.62	4.58	0.35	1.04	1.4
4.125	Oct 31 2027	5	43.0	4.148	4.095	3.918	3.853	-23.0	-24.3	-1.3	-2.2	-21.6	-21.8	-0.2	1.8	-26.4	-27.8	-1.4	-2.5	4.65	4.62	0.35	1.02	0.0
0.500	Oct 31 2027	7	58.6	4.165	4.117	3.918	3.853	-24.8	-26.5	-1.7	-2.7	-26.3	-25.8	0.6	-1.8	-28.2	-30.0	-1.8	-3.0	4.65	4.62	0.34	0.97	19.9
6.125	Nov 15 2027	30	22.5	4.113	4.057	3.914	3.850	-19.9	-20.8	-0.9	-1.8	-16.6	-17.0	-0.3	-2.8	-23.3	-24.3	-1.0	-2.0	4.65	4.62	0.36	1.03	64.7
2.250	Nov 15 2027	10	66.5	4.167	4.118	3.914	3.850	-25.2	-26.9	-1.7	-2.6	-24.7	-24.6	0.1	-3.4	-28.6	-30.4	-1.8	-2.9	4.65	4.62	0.34	0.98	32.6
4.125	Nov 15 2027	3	72.1	4.155	4.109	3.914	3.849	-24.0	-26.0	-1.9	-2.8	-22.1	-22.8	-0.7	-0.3	-27.4	-29.5	-2.1	-3.1	4.59	4.57	0.35	1.01	19.6
3.875	Nov 30 2027	5	47.7	4.160	4.109	3.912	3.847	-24.8	-26.1	-1.3	-2.4	-23.3	-23.5	-0.2	-0.9	-28.3	-29.7	-1.5	-2.7	4.65	4.62	0.34	0.99	9.8
0.625	Nov 30 2027	7	63.8	4.165	4.116	3.912	3.847	-25.3	-26.9	-1.6	-2.7	-26.3	-25.8	0.5	-2.6	-28.7	-30.4	-1.7	-3.0	4.65	4.62	0.33	0.94	21.6
3.875	Dec 31 2027	5	43.0	4.152	4.101	3.902	3.842	-25.0	-25.9	-0.9	-2.4	-22.7	-23.4	-0.6	-0.9	-28.4	-29.5	-1.1	-2.7	4.65	4.62	0.34	0.96	0.0
0.625	Dec 31 2027	7	68.0	4.166	4.119	3.902	3.842	-26.4	-27.7	-1.3	-2.8	-27.1	-26.8	0.3	-2.1	-29.9	-31.3	-1.4	-3.1	4.65	4.62	0.32	0.92	18.0
3.500	Jan 31 2028	5	43.0	4.162	4.112	3.893	3.838	-26.9	-27.4	-0.5	-2.6	-24.8	-25.5	-0.7	-2.4	-30.4	-31.1	-0.6	-2.9	4.65	4.62	0.33	0.93	0.0
0.750	Jan 31 2028	7	70.4	4.175	4.127	3.893	3.838	-28.2	-29.0	-0.8	-2.9	-28.6	-28.5	0.1	-2.3	-31.7	-32.7	-1.0	-3.2	4.65	4.62	0.31	0.89	12.8
2.750	Feb 15 2028	10	70.6	4.160	4.110	3.889	3.836	-27.2	-27.4	-0.2	-2.6	-25.5	-26.0	-0.5	-0.3	-30.7	-31.1	-0.4	-2.9	4.65	4.62	0.32	0.91	14.4
4.000	Feb 29 2028	5	52.8	4.159	4.113	3.886	3.834	-27.3	-27.9	-0.6	-2.5	-24.8	-25.7	-0.9	-0.6	-30.9	-31.6	-0.7	-2.8	4.65	4.62	0.32	0.92	18.5
1.125	Feb 29 2028	7	75.4	4.169	4.126	3.886	3.834	-28.3	-29.2	-0.9	-2.8	-28.4	-28.5	-0.1	-2.0	-31.9	-32.9	-1.0	-3.1	4.65	4.62	0.31	0.88	17.8
3.625	Mar 31 2028	5	43.0	4.156	4.109	3.878	3.826	-27.7	-28.2	-0.5	-2.4	-25.3	-25.7	-0.3	-2.3	-31.3	-32.0	-0.7	-2.7	4.65	4.62	0.31	0.89	0.0
1.250	Mar 31 2028	7	73.1	4.170	4.127	3.878	3.826	-29.2	-30.0	-0.8	-2.8	-29.0	-28.9	0.1	-1.9	-32.8	-33.8	-1.0	-3.0	4.65	4.62	0.30	0.85	23.1
3.500	Apr 30 2028	5	47.2	4.157	4.114	3.872	3.820	-28.5	-29.4	-0.9	-2.4	-27.3	-27.7	-0.4	-2.1	-32.2	-33.2	-1.1	-2.7	4.65	4.62	0.30	0.86	8.9
1.250	Apr 30 2028	7	73.8	4.166	4.125	3.872	3.820	-29.4	-30.5	-1.1	-2.7	-30.2	-30.3	0.0	-1.6	-33.0	-34.3	-1.3	-2.9	4.65	4.62	0.29	0.83	16.1
2.875	May 15 2028	10	75.1	4.162	4.120	3.869	3.816	-29.3	-30.4	-1.1	-2.5	-28.0	-28.3	-0.3	-2.3	-33.0	-34.2	-1.2	-2.7	4.65	4.62	0.29	0.84	14.6
3.625	May 31 2028	5	51.1	4.154	4.109	3.866	3.813	-28.8	-29.6	-0.8	-2.4	-26.7	-27.0	-0.4	-1.4	-32.5	-33.4	-1.0	-2.7	4.65	4.62	0.29	0.84	15.8
1.250	May 31 2028	7	74.0	4.158	4.116	3.866	3.813	-29.2	-30.3	-1.0	-2.6	-29.2	-29.1	0.1	-0.8	-32.9	-34.1	-1.2	-2.9	4.65	4.62	0.28	0.81	16.3
4.000	Jun 30 2028	5	43.0	4.152	4.108	3.860	3.807	-29.2	-30.1	-0.9	-2.3	-26.5	-27.5	-1.0	-0.2	-32.9	-33.9	-1.0	-2.6	4.65	4.62	0.29	0.83	0.0
1.250	Jun 30 2028	7	71.4	4.161	4.120	3.860	3.807	-30.1	-31.3	-1.2	-2.6	-30.2	-30.4	-0.2	-1.0	-33.8	-35.1	-1.3	-2.8	4.65	4.62	0.28	0.79	20.0
4.125	Jul 31 2028	5	43.0	4.156	4.111	3.855	3.802	-30.1	-30.9	-0.8	-2.3	-27.4	-28.4	-1.1	0.9	-33.8	-34.8	-1.0	-2.6	4.65	4.62	0.29	0.81	0.0
1.000	Jul 31 2028	7	67.9	4.162	4.120	3.855	3.802	-30.6	-31.8	-1.1	-2.6	-31.1	-31.2	-0.1	-0.7	-34.4	-35.7	-1.3	-2.9	4.65	4.62	0.27	0.77	10.2
5.500	Aug 15 2028	30	11.8	4.047	3.993	3.853	3.800	-19.4	-19.3	0.2	-1.2	-15.9	-16.3	-0.5	2.5	-23.2	-23.2	0.0	-1.5	4.65	4.62	0.29	0.82	60.6
2.875	Aug 15 2028	10	75.5	4.157	4.113	3.853	3.800	-30.3	-31.3	-0.9	-2.3	-28.8	-29.6	-0.7	0.0	-34.1	-35.2	-1.1	-2.6	4.65	4.62	0.28	0.79	14.3
4.375	Aug 31 2028	5	50.8	4.165	4.125	3.851	3.798	-31.4	-32.7	-1.3	-2.2	-28.2	-29.4	-1.2	-0.3	-35.2	-36.7	-1.5	-2.4	4.65	4.62	0.28	0.80	9.4

* 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	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	
1.125	Aug 31 2028	7	69.8	4.163	4.126	3.851	3.798	-31.2	-32.8	-1.6	-2.4	-31.2	-31.4	-0.2	-1.8	-35.0	-36.7	-1.7	-2.7	4.65	4.62	0.27	0.75	13.2
4.625	Sep 30 2028	5	49.0	4.159	4.117	3.847	3.794	-31.1	-32.4	-1.2	-2.0	-28.3	-28.9	-0.6	-1.1	-35.0	-36.3	-1.4	-2.3	4.65	4.62	0.28	0.78	0.0
1.250	Sep 30 2028	7	69.5	4.161	4.123	3.847	3.794	-31.4	-32.9	-1.5	-2.3	-31.9	-31.9	0.0	-1.6	-35.2	-36.9	-1.6	-2.6	4.65	4.62	0.26	0.74	12.4
4.875	Oct 31 2028	5	52.0	4.154	4.115	3.843	3.790	-31.0	-32.5	-1.5	-1.9	-28.0	-28.6	-0.6	0.0	-34.9	-36.5	-1.6	-2.2	4.65	4.62	0.27	0.77	0.0
1.375	Oct 31 2028	7	68.3	4.155	4.118	3.843	3.790	-31.1	-32.8	-1.7	-2.2	-31.4	-31.4	0.0	-0.3	-35.0	-36.8	-1.8	-2.4	4.65	4.62	0.25	0.72	15.9
5.250	Nov 15 2028	30	10.9	4.123	4.082	3.842	3.789	-28.1	-29.4	-1.3	-1.6	-25.0	-25.5	-0.5	-8.4	-32.0	-33.4	-1.4	-1.9	4.65	4.62	0.27	0.76	29.3
3.125	Nov 15 2028	10	80.5	4.147	4.109	3.842	3.788	-30.5	-32.1	-1.6	-2.0	-29.2	-29.5	-0.3	0.0	-34.4	-36.1	-1.7	-2.2	4.65	4.62	0.26	0.74	25.8
4.375	Nov 30 2028	5	55.6	4.153	4.114	3.840	3.787	-31.3	-32.7	-1.4	-1.9	-29.1	-29.6	-0.5	-0.3	-35.2	-36.8	-1.5	-2.1	4.65	4.62	0.26	0.74	1.1
1.500	Nov 30 2028	7	63.9	4.152	4.114	3.840	3.787	-31.1	-32.7	-1.6	-2.0	-31.6	-31.7	-0.1	-0.4	-35.1	-36.8	-1.7	-2.3	4.65	4.62	0.25	0.71	9.7
3.750	Dec 31 2028	5	58.0	4.155	4.117	3.834	3.784	-32.0	-33.2	-1.2	-1.8	-30.1	-31.2	-1.1	-0.7	-36.0	-37.3	-1.3	-2.1	4.65	4.62	0.26	0.72	0.0
1.375	Dec 31 2028	7	63.6	4.149	4.112	3.834	3.784	-31.5	-32.8	-1.3	-2.0	-32.2	-32.5	-0.3	0.0	-35.4	-36.9	-1.5	-2.2	4.65	4.62	0.25	0.69	12.0
1.750	Jan 31 2029	7	60.9	4.149	4.111	3.829	3.782	-32.1	-32.9	-0.9	-1.8	-31.7	-32.2	-0.5	0.2	-36.1	-37.1	-1.0	-2.1	4.65	4.62	0.24	0.68	13.0
4.000	Jan 31 2029	5	61.0	4.150	4.110	3.829	3.782	-32.1	-32.8	-0.7	-1.7	-29.4	-30.5	-1.1	-0.2	-36.1	-37.0	-0.8	-1.9	4.65	4.62	0.25	0.71	0.0
5.250	Feb 15 2029	30	11.3	4.045	3.997	3.826	3.781	-21.9	-21.6	0.4	-0.8	-18.2	-18.7	-0.6	7.2	-26.0	-25.7	0.2	-1.1	4.65	4.62	0.26	0.72	62.3
2.625	Feb 15 2029	10	81.5	4.145	4.105	3.826	3.781	-31.9	-32.4	-0.5	-1.7	-30.4	-31.1	-0.7	-0.5	-35.9	-36.6	-0.7	-1.9	4.65	4.62	0.24	0.69	26.4
1.875	Feb 28 2029	7	58.6	4.145	4.111	3.824	3.780	-32.2	-33.1	-0.9	-1.7	-32.0	-32.5	-0.5	0.2	-36.2	-37.3	-1.1	-2.0	4.65	4.62	0.24	0.67	14.6
4.250	Feb 28 2029	5	66.8	4.147	4.111	3.824	3.780	-32.3	-33.0	-0.7	-1.6	-29.6	-30.8	-1.2	0.7	-36.3	-37.2	-0.9	-1.8	4.65	4.62	0.25	0.71	4.1
2.375	Mar 31 2029	7	55.8	4.149	4.114	3.819	3.775	-33.0	-33.8	-0.8	-1.6	-32.7	-33.0	-0.3	-0.1	-37.1	-38.0	-1.0	-1.9	4.65	4.62	0.24	0.66	15.7
4.125	Mar 31 2029	5	67.0	4.150	4.113	3.819	3.775	-33.1	-33.8	-0.7	-1.5	-30.9	-31.5	-0.6	-0.2	-37.1	-38.0	-0.9	-1.8	4.65	4.62	0.24	0.69	0.0
2.875	Apr 30 2029	7	50.1	4.145	4.111	3.815	3.771	-33.0	-34.0	-1.0	-1.5	-31.9	-32.3	-0.4	0.2	-37.0	-38.2	-1.2	-1.8	4.65	4.62	0.23	0.66	12.3
4.625	Apr 30 2029	5	70.3	4.143	4.108	3.815	3.771	-32.8	-33.7	-0.9	-1.4	-30.0	-30.6	-0.6	0.0	-36.9	-38.0	-1.0	-1.6	4.65	4.62	0.24	0.68	0.5
2.375	May 15 2029	10	84.4	4.126	4.091	3.813	3.769	-31.2	-32.2	-1.0	-1.4	-30.7	-30.9	-0.2	0.0	-35.3	-36.5	-1.1	-1.6	4.65	4.62	0.23	0.64	41.8
2.750	May 31 2029	7	48.3	4.144	4.109	3.811	3.767	-33.2	-34.2	-1.0	-1.5	-32.2	-32.6	-0.4	0.1	-37.4	-38.5	-1.1	-1.8	4.65	4.62	0.23	0.64	13.2
4.500	May 31 2029	5	74.2	4.131	4.094	3.811	3.767	-32.0	-32.7	-0.8	-1.3	-29.2	-29.7	-0.5	0.9	-36.1	-37.0	-0.9	-1.6	4.65	4.62	0.23	0.66	5.6
3.250	Jun 30 2029	7	43.1	4.145	4.110	3.808	3.763	-33.6	-34.7	-1.0	-1.5	-32.1	-33.0	-1.0	1.6	-37.8	-38.9	-1.2	-1.7	4.65	4.62	0.23	0.64	7.1
4.250	Jun 30 2029	5	72.4	4.139	4.104	3.808	3.764	-33.1	-34.0	-0.9	-1.4	-30.5	-31.6	-1.2	1.6	-37.3	-38.3	-1.1	-1.6	4.65	4.62	0.23	0.65	3.4
2.625	Jul 31 2029	7	41.3	4.136	4.101	3.805	3.760	-33.1	-34.1	-1.0	-1.5	-32.1	-32.9	-0.7	0.5	-37.3	-38.4	-1.1	-1.8	4.65	4.62	0.22	0.62	8.1
4.000	Jul 31 2029	5	73.9	4.134	4.098	3.805	3.760	-32.9	-33.7	-0.8	-1.4	-30.4	-31.4	-1.1	2.5	-37.1	-38.0	-1.0	-1.6	4.65	4.62	0.23	0.64	5.2
6.125	Aug 15 2029	30	11.2	4.117	4.077	3.804	3.759	-31.3	-31.8	-0.5	-1.2	-26.7	-28.1	-1.4	-2.9	-35.4	-36.1	-0.7	-1.4	4.65	4.62	0.23	0.66	64.1
1.625	Aug 15 2029	10	92.6	4.105	4.068	3.804	3.759	-30.1	-30.9	-0.8	-1.4	-30.2	-30.5	-0.3	0.7	-34.3	-35.2	-1.0	-1.6	4.65	4.62	0.21	0.60	50.9
3.125	Aug 31 2029	7	41.8	4.146	4.115	3.803	3.758	-34.4	-35.7	-1.3	-1.5	-32.6	-33.5	-0.9	0.6	-38.6	-40.0	-1.5	-1.7	4.65	4.62	0.22	0.62	11.6
3.625	Aug 31 2029	5	75.6	4.125	4.093	3.803	3.758	-32.2	-33.6	-1.3	-1.5	-29.9	-30.9	-1.1	3.4	-36.4	-37.9	-1.5	-1.8	4.62	4.59	0.22	0.63	7.4
3.875	Sep 30 2029	7	36.0	4.141	4.108	3.801	3.756	-34.0	-35.2	-1.2	-1.5	-32.1	-32.6	-0.5	0.4	-38.2	-39.6	-1.3	-1.7	4.65	4.62	0.22	0.62	0.0
3.500	**Sep 30 2029**	**5**	**71.4**	4.131	4.099	3.801	3.756	-33.0	-34.4	-1.3	-1.7	-31.5	-32.1	-0.6	1.1	-37.2	-38.7	-1.5	-1.9	4.62	4.59	0.22	0.61	2.0
4.000	Oct 31 2029	7	35.0	4.137	4.105	3.799	3.754	-33.8	-35.1	-1.4	-1.6	-31.6	-32.0	-0.5	1.0	-38.0	-39.5	-1.5	-1.8	4.65	4.62	0.22	0.61	0.0
4.125	**Oct 31 2029**	**5**	**71.2**	4.125	4.099	3.799	3.754	-32.6	-34.5	-1.9	-2.1	-30.3	-31.3	-1.0	1.1	-36.9	-38.9	-2.0	-2.3	4.45	4.52	0.24	0.61	1.7
1.750	Nov 15 2029	10	88.6	4.095	4.063	3.798	3.753	-29.7	-31.0	-1.3	-1.6	-30.0	-29.9	0.0	0.2	-34.0	-35.4	-1.4	-1.8	4.65	4.62	0.20	0.57	61.6

* 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	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	Nov 30 2029	7	38.8	4.138	4.106	3.797	3.752	-34.1	-35.4	-1.3	-1.6	-32.3	-32.7	-0.4	0.7	-38.3	-39.8	-1.4	-1.9	4.65	4.62	0.21	0.59	9.8
3.875	Dec 31 2029	7	35.0	4.143	4.111	3.794	3.751	-34.9	-36.0	-1.1	-1.8	-32.4	-33.5	-1.1	0.8	-39.2	-40.5	-1.2	-2.0	4.65	4.62	0.21	0.59	0.0
3.500	Jan 31 2030	7	35.0	4.145	4.112	3.790	3.750	-35.4	-36.2	-0.8	-1.9	-33.3	-34.4	-1.0	-0.7	-39.8	-40.7	-0.9	-2.1	4.65	4.62	0.21	0.57	0.0
1.500	Feb 15 2030	10	88.1	4.149	4.118	3.788	3.750	-36.1	-36.8	-0.8	-2.1	-36.6	-37.1	-0.6	-5.9	-40.4	-41.3	-0.9	-2.3	4.65	4.62	0.19	0.54	33.7
4.000	Feb 28 2030	7	43.0	4.143	4.113	3.787	3.750	-35.5	-36.3	-0.8	-1.9	-33.1	-34.3	-1.2	0.4	-39.9	-40.8	-0.9	-2.1	4.65	4.62	0.20	0.57	18.7
3.625	Mar 31 2030	7	35.0	4.145	4.115	3.785	3.747	-36.0	-36.8	-0.8	-2.0	-34.4	-34.8	-0.5	-1.4	-40.4	-41.3	-0.9	-2.2	4.65	4.62	0.20	0.56	0.0
3.500	Apr 30 2030	7	38.4	4.143	4.115	3.783	3.745	-36.1	-37.0	-1.0	-2.0	-34.5	-34.9	-0.5	-0.7	-40.5	-41.6	-1.1	-2.2	4.65	4.62	0.19	0.55	9.0
6.250	May 15 2030	31	17.0	4.139	4.109	3.782	3.744	-35.7	-36.6	-0.8	-1.8	-31.3	-32.0	-0.7	-0.8	-40.1	-41.1	-1.0	-2.0	4.65	4.62	0.20	0.57	62.2
0.625	May 15 2030	10	109.9	4.152	4.127	3.782	3.743	-37.1	-38.3	-1.3	-2.3	-39.6	-39.7	-0.2	-2.9	-41.5	-42.9	-1.4	-2.5	4.65	4.62	0.18	0.50	27.3
3.750	May 31 2030	7	41.6	4.149	4.120	3.781	3.742	-36.8	-37.8	-0.9	-2.1	-34.9	-35.4	-0.5	-1.3	-41.3	-42.3	-1.1	-2.3	4.65	4.62	0.19	0.54	15.9
3.750	Jun 30 2030	7	35.0	4.149	4.121	3.779	3.741	-37.0	-38.0	-1.0	-2.1	-35.1	-36.3	-1.2	0.4	-41.5	-42.6	-1.1	-2.3	4.65	4.62	0.19	0.53	0.0
4.000	Jul 31 2030	7	35.0	4.154	4.124	3.778	3.739	-37.6	-38.5	-0.9	-2.1	-35.1	-36.3	-1.2	0.6	-42.0	-43.1	-1.1	-2.3	4.65	4.62	0.19	0.53	0.0
0.625	Aug 15 2030	10	133.0	4.156	4.129	3.777	3.739	-37.8	-39.0	-1.2	-2.4	-40.5	-40.8	-0.3	-0.6	-42.3	-43.6	-1.3	-2.6	4.65	4.62	0.17	0.48	21.3
4.125	Aug 31 2030	7	39.7	4.158	4.131	3.777	3.738	-38.1	-39.3	-1.2	-2.0	-35.5	-36.7	-1.3	0.7	-42.6	-43.9	-1.3	-2.2	4.65	4.62	0.19	0.53	9.4
4.625	Sep 30 2030	7	37.0	4.155	4.127	3.776	3.737	-37.9	-39.0	-1.1	-2.0	-34.8	-35.3	-0.5	0.9	-42.4	-43.6	-1.2	-2.2	4.65	4.62	0.19	0.52	0.0
4.875	Oct 31 2030	7	38.0	4.159	4.133	3.776	3.736	-38.4	-39.7	-1.3	-1.9	-35.2	-35.8	-0.6	0.4	-42.9	-44.3	-1.4	-2.1	4.65	4.62	0.19	0.52	0.0
0.875	Nov 15 2030	10	133.7	4.126	4.101	3.775	3.736	-35.1	-36.5	-1.4	-2.1	-37.3	-37.4	0.0	3.1	-39.6	-41.2	-1.6	-2.3	4.65	4.62	0.17	0.46	18.6
4.375	Nov 30 2030	7	39.5	4.163	4.137	3.775	3.736	-38.8	-40.1	-1.3	-1.9	-36.7	-37.2	-0.5	-0.7	-43.3	-44.7	-1.4	-2.1	4.65	4.62	0.18	0.50	1.1
3.750	Dec 31 2030	7	40.0	4.160	4.134	3.773	3.736	-38.7	-39.8	-1.1	-1.9	-36.5	-37.6	-1.2	-0.5	-43.3	-44.5	-1.2	-2.1	4.65	4.62	0.18	0.49	0.0
4.000	Jan 31 2031	7	41.0	4.164	4.138	3.771	3.736	-39.4	-40.2	-0.8	-1.8	-36.7	-38.0	-1.2	-0.2	-44.0	-44.9	-0.9	-2.0	4.65	4.62	0.18	0.49	0.0
5.375	Feb 15 2031	30	16.4	4.118	4.088	3.769	3.736	-34.9	-35.2	-0.3	-1.5	-30.2	-31.4	-1.2	5.4	-39.5	-39.9	-0.4	-1.6	4.65	4.62	0.18	0.50	50.6
1.125	Feb 15 2031	10	140.1	4.108	4.081	3.769	3.736	-33.9	-34.5	-0.6	-1.8	-34.7	-34.9	-0.2	2.8	-38.5	-39.2	-0.7	-2.0	4.65	4.62	0.16	0.45	24.9
4.250	Feb 28 2031	7	43.8	4.167	4.142	3.769	3.736	-39.8	-40.6	-0.9	-1.8	-37.1	-38.4	-1.3	0.9	-44.4	-45.4	-1.0	-2.0	4.65	4.62	0.18	0.49	4.2
4.125	Mar 31 2031	7	43.0	4.169	4.145	3.767	3.734	-40.2	-41.0	-0.8	-1.7	-37.7	-38.2	-0.5	-0.7	-44.9	-45.8	-0.9	-1.9	4.65	4.62	0.17	0.48	0.0
4.625	Apr 30 2031	7	44.2	4.169	4.145	3.766	3.733	-40.3	-41.2	-1.0	-1.7	-37.4	-38.0	-0.6	-0.1	-44.9	-46.0	-1.1	-1.8	4.65	4.62	0.17	0.48	0.5
1.625	May 15 2031	10	148.5	4.170	4.148	3.765	3.732	-40.4	-41.6	-1.2	-1.9	-42.0	-42.4	-0.3	-7.1	-45.1	-46.4	-1.3	-2.1	4.65	4.62	0.16	0.44	29.9
4.625	May 31 2031	7	46.6	4.173	4.149	3.765	3.731	-40.9	-41.8	-0.9	-1.7	-38.1	-38.7	-0.6	-0.5	-45.5	-46.6	-1.1	-1.8	4.65	4.62	0.17	0.47	5.6
4.250	Jun 30 2031	7	45.5	4.172	4.148	3.764	3.730	-40.8	-41.8	-1.0	-1.7	-37.9	-39.2	-1.3	1.2	-45.5	-46.6	-1.1	-1.9	4.65	4.62	0.17	0.46	3.4
4.125	Jul 31 2031	7	46.4	4.172	4.148	3.763	3.729	-40.9	-41.8	-0.9	-1.7	-38.2	-39.5	-1.3	0.4	-45.6	-46.7	-1.1	-1.9	4.65	4.62	0.17	0.46	5.2
1.250	Aug 15 2031	10	142.2	4.177	4.154	3.763	3.729	-41.4	-42.5	-1.1	-2.0	-43.7	-44.3	-0.6	-1.0	-46.1	-47.4	-1.3	-2.1	4.65	4.62	0.15	0.42	19.7
3.750	Aug 31 2031	7	47.5	4.176	4.155	3.763	3.729	-41.3	-42.7	-1.4	-1.9	-39.4	-40.8	-1.4	0.2	-46.0	-47.5	-1.5	-2.0	4.62	4.59	0.16	0.45	7.4
3.625	**Sep 30 2031**	**7**	**44.9**	4.173	4.151	3.763	3.729	-41.0	-42.3	-1.3	-1.9	-39.2	-39.8	-0.6	-0.8	-45.7	-47.1	-1.4	-2.1	4.62	4.59	0.16	0.44	2.0
4.125	**Oct 31 2031**	**7**	**44.7**	4.171	4.151	3.763	3.728	-40.8	-42.2	-1.4	-1.9	-38.6	-39.2	-0.6	0.2	-45.6	-47.1	-1.5	-2.1	4.61	4.59	0.16	0.44	1.7
1.375	Nov 15 2031	10	144.6	4.185	4.165	3.763	3.728	-42.2	-43.7	-1.5	-2.1	-44.3	-44.6	-0.3	-0.4	-46.9	-48.6	-1.6	-2.3	4.65	4.62	0.15	0.40	23.3
1.875	Feb 15 2032	10	141.2	4.192	4.171	3.760	3.730	-43.3	-44.1	-0.9	-2.3	-44.1	-44.9	-0.8	1.1	-48.1	-49.1	-1.0	-2.5	4.65	4.62	0.14	0.40	25.7
2.875	May 15 2032	10	133.3	4.198	4.180	3.758	3.728	-44.0	-45.2	-1.1	-2.3	-43.5	-43.9	-0.4	1.0	-48.9	-50.1	-1.2	-2.4	4.65	4.62	0.14	0.40	23.5
2.750	Aug 15 2032	10	121.1	4.207	4.187	3.758	3.727	-44.9	-45.9	-1.0	-2.2	-44.4	-45.5	-1.1	0.2	-49.8	-50.9	-1.1	-2.4	4.65	4.62	0.14	0.39	18.3

* 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	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	Nov 15 2032	10	111.3	4.187	4.169	3.759	3.728	-42.8	-44.0	-1.2	-1.9	-40.6	-41.0	-0.4	4.1	-47.7	-49.1	-1.3	-2.0	4.65	4.62	0.14	0.39	11.0
3.500	Feb 15 2033	10	114.7	4.214	4.195	3.757	3.731	-45.6	-46.4	-0.7	-1.7	-43.8	-45.1	-1.2	-1.9	-50.6	-51.5	-0.9	-1.9	4.65	4.62	0.14	0.37	13.7
3.375	May 15 2033	10	108.5	4.223	4.208	3.757	3.730	-46.7	-47.7	-1.1	-1.3	-45.6	-46.1	-0.4	-1.4	-51.7	-52.8	-1.2	-1.4	4.65	4.62	0.13	0.36	8.8
3.875	Aug 15 2033	10	122.2	4.228	4.211	3.757	3.730	-47.1	-48.0	-0.9	-0.8	-44.9	-46.2	-1.3	2.1	-52.1	-53.2	-1.0	-0.9	4.65	4.62	0.13	0.36	11.7
4.500	Nov 15 2033	10	114.7	4.230	4.215	3.760	3.732	-47.1	-48.3	-1.2	-0.4	-44.4	-44.8	-0.4	0.9	-52.1	-53.4	-1.3	-0.5	4.65	4.62	0.13	0.36	0.7
4.000	Feb 15 2034	10	123.7	4.240	4.224	3.759	3.735	-48.1	-48.9	-0.7	-0.1	-45.6	-46.9	-1.4	0.2	-53.2	-54.0	-0.8	-0.3	4.65	4.62	0.12	0.34	3.0
4.375	May 15 2034	10	132.9	4.243	4.230	3.759	3.735	-48.4	-49.5	-1.1	-0.1	-45.8	-46.3	-0.5	0.3	-53.5	-54.7	-1.2	-0.2	4.62	4.59	0.12	0.34	9.7
3.875	**Aug 15 2034**	**10**	**128.9**	4.243	4.229	3.760	3.736	-48.2	-49.4	-1.1	-0.3	-46.1	-47.6	-1.5	1.3	-53.3	-54.6	-1.2	-0.4	4.52	4.55	0.13	0.33	6.9
4.250	**Nov 15 2034**	**10**	**52.2**	4.240	4.235	3.763	3.738	-47.7	-49.8	-2.1	-1.0	-45.4	-46.7	-1.3	1.9	-52.8	-55.0	-2.2	-1.2	4.27	4.34	0.13	0.33	19.6
4.500	Feb 15 2036	30	26.4	4.156	4.139	3.773	3.753	-38.3	-38.6	-0.3	-0.7	-35.1	-36.0	-0.9	2.9	-43.5	-43.9	-0.4	-0.8	4.65	4.62	0.11	0.30	68.3
4.750	Feb 15 2037	30	16.6	4.232	4.218	3.783	3.764	-45.0	-45.4	-0.4	-1.4	-41.1	-42.2	-1.1	-0.3	-50.2	-50.8	-0.5	-1.5	4.65	4.62	0.10	0.28	70.0
5.000	May 15 2037	30	21.4	4.249	4.237	3.784	3.766	-46.4	-47.1	-0.7	-1.5	-42.9	-43.1	-0.2	-1.6	-51.7	-52.5	-0.8	-1.6	4.65	4.62	0.10	0.28	70.0
4.375	Feb 15 2038	30	22.5	4.285	4.274	3.792	3.775	-49.3	-49.9	-0.5	-1.8	-46.1	-47.4	-1.2	0.1	-54.6	-55.3	-0.6	-1.9	4.65	4.62	0.10	0.26	70.0
4.500	May 15 2038	30	25.5	4.302	4.292	3.794	3.777	-50.8	-51.6	-0.8	-1.9	-47.9	-48.2	-0.2	-1.6	-56.1	-57.0	-0.9	-1.9	4.65	4.62	0.09	0.26	70.0
3.500	Feb 15 2039	30	25.9	4.328	4.319	3.800	3.784	-52.8	-53.5	-0.6	-2.1	-51.8	-53.0	-1.2	-0.1	-58.2	-58.9	-0.7	-2.2	4.65	4.62	0.09	0.24	69.8
4.250	May 15 2039	30	38.8	4.359	4.351	3.801	3.785	-55.8	-56.6	-0.9	-2.1	-53.6	-53.9	-0.2	-1.6	-61.2	-62.1	-0.9	-2.1	4.65	4.62	0.09	0.24	70.0
4.500	Aug 15 2039	30	41.4	4.371	4.362	3.802	3.785	-56.9	-57.7	-0.8	-2.1	-53.6	-55.1	-1.4	1.4	-62.3	-63.2	-0.9	-2.1	4.65	4.62	0.09	0.24	70.0
4.375	Nov 15 2039	30	44.6	4.378	4.371	3.804	3.787	-57.4	-58.4	-1.0	-2.1	-55.1	-55.3	-0.2	-1.2	-62.8	-63.9	-1.1	-2.2	4.65	4.62	0.09	0.24	70.0
4.625	Feb 15 2040	30	44.9	4.383	4.374	3.803	3.788	-57.9	-58.6	-0.7	-2.0	-54.3	-55.8	-1.5	2.2	-63.3	-64.1	-0.7	-2.1	4.65	4.62	0.09	0.24	70.0
4.375	May 15 2040	30	43.5	4.388	4.381	3.803	3.788	-58.5	-59.3	-0.9	-2.0	-56.1	-56.3	-0.2	-1.5	-63.9	-64.8	-0.9	-2.1	4.65	4.62	0.08	0.23	70.0
1.125	May 15 2040	20	60.4	4.450	4.445	3.803	3.788	-64.6	-65.7	-1.1	-2.6	-75.9	-76.1	-0.2	-0.7	-70.0	-71.2	-1.2	-2.6	4.65	4.62	0.07	0.19	33.4
3.875	Aug 15 2040	30	43.2	4.398	4.391	3.804	3.788	-59.4	-60.2	-0.8	-2.1	-57.7	-59.1	-1.4	-0.2	-64.8	-65.7	-0.9	-2.1	4.65	4.62	0.08	0.23	70.0
1.125	Aug 15 2040	20	76.5	4.467	4.462	3.804	3.788	-66.3	-67.3	-1.1	-2.5	-77.8	-78.7	-0.9	-1.0	-71.7	-72.9	-1.2	-2.6	4.65	4.62	0.07	0.19	35.8
4.250	Nov 15 2040	30	42.9	4.401	4.395	3.805	3.789	-59.6	-60.6	-1.0	-2.0	-57.6	-57.8	-0.2	0.3	-65.0	-66.1	-1.1	-2.1	4.65	4.62	0.08	0.23	70.0
1.375	Nov 15 2040	20	85.6	4.481	4.478	3.805	3.789	-67.6	-68.9	-1.3	-2.5	-78.4	-78.6	-0.2	-0.4	-73.0	-74.4	-1.4	-2.5	4.65	4.62	0.07	0.19	36.1
4.750	Feb 15 2041	30	43.0	4.397	4.389	3.805	3.790	-59.2	-59.8	-0.7	-1.9	-55.2	-56.7	-1.5	3.8	-64.6	-65.4	-0.7	-2.0	4.65	4.62	0.08	0.23	68.3
1.875	Feb 15 2041	20	89.7	4.484	4.479	3.805	3.790	-67.9	-68.9	-0.9	-2.4	-75.2	-76.5	-1.3	4.3	-73.4	-74.4	-1.0	-2.4	4.65	4.62	0.07	0.20	26.1
4.375	May 15 2041	30	42.0	4.411	4.405	3.804	3.790	-60.6	-61.5	-0.9	-1.9	-58.3	-58.5	-0.2	-2.9	-66.1	-67.0	-1.0	-2.0	4.65	4.62	0.08	0.22	70.0
2.250	May 15 2041	20	86.2	4.476	4.472	3.804	3.790	-67.1	-68.2	-1.1	-2.2	-73.0	-73.2	-0.2	2.5	-72.6	-73.7	-1.1	-2.3	4.65	4.62	0.07	0.20	34.4
3.750	Aug 15 2041	30	42.5	4.438	4.431	3.805	3.790	-63.3	-64.2	-0.9	-2.0	-62.2	-63.6	-1.5	-2.3	-68.7	-69.7	-1.0	-2.0	4.65	4.62	0.08	0.21	70.0
1.750	Aug 15 2041	20	83.7	4.509	4.504	3.805	3.790	-70.4	-71.5	-1.1	-2.3	-79.3	-80.6	-1.3	-4.9	-75.9	-77.0	-1.2	-2.4	4.65	4.62	0.07	0.19	10.5
3.125	Nov 15 2041	30	44.6	4.459	4.455	3.806	3.790	-65.3	-66.5	-1.1	-2.0	-67.3	-67.5	-0.2	-4.8	-70.8	-72.0	-1.2	-2.1	4.65	4.62	0.07	0.20	70.0
2.000	Nov 15 2041	20	70.6	4.523	4.520	3.806	3.790	-71.7	-73.0	-1.3	-2.3	-80.1	-80.3	-0.2	-0.6	-77.2	-78.6	-1.4	-2.3	4.65	4.62	0.07	0.19	10.9
3.125	Feb 15 2042	30	47.2	4.482	4.476	3.804	3.791	-67.7	-68.6	-0.9	-2.0	-69.0	-70.5	-1.5	-0.1	-73.2	-74.1	-0.9	-2.1	4.65	4.62	0.07	0.20	70.0
2.375	Feb 15 2042	20	59.4	4.525	4.521	3.804	3.791	-72.1	-73.0	-1.0	-2.2	-77.4	-78.9	-1.5	-8.4	-77.5	-78.6	-1.0	-2.3	4.65	4.62	0.07	0.19	14.4
3.000	May 15 2042	30	43.9	4.508	4.504	3.804	3.790	-70.4	-71.5	-1.1	-2.1	-73.4	-73.7	-0.2	-4.3	-75.9	-77.0	-1.1	-2.1	4.65	4.62	0.07	0.20	70.0
3.250	May 15 2042	20	49.8	4.498	4.495	3.804	3.790	-69.4	-70.5	-1.0	-2.0	-71.3	-71.6	-0.2	-2.1	-74.9	-76.1	-1.1	-2.1	4.65	4.62	0.07	0.20	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	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	4.507	4.503	3.803	3.789	-70.4	-71.4	-1.0	-2.0	-71.2	-72.8	-1.6	3.8	-75.9	-76.9	-1.1	-2.1	4.65	4.62	0.07	0.20	4.8
2.750	Aug 15 2042	30	42.0	4.527	4.523	3.803	3.789	-72.4	-73.5	-1.1	-2.1	-76.3	-77.8	-1.6	-1.2	-77.9	-79.0	-1.1	-2.2	4.65	4.62	0.07	0.19	63.6
4.000	Nov 15 2042	20	40.6	4.489	4.485	3.803	3.788	-68.6	-69.7	-1.1	-1.9	-67.6	-67.8	-0.2	8.6	-74.1	-75.3	-1.2	-2.0	4.65	4.62	0.07	0.21	4.0
2.750	Nov 15 2042	30	42.0	4.541	4.539	3.803	3.788	-73.8	-75.0	-1.3	-2.1	-78.5	-78.7	-0.2	-2.0	-79.3	-80.6	-1.3	-2.2	4.65	4.62	0.07	0.19	46.9
3.125	Feb 15 2043	30	42.0	4.538	4.534	3.802	3.788	-73.6	-74.5	-0.9	-2.0	-75.7	-77.3	-1.7	4.4	-79.1	-80.1	-1.0	-2.1	4.65	4.62	0.07	0.20	54.4
3.875	Feb 15 2043	20	43.6	4.509	4.505	3.802	3.788	-70.8	-71.6	-0.9	-1.9	-69.5	-71.2	-1.7	10.5	-76.3	-77.2	-0.9	-2.0	4.65	4.62	0.07	0.20	10.5
3.875	May 15 2043	20	41.7	4.519	4.516	3.800	3.787	-71.9	-73.0	-1.0	-1.9	-71.6	-71.9	-0.2	4.3	-77.4	-78.5	-1.1	-1.9	4.65	4.62	0.07	0.20	6.8
2.875	May 15 2043	30	42.0	4.551	4.549	3.800	3.787	-75.1	-76.2	-1.1	-2.0	-79.6	-79.8	-0.2	-3.7	-80.6	-81.8	-1.2	-2.0	4.65	4.62	0.07	0.19	28.0
3.625	Aug 15 2043	30	42.0	4.540	4.536	3.799	3.785	-74.1	-75.2	-1.0	-1.9	-74.1	-75.9	-1.7	7.0	-79.6	-80.7	-1.1	-2.0	4.65	4.62	0.07	0.20	48.3
4.375	Aug 15 2043	20	43.7	4.505	4.500	3.799	3.785	-70.6	-71.6	-0.9	-1.8	-67.7	-69.4	-1.7	5.5	-76.1	-77.2	-1.0	-1.9	4.65	4.62	0.07	0.21	3.8
3.750	Nov 15 2043	30	42.0	4.547	4.544	3.798	3.783	-74.8	-76.1	-1.2	-1.9	-75.3	-75.5	-0.2	-1.0	-80.4	-81.7	-1.3	-2.0	4.65	4.62	0.07	0.20	47.3
4.750	Nov 15 2043	20	42.2	4.501	4.497	3.798	3.783	-70.2	-71.4	-1.1	-1.8	-67.1	-67.2	-0.2	7.1	-75.8	-77.0	-1.2	-1.8	4.65	4.62	0.07	0.21	0.4
3.625	Feb 15 2044	30	42.0	4.562	4.558	3.795	3.783	-76.6	-77.6	-1.0	-1.9	-76.8	-78.7	-1.8	0.3	-82.2	-83.2	-1.0	-2.0	4.65	4.62	0.07	0.19	44.1
4.500	Feb 15 2044	20	42.7	4.524	4.519	3.795	3.783	-72.8	-73.7	-0.9	-1.8	-69.5	-71.3	-1.8	7.4	-78.4	-79.3	-0.9	-1.9	4.65	4.62	0.07	0.20	1.8
3.375	May 15 2044	30	42.0	4.568	4.566	3.793	3.780	-77.5	-78.6	-1.1	-1.9	-79.8	-80.0	-0.2	-2.7	-83.0	-84.2	-1.2	-1.9	4.65	4.62	0.07	0.19	48.0
4.625	May 15 2044	20	44.1	4.526	4.524	3.793	3.780	-73.3	-74.4	-1.1	-1.8	-70.4	-70.7	-0.3	6.7	-78.9	-80.0	-1.1	-1.9	4.62	4.59	0.07	0.20	4.8
3.125	Aug 15 2044	30	42.0	4.577	4.574	3.791	3.777	-78.6	-79.7	-1.1	-1.9	-81.6	-83.4	-1.8	-0.1	-84.2	-85.3	-1.1	-1.9	4.65	4.62	0.07	0.19	33.0
4.125	Aug 15 2044	20	43.8	4.541	4.538	3.791	3.777	-75.0	-76.1	-1.2	-1.9	-73.1	-75.1	-1.9	8.4	-80.5	-81.7	-1.2	-2.0	4.55	4.54	0.07	0.20	4.0
4.625	Nov 15 2044	20	17.1	4.514	4.511	3.789	3.775	-72.5	-73.6	-1.1	-1.7	-69.7	-69.8	-0.2	3.6	-78.0	-79.2	-1.2	-1.8	4.65	4.62	0.07	0.19	0.0
3.000	Nov 15 2044	30	42.0	4.586	4.585	3.789	3.775	-79.7	-81.0	-1.3	-1.9	-84.5	-84.7	-0.2	-2.6	-85.3	-86.6	-1.3	-1.9	4.65	4.62	0.07	0.18	42.0
2.500	Feb 15 2045	30	42.0	4.585	4.582	3.785	3.773	-79.9	-80.9	-1.0	-1.9	-87.1	-88.8	-1.7	-0.8	-85.5	-86.5	-1.1	-1.9	4.65	4.62	0.06	0.17	22.2
3.000	May 15 2045	30	42.4	4.580	4.578	3.782	3.769	-79.8	-80.9	-1.1	-1.8	-84.6	-84.8	-0.2	2.7	-85.3	-86.5	-1.2	-1.8	4.65	4.62	0.07	0.18	63.1
2.875	Aug 15 2045	30	42.3	4.579	4.576	3.779	3.766	-79.9	-81.0	-1.1	-1.8	-84.9	-86.6	-1.8	1.5	-85.5	-86.7	-1.1	-1.8	4.65	4.62	0.06	0.18	49.3
3.000	Nov 15 2045	30	42.1	4.580	4.579	3.777	3.763	-80.3	-81.6	-1.3	-1.7	-85.5	-85.7	-0.2	-0.5	-85.9	-87.2	-1.3	-1.8	4.65	4.62	0.06	0.18	69.5
2.500	Feb 15 2046	30	40.3	4.593	4.590	3.772	3.760	-82.0	-83.0	-1.0	-1.7	-90.0	-91.8	-1.8	-2.7	-87.6	-88.7	-1.1	-1.8	4.65	4.62	0.06	0.17	34.3
2.500	May 15 2046	30	43.2	4.596	4.594	3.769	3.756	-82.7	-83.8	-1.1	-1.6	-91.8	-92.0	-0.2	-1.6	-88.3	-89.5	-1.2	-1.7	4.65	4.62	0.06	0.17	38.2
2.250	Aug 15 2046	30	40.5	4.600	4.597	3.765	3.752	-83.4	-84.6	-1.1	-1.6	-94.1	-95.8	-1.7	-0.5	-89.0	-90.2	-1.2	-1.7	4.65	4.62	0.06	0.16	18.4
2.875	Nov 15 2046	30	42.9	4.597	4.595	3.762	3.748	-83.4	-84.7	-1.3	-1.6	-90.2	-90.3	-0.1	4.0	-89.0	-90.4	-1.3	-1.6	4.65	4.62	0.06	0.17	65.3
3.000	Feb 15 2047	30	40.8	4.603	4.601	3.758	3.745	-84.5	-85.5	-1.0	-1.5	-89.6	-91.5	-1.9	2.4	-90.2	-91.2	-1.1	-1.6	4.65	4.62	0.06	0.17	28.0
3.000	May 15 2047	30	44.2	4.604	4.603	3.754	3.741	-85.1	-86.2	-1.1	-1.5	-91.2	-91.4	-0.2	-1.4	-90.7	-91.9	-1.2	-1.5	4.65	4.62	0.06	0.17	49.0
2.750	Aug 15 2047	30	43.5	4.602	4.600	3.750	3.737	-85.2	-86.3	-1.1	-1.4	-92.5	-94.4	-1.9	0.6	-90.9	-92.0	-1.2	-1.5	4.65	4.62	0.06	0.17	25.6
2.750	Nov 15 2047	30	41.2	4.603	4.602	3.747	3.733	-85.7	-86.9	-1.3	-1.4	-94.0	-94.2	-0.1	-1.4	-91.3	-92.6	-1.3	-1.4	4.65	4.62	0.06	0.16	20.8
3.000	Feb 15 2048	30	45.0	4.600	4.598	3.742	3.729	-85.8	-86.8	-1.0	-1.3	-91.2	-93.2	-1.9	4.7	-91.5	-92.5	-1.1	-1.4	4.65	4.62	0.06	0.17	17.2
3.125	May 15 2048	30	49.2	4.598	4.597	3.737	3.725	-86.1	-87.2	-1.1	-1.3	-91.7	-91.9	-0.1	-0.3	-91.7	-92.9	-1.2	-1.3	4.65	4.62	0.06	0.17	18.7
3.000	Aug 15 2048	30	50.4	4.598	4.595	3.733	3.720	-86.4	-87.5	-1.1	-1.2	-92.1	-94.0	-1.9	1.5	-92.1	-93.2	-1.1	-1.3	4.65	4.62	0.06	0.16	13.0
3.375	Nov 15 2048	30	54.9	4.593	4.592	3.730	3.716	-86.3	-87.6	-1.2	-1.2	-90.4	-90.5	-0.1	1.8	-92.0	-93.3	-1.3	-1.3	4.65	4.62	0.06	0.17	18.1
3.000	Feb 15 2049	30	55.6	4.590	4.587	3.725	3.713	-86.5	-87.4	-1.0	-1.1	-92.3	-94.2	-1.9	0.1	-92.1	-93.2	-1.0	-1.2	4.65	4.62	0.06	0.16	14.8

* 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	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	May 15 2049	30	57.6	4.588	4.587	3.720	3.708	-86.8	-87.9	-1.1	-1.0	-94.6	-94.7	-0.1	-2.2	-92.4	-93.6	-1.2	-1.1	4.65	4.62	0.06	0.16	19.8
2.250	Aug 15 2049	30	63.4	4.587	4.585	3.716	3.703	-87.1	-88.1	-1.1	-1.0	-100.1	-102.0	-1.8	-3.6	-92.8	-93.9	-1.1	-1.0	4.65	4.62	0.06	0.15	31.3
2.375	Nov 15 2049	30	60.5	4.579	4.578	3.713	3.699	-86.6	-87.8	-1.2	-0.9	-99.4	-99.5	-0.1	0.8	-92.3	-93.6	-1.3	-1.0	4.65	4.62	0.05	0.15	32.4
2.000	Feb 15 2050	30	60.5	4.575	4.573	3.708	3.696	-86.7	-87.7	-1.0	-0.8	-102.9	-104.7	-1.8	-1.7	-92.4	-93.4	-1.0	-0.9	4.65	4.62	0.05	0.15	15.0
1.250	May 15 2050	30	73.6	4.540	4.538	3.703	3.691	-83.6	-84.7	-1.1	-0.6	-111.1	-111.2	-0.1	-8.2	-89.3	-90.4	-1.1	-0.7	4.65	4.62	0.05	0.13	18.7
1.375	Aug 15 2050	30	89.1	4.552	4.550	3.699	3.686	-85.3	-86.3	-1.1	-0.6	-110.9	-112.4	-1.5	1.8	-91.0	-92.1	-1.1	-0.7	4.65	4.62	0.05	0.13	24.4
1.625	Nov 15 2050	30	85.8	4.551	4.549	3.696	3.682	-85.5	-86.7	-1.2	-0.6	-108.1	-108.2	0.0	2.7	-91.2	-92.4	-1.2	-0.7	4.65	4.62	0.05	0.14	22.4
1.875	Feb 15 2051	30	90.0	4.537	4.534	3.691	3.679	-84.6	-85.5	-0.9	-0.6	-102.6	-104.3	-1.7	7.1	-90.3	-91.3	-1.0	-0.6	4.65	4.62	0.05	0.14	17.4
2.375	May 15 2051	30	95.5	4.531	4.529	3.686	3.674	-84.5	-85.5	-1.0	-0.6	-97.4	-97.5	-0.1	5.3	-90.2	-91.3	-1.1	-0.7	4.65	4.62	0.05	0.15	21.7
2.000	Aug 15 2051	30	91.4	4.526	4.523	3.682	3.669	-84.4	-85.4	-1.0	-0.6	-101.1	-102.7	-1.7	-1.9	-90.1	-91.2	-1.1	-0.6	4.65	4.62	0.05	0.14	19.0
1.875	Nov 15 2051	30	90.2	4.520	4.518	3.678	3.665	-84.2	-85.3	-1.1	-0.5	-103.5	-103.5	0.0	-2.4	-89.9	-91.1	-1.2	-0.6	4.65	4.62	0.05	0.14	23.6
2.250	Feb 15 2052	30	85.0	4.513	4.509	3.673	3.661	-83.9	-84.8	-0.9	-0.6	-97.6	-99.3	-1.7	7.6	-89.7	-90.6	-0.9	-0.6	4.65	4.62	0.05	0.14	25.9
2.875	May 15 2052	30	78.9	4.504	4.502	3.669	3.656	-83.5	-84.5	-1.0	-0.6	-91.7	-91.7	0.0	5.9	-89.3	-90.3	-1.0	-0.7	4.65	4.62	0.05	0.15	24.1
3.000	Aug 15 2052	30	70.3	4.494	4.490	3.664	3.651	-83.0	-83.9	-0.9	-0.6	-89.1	-90.9	-1.7	4.3	-88.7	-89.7	-1.0	-0.7	4.65	4.62	0.05	0.15	19.0
4.000	Nov 15 2052	30	64.3	4.474	4.471	3.660	3.647	-81.3	-82.3	-1.0	-0.7	-81.3	-81.3	0.0	7.7	-87.1	-88.2	-1.1	-0.7	4.65	4.62	0.06	0.16	11.4
3.625	Feb 15 2053	30	66.3	4.475	4.471	3.655	3.643	-81.9	-82.7	-0.8	-0.7	-83.2	-84.9	-1.8	-0.1	-87.7	-88.6	-0.9	-0.8	4.65	4.62	0.06	0.15	14.2
3.625	May 15 2053	30	62.7	4.470	4.466	3.651	3.638	-81.9	-82.8	-0.9	-0.7	-84.1	-84.1	0.0	-1.0	-87.7	-88.7	-1.0	-0.7	4.65	4.62	0.06	0.15	9.1
4.125	Aug 15 2053	30	71.6	4.459	4.454	3.646	3.633	-81.2	-82.1	-0.9	-0.8	-79.5	-81.2	-1.7	6.3	-87.0	-87.9	-0.9	-0.8	4.65	4.62	0.06	0.16	12.0
4.750	Nov 15 2053	30	66.4	4.443	4.439	3.642	3.629	-80.0	-81.0	-1.0	-0.8	-76.0	-75.9	0.0	3.4	-85.8	-86.9	-1.0	-0.8	4.65	4.62	0.06	0.16	0.7
4.250	Feb 15 2054	30	71.2	4.444	4.440	3.637	3.625	-80.7	-81.5	-0.8	-0.8	-78.2	-79.9	-1.7	-0.4	-86.5	-87.3	-0.8	-0.9	4.65	4.62	0.06	0.16	3.1
4.625	**May 15 2054**	**30**	**76.4**	4.437	4.433	3.632	3.620	-80.4	-81.3	-0.9	-0.8	-76.9	-76.9	0.0	1.3	-86.3	-87.2	-0.9	-0.9	4.65	4.62	0.06	0.16	9.7
4.250	**Aug 15 2054**	**30**	**74.3**	4.434	4.430	3.627	3.615	-80.7	-81.6	-0.9	-1.0	-78.1	-79.9	-1.8	0.6	-86.5	-87.4	-1.0	-1.1	4.57	4.56	0.06	0.16	7.1
4.500	Nov 15 2054	30	31.1	4.427	4.424	3.623	3.610	-80.4	-81.4	-1.0	-1.0	-77.4	-77.4	0.0	0.7	-86.2	-87.3	-1.1	-1.1	4.59	4.57	0.06	0.16	19.6

* 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

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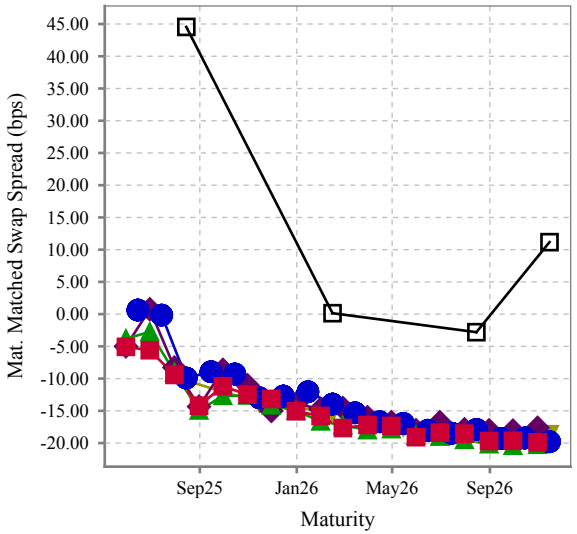
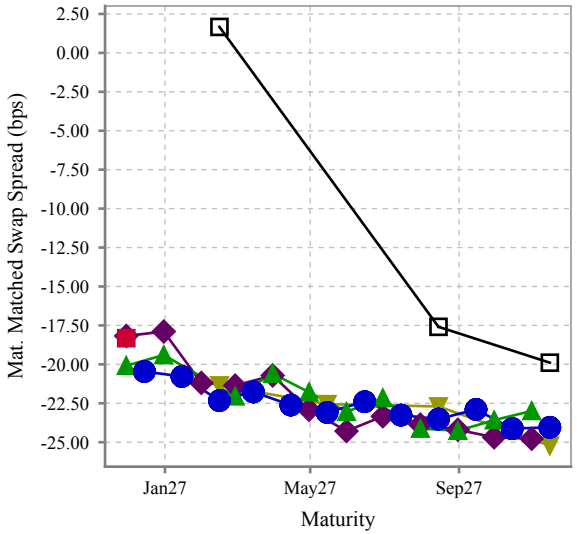
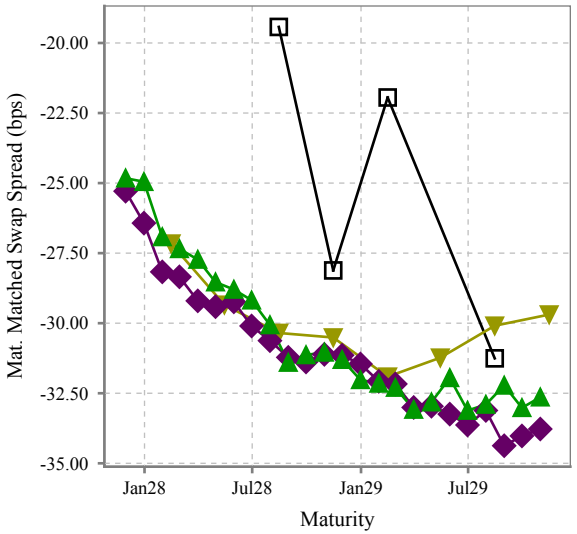
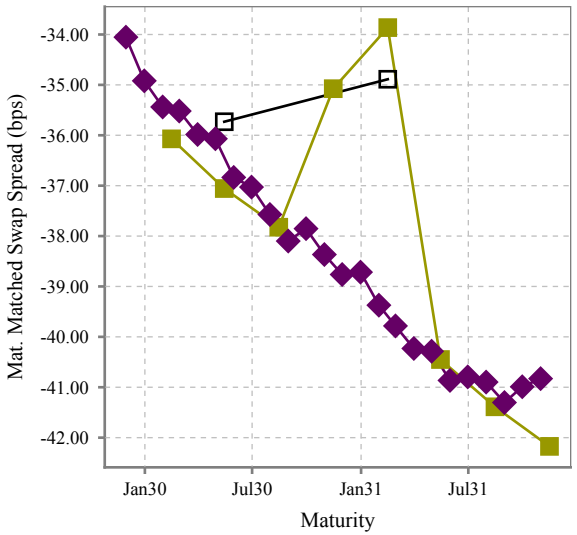
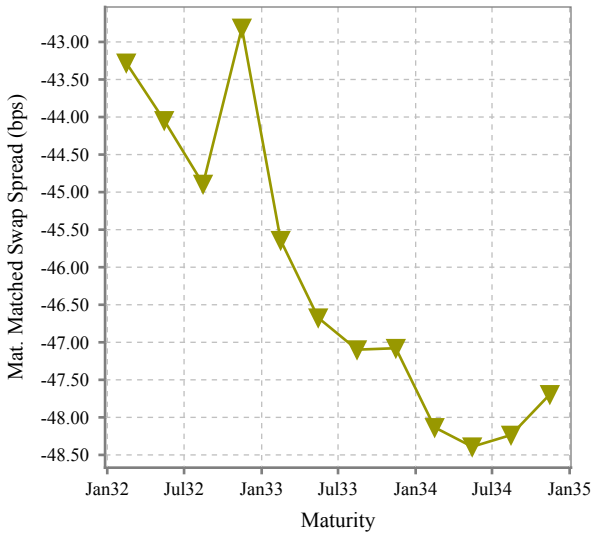
Issue Specific Maturity Matched SOFR Swap Spread

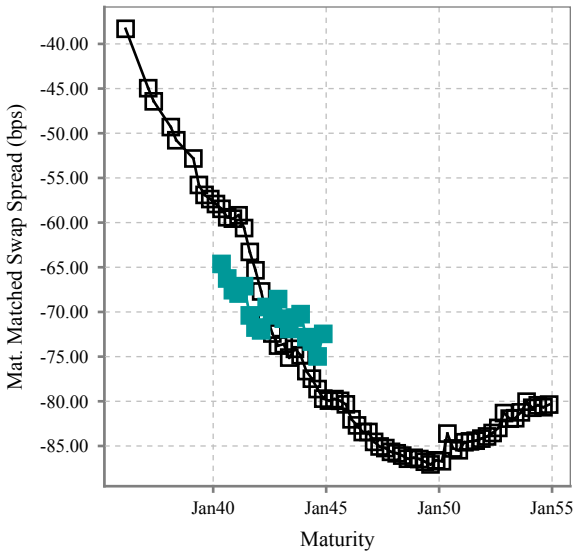












1) The charts are broken down into six buckets, that is, shorter than 2yr,2yr-3yr,3yr-5yr,5yr-7yr,7yr-10yr and 10yr+ remaining maturities
2) Notes/bonds in each bucket are grouped based on their original issue maturities: 2-, 3-, 5-, 7-, 10-, 20- and 30-year.

2y 3y 5y 7y 10y 20y 30y

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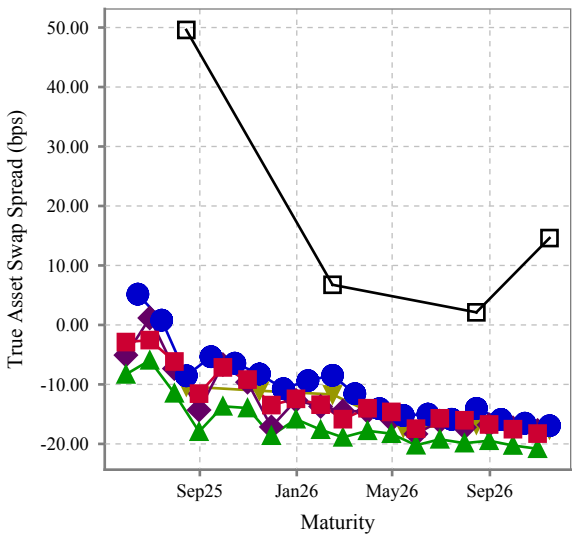
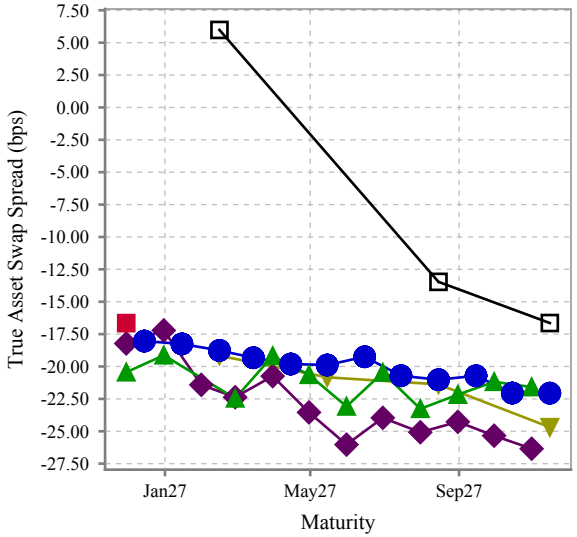
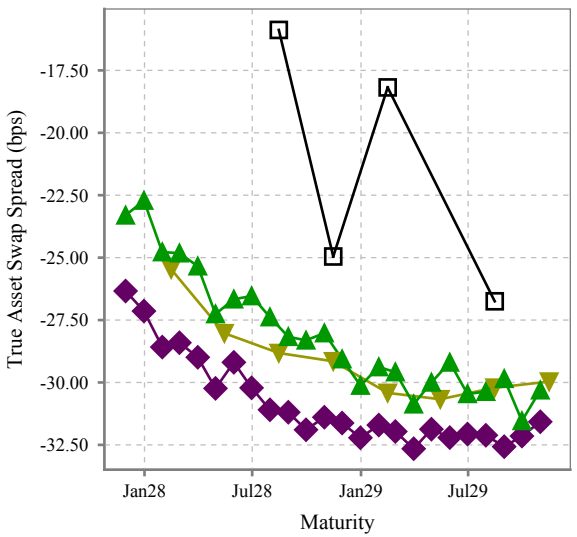
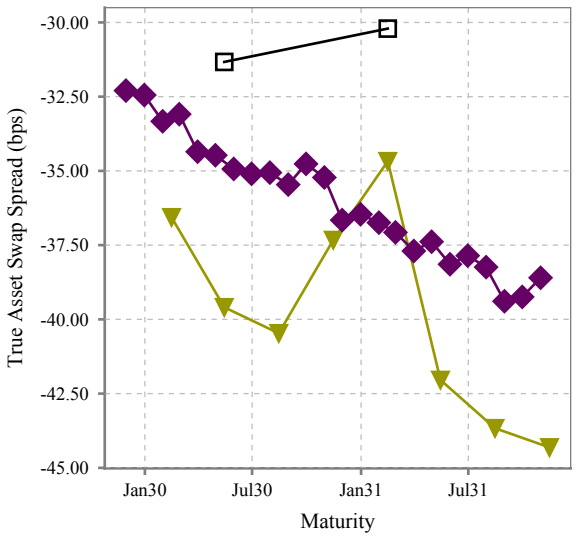
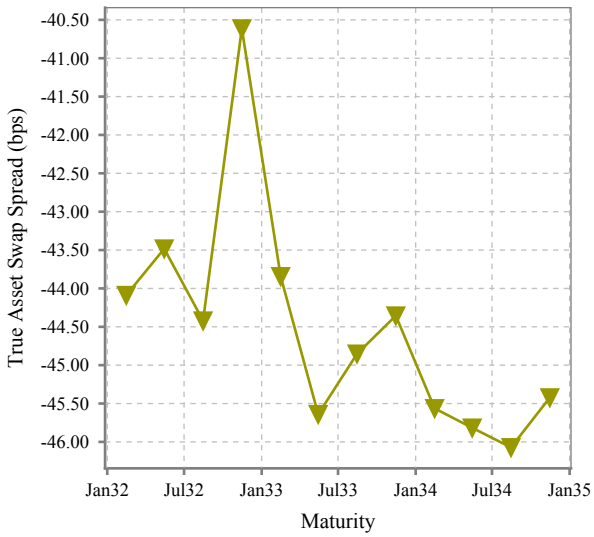
Issue Specific SOFR True Asset Swap Spread

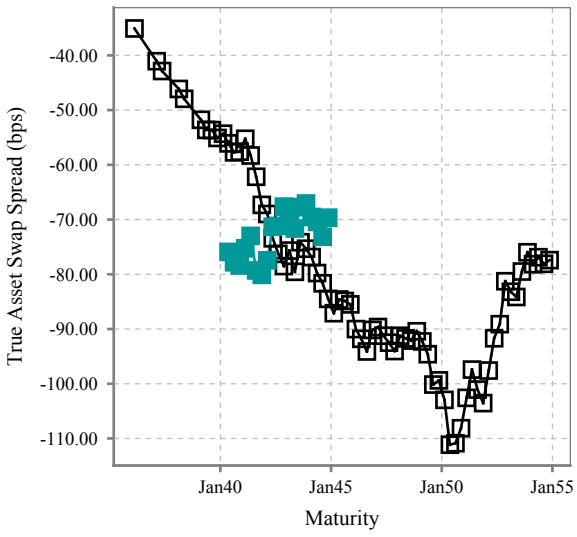


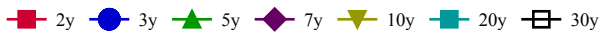












1) The charts are broken down into six buckets, that is, shorter than 2yr,2yr-3yr,3yr-5yr,5yr-7yr,7yr-10yr and 10yr+ remaining maturities
2) Notes/bonds in each bucket are grouped based on their original issue maturities: 2-, 3-, 5-, 7-, 10-, 20- and 30-year.

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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			
		Orignal Mat	Old	Yld Err	ASW		Orignal 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	0	-30.8	9.3	0.5% FEB-26	5	0	4.9	-19.5	35.7	-1.6	37.3	0.5	-28.8	48.0	-76.8	-0.2
3y-5y	5.25% FEB-29	30	0	-11.7	-23.4	3.25% JUN-29	7	0	1.7	-37.1	13.4	2.2	11.3	-1.0	-13.7	39.1	-52.9	-0.4
5y-10y	1.125% FEB-31	10	0	-5.2	-38.8	3.875% AUG-34	10	0	5.1	-50.8	10.3	0.0	10.3		-12.0	0.0	-12.0	
10y-30y	1.25% MAY-50	30	0	-4.5	-83.9	4.25% NOV-34	10	0	5.7	-50.1	10.2	8.6	1.5	-1.2	33.8	35.0	-1.3	-1.2

*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			
			Orignal Mat	Old	Yld Err	ASW		Orignal 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	0	-3.2	-15.7	3.625% MAY-26	3	0	1.2	-18.9	4.4	0.0	4.4		-3.2	0.0	-3.2	
5s	1y-3y	4.125% SEP-27	5	0	-1.7	-23.9	0.5% FEB-26	5	0	4.9	-19.5	6.6	0.0	6.6		4.4	0.0	4.4	
5s	3y-5y	3.625% AUG-29	5	0	-1.9	-34.5	4.125% MAR-29	5	0	0.8	-35.4	2.7	0.0	2.7		-0.9	0.0	-0.9	
7s	1y-3y	1.625% SEP-26	7	0	-2.2	-18.3	2.875% NOV-25	7	0	4.1	-14.1	6.3	0.0	6.3		4.2	0.0	4.2	
7s	3y-5y	1.25% MAY-28	7	0	-0.1	-31.2	3.25% JUN-29	7	0	1.7	-37.1	1.8	0.0	1.8		-5.9	0.0	-5.9	
7s	5y-10y	4.125% OCT-31	7	0	-0.1	-45.0	4.625% MAY-31	7	0	1.9	-45.3	1.9	0.0	1.9		-0.3	0.0	-0.3	
10s	1y-3y	2% NOV-26	10	0	-2.6	-18.6	1.625% MAY-26	10	0	1.0	-18.6	3.6	0.0	3.6		0.1	0.0	0.1	
10s	3y-5y	1.625% AUG-29	10	0	-3.3	-32.7	2.875% MAY-28	10	0	0.4	-31.2	3.8	0.0	3.8		1.5	0.0	1.5	
10s	5y-10y	1.125% FEB-31	10	0	-5.2	-38.8	3.875% AUG-34	10	0	5.1	-50.8	10.3	0.0	10.3		-12.0	0.0	-12.0	
30s	1y-3y	6.5% NOV-26	30	0	-30.8	9.3	6.375% AUG-27	30	0	-6.8	-18.2	23.9	0.0	23.9		-27.5	0.0	-27.5	
30s	3y-5y	5.25% FEB-29	30	0	-11.7	-23.4	6.125% AUG-29	30	0	-1.1	-35.0	10.6	0.0	10.6		-11.6	0.0	-11.6	
30s	5y-10y	5.375% FEB-31	30	0	-4.5	-38.8	6.25% MAY-30	30	0	-0.1	-39.0	4.3	0.0	4.3		-0.1	0.0	-0.1	
30s	10y-30y	1.25% MAY-50	30	0	-4.5	-83.9	3.375% NOV-48	30	0	2.2	-87.4	6.7	0.0	6.7		-3.5	0.0	-3.5	

*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.

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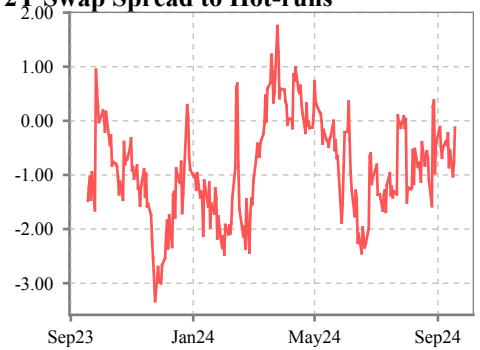
Treasury Futures Asset Swap Report - Front Contract

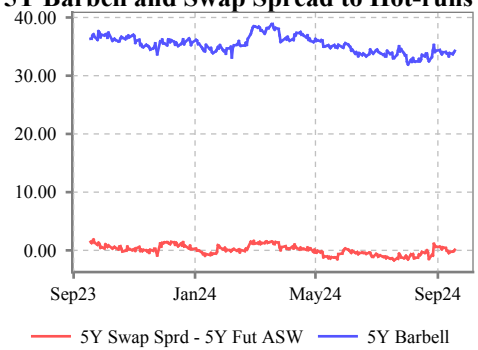
Swap Spread		ASW		Carry to Deliver			Spread to Hot-Run			Weighted Spread to Hot-Run				Barbell to Hot-Run			Weighted Barbell to Hot-Run				
Futures	CTD	Cash	Futures	Current	Average	ZScore	Current	Average	ZScore	Weight	Current	Average	Zscore	Current	Average	ZScore	Weight 1	Weight 2	Current	Average	ZScore
TUU24	4.125 06/15/2026	-17.88	-17.80	0.08	1.65	-0.97	-0.31	-0.27	-0.04	1.10	-2.16	-1.59	-0.44								
FVU24	4.375 11/30/2028	-29.46	-28.04	1.42	0.44	1.06	-1.20	-0.66	-0.49	0.90	1.63	1.90	-0.23	4.36	6.11	-1.07	-0.53	2.07	-22.77	-22.04	-0.59
TYZ24	4.625 04/30/2031	-37.86	-37.76	0.10	-0.12	0.53	-7.73	-5.59	-1.25	0.51	14.59	14.42	0.17	0.39	1.56	-0.90	1.87	-0.68	13.79	13.22	0.50
USZ24	4.625 02/15/2040	-53.20	-53.83	-0.63	0.41	-0.92	-19.86	-19.11	-0.29	0.77	-2.67	-2.81	0.07	-5.76	-4.57	-0.50	1.58	-0.29	3.19	6.44	-1.13
WNZ24	4.750 11/15/2053	-79.08	-80.32	-1.24	-4.11	0.95	0.21	3.16	-0.99	0.45	44.21	45.74	-0.36	3.42	6.98	-1.48	-0.59	2.90	-108.65	-103.04	-1.88

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	4.125 06/15/2026	-23.28	-26.71	-3.43	-2.94	-0.17	2.40	4.28	-0.88	1.05	1.12	3.46	-1.19								
FVU24	4.375 11/30/2028	-38.90	-39.20	-0.30	-2.17	1.12	3.23	1.82	0.81	0.90	6.80	4.86	1.00	15.52	12.71	1.36	-0.60	2.94	-35.76	-37.56	0.95
TYZ24	4.625 04/30/2031	-44.07	-44.85	-0.78	-2.00	1.80	-7.08	-4.07	-1.98	0.61	13.15	13.70	-0.46	7.49	7.92	-0.43	1.69	-0.19	4.03	4.51	-0.49
USZ24	4.625 02/15/2040	-59.89	-60.92	-1.02	-0.48	-0.43	-19.67	-18.45	-0.47	0.80	-3.40	-3.24	-0.08	1.33	1.57	-0.13	1.11	0.19	-3.63	-1.70	-0.87
WNZ24	4.750 11/15/2053	-86.34	-87.84	-1.50	-4.71	1.06	0.44	3.74	-1.10	0.57	37.72	39.37	-0.39	10.93	13.57	-0.88	-0.14	2.48	-100.00	-94.70	-1.91

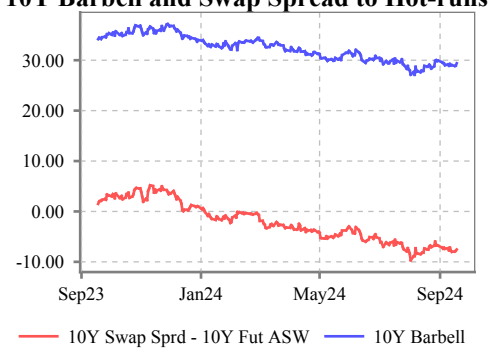
2Y Swap Spread to Hot-runs



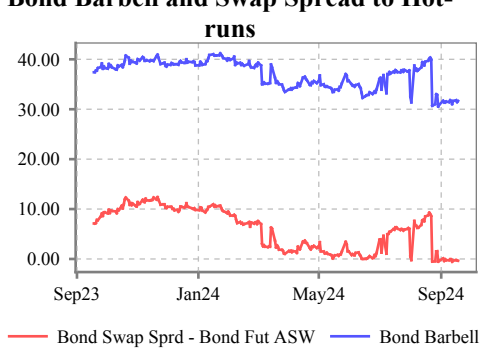
5Y Barbell and Swap Spread to Hot-runs



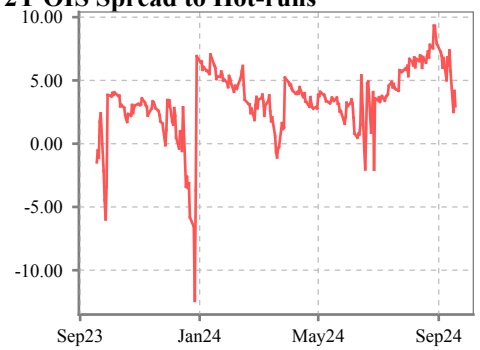
10Y Barbell and Swap Spread to Hot-runs



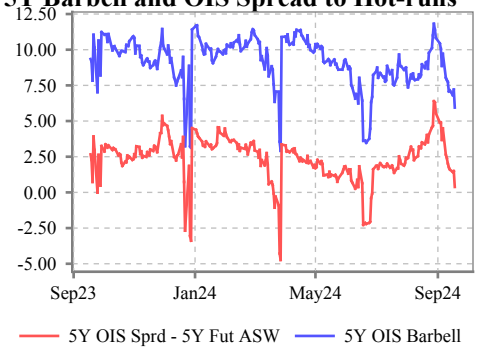
Bond Barbell and Swap Spread to Hot-runs



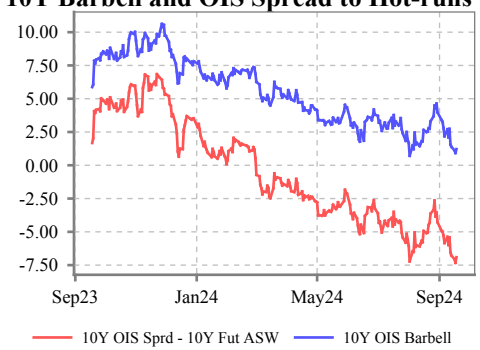
2Y OIS Spread to Hot-runs



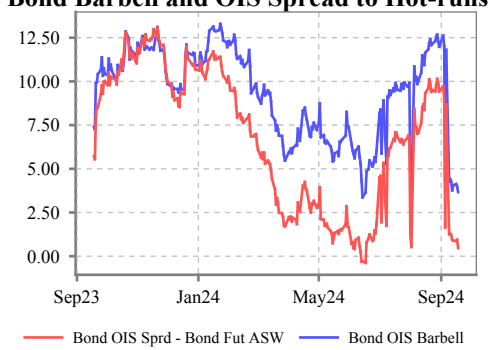
5Y Barbell and OIS Spread to Hot-runs



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 and Wt2 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 OTR swap sprd + 5Y OTR swap sprd) - 5Y futures ASW. The 10y barbell to HR is defined as 0.5*(5Y OTR swap sprd + 10Y OTR swap sprd) - 10Y futures ASW.
The bond barbell to HR is defined as 0.5*(10Y OTR swap sprd + 20Y swap sprd) - bond futures ASW. The Ultra-bond barbell to HR is defined as 0.5*(20Y swap sprd + 30Y OTR swap sprd) – ultra-bond futures ASW.
Asset swap spreads are based on SOFR swaps.

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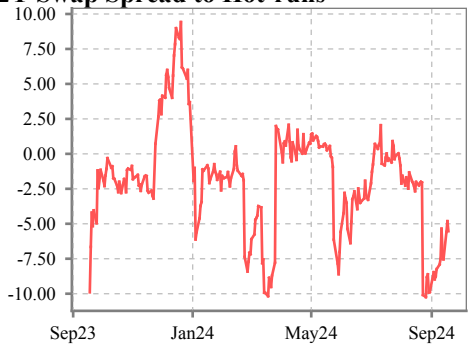
Treasury Futures Asset Swap Report - Back Contract

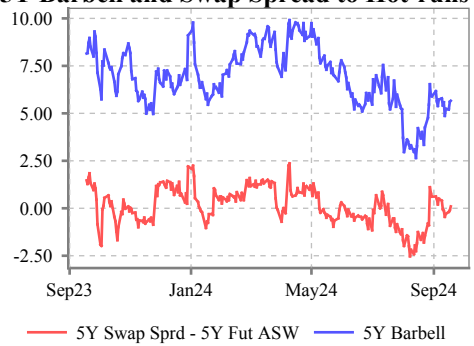
Swap Spread		ASW		Carry to Deliver			Spread to Hot-Run			Weighted Spread to Hot-Run				Barbell to Hot-Run			Weighted Barbell to Hot-Run				
Futures	CTD	Cash	Futures	Current	Average	ZScore	Current	Average	ZScore	Weight	Current	Average	Zscore	Current	Average	ZScore	Weight 1	Weight 2	Current	Average	ZScore
TUZ24	0.875 09/30/2026	-17.75	-17.99	-0.24	1.76	-1.40	-0.12	-0.41	0.25	1.06	-1.29	-1.25	-0.03								
FVZ24	4.250 02/28/2029	-29.12	-29.34	-0.22	-0.41	0.25	0.10	-0.19	0.30	0.92	2.55	2.03	0.60	5.66	6.58	-0.49	-0.45	1.69	-11.78	-12.52	0.83
TYM25	4.250 06/30/2031	-37.70	-37.94	-0.24	-0.67	0.42	-7.55	-4.95	-1.14	0.54	13.27	13.73	-0.35	0.58	2.22	-0.86	4.09	-2.29	22.35	20.81	0.68
USM25	4.625 02/15/2040	-53.20	-53.49	-0.29	-1.26	1.09	-20.21	-17.44	-0.77	0.76	-2.64	-0.78	-0.69	-6.10	-2.90	-1.00	3.15	-1.43	16.02	24.26	-1.73
WNM25	4.750 11/15/2053	-79.08	-79.75	-0.67	-1.45	0.43	-0.36	0.50	-0.44	0.20	63.95	62.72	0.45	2.85	4.32	-0.61	-1.83	3.89	-96.89	-95.54	-0.53

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	-23.99	-32.80	-8.81	-3.58	-2.05	8.49	5.10	2.54	1.01	8.24	4.94	2.51								
FVZ24	4.250 02/28/2029	-38.67	-43.03	-4.36	-3.37	-1.33	7.05	2.72	4.52	0.91	10.20	5.39	4.88	19.35	13.60	4.89	-0.20	1.87	-7.90	-13.52	5.21
TYM25	4.250 06/30/2031	-43.96	-46.45	-2.49	-2.67	0.17	-5.49	-3.41	-0.94	0.63	13.71	13.54	0.14	9.08	8.66	0.34	2.58	-0.94	13.84	12.36	0.93
USM25	4.625 02/15/2040	-59.89	-61.15	-1.25	-2.20	1.03	-19.44	-16.74	-0.76	0.80	-3.11	-1.46	-0.62	1.56	3.29	-0.76	1.25	-0.17	16.34	19.07	-1.17
WNM25	4.750 11/15/2053	-86.34	-87.69	-1.36	-2.13	0.43	0.29	1.16	-0.45	0.38	54.70	53.15	0.59	10.79	10.99	-0.11	-1.21	3.15	-75.84	-75.30	-0.27

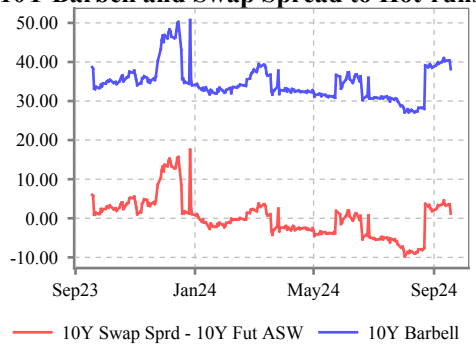
2Y Swap Spread to Hot-runs



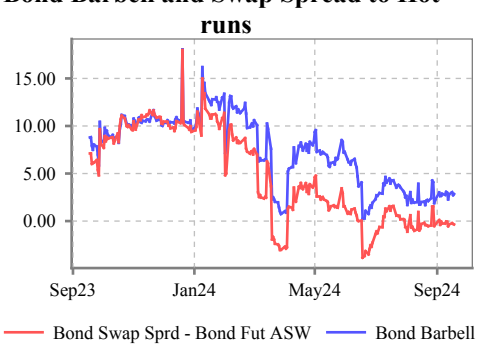
5Y Barbell and Swap Spread to Hot-runs



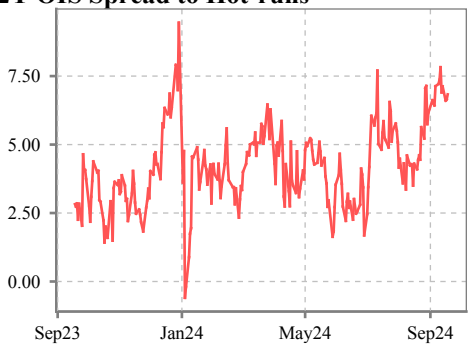
10Y Barbell and Swap Spread to Hot-runs



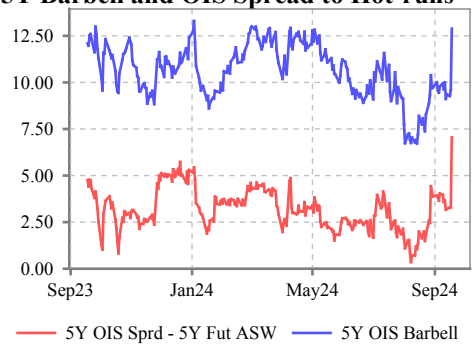
Bond Barbell and Swap Spread to Hot-runs



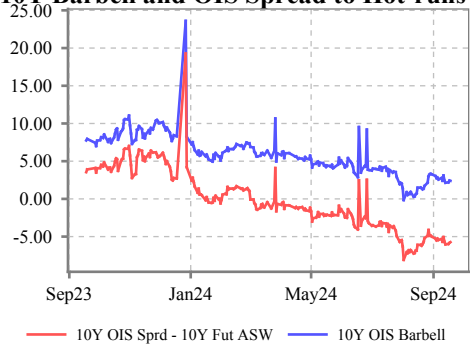
2Y OIS Spread to Hot-runs



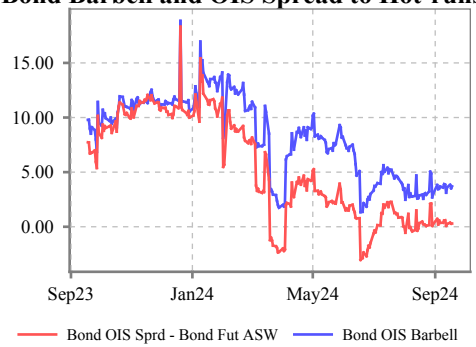
5Y Barbell and OIS Spread to Hot-runs



10Y Barbell and OIS Spread to Hot-runs



Bond Barbell and OIS Spread to Hot-runs



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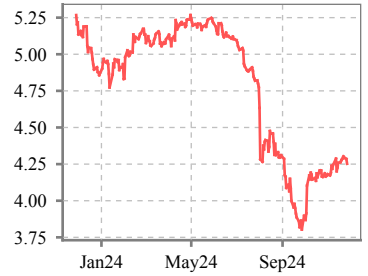
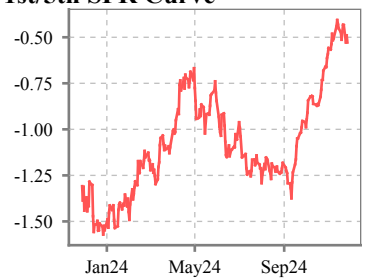
SOFR Swap Curve Fair Value Model Report

	Coefficients								Model Info.		Results Summary			Current Driver	Values
Curve	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
2s/5s	-1.08	-0.04	-0.27	0.05	-0.03	0.91	-0.12	0.15	96 %	0.10	-0.25	-0.40	0.15	3Mx3M OIS	4.25
2s/10s	-1.64	-0.07	-0.50	-0.15	-0.04	1.53	-0.21	0.22	95 %	0.17	-0.29	-0.53	0.25	Fed Expec. Crv	-0.53
2s/30s	-1.65	-0.11	-0.73	-0.41	-0.07	1.90	-0.25	0.27	95 %	0.21	-0.44	-0.75	0.31	Fed B/S	6.98
5s/10s	-0.56	-0.03	-0.23	-0.20	-0.01	0.62	-0.09	0.07	91 %	0.08	-0.04	-0.14	0.10	5Yx5Y Infl.swap	2.46
5s/30s	-0.56	-0.07	-0.46	-0.46	-0.04	0.99	-0.12	0.12	93 %	0.14	-0.19	-0.35	0.16	2Y Infl. swap	2.58
10s/30s	-0.00	-0.04	-0.23	-0.27	-0.03	0.37	-0.03	0.05	94 %	0.07	-0.15	-0.21	0.07	Intercept shift	1.00
20s/30s	0.11	-0.01	-0.08	-0.08	-0.02	0.06	-0.00	0.02	97 %	0.02	-0.17	-0.16	-0.00		
1Y fwd 2s/5s	-0.94	-0.03	-0.26	-0.27	-0.02	0.82	-0.12	0.09	89 %	0.10	-0.07	-0.19	0.12		
1Y fwd 2s/10s	-1.25	-0.06	-0.43	-0.52	-0.02	1.25	-0.18	0.12	89 %	0.15	-0.03	-0.22	0.20		
1Y fwd 2s/30s	-1.11	-0.09	-0.62	-0.79	-0.06	1.48	-0.19	0.16	92 %	0.19	-0.18	-0.41	0.23		
1Y fwd 5s/10s	-0.31	-0.03	-0.17	-0.25	-0.01	0.43	-0.06	0.03	85 %	0.07	0.04	-0.03	0.07		
1Y fwd 5s/30s	-0.17	-0.05	-0.36	-0.51	-0.04	0.66	-0.07	0.07	90 %	0.12	-0.11	-0.22	0.11		
1Y fwd 10s/30s	0.14	-0.03	-0.19	-0.27	-0.03	0.23	-0.01	0.03	92 %	0.06	-0.15	-0.19	0.04		
1Y fwd 20s/30s	0.14	-0.00	-0.06	-0.07	-0.02	0.03	0.00	0.01	97 %	0.02	-0.18	-0.16	-0.01		
2Y fwd 2s/5s	-0.45	-0.02	-0.17	-0.24	0.00	0.45	-0.07	0.02	80 %	0.08	0.00	-0.06	0.06		
2Y fwd 2s/10s	-0.52	-0.04	-0.28	-0.43	0.00	0.68	-0.10	0.02	80 %	0.13	0.08	-0.03	0.11		
2Y fwd 2s/30s	-0.23	-0.06	-0.42	-0.65	-0.03	0.77	-0.10	0.04	87 %	0.16	-0.11	-0.23	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	0.08	0.03	0.05		
2Y fwd 5s/30s	0.22	-0.04	-0.26	-0.41	-0.04	0.32	-0.02	0.01	87 %	0.10	-0.11	-0.17	0.06		
2Y fwd 10s/30s	0.29	-0.02	-0.14	-0.21	-0.04	0.09	0.01	0.01	92 %	0.05	-0.19	-0.20	0.01		
2Y fwd 20s/30s	0.18	-0.00	-0.05	-0.06	-0.02	-0.00	0.01	0.00	96 %	0.02	-0.19	-0.17	-0.02		

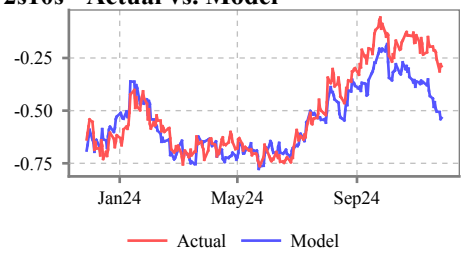
3Mx3M OIS



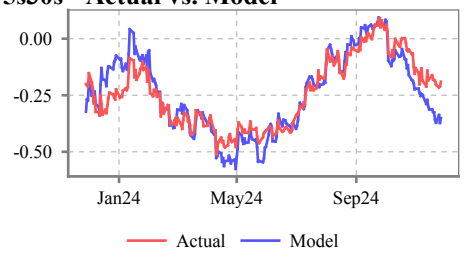
1st/5th SFR Curve



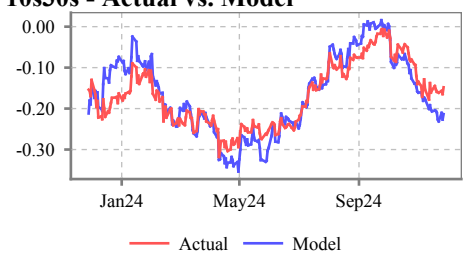
2s10s - Actual vs. Model



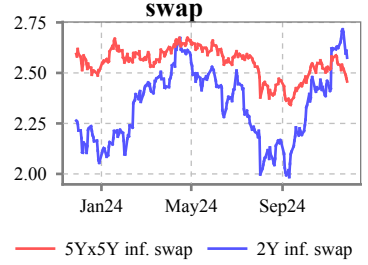
5s30s - Actual vs. Model



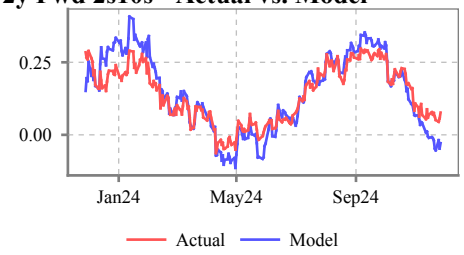
10s30s - Actual vs. Model



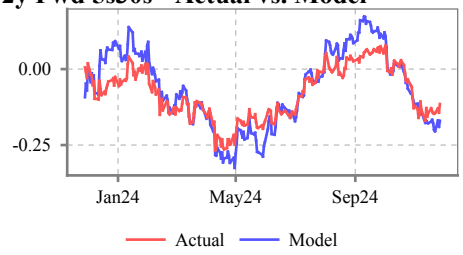
5Yx5Y infl. swap and 2Y infl. swap



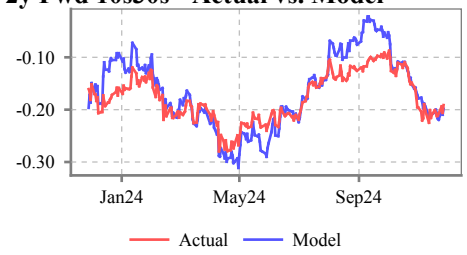
2y Fwd 2s10s - Actual vs. Model



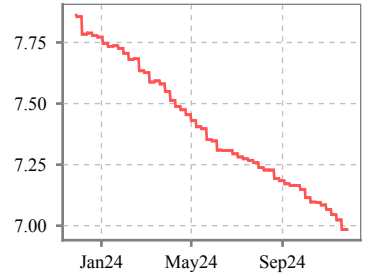
2y Fwd 5s30s - Actual vs. Model



2y Fwd 10s30s - Actual vs. Model



Fed B/S Size



* Regression from Jan 2014 – Jun 2024. Underlying drivers are: Forward Guidance (number of years of forward policy commitment by the Fed), 3Mx3M OIS rate (%), Fed expectations curve (15Mx3M - 3Mx3M OIS curve as a proxy), size of the Fed balance sheet ($tn), 5Yx5Y inflation swap yield (%), 2Y inflation swap yield (%), intercept shift (0s before 11/1/2023, 1s after)

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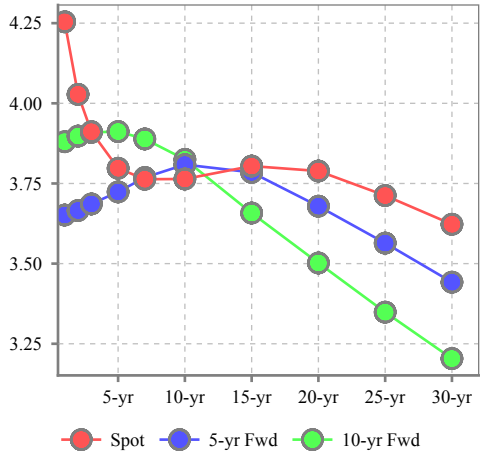
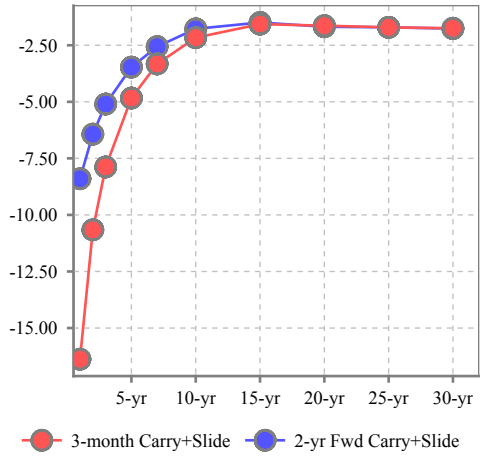
USD SOFR 3M Swap Carry+Slide Matrix

		1-yr	2-yr	3-yr	5-yr	7-yr	10-yr	15-yr	20-yr	25-yr	30-yr
Spot	**Rate**	4.25	4.03	3.91	3.80	3.76	3.76	3.80	3.79	3.71	3.62
	1D Chg	-4.33	-5.88	-6.76	-7.10	-7.08	-6.75	-6.05	-5.68	-5.49	-5.30
	5D Chg	-4.35	-7.64	-10.22	-12.62	-13.84	-14.38	-14.00	-13.62	-13.43	-13.31
	20D Chg	7.59	9.75	6.59	2.94	0.85	-0.56	-1.38	-1.95	-2.54	-3.08
	Carry + Slide	-17.81	-11.79	-8.40	-5.10	-3.47	-2.24	-1.56	-1.62	-1.71	-1.75
6-mo Fwd	**Rate**	3.96	3.84	3.77	3.71	3.71	3.73	3.78	3.76	3.68	3.59
	Carry + Slide	-14.55	-9.70	-7.31	-4.52	-3.16	-2.03	-1.52	-1.63	-1.70	-1.75
1-yr Fwd	**Rate**	3.79	3.73	3.69	3.67	3.68	3.71	3.77	3.74	3.66	3.57
	Carry + Slide	-11.79	-8.40	-6.43	-4.12	-2.94	-1.92	-1.52	-1.66	-1.71	-1.76
2-yr Fwd	**Rate**	3.67	3.64	3.63	3.64	3.67	3.72	3.77	3.72	3.63	3.53
	Carry + Slide	-8.40	-6.43	-5.10	-3.47	-2.56	-1.77	-1.49	-1.68	-1.71	-1.76
3-yr Fwd	**Rate**	3.61	3.61	3.62	3.65	3.69	3.75	3.77	3.71	3.61	3.50
	Carry + Slide	-6.43	-5.10	-4.12	-2.94	-2.24	-1.61	-1.51	-1.70	-1.72	-1.77
5-yr Fwd	**Rate**	3.65	3.67	3.69	3.72	3.77	3.81	3.78	3.68	3.56	3.44
	Carry + Slide	-4.12	-3.47	-2.94	-2.24	-1.77	-1.56	-1.62	-1.71	-1.75	-1.79
10-yr Fwd	**Rate**	3.88	3.90	3.91	3.91	3.89	3.83	3.66	3.50	3.35	3.20
	Carry + Slide	-1.92	-1.77	-1.61	-1.56	-1.49	-1.62	-1.71	-1.75	-1.79	-1.81



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**	4.24	4.00	3.88	3.75	3.72	3.71	3.75	3.73	3.66	3.56
	1D Chg	-3.91	-5.66	-6.61	-7.05	-7.04	-6.58	-5.80	-5.37	-5.15	-4.93
	5D Chg	-2.49	-6.19	-9.05	-11.75	-13.10	-13.62	-13.24	-12.86	-12.66	-12.52
	20D Chg	11.35	15.62	12.42	6.78	2.91	-0.27	-2.48	-3.78	-4.84	-5.69
	Carry+ Slide	-16.42	-11.11	-7.95	-4.82	-3.26	-2.08	-1.44	-1.51	-1.62	-1.67
6-mo Fwd	**Rate**	3.94	3.80	3.73	3.67	3.65	3.67	3.72	3.70	3.62	3.53
	Carry + Slide	-12.70	-8.69	-6.65	-4.10	-2.85	-1.81	-1.37	-1.51	-1.60	-1.66
1-yr Fwd	**Rate**	3.75	3.69	3.64	3.62	3.62	3.66	3.71	3.68	3.60	3.51
	Carry + Slide	-11.11	-7.95	-6.08	-3.89	-2.76	-1.77	-1.40	-1.55	-1.62	-1.68



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USD Front-end Bullish SOFR Swaption Structures Report

	Swaprate			Rec swaption prem (bpyld)			Outrights (bpyld)		Spreads (bpyld)		1x2s (bpyld)		Ladders (bpyld)		Bflies (bpyld)		Condors (bpyld)	
Structure	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	4.090	4.254	-16.4	18.7	27.8	39.3	18.7	-16.4	-9.1	-16.4	-36.8	-16.4	-48.4	-16.4	2.5	-16.4	4.0	-16.4
3Mx2Y	3.921	4.028	-10.7	21.3	26.8	33.3	21.3	-10.7	-5.5	-10.7	-32.3	-10.7	-38.8	-10.7	1.0	-10.7	2.1	-10.7
3Mx3Y	3.833	3.911	-7.9	21.6	25.7	30.3	21.6	-7.9	-4.1	-7.9	-29.7	-7.9	-34.4	-7.9	0.6	-7.9	0.8	-7.9
3Mx5Y	3.749	3.797	-4.8	21.2	23.8	26.4	21.2	-4.8	-2.6	-4.8	-26.4	-4.8	-29.0	-4.8	0.0	-4.8	0.5	-4.8
6Mx1Y	3.961	4.090	-12.9	29.9	46.1	67.2	29.9	-16.1	-16.2	2.0	-62.3	20.1	-83.4	19.1	4.9	3.0	8.6	3.9
6Mx2Y	3.839	3.921	-8.2	31.3	41.4	53.6	31.3	-13.3	-10.1	1.0	-51.5	15.4	-63.7	15.2	2.1	1.2	3.6	1.9
6Mx3Y	3.772	3.833	-6.1	31.3	38.7	47.1	31.3	-12.2	-7.4	0.6	-46.1	13.4	-54.5	13.3	1.0	0.7	2.2	1.3
6Mx5Y	3.713	3.749	-3.6	30.2	34.6	39.5	30.2	-10.4	-4.4	0.2	-39.0	10.7	-44.0	10.8	0.5	0.1	0.6	0.5
1Yx1Y	3.793	3.864	-7.1	46.1	72.7	106.6	46.1	-9.9	-26.5	0.8	-99.2	11.5	-133.2	10.9	7.5	1.5	14.3	2.2
1Yx2Y	3.730	3.777	-4.7	45.9	62.3	81.9	45.9	-8.3	-16.3	0.6	-78.6	9.5	-98.2	9.1	3.2	1.0	6.1	1.4
1Yx3Y	3.692	3.726	-3.4	45.2	57.1	71.0	45.2	-7.6	-11.9	0.2	-69.0	8.1	-82.8	8.0	1.9	0.4	3.6	0.6
1Yx5Y	3.669	3.687	-1.8	43.1	50.1	57.6	43.1	-6.4	-7.0	0.2	-57.1	6.7	-64.6	6.6	0.6	0.2	1.5	0.3
18Mx1Y	3.713	3.746	-3.4	55.6	87.5	128.0	55.6	-5.9	-31.9	0.5	-119.4	6.9	-159.9	6.2	8.7	1.1	14.9	2.0
18Mx2Y	3.672	3.697	-2.5	55.0	75.3	99.2	55.0	-5.4	-20.3	0.4	-95.7	6.1	-119.5	5.9	3.5	0.6	7.4	0.7
18Mx3Y	3.650	3.668	-1.8	54.0	68.5	85.2	54.0	-4.9	-14.5	0.2	-83.0	5.2	-99.7	5.1	2.2	0.3	4.1	0.6
18Mx5Y	3.649	3.657	-0.8	51.9	60.1	69.0	51.9	-4.4	-8.2	0.0	-68.3	4.5	-77.2	4.4	0.7	0.1	1.4	0.2
2Yx1Y	3.665	3.686	-2.1	63.4	99.0	143.8	63.4	-4.1	-35.7	0.4	-134.7	4.8	-179.5	4.4	9.1	0.7	14.1	1.4
2Yx2Y	3.639	3.653	-1.4	62.3	85.1	111.6	62.3	-3.7	-22.8	0.2	-107.9	4.1	-134.4	4.1	3.7	0.3	8.0	0.6
2Yx3Y	3.629	3.638	-0.8	61.3	77.5	95.8	61.3	-3.4	-16.2	0.2	-93.6	3.8	-112.0	3.7	2.2	0.2	4.1	0.4
2Yx5Y	3.643	3.645	-0.2	59.2	67.9	77.2	59.2	-3.1	-8.6	0.0	-76.5	3.1	-85.8	3.1	0.7	0.1	1.2	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

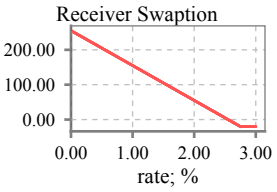
1x2: +ATMF/-2xATMS

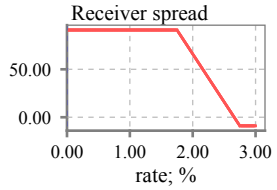
Ladders: +ATMF/-ATMS/-(ATMS-1C)

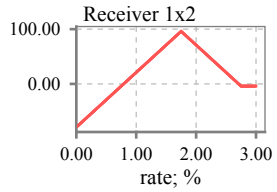
Bflies: +ATMF/-2*ATMS/+(ATMS-1C)

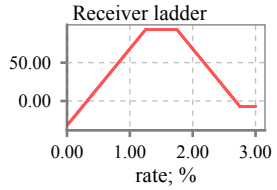
Condors: +ATMF/-ATMS/-(ATMS-1C)/+(ATMS-2C); ATMS-2C is defined as swaption struck at (ATMS – 2*(ATMF-ATMS))

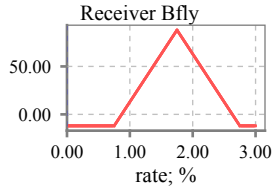
Stylized payoff (bp) profile of various bullish structures

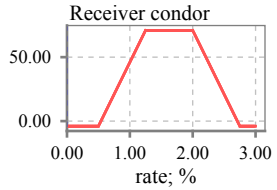












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USD Front-end Bullish SOFR Swaption Structures Statistics Report: 3M expiry

3Mx1Y

ATMF: 4.090 ATMS: 4.254 3M Carry: -16.4 1Y min: 3.756 1Y max:5.281

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	4.090	+1	18.7	-16.4	-	390.3	-	18.7	-187%	-114%
Spread	4.090/4.254	+1/-1	-9.1	-16.4	-	418.1	-7.3	-9.1	81%	55%
1x2	4.090/4.254	+1/-2	-36.8	-16.4	405.0	445.9	20.4	29.4	-56%	-179%
Ladder	4.090/4.254/4.418	+1/-1/-1	-48.4	-16.4	409.8	457.4	32.0	34.2	-66%	-209%
Ladder	4.090/4.254/4.582	+1/-1/-1	-61.4	-16.4	413.2	470.4	45.0	37.6	-73%	-229%
Butterfly	4.090/4.254/4.418	+1/-2/+1	2.5	-16.4	444.3	406.5	-18.9	2.5	-751%	-15%
Condor	4.090/4.254/4.418/4.582	+1/-1/-1/+1	4.0	-16.4	462.1	405.1	-20.3	4.0	-515%	-24%

3Mx2Y

ATMF: 3.921 ATMS: 4.028 3M Carry: -10.7 1Y min: 3.331 1Y max:4.969

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.921	+1	21.3	-10.7	-	370.8	-	21.3	-150%	-200%
Spread	3.921/4.028	+1/-1	-5.5	-10.7	-	397.6	-5.2	-5.5	94%	51%
1x2	3.921/4.028	+1/-2	-32.3	-10.7	381.2	424.4	21.6	48.1	-67%	-452%
Ladder	3.921/4.028/4.134	+1/-1/-1	-38.8	-10.7	385.3	430.9	28.1	52.2	-73%	-490%
Ladder	3.921/4.028/4.241	+1/-1/-1	-46.4	-10.7	388.4	438.5	35.7	55.3	-77%	-519%
Butterfly	3.921/4.028/4.134	+1/-2/+1	1.0	-10.7	414.5	391.1	-11.7	1.0	-1115%	-10%
Condor	3.921/4.028/4.134/4.241	+1/-1/-1/+1	2.1	-10.7	426.2	390.0	-12.7	2.1	-610%	-20%

3Mx3Y

ATMF: 3.833 ATMS: 3.911 3M Carry: -7.9 1Y min: 3.193 1Y max:4.741

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.833	+1	21.6	-7.9	-	361.7	-	21.6	-136%	-274%
Spread	3.833/3.911	+1/-1	-4.1	-7.9	-	387.3	-3.8	-4.1	94%	52%
1x2	3.833/3.911	+1/-2	-29.7	-7.9	369.3	413.0	21.8	49.9	-73%	-634%
Ladder	3.833/3.911/3.990	+1/-1/-1	-34.4	-7.9	372.5	417.6	26.5	53.2	-77%	-675%
Ladder	3.833/3.911/4.069	+1/-1/-1	-39.3	-7.9	375.5	422.5	31.4	56.2	-80%	-713%
Butterfly	3.833/3.911/3.990	+1/-2/+1	0.6	-7.9	399.6	382.7	-8.5	0.6	-1438%	-7%
Condor	3.833/3.911/3.990/4.069	+1/-1/-1/+1	0.8	-7.9	407.7	382.5	-8.7	0.8	-1078%	-10%

3Mx5Y

ATMF: 3.749 ATMS: 3.797 3M Carry: -4.8 1Y min: 3.106 1Y max:4.488

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.749	+1	21.2	-4.8	-	353.7	-	21.2	-123%	-440%
Spread	3.749/3.797	+1/-1	-2.6	-4.8	-	377.5	-2.3	-2.6	87%	53%
1x2	3.749/3.797	+1/-2	-26.4	-4.8	358.2	401.3	21.6	47.6	-82%	-984%
Ladder	3.749/3.797/3.846	+1/-1/-1	-29.0	-4.8	360.4	403.9	24.2	49.8	-83%	-1031%
Ladder	3.749/3.797/3.894	+1/-1/-1	-32.0	-4.8	362.2	406.9	27.2	51.6	-85%	-1068%
Butterfly	3.749/3.797/3.846	+1/-2/+1	0.0	-4.8	384.6	374.9	-4.8	0.0	-9183262165688222%	-0%
Condor	3.749/3.797/3.846/3.894	+1/-1/-1/+1	0.5	-4.8	389.9	374.5	-5.3	0.5	-1165%	-9%

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.

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

6Mx1Y

ATMF: 3.961 ATMS: 4.254 6M Carry: -29.3 1Y min: 3.756 1Y max:5.281

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.961	+1	29.9	-29.3	-	366.2	-	29.9	-198%	-102%
Spread	3.961/4.254	+1/-1	-16.2	-29.3	-	412.3	-13.1	-16.2	81%	55%
1x2	3.961/4.254	+1/-2	-62.3	-29.3	392.4	458.5	33.0	16.8	-53%	-57%
Ladder	3.961/4.254/4.547	+1/-1/-1	-83.4	-29.3	400.6	479.5	54.1	25.0	-65%	-85%
Ladder	3.961/4.254/4.840	+1/-1/-1	-108.2	-29.3	405.1	504.3	78.9	29.5	-73%	-101%
Butterfly	3.961/4.254/4.547	+1/-2/+1	4.9	-29.3	459.5	391.3	-34.1	4.9	-703%	-17%
Condor	3.961/4.254/4.547/4.840	+1/-1/-1/+1	8.6	-29.3	492.5	387.6	-37.8	8.6	-442%	-29%

6Mx2Y

ATMF: 3.839 ATMS: 4.028 6M Carry: -18.9 1Y min: 3.331 1Y max:4.969

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.839	+1	31.3	-18.9	-	352.6	-	31.3	-160%	-166%
Spread	3.839/4.028	+1/-1	-10.1	-18.9	-	394.0	-8.8	-10.1	87%	53%
1x2	3.839/4.028	+1/-2	-51.5	-18.9	370.2	435.4	32.6	37.1	-63%	-197%
Ladder	3.839/4.028/4.217	+1/-1/-1	-63.7	-18.9	376.9	447.6	44.8	43.8	-70%	-232%
Ladder	3.839/4.028/4.405	+1/-1/-1	-77.3	-18.9	382.1	461.2	58.5	49.0	-76%	-260%
Butterfly	3.839/4.028/4.217	+1/-2/+1	2.1	-18.9	423.8	381.8	-21.0	2.1	-987%	-11%
Condor	3.839/4.028/4.217/4.405	+1/-1/-1/+1	3.6	-18.9	444.1	380.4	-22.4	3.6	-629%	-19%

6Mx3Y

ATMF: 3.772 ATMS: 3.911 6M Carry: -14.0 1Y min: 3.193 1Y max:4.741

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.772	+1	31.3	-14.0	-	345.9	-	31.3	-145%	-224%
Spread	3.772/3.911	+1/-1	-7.4	-14.0	-	384.6	-6.6	-7.4	89%	53%
1x2	3.772/3.911	+1/-2	-46.1	-14.0	359.0	423.3	32.1	39.7	-70%	-284%
Ladder	3.772/3.911/4.051	+1/-1/-1	-54.5	-14.0	364.6	431.7	40.5	45.2	-74%	-324%
Ladder	3.772/3.911/4.191	+1/-1/-1	-64.1	-14.0	368.9	441.3	50.2	49.6	-78%	-355%
Butterfly	3.772/3.911/4.051	+1/-2/+1	1.0	-14.0	406.2	376.1	-15.0	1.0	-1444%	-7%
Condor	3.772/3.911/4.051/4.191	+1/-1/-1/+1	2.2	-14.0	421.3	374.9	-16.2	2.2	-725%	-16%

6Mx5Y

ATMF: 3.713 ATMS: 3.797 6M Carry: -8.4 1Y min: 3.106 1Y max:4.488

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.713	+1	30.2	-8.4	-	341.1	-	30.2	-128%	-358%
Spread	3.713/3.797	+1/-1	-4.4	-8.4	-	375.7	-4.0	-4.4	91%	52%
1x2	3.713/3.797	+1/-2	-39.0	-8.4	349.1	410.3	30.6	38.6	-78%	-457%
Ladder	3.713/3.797/3.882	+1/-1/-1	-44.0	-8.4	352.6	415.3	35.5	42.1	-81%	-498%
Ladder	3.713/3.797/3.966	+1/-1/-1	-49.0	-8.4	356.0	420.3	40.6	45.4	-83%	-538%
Butterfly	3.713/3.797/3.882	+1/-2/+1	0.5	-8.4	388.7	370.8	-8.9	0.5	-1784%	-6%
Condor	3.713/3.797/3.882/3.966	+1/-1/-1/+1	0.6	-8.4	397.3	370.7	-9.1	0.6	-1401%	-8%

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.

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

1Yx1Y

ATMF: 3.793 ATMS: 4.254 1Y Carry: -46.1 1Y min: 3.756 1Y max:5.281

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff(bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.793	+1	46.1	-46.1	-	333.2	-	46.1	-200%	-100%
Spread	3.793/4.254	+1/-1	-26.5	-46.1	-	405.8	-19.6	-26.5	74%	58%
1x2	3.793/4.254	+1/-2	-99.2	-46.1	372.3	478.5	53.1	-3.2	-54%	7%
Ladder	3.793/4.254/4.715	+1/-1/-1	-133.2	-46.1	384.5	512.5	87.1	8.9	-65%	-19%
Ladder	3.793/4.254/5.176	+1/-1/-1	-174.0	-46.1	389.8	553.3	127.8	14.2	-73%	-31%
Butterfly	3.793/4.254/4.715	+1/-2/+1	7.5	-46.1	479.0	371.8	-53.6	7.5	-718%	-16%
Condor	3.793/4.254/4.715/5.176	+1/-1/-1/+1	14.3	-46.1	531.9	365.0	-60.4	14.3	-423%	-31%

1Yx2Y

ATMF: 3.730 ATMS: 4.028 1Y Carry: -29.8 1Y min: 3.331 1Y max:4.969

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.730	+1	45.9	-29.8	-	327.1	-	45.9	-165%	-154%
Spread	3.730/4.028	+1/-1	-16.3	-29.8	-	389.4	-13.4	-16.3	82%	55%
1x2	3.730/4.028	+1/-2	-78.6	-29.8	354.0	451.6	48.8	20.9	-62%	-70%
Ladder	3.730/4.028/4.326	+1/-1/-1	-98.2	-29.8	364.1	471.2	68.4	31.1	-70%	-104%
Ladder	3.730/4.028/4.623	+1/-1/-1	-120.6	-29.8	371.5	493.6	90.9	38.4	-75%	-129%
Butterfly	3.730/4.028/4.326	+1/-2/+1	3.2	-29.8	435.8	369.8	-33.0	3.2	-1017%	-11%
Condor	3.730/4.028/4.326/4.623	+1/-1/-1/+1	6.1	-29.8	468.4	366.9	-35.8	6.1	-590%	-20%

1Yx3Y

ATMF: 3.692 ATMS: 3.911 1Y Carry: -22.0 1Y min: 3.193 1Y max:4.741

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.692	+1	45.2	-22.0	-	324.0	-	45.2	-149%	-206%
Spread	3.692/3.911	+1/-1	-11.9	-22.0	-	381.1	-10.1	-11.9	85%	54%
1x2	3.692/3.911	+1/-2	-69.0	-22.0	344.1	438.2	47.0	24.7	-68%	-113%
Ladder	3.692/3.911/4.131	+1/-1/-1	-82.8	-22.0	352.2	452.0	60.9	32.9	-73%	-150%
Ladder	3.692/3.911/4.351	+1/-1/-1	-98.3	-22.0	358.7	467.5	76.3	39.4	-78%	-179%
Butterfly	3.692/3.911/4.131	+1/-2/+1	1.9	-22.0	415.1	367.2	-23.9	1.9	-1227%	-9%
Condor	3.692/3.911/4.131/4.351	+1/-1/-1/+1	3.6	-22.0	438.6	365.6	-25.5	3.6	-718%	-16%

1Yx5Y

ATMF: 3.669 ATMS: 3.797 1Y Carry: -12.9 1Y min: 3.106 1Y max:4.488

					Yield bounds (bpyld)		Max P&L (bpyld)			
Structure	Strike	Contracts	Cost (bpyld)	Proj payoff (bpyld)	Lower	Upper	Upside	Downside	Proj return (%)	Downside / Payoff
Outright	3.669	+1	43.1	-12.9	-	323.8	-	43.1	-130%	-335%
Spread	3.669/3.797	+1/-1	-7.0	-12.9	-	373.9	-5.9	-7.0	84%	54%
1x2	3.669/3.797	+1/-2	-57.1	-12.9	335.5	423.9	44.2	25.0	-77%	-194%
Ladder	3.669/3.797/3.926	+1/-1/-1	-64.6	-12.9	340.9	431.5	51.8	30.3	-80%	-235%
Ladder	3.669/3.797/4.055	+1/-1/-1	-73.1	-12.9	345.2	440.0	60.3	34.7	-82%	-269%
Butterfly	3.669/3.797/3.926	+1/-2/+1	0.6	-12.9	393.2	366.3	-13.5	0.6	-2359%	-4%
Condor	3.669/3.797/3.926/4.055	+1/-1/-1/+1	1.5	-12.9	407.0	365.4	-14.4	1.5	-958%	-12%

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USD SOFR Spot and Forward Swap Butterflies - Summary

					Crv and lvl Sprd				Spot		1Y Fwd					2Y Fwd					3Y Fwd					5Y Fwd				
Structure	Not1	Not2	Wt1	Wt2	Spot	1mf	3mf	6mf	Res	Z	Wt1	Wt2	CLspr	Res	Z	Wt1	Wt2	CLspr	Res	Z	Wt1	Wt2	CLspr	Res	Z	Wt1	Wt2	CLspr	Res	Z
2Y3Y5Y	64.6	38.3	43.9	61.6	-19.7	-19.7	-19.9	-20.2	0.6	0.7	50.0	51.7	-7.0	0.9	1.6	53.2	47.2	-2.3	0.4	0.7	57.4	42.8	-1.4	-0.1	-0.1	62.2	37.5	0.6	0.0	0.0
2Y5Y7Y	35.4	67.0	15.0	90.5	-21.4	-21.5	-21.6	-21.7	1.1	1.5	20.3	81.6	-8.9	0.9	1.3	25.0	75.6	-4.1	0.1	0.1	29.7	70.4	-1.6	-0.2	-1.3	29.9	69.9	-0.3	-0.1	-0.1
2Y5Y10Y	58.8	47.2	24.9	86.4	-45.6	-45.8	-46.0	-46.3	2.2	1.5	33.7	69.5	-16.9	1.5	1.1	40.4	60.4	-7.1	0.0	0.0	45.6	54.5	-3.3	-0.4	-1.1	45.4	54.3	-0.4	-0.1	-0.1
2Y5Y15Y	77.6	33.2	32.8	83.5	-69.8	-69.9	-69.9	-69.9	3.2	1.5	43.0	61.1	-23.0	2.0	0.9	49.7	51.4	-9.5	0.0	0.0	55.0	45.5	-4.2	-0.6	-0.8	56.6	43.3	1.1	-0.1	0.1
2Y5Y30Y	99.8	20.4	42.1	80.6	-81.7	-81.4	-80.7	-79.7	4.5	1.4	51.9	53.6	-17.1	2.3	0.8	58.4	43.5	-1.4	-0.2	0.1	64.4	36.5	5.3	-0.8	-0.4	68.2	31.8	12.9	-0.2	0.2
2Y7Y15Y	61.4	49.9	19.2	92.9	-54.1	-54.1	-54.0	-53.9	2.4	1.4	27.2	75.8	-18.8	1.3	0.7	32.2	68.5	-7.9	-0.1	0.0	35.5	65.0	-4.2	-0.5	-0.4	37.2	63.2	1.3	-0.1	0.4
2Y10Y30Y	84.1	43.6	19.4	94.2	-42.5	-42.0	-41.0	-39.6	3.1	1.2	25.5	78.2	-2.1	1.1	0.6	29.1	73.3	7.8	-0.3	0.3	33.3	68.7	13.8	-0.6	0.1	40.5	60.7	23.2	-0.2	0.5
3Y5Y7Y	46.7	54.6	29.0	73.7	-11.4	-11.5	-11.5	-11.5	0.9	1.7	34.1	66.8	-4.5	0.4	1.0	38.5	61.8	-2.4	-0.1	-0.6	42.4	57.6	-0.7	-0.1	-1.7	40.9	58.9	-0.4	-0.1	-0.1
3Y5Y10Y	69.7	34.0	43.3	62.1	-23.7	-23.7	-23.8	-23.8	1.6	1.5	50.6	50.7	-8.2	0.7	0.7	56.0	44.4	-4.0	-0.2	-0.6	59.2	40.7	-1.6	-0.3	-1.3	57.6	42.2	-0.5	-0.1	-0.2
3Y7Y15Y	68.1	40.6	31.3	75.5	-32.9	-32.8	-32.6	-32.4	1.9	1.2	38.1	63.3	-10.9	0.6	0.3	42.2	58.2	-4.9	-0.3	-0.2	44.1	56.2	-2.6	-0.3	-0.4	45.2	55.3	1.2	-0.1	0.4
5Y7Y10Y	60.3	41.8	44.7	56.6	-6.1	-6.1	-6.1	-6.1	0.3	0.9	48.5	51.6	-1.9	0.1	-0.4	50.1	49.8	-0.7	-0.1	-0.2	49.5	50.4	-0.7	-0.1	-0.3	47.7	52.4	-0.3	0.0	0.1
5Y10Y30Y	86.0	25.9	47.0	56.0	-4.3	-4.0	-3.3	-2.3	0.9	0.7	49.4	51.6	6.4	0.0	0.2	51.2	49.6	10.2	-0.2	0.3	54.1	46.8	13.0	-0.2	0.3	62.5	38.1	16.6	-0.1	0.3
5Y15Y30Y	64.6	48.7	25.7	76.7	5.2	5.6	6.2	7.1	0.6	0.7	27.3	73.9	12.8	-0.1	0.3	29.0	72.2	15.7	-0.3	0.4	31.7	69.3	18.5	-0.3	0.3	37.5	63.2	21.2	-0.1	0.3
7Y10Y12Y	40.8	60.5	30.1	70.1	-1.7	-1.7	-1.6	-1.6	0.1	0.3	30.4	69.6	-0.7	0.0	-0.2	30.2	69.8	-0.5	0.0	-0.3	30.2	69.9	-0.2	0.0	0.3	33.8	66.4	0.5	0.0	0.9
7Y15Y30Y	67.3	41.4	36.2	65.1	8.4	8.7	9.2	9.9	0.3	0.7	37.3	63.5	12.7	-0.1	0.4	39.3	61.5	14.8	-0.2	0.3	42.6	58.0	16.7	-0.2	0.3	48.0	52.3	17.5	-0.1	0.2
7Y20Y30Y	44.4	63.3	19.5	81.4	10.7	10.8	11.1	11.5	0.2	0.6	20.2	80.4	13.3	0.0	0.3	21.1	79.5	14.1	0.0	0.5	21.8	78.7	14.7	0.2	0.7	20.4	80.1	15.2	0.4	1.0
10Y12Y15Y	58.1	42.1	50.2	49.9	-0.6	-0.6	-0.5	-0.4	0.0	0.3	50.7	49.4	-0.2	0.0	0.6	51.5	48.7	0.1	0.0	0.9	54.1	46.0	0.6	0.0	0.7	58.4	41.6	1.2	0.0	-0.6
10Y15Y30Y	75.7	28.9	55.2	45.5	8.0	8.1	8.4	8.8	0.1	0.6	56.6	43.7	10.2	-0.1	0.3	59.1	41.2	11.2	-0.2	0.2	61.6	38.5	11.7	-0.2	0.0	61.6	38.5	11.2	0.0	0.1
10Y20Y30Y	50.1	55.0	29.8	70.7	10.5	10.6	10.7	10.9	0.1	0.5	30.6	69.6	11.9	0.0	0.3	31.6	68.6	12.1	0.1	0.5	31.2	69.1	12.0	0.2	0.7	25.8	74.7	12.5	0.4	1.2
15Y20Y30Y	66.7	35.5	54.5	45.6	6.3	6.3	6.3	6.3	0.0	0.2	54.6	45.5	6.5	0.0	0.1	53.6	46.5	6.1	0.1	0.7	50.6	49.7	6.0	0.3	1.4	43.4	57.0	7.6	0.4	1.5

Note:
1. Wt1 and Wt2 refer to the curve- and level-neutral risk weightings in the short and long legs of the butterfly.
2. Not1 and Not2 refer to the pvbp-weighted notional in the short and long legs of the butterfly.
3. CrvlSpd refers to the current value of the curve- and level-neutral butterfly spread, i.e Body - Wt1 * short-wing - Wt2 * long_wing. 1mf, 3mf, 6mf refer to the butterfly spread 1-month, 3-month and 6-month forward respectively.
4. Res refers to the mispricing of the curve butterfly and is based on a model of the butterfly spread. Z refers to the z-score of the residual. Res and Z are calculated based on 3-month of historical data.

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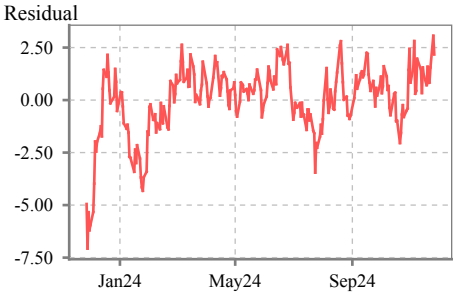
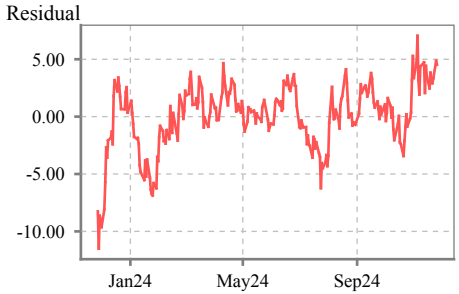
Benchmark SOFR Butterflies

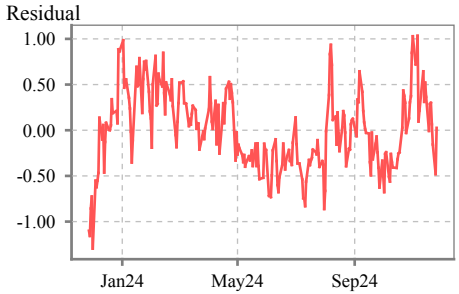
2Y5Y10Y Spot	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	24.9	86.4	-45.6	2.2	1.5	-9.1	0.6



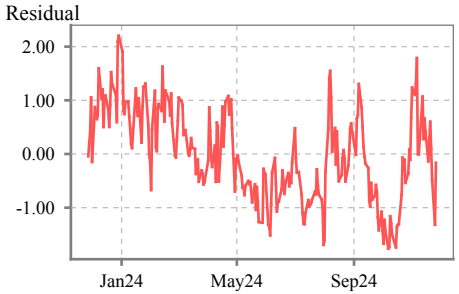
2Y5Y30Y Spot	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	42.1	80.6	-81.7	4.5	1.4	-1.3	0.8



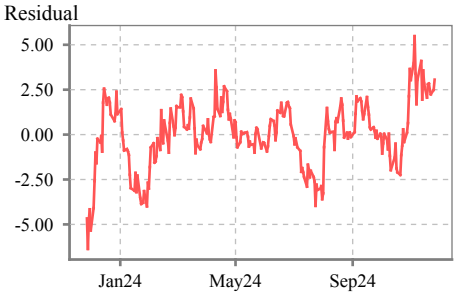
2Y5Y10Y 2YF	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	40.4	60.4	-7.1	0.0	0.0	-3.5	0.8



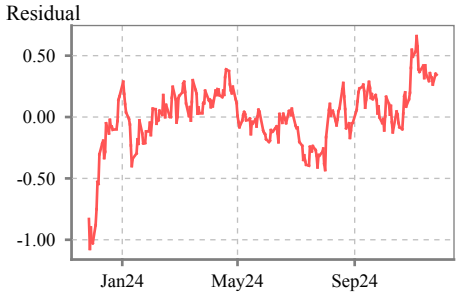
2Y5Y30Y 2YF	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	58.4	43.5	-1.4	-0.2	0.1	6.6	1.0



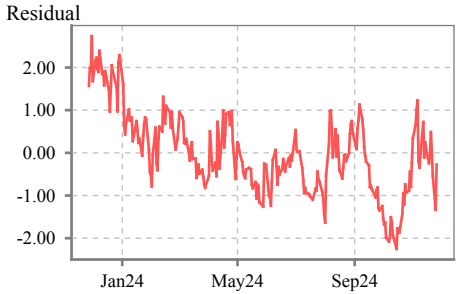
2Y10Y30Y Spot	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	19.4	94.2	-42.5	3.1	1.2	-5.0	1.0



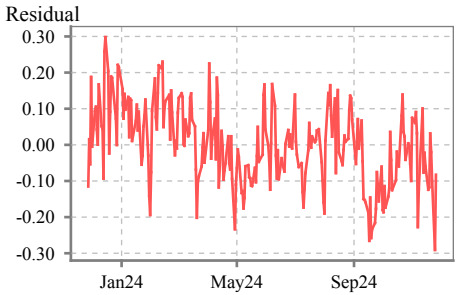
5Y7Y10Y Spot	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	44.7	56.6	-6.1	0.3	0.9	-1.6	1.0



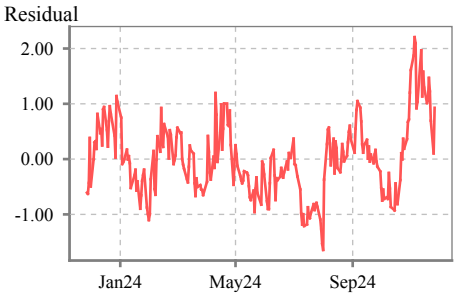
2Y10Y30Y 2YF	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	29.1	73.3	7.8	-0.3	0.3	13.3	1.2



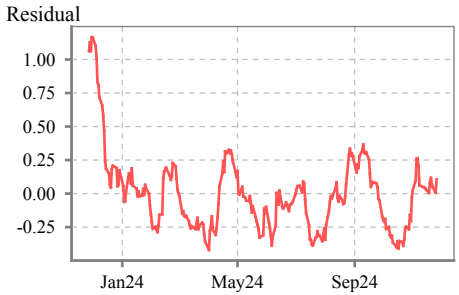
5Y7Y10Y 2YF	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	50.1	49.8	-0.7	-0.1	-0.2	-1.1	0.6



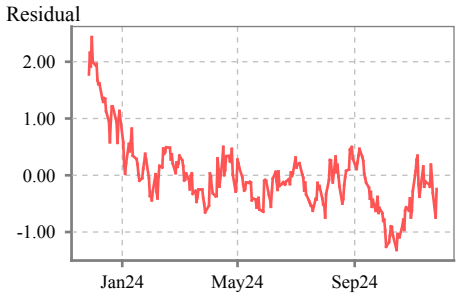
5Y10Y30Y Spot	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	47.0	56.0	-4.3	0.9	0.7	5.9	1.2



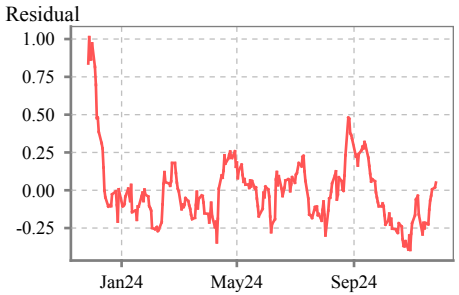
10Y20Y30Y Spot	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	29.8	70.7	10.5	0.1	0.5	9.2	1.9



5Y10Y30Y 2YF	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	51.2	49.6	10.2	-0.2	0.3	13.4	1.2



10Y20Y30Y 2YF	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
	31.6	68.6	12.1	0.1	0.5	9.2	1.6



Note:
1. Wt1 and Wt2 refer to the curve- and leve-neutral risk weightings in the short and long legs of the buttefly.
2. CrvlSpd and Spd refer to the current value of the curve- and level neutral spread and the 50:50 weighted spread, respectively.
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.

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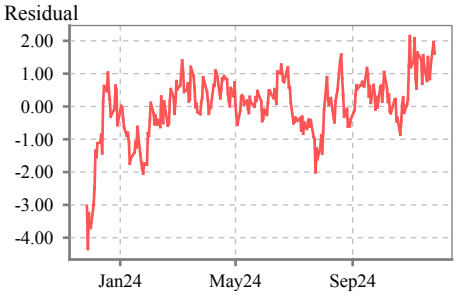
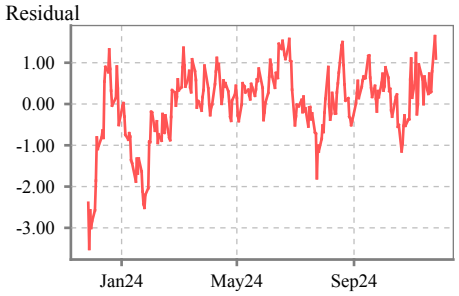
Most Mispriced SOFR Butterflies I – spot and fwd

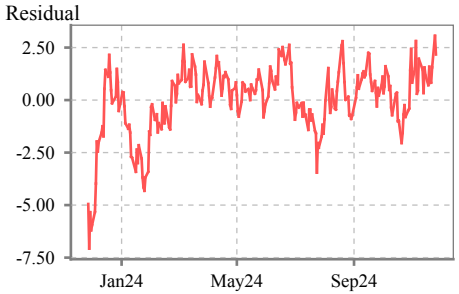
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
3Y5Y10Y Spot	43.3	62.1	-23.7	1.6	1.5	-3.7	0.6



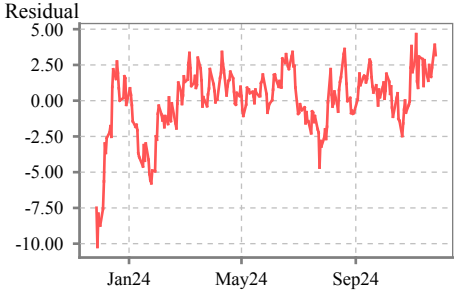
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y5Y7Y Spot	15.0	90.5	-21.4	1.1	1.5	-9.2	0.6



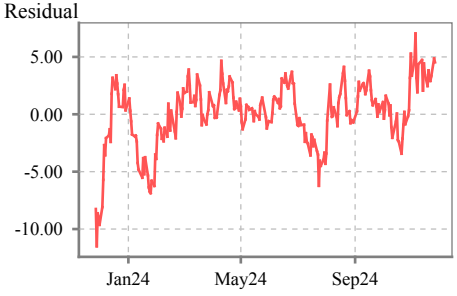
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y5Y10Y Spot	24.9	86.4	-45.6	2.2	1.5	-9.1	0.6



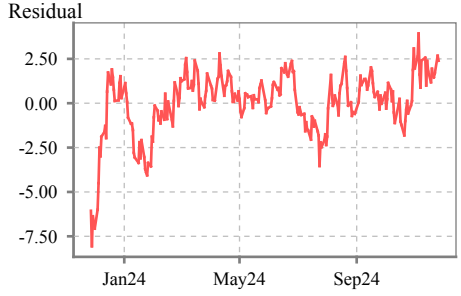
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y5Y15Y Spot	32.8	83.5	-69.8	3.2	1.5	-10.7	0.7



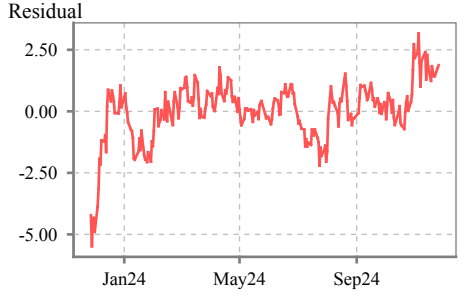
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y5Y30Y Spot	42.1	80.6	-81.7	4.5	1.4	-1.3	0.8



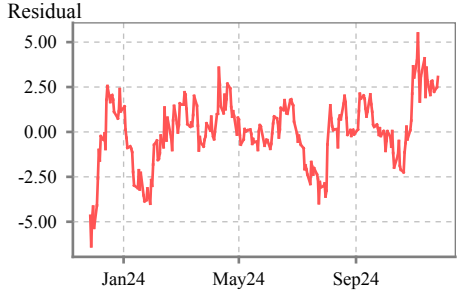
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y7Y15Y Spot	19.2	92.9	-54.1	2.4	1.4	-14.2	0.7



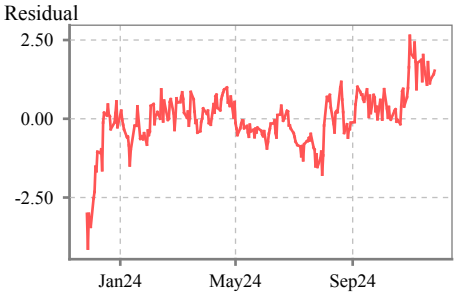
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
3Y7Y15Y Spot	31.3	75.5	-32.9	1.9	1.2	-8.8	0.8



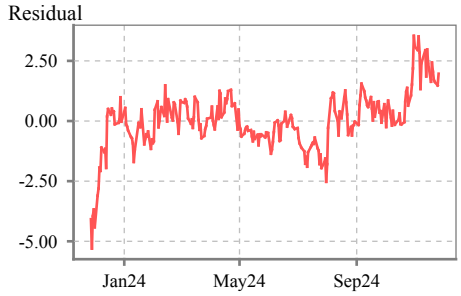
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y10Y30Y Spot	19.4	94.2	-42.5	3.1	1.2	-5.0	1.0



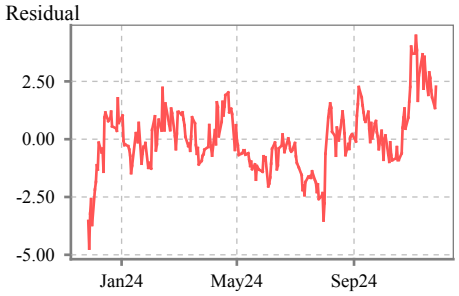
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y5Y10Y 1YF	33.7	69.5	-16.9	1.5	1.1	-5.1	0.7



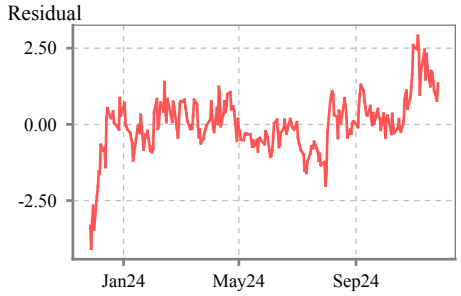
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y5Y15Y 1YF	43.0	61.1	-23.0	2.0	0.9	-7.3	0.8



	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y5Y30Y 1YF	51.9	53.6	-17.1	2.3	0.8	3.0	1.0



	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y7Y15Y 1YF	27.2	75.8	-18.8	1.3	0.7	-6.8	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. CrvlSprd 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.

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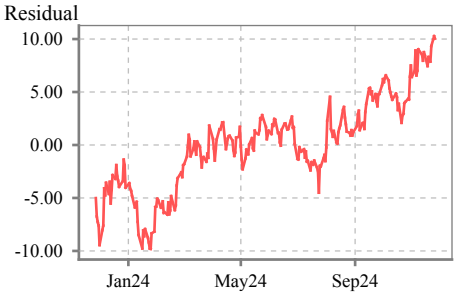
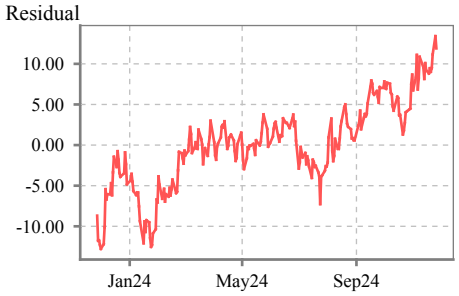
Derivatives Strategy

Most Mispriced SOFR Butterflies II – spot and fwd

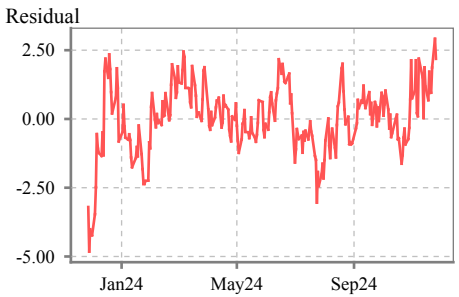
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Yx1Y/4Yx1Y/7Y	-97.9	224.0	-111.7	10.0	2.0	-17.0	0.9



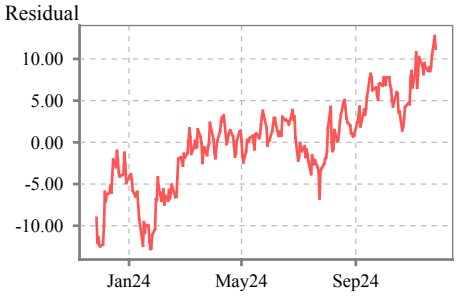
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Yx1Y/3Yx1Y/7Y	-86.7	221.2	-143.6	11.9	1.9	-16.1	0.8



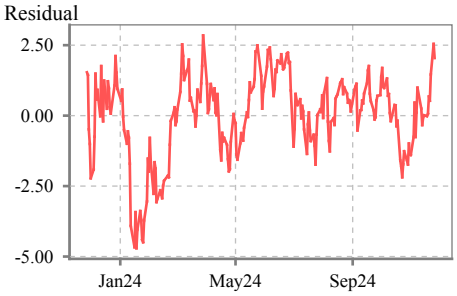
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Y/3Yx1Y/7Y	-48.9	155.0	-25.2	2.2	1.9	-26.9	0.6



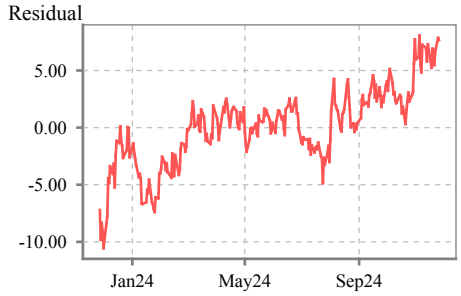
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Yx1Y/2Yx3Y/7Y	-77.8	211.6	-139.3	11.2	1.8	-14.3	0.8



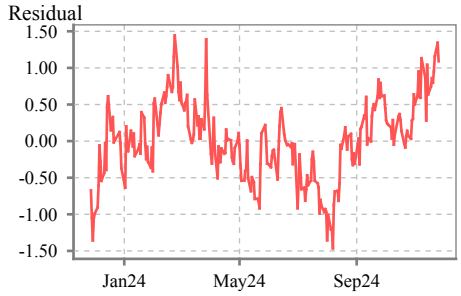
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Y/2Y/2Yx1Y	68.3	47.0	-61.3	2.0	1.8	6.3	0.9



	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Yx1Y/4Yx1Y/10Y	-52.3	174.2	-96.8	7.6	1.8	-16.9	0.8

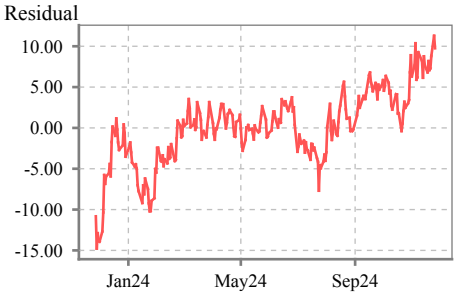


	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
2Yx1Y/3Yx1Y/2Yx3Y	-22.2	123.0	-3.9	1.1	1.8	-3.8	0.7

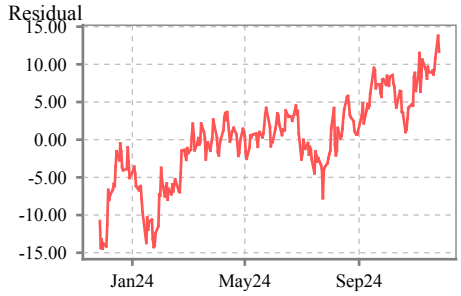


	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Yx1Y/3Yx1Y/5Y	-169.1	313.4	-188.8	17.7	1.8	-17.8	1.0

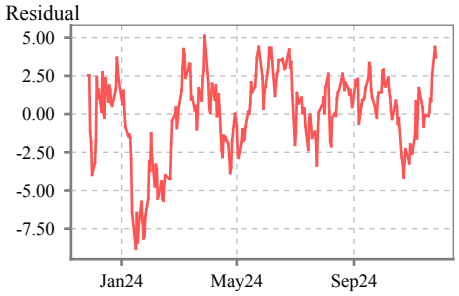
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Yx1Y/3Yx1Y/10Y	-41.8	172.3	-129.1	9.8	1.8	-15.9	0.8



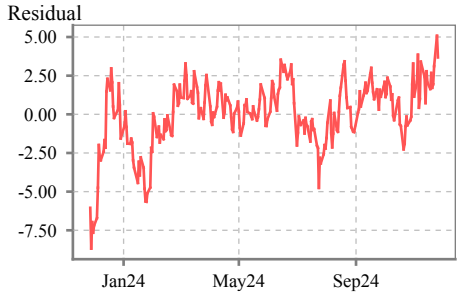
	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Yx1Y/2Yx2Y/7Y	-70.1	208.6	-156.3	11.7	1.7	-13.1	0.8



	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
1Y/1Yx1Y/2Yx1Y	35.1	96.0	-124.0	3.7	1.7	-15.4	0.9



	Wt1	Wt2	CLsp	Res	Z	Sprd	MRev
3Y/3Yx1Y/7Y	-87.0	200.1	-51.9	3.7	1.7	-21.5	0.6



Note:
1. The most mispriced butterflies are the curve- and level-neutral structures that have the greatest z-scores (in absolute values)
2. CrvlSprd 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.

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SOFR Future Butterfly Spreads - Curve and Level Neutral Analysis

		3 - Month						6 - Month						9 - Month						12 - Month					
	Price	Wt1	Wt2	CrvSprd	Res	Z	Carry	Wt1	Wt2	CrvSprd	Res	Z	Carry	Wt1	Wt2	CrvSprd	Res	Z	Carry	Wt1	Wt2	CrvSprd	Res	Z	Carry
Dec24	95.573	50.2	58.6	-37.2	1.8	1.3	8.27	54.9	75.5	-126.4	5.3	1.2	7.62	58.6	89.7	-200.0	7.0	1.2	7.11	47.7	105.7	-216.6	6.5	1.3	6.53
Mar25	95.775	47.7	59.2	-28.1	1.6	1.1	-0.65	50.5	67.2	-73.8	3.5	1.0	-1.43	43.2	81.5	-100.2	4.1	1.2	-1.70	28.9	101.3	-116.7	3.3	0.8	-0.37
Jun25	95.945	49.0	54.7	-15.8	0.8	0.8	-0.02	43.1	66.1	-37.5	1.6	0.9	-0.80	30.9	84.8	-61.0	1.5	0.5	0.90	17.2	107.1	-88.4	2.1	0.5	-0.03
Sep25	96.080	45.3	56.9	-8.9	0.5	0.8	-0.60	35.2	71.6	-25.9	0.9	0.5	0.10	21.1	93.7	-54.3	1.0	0.3	0.24	11.0	111.8	-80.9	2.1	0.5	0.39
Dec25	96.175	41.7	59.8	-6.0	0.1	0.3	0.34	29.1	77.7	-25.3	0.5	0.2	0.96	16.1	98.4	-51.8	1.5	0.4	-0.01	11.5	107.9	-68.5	3.0	0.8	-0.09
Mar26	96.245	38.8	62.9	-6.4	0.4	0.6	-0.11	25.3	81.5	-25.1	0.8	0.4	0.01	18.0	93.7	-41.0	2.7	1.0	-1.20	18.2	94.5	-45.8	3.6	1.4	0.23
Jun26	96.290	38.3	63.2	-6.1	0.0	0.0	0.65	28.7	76.3	-17.2	1.8	1.1	-1.43	27.2	79.1	-22.5	2.2	1.4	0.28	25.3	81.5	-26.0	2.9	1.8	0.77
Sep26	96.320	38.9	62.4	-4.1	0.8	1.3	-1.10	34.9	67.7	-8.5	1.4	1.8	-0.22	32.1	71.2	-12.6	1.5	1.9	0.54	29.9	73.7	-15.1	2.4	2.2	0.47
Dec26	96.330	43.2	57.2	-1.5	0.3	1.5	0.21	37.4	64.1	-6.1	0.2	0.5	1.13	34.9	66.8	-7.8	0.8	1.4	0.98	32.2	69.9	-10.4	2.2	2.0	0.38
Mar27	96.345	42.3	58.2	-1.9	0.0	0.2	0.28	40.6	60.0	-3.1	0.2	0.5	0.39	37.2	63.5	-4.0	1.3	2.0	-0.24	35.6	65.3	-6.3	1.9	1.7	0.45
Jun27	96.360	46.5	53.5	-0.7	-0.1	-0.8	0.30	41.8	58.2	-0.9	0.7	1.7	-0.34	39.4	61.0	-2.9	1.2	1.8	0.02	39.8	59.8	-1.7	1.4	1.2	0.40
Sep27	96.370	46.4	53.5	0.3	0.4	1.8	-0.46	42.5	57.6	-0.9	0.7	1.8	-0.14	43.2	56.6	-0.6	1.1	1.5	-0.08	41.8	57.1	0.2	0.7	0.6	0.51

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. CrvlSprd 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

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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
21Mx3M/24Mx3M/27Mx3M	Belly richening	-0.40	1.00	-0.62	89%	-0.04	-0.04	0.35	-0.1	0.8	2	1.8
21Mx3M/24Mx3M/30Mx3M	Belly richening	-0.53	1.00	-0.50	90%	-0.07	-0.08	0.72	-0.1	1.2	3	1.5
27Mx3M/30Mx3M/36Mx3M	Belly cheapening	0.58	-1.00	0.43	84%	-0.02	-0.02	-0.06	0.0	0.7	2	1.5
27Mx3M/33Mx3M/36Mx3M	Belly cheapening	0.23	-1.00	0.77	96%	-0.03	-0.02	-0.24	0.0	0.6	2	1.1
18Mx3M/24Mx3M/27Mx3M	Belly richening	-0.22	1.00	-0.79	99%	-0.06	-0.07	0.46	-0.1	0.9	3	1.1
21Mx3M/27Mx3M/30Mx3M	Belly richening	-0.21	1.00	-0.81	98%	-0.06	-0.07	0.59	-0.1	0.7	3	1.1
18Mx3M/24Mx3M/30Mx3M	Belly richening	-0.33	1.00	-0.71	93%	-0.13	-0.14	1.04	-0.1	1.6	6	1.1
21Mx3M/24Mx3M/33Mx3M	Belly richening	-0.60	1.00	-0.43	96%	-0.10	-0.11	0.98	-0.1	1.2	4	1.1
18Mx3M/27Mx3M/30Mx3M	Belly richening	-0.13	1.00	-0.90	99%	-0.08	-0.09	0.72	-0.1	0.8	4	0.9
24Mx3M/33Mx3M/36Mx3M	Belly cheapening	0.14	-1.00	0.87	99%	-0.04	-0.04	-0.14	0.0	0.6	3	0.9
15Mx3M/27Mx3M/30Mx3M	Belly richening	-0.09	1.00	-0.94	100%	-0.10	-0.11	0.84	-0.1	0.9	4	0.8
15Mx3M/24Mx3M/30Mx3M	Belly richening	-0.22	1.00	-0.83	98%	-0.17	-0.18	1.35	-0.2	1.7	8	0.8
12Mx3M/24Mx3M/30Mx3M	Belly richening	-0.16	1.00	-0.91	99%	-0.22	-0.24	1.71	-0.2	2.0	10	0.8
15Mx3M/24Mx3M/27Mx3M	Belly richening	-0.14	1.00	-0.88	100%	-0.08	-0.09	0.61	-0.1	0.9	5	0.8
18Mx3M/24Mx3M/33Mx3M	Belly richening	-0.40	1.00	-0.66	81%	-0.19	-0.20	1.50	-0.2	1.5	8	0.8
12Mx3M/24Mx3M/27Mx3M	Belly richening	-0.10	1.00	-0.93	100%	-0.11	-0.12	0.79	-0.1	1.1	6	0.8
21Mx3M/24Mx3M/36Mx3M	Belly richening	-0.64	1.00	-0.40	97%	-0.13	-0.14	0.98	-0.1	0.9	6	0.7
24Mx3M/27Mx3M/30Mx3M	Belly richening	-0.40	1.00	-0.61	78%	-0.03	-0.03	0.31	0.0	0.2	1	0.6
12Mx3M/15Mx3M/18Mx3M	Belly richening	-0.43	1.00	-0.59	83%	-0.06	-0.06	0.44	-0.1	0.7	4	0.6
12Mx3M/24Mx3M/33Mx3M	Belly richening	-0.20	1.00	-0.89	97%	-0.32	-0.35	2.51	-0.3	2.1	14	0.6
15Mx3M/24Mx3M/33Mx3M	Belly richening	-0.28	1.00	-0.80	94%	-0.25	-0.27	1.98	-0.3	1.7	11	0.6
12Mx3M/15Mx3M/30Mx3M	Belly richening	-0.72	1.00	-0.34	98%	-0.21	-0.23	1.72	-0.2	1.5	11	0.5
12Mx3M/15Mx3M/21Mx3M	Belly richening	-0.58	1.00	-0.44	93%	-0.09	-0.10	0.82	-0.1	0.9	7	0.5
21Mx3M/27Mx3M/33Mx3M	Belly richening	-0.33	1.00	-0.71	90%	-0.11	-0.12	1.02	-0.1	0.6	5	0.5
12Mx3M/15Mx3M/33Mx3M	Belly richening	-0.73	1.00	-0.33	98%	-0.25	-0.27	2.03	-0.3	1.6	12	0.5
18Mx3M/27Mx3M/33Mx3M	Belly richening	-0.21	1.00	-0.83	97%	-0.15	-0.17	1.30	-0.2	0.8	7	0.5
18Mx3M/21Mx3M/30Mx3M	Belly richening	-0.63	1.00	-0.40	97%	-0.10	-0.11	0.63	-0.1	0.6	5	0.5
18Mx3M/24Mx3M/36Mx3M	Belly richening	-0.44	1.00	-0.64	78%	-0.24	-0.25	1.56	-0.2	1.2	10	0.5
12Mx3M/15Mx3M/27Mx3M	Belly richening	-0.69	1.00	-0.35	97%	-0.17	-0.18	1.36	-0.2	1.2	10	0.5
6Mx3M/9Mx3M/12Mx3M	Belly richening	-0.42	1.00	-0.64	93%	-0.22	-0.23	0.99	-0.2	1.0	9	0.5
12Mx3M/15Mx3M/36Mx3M	Belly richening	-0.74	1.00	-0.33	98%	-0.28	-0.30	2.12	-0.3	1.4	13	0.4
15Mx3M/27Mx3M/33Mx3M	Belly richening	-0.15	1.00	-0.91	99%	-0.19	-0.21	1.56	-0.2	0.9	8	0.4
12Mx3M/21Mx3M/30Mx3M	Belly richening	-0.30	1.00	-0.77	94%	-0.27	-0.29	1.93	-0.3	1.5	14	0.4
6Mx3M/15Mx3M/30Mx3M	Belly richening	-0.45	1.00	-0.80	92%	-0.94	-1.00	5.74	-1.0	2.7	27	0.4
6Mx3M/9Mx3M/33Mx3M	Belly richening	-0.83	1.00	-0.41	99%	-0.93	-0.98	5.23	-0.9	2.2	22	0.4

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+beta_curve)/(1-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 risk adjusted ann. carry.

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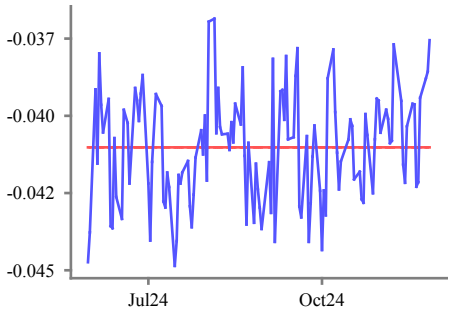
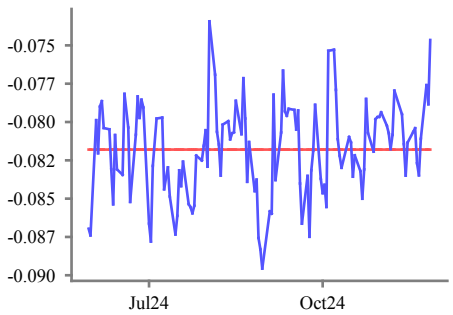
SOFR Futures Butterfly Carry Report

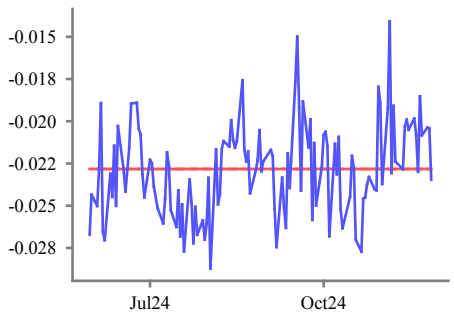
24Mx3M-0.4*21Mx3M-0.62*27Mx3M vs. 6M Avg; %



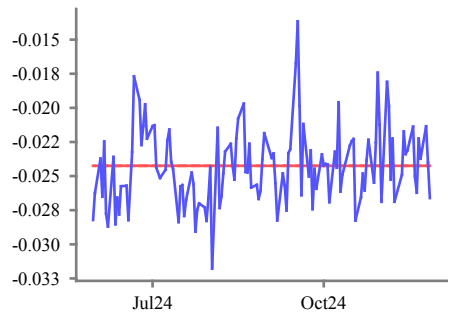
24Mx3M-0.53*21Mx3M-0.5*30Mx3M vs. 6M Avg; %



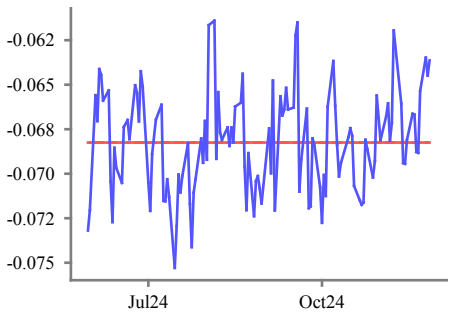
30Mx3M-0.58*27Mx3M-0.43*36Mx3M vs. 6M Avg; %



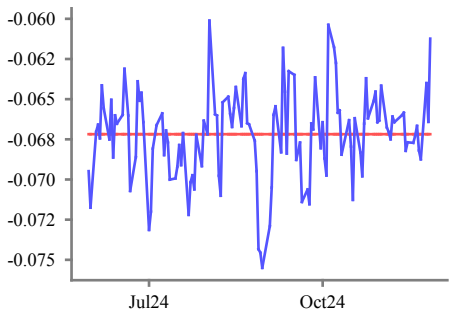
33Mx3M-0.23*27Mx3M-0.77*36Mx3M vs. 6M Avg; %



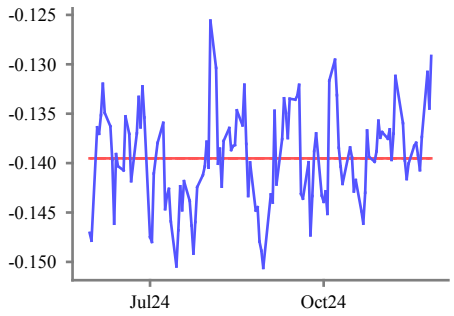
24Mx3M-0.22*18Mx3M-0.79*27Mx3M vs. 6M Avg; %



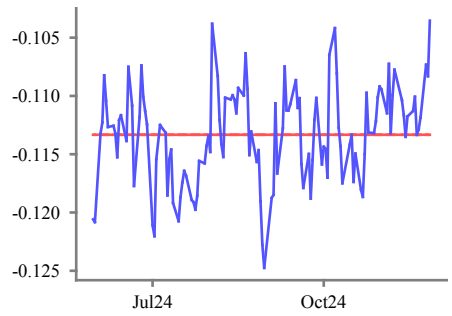
27Mx3M-0.21*21Mx3M-0.81*30Mx3M vs. 6M Avg; %



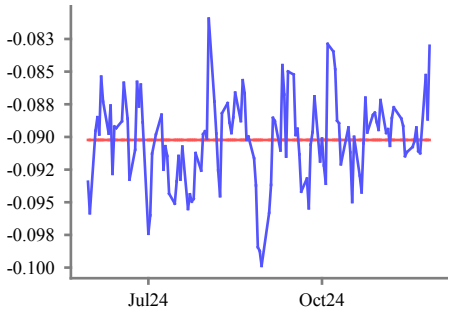
24Mx3M-0.33*18Mx3M-0.71*30Mx3M vs. 6M Avg; %



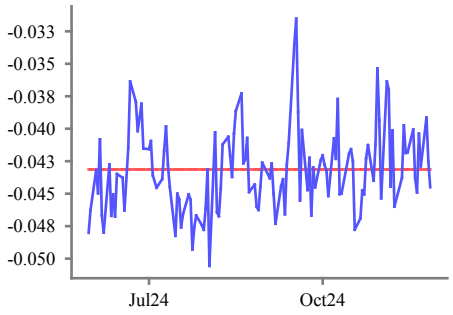
24Mx3M-0.6*21Mx3M-0.43*33Mx3M vs. 6M Avg; %



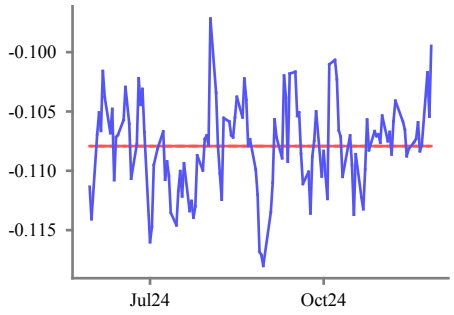
27Mx3M-0.13*18Mx3M-0.9*30Mx3M vs. 6M Avg; %



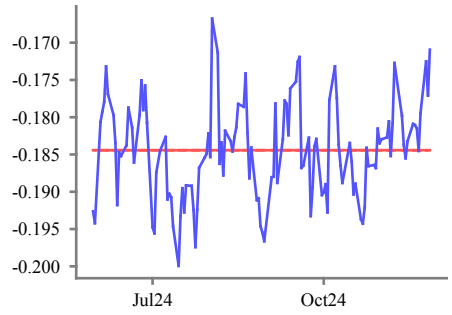
33Mx3M-0.14*24Mx3M-0.87*36Mx3M vs. 6M Avg; %



27Mx3M-0.09*15Mx3M-0.94*30Mx3M vs. 6M Avg; %



24Mx3M-0.22*15Mx3M-0.83*30Mx3M 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+beta_curve)/(1-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 risk adjusted ann. carry.

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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-21Mx3M	30Mx3M-18Mx3M	flattener	steepener	-0.02	-0.10	-0.01	0.28	0.01	99%	1.8	-0.9	0.9	1	2.9
30Mx3M-24Mx3M	36Mx3M-21Mx3M	steepener	flattener	-0.04	-0.10	0.00	0.42	-0.01	100%	0.5	1.1	1.5	2	2.7
30Mx3M-24Mx3M	33Mx3M-21Mx3M	steepener	flattener	-0.04	-0.08	0.00	0.48	-0.01	99%	0.5	0.8	1.3	2	2.3
33Mx3M-24Mx3M	36Mx3M-21Mx3M	steepener	flattener	-0.06	-0.10	-0.01	0.58	-0.01	99%	0.0	1.5	1.5	3	2.3
30Mx3M-27Mx3M	36Mx3M-24Mx3M	steepener	flattener	-0.02	-0.08	0.00	0.27	0.00	99%	0.4	0.2	0.6	1	2.2
24Mx3M-21Mx3M	27Mx3M-18Mx3M	flattener	steepener	-0.02	-0.08	-0.01	0.34	0.00	100%	1.8	-1.2	0.6	1	1.9
24Mx3M-18Mx3M	30Mx3M-15Mx3M	flattener	steepener	-0.06	-0.16	-0.01	0.44	0.01	99%	3.5	-2.2	1.3	3	1.9
24Mx3M-21Mx3M	33Mx3M-18Mx3M	flattener	steepener	-0.02	-0.12	-0.01	0.25	0.01	98%	1.8	-0.8	0.9	2	1.9
30Mx3M-27Mx3M	33Mx3M-24Mx3M	steepener	flattener	-0.02	-0.06	0.00	0.32	0.00	99%	0.4	0.0	0.4	1	1.9
27Mx3M-24Mx3M	30Mx3M-21Mx3M	steepener	flattener	-0.02	-0.06	0.00	0.33	0.00	100%	0.1	0.4	0.5	1	1.8
30Mx3M-27Mx3M	33Mx3M-21Mx3M	steepener	flattener	-0.02	-0.08	-0.01	0.21	-0.01	96%	0.4	0.4	0.8	2	1.6
30Mx3M-24Mx3M	36Mx3M-18Mx3M	steepener	flattener	-0.04	-0.13	0.00	0.31	-0.01	98%	0.5	1.3	1.8	5	1.5
36Mx3M-30Mx3M	33Mx3M-27Mx3M	flattener	steepener	-0.03	-0.04	0.00	0.81	0.00	98%	1.2	0.0	1.1	3	1.4
30Mx3M-24Mx3M	27Mx3M-21Mx3M	steepener	flattener	-0.04	-0.04	-0.01	0.77	-0.02	96%	0.5	1.3	1.8	5	1.4
36Mx3M-33Mx3M	30Mx3M-27Mx3M	flattener	steepener	-0.01	-0.02	0.00	0.64	0.00	90%	0.7	0.2	1.0	3	1.4
24Mx3M-18Mx3M	33Mx3M-15Mx3M	flattener	steepener	-0.06	-0.17	-0.01	0.40	0.01	99%	3.5	-2.1	1.4	4	1.4
30Mx3M-27Mx3M	24Mx3M-21Mx3M	steepener	flattener	-0.02	-0.02	-0.01	0.57	-0.02	84%	0.4	1.0	1.4	4	1.3
24Mx3M-21Mx3M	36Mx3M-18Mx3M	flattener	steepener	-0.02	-0.13	-0.01	0.22	0.01	97%	1.8	-0.9	0.9	3	1.2
30Mx3M-24Mx3M	33Mx3M-18Mx3M	steepener	flattener	-0.04	-0.12	0.00	0.34	-0.01	97%	0.5	1.2	1.6	6	1.2
33Mx3M-27Mx3M	36Mx3M-21Mx3M	steepener	flattener	-0.04	-0.10	-0.01	0.35	-0.01	97%	0.0	0.9	0.8	3	1.1
33Mx3M-24Mx3M	36Mx3M-18Mx3M	steepener	flattener	-0.06	-0.13	-0.01	0.43	-0.02	97%	0.0	1.8	1.8	7	1.0
33Mx3M-27Mx3M	36Mx3M-24Mx3M	steepener	flattener	-0.04	-0.08	-0.01	0.50	-0.01	99%	0.0	0.3	0.3	1	1.0
24Mx3M-21Mx3M	33Mx3M-27Mx3M	flattener	steepener	-0.02	-0.04	-0.01	0.78	0.03	82%	1.8	0.0	1.8	7	1.0
27Mx3M-24Mx3M	30Mx3M-18Mx3M	steepener	flattener	-0.02	-0.10	0.00	0.22	-0.01	98%	0.1	0.7	0.7	3	1.0
30Mx3M-24Mx3M	27Mx3M-18Mx3M	steepener	flattener	-0.04	-0.08	-0.01	0.45	-0.02	92%	0.5	1.6	2.0	8	1.0
27Mx3M-21Mx3M	33Mx3M-24Mx3M	flattener	steepener	-0.04	-0.06	-0.02	0.89	0.03	94%	1.7	0.0	1.8	7	0.9
30Mx3M-27Mx3M	24Mx3M-18Mx3M	steepener	flattener	-0.02	-0.06	-0.01	0.26	-0.02	81%	0.4	0.9	1.3	6	0.9
30Mx3M-21Mx3M	36Mx3M-18Mx3M	steepener	flattener	-0.06	-0.13	0.01	0.54	0.00	100%	-1.3	2.2	0.9	4	0.9
30Mx3M-24Mx3M	36Mx3M-15Mx3M	steepener	flattener	-0.04	-0.19	0.00	0.24	-0.02	96%	0.5	1.4	1.9	8	0.9
24Mx3M-18Mx3M	36Mx3M-15Mx3M	flattener	steepener	-0.06	-0.19	-0.01	0.38	0.02	98%	3.5	-2.3	1.2	6	0.9
30Mx3M-24Mx3M	33Mx3M-15Mx3M	steepener	flattener	-0.04	-0.17	0.00	0.25	-0.02	94%	0.5	1.3	1.8	9	0.8
12Mx3M-9Mx3M	15Mx3M-6Mx3M	steepener	flattener	-0.11	-0.32	-0.01	0.33	-0.02	93%	-2.5	3.5	1.1	5	0.8
24Mx3M-18Mx3M	30Mx3M-21Mx3M	flattener	steepener	-0.06	-0.06	0.00	0.90	0.03	95%	3.5	-1.2	2.3	12	0.8
21Mx3M-15Mx3M	24Mx3M-12Mx3M	steepener	flattener	-0.09	-0.18	0.00	0.50	-0.01	100%	-3.5	4.6	1.1	6	0.8
33Mx3M-24Mx3M	30Mx3M-21Mx3M	steepener	flattener	-0.06	-0.06	-0.01	0.80	-0.02	97%	0.0	1.1	1.1	6	0.8

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.

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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
9Mx2Y/9Mx10Y/9Mx30Y	Belly richening	-0.22	1.00	-0.85	95%	-0.15	-0.17	1.73	-0.2	1.4	9	0.7
12Mx2Y/12Mx10Y/12Mx30Y	Belly richening	-0.24	1.00	-0.81	94%	-0.07	-0.08	1.32	-0.1	1.4	8	0.8
6Mx2Y/6Mx10Y/6Mx30Y	Belly richening	-0.20	1.00	-0.89	95%	-0.25	-0.27	2.08	-0.3	1.4	10	0.6
3Mx2Y/3Mx10Y/3Mx30Y	Belly richening	-0.19	1.00	-0.93	95%	-0.35	-0.38	2.46	-0.4	1.4	11	0.5
9Mx3Y/9Mx10Y/9Mx30Y	Belly richening	-0.31	1.00	-0.73	90%	-0.04	-0.05	1.00	-0.1	1.4	7	0.8
12Mx3Y/12Mx10Y/12Mx30Y	Belly richening	-0.33	1.00	-0.70	89%	0.02	0.01	0.65	0.0	1.4	6	0.8
6Mx3Y/6Mx10Y/6Mx30Y	Belly richening	-0.29	1.00	-0.77	91%	-0.11	-0.12	1.34	-0.1	1.3	7	0.7
3Mx3Y/3Mx10Y/3Mx30Y	Belly richening	-0.27	1.00	-0.80	91%	-0.19	-0.21	1.70	-0.2	1.3	8	0.7
9Mx2Y/9Mx7Y/9Mx30Y	Belly richening	-0.33	1.00	-0.77	75%	-0.31	-0.33	2.39	-0.3	1.2	11	0.5
6Mx2Y/6Mx7Y/6Mx30Y	Belly richening	-0.30	1.00	-0.83	80%	-0.43	-0.46	2.87	-0.4	1.2	13	0.4
9Mx2Y/9Mx15Y/9Mx30Y	Belly richening	-0.13	1.00	-0.91	99%	0.04	0.03	1.15	0.0	1.2	6	0.7
3Mx2Y/3Mx7Y/3Mx30Y	Belly richening	-0.29	1.00	-0.88	83%	-0.56	-0.60	3.36	-0.6	1.2	16	0.3
6Mx2Y/6Mx15Y/6Mx30Y	Belly richening	-0.11	1.00	-0.94	99%	-0.02	-0.03	1.38	0.0	1.1	7	0.7
6Mx3Y/6Mx15Y/6Mx30Y	Belly richening	-0.16	1.00	-0.87	99%	0.05	0.04	0.96	0.0	1.1	6	0.8
12Mx2Y/12Mx15Y/12Mx30Y	Belly richening	-0.14	1.00	-0.88	99%	0.09	0.09	0.87	0.1	1.1	6	0.7
3Mx3Y/3Mx15Y/3Mx30Y	Belly richening	-0.15	1.00	-0.89	98%	0.00	-0.02	1.20	0.0	1.1	6	0.7
9Mx3Y/9Mx15Y/9Mx30Y	Belly richening	-0.18	1.00	-0.84	99%	0.10	0.09	0.73	0.1	1.1	6	0.8
12Mx3Y/12Mx15Y/12Mx30Y	Belly richening	-0.19	1.00	-0.82	99%	0.14	0.14	0.48	0.1	1.1	6	0.7
24Mx2Y/24Mx5Y/24Mx30Y	Belly richening	-0.60	1.00	-0.42	78%	0.01	0.01	0.11	0.0	1.0	6	0.7
3Mx5Y/3Mx15Y/3Mx30Y	Belly richening	-0.26	1.00	-0.76	97%	0.09	0.08	0.62	0.1	1.0	5	0.8
12Mx2Y/12Mx10Y/12Mx20Y	Belly richening	-0.17	1.00	-0.87	98%	-0.19	-0.19	0.88	-0.2	0.9	5	0.7
12Mx3Y/12Mx10Y/12Mx20Y	Belly richening	-0.24	1.00	-0.78	97%	-0.11	-0.11	0.43	-0.1	0.9	4	0.9
6Mx5Y/6Mx15Y/6Mx30Y	Belly richening	-0.27	1.00	-0.74	97%	0.12	0.12	0.45	0.1	0.9	5	0.8
9Mx5Y/9Mx15Y/9Mx30Y	Belly richening	-0.28	1.00	-0.72	97%	0.15	0.15	0.32	0.1	0.9	5	0.7
9Mx2Y/9Mx10Y/9Mx20Y	Belly richening	-0.15	1.00	-0.90	98%	-0.25	-0.26	1.13	-0.3	0.9	6	0.6
9Mx3Y/9Mx10Y/9Mx20Y	Belly richening	-0.23	1.00	-0.81	97%	-0.16	-0.16	0.66	-0.2	0.9	4	0.8
12Mx5Y/12Mx15Y/12Mx30Y	Belly richening	-0.29	1.00	-0.70	97%	0.18	0.17	0.17	0.2	0.8	5	0.7
6Mx3Y/6Mx10Y/6Mx20Y	Belly richening	-0.21	1.00	-0.83	97%	-0.21	-0.21	0.89	-0.2	0.8	5	0.7
6Mx2Y/6Mx10Y/6Mx20Y	Belly richening	-0.14	1.00	-0.93	98%	-0.31	-0.32	1.35	-0.3	0.8	7	0.5
12Mx3Y/12Mx5Y/12Mx30Y	Belly richening	-0.66	1.00	-0.37	93%	-0.10	-0.11	0.99	-0.1	0.8	5	0.6
9Mx3Y/9Mx5Y/9Mx30Y	Belly richening	-0.64	1.00	-0.41	92%	-0.16	-0.17	1.43	-0.2	0.8	6	0.5
12Mx2Y/12Mx7Y/12Mx20Y	Belly richening	-0.29	1.00	-0.78	87%	-0.31	-0.32	1.46	-0.3	0.8	7	0.4
6Mx3Y/6Mx5Y/6Mx30Y	Belly richening	-0.62	1.00	-0.45	90%	-0.23	-0.25	1.87	-0.2	0.8	8	0.4
3Mx3Y/3Mx10Y/3Mx20Y	Belly richening	-0.20	1.00	-0.86	97%	-0.26	-0.27	1.11	-0.3	0.8	6	0.6
3Mx7Y/3Mx15Y/3Mx30Y	Belly richening	-0.37	1.00	-0.64	93%	0.12	0.12	0.39	0.1	0.7	4	0.7

* 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+beta_curve)/(1-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.

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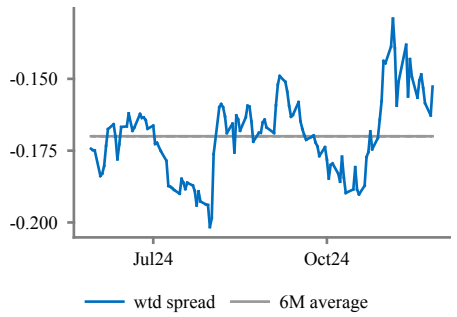
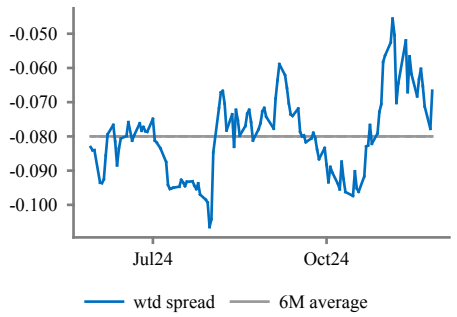
Swap Curve Butterfly Carry Report

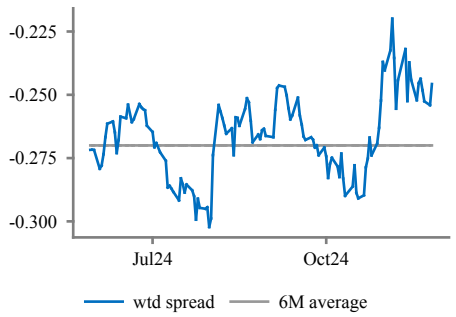
9Mx10Y-0.22*9Mx2Y-0.85*9Mx30Y vs. 6M Avg; %



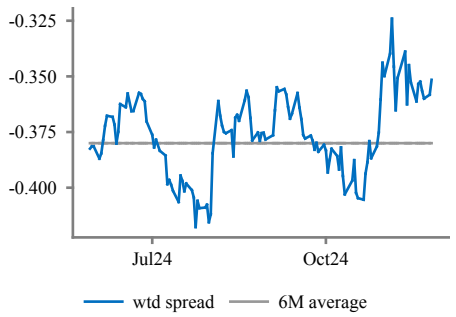
12Mx10Y-0.24*12Mx2Y-0.81*12Mx30Y vs. 6M Avg; %



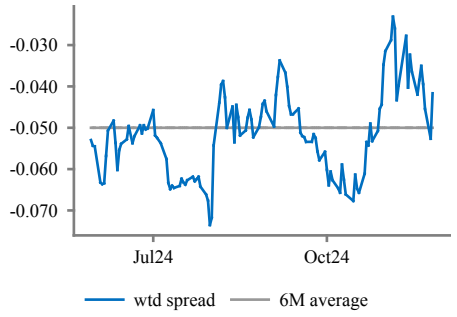
6Mx10Y-0.2*6Mx2Y-0.89*6Mx30Y vs. 6M Avg; %



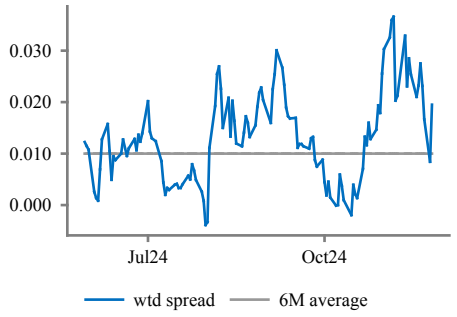
3Mx10Y-0.19*3Mx2Y-0.93*3Mx30Y vs. 6M Avg; %



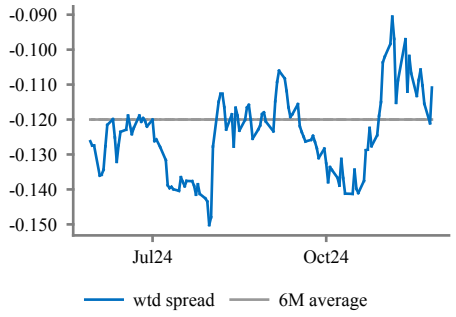
9Mx10Y-0.31*9Mx3Y-0.73*9Mx30Y vs. 6M Avg; %



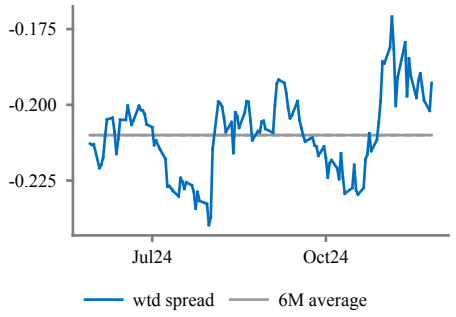
12Mx10Y-0.33*12Mx3Y-0.7*12Mx30Y vs. 6M Avg; %



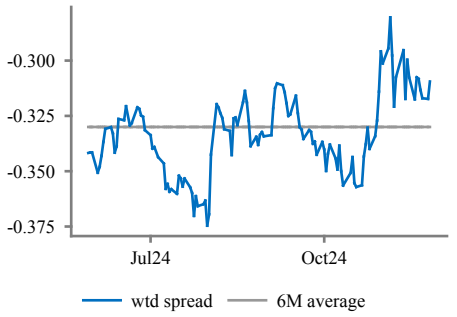
6Mx10Y-0.29*6Mx3Y-0.77*6Mx30Y vs. 6M Avg; %



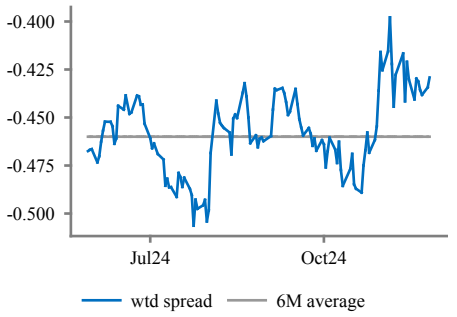
3Mx10Y-0.27*3Mx3Y-0.8*3Mx30Y vs. 6M Avg; %



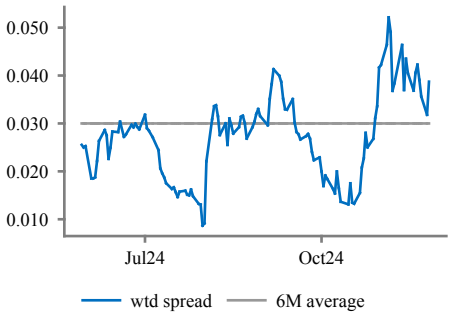
9Mx7Y-0.33*9Mx2Y-0.77*9Mx30Y vs. 6M Avg; %



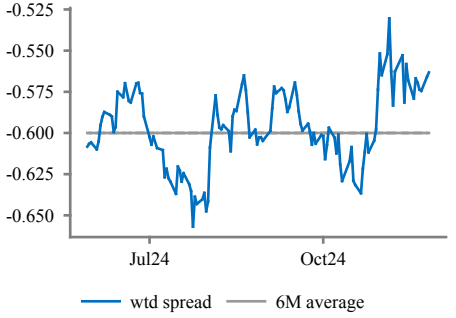
6Mx7Y-0.3*6Mx2Y-0.83*6Mx30Y vs. 6M Avg; %



9Mx15Y-0.13*9Mx2Y-0.91*9Mx30Y vs. 6M Avg; %



3Mx7Y-0.29*3Mx2Y-0.88*3Mx30Y vs. 6M Avg; %



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i-PCA: Implied Principal Component Analysis Report

Implied Correlation, from YCSOs

	2Y	5Y	10Y	30Y
2Y	1.00	0.94	0.84	0.69
5Y	0.94	1.00	0.96	0.84
10Y	0.84	0.96	1.00	0.95
30Y	0.69	0.84	0.95	1.00

combined with

Implied Vol, 6M Exp

	6M expiry bpvol
2Y	7.12
5Y	6.85
10Y	6.37
30Y	5.81

gives us

Implied Covariance Matrix

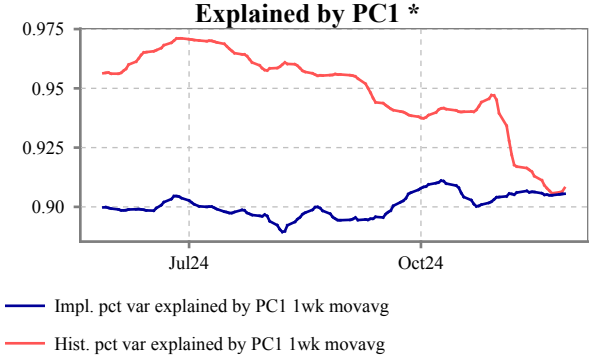
	2Y	5Y	10Y	30Y
2Y	50.72	45.68	37.88	28.68
5Y	45.68	46.98	42.00	33.62
10Y	37.88	42.00	40.58	35.00
30Y	28.68	34.93	35.00	33.76

which when factorized gives

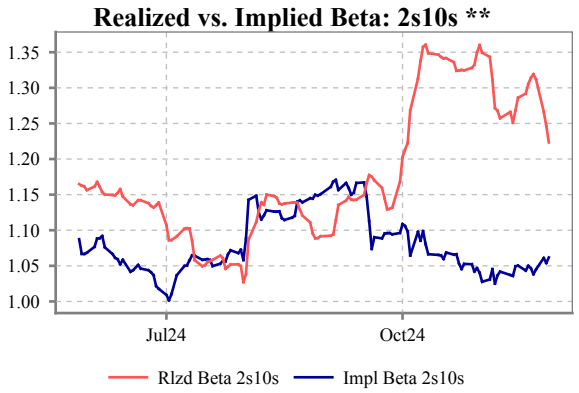
Implied Principal Components

	PC1	PC2	PC3
2Y	6.62	2.56	0.64
5Y	6.79	0.49	-0.76
10Y	6.23	-1.20	-0.49
30Y	5.21	-2.46	0.75

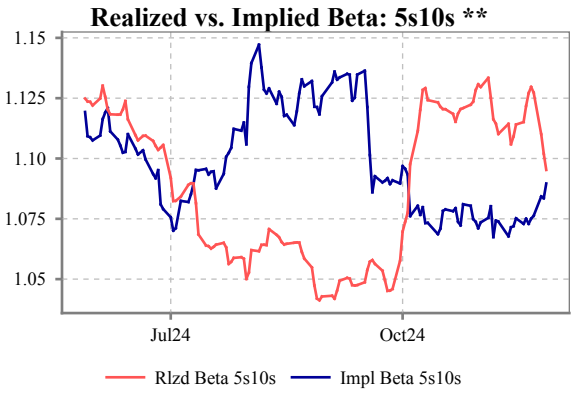
Historical vs. Implied Percent of Variance - Explained by PC1 *



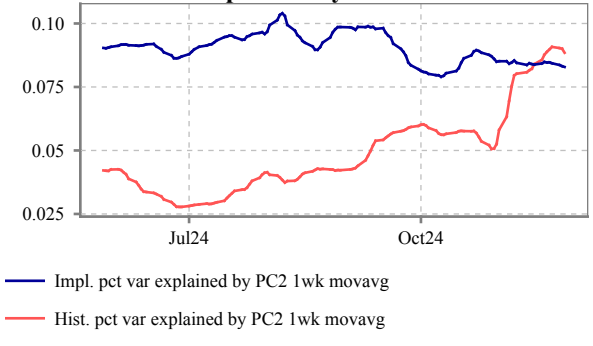
Realized vs. Implied Beta: 2s10s **



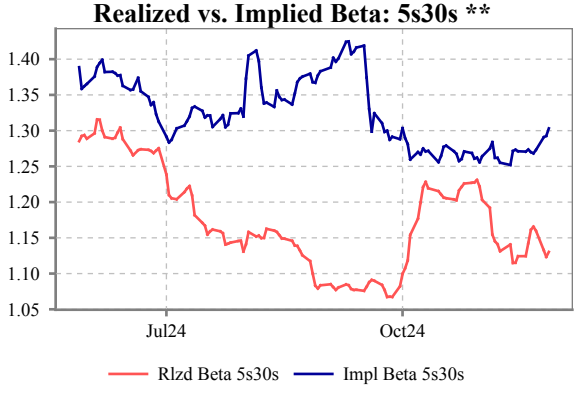
Realized vs. Implied Beta: 5s10s **



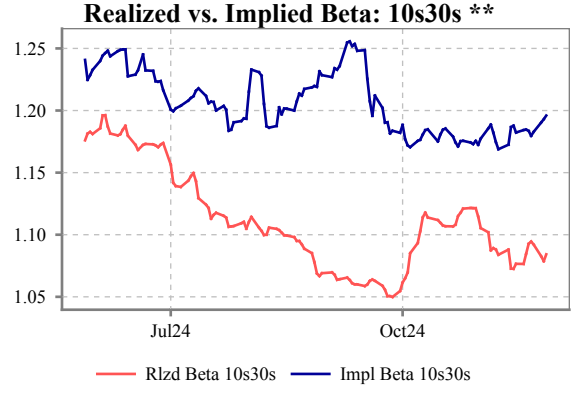
Historical vs. Implied Percent of Variance - Explained by PC2 *



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.

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SOFR Carry Efficient Bearish Trades Report

		6M	6M	Fed tightening		3M Carry/Slide			Proj PnL			Wtd Sprd	Return to
Trade	Wts	Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
-3Mx2Y	-1/	1.00	100	1.00	0.0	10.7	20.5	-1.7	35.7	10.7	-14.3	67.2	0.5
-SFR2/+SFR5/-SFR6	-0.319/1.000/-1.000	0.26	98	0.25	-2.1	3.9	8.0	-1.1	10.4	3.9	-2.6	17.8	0.6
-SFR2/+SFR3	-1.000/0.053	0.91	96	0.81	-24.9	17.3	37.4	-1.5	40.0	17.3	-5.4	68.4	0.6
+3Mx1Y/-SFR2	0.057/-1.000	0.91	96	0.81	-24.2	17.1	37.0	-1.5	39.8	17.1	-5.6	68.2	0.6
-3Mx1Y/+SFR3	-1.000/0.055	0.93	98	0.85	-19.0	15.4	31.8	-1.6	38.7	15.4	-7.8	67.7	0.6
-3Mx1Y/+SFR5/-SFR6	-0.416/1.000/-1.000	0.37	99	0.35	-2.1	4.9	9.5	-1.2	14.0	4.9	-4.2	24.5	0.6
-SFR2/+SFR5/-SFR7	-0.498/1.000/-1.000	0.38	97	0.38	-3.6	5.4	12.1	-1.0	15.0	5.4	-4.2	26.5	0.6
-3Mx1Y/+SFR5/-SFR7	-0.648/1.000/-1.000	0.55	99	0.54	-3.6	6.9	14.4	-1.2	20.6	6.9	-6.7	36.5	0.6
-3Mx1Y/+3Mx5Y/-GRNS	-0.635/1.000/-1.000	0.65	99	0.67	-0.2	7.8	14.5	-1.6	24.2	7.8	-8.5	43.7	0.6
+3Mx5Y/-GRNS/-SFR2	0.612/-1.000/-0.685	1.02	100	1.04	-1.3	11.8	23.2	-1.6	37.2	11.8	-13.7	67.5	0.6
-3Mx3Y/-3Mx30Y/+GOLD	-0.660/-1.000/1.000	0.54	92	0.37	-1.8	6.9	13.0	-1.7	20.4	6.9	-6.6	37.2	0.5
-3Mx1Y/-GRNS/+SFR5	-0.743/-1.000/1.000	0.56	94	0.56	-5.8	7.1	14.8	-1.0	21.1	7.1	-6.9	38.7	0.5
+3Mx1Y/-GRNS/-SFR2	0.492/-0.625/-1.000	1.03	99	1.05	-1.9	11.5	23.5	-1.6	37.2	11.5	-14.1	68.3	0.5
-GRNS/-SFR2/+SFR6	-1.000/-0.654/0.460	1.05	99	1.07	-3.4	11.7	23.7	-1.5	37.8	11.7	-14.5	69.4	0.5
+3Mx3Y/-GRNS/-SFR2	0.644/-1.000/-0.794	1.03	99	1.05	-2.3	11.6	23.4	-1.6	37.4	11.6	-14.2	68.7	0.5
-GRNS/-SFR2/+SFR7	-1.000/-0.597/0.432	1.04	99	1.06	-2.7	11.5	23.0	-1.6	37.5	11.5	-14.5	69.1	0.5
+3Mx1Y/-3Mx3Y/-SFR2	0.896/-0.988/-1.000	1.02	100	1.03	-1.2	11.3	23.0	-1.6	36.7	11.3	-14.1	67.7	0.5
-3Mx1Y/-GRNS/+SFR6	-0.747/-1.000/0.568	1.05	99	1.06	-3.4	11.4	22.4	-1.5	37.5	11.4	-14.8	69.4	0.5
-3Mx3Y/+GOLD/-SFR2	-1.000/0.176/-0.176	1.00	100	1.01	-0.2	11.0	21.2	-1.7	36.1	11.0	-14.0	66.9	0.5
+3Mx1Y/-SFR2/-SFR7	0.559/-1.000/-0.618	1.00	100	1.02	-0.6	11.3	23.0	-1.6	36.4	11.3	-13.8	67.3	0.5
-SFR2/+SFR6/-SFR7	-0.561/0.487/-1.000	1.01	100	1.02	-1.3	11.2	22.7	-1.6	36.4	11.2	-14.0	67.4	0.5
-3Mx3Y/+SFR6	-1.000/0.423	0.53	99	0.53	-1.5	5.6	11.1	-1.6	18.7	5.6	-7.6	34.7	0.5
-3Mx1Y/+3Mx3Y/-GRNS	-0.955/0.836/-1.000	1.03	99	1.04	-2.1	11.2	21.7	-1.6	37.0	11.2	-14.5	68.6	0.5
-3Mx3Y/+SFR6/-SFR7	-1.000/1.000/-0.465	0.39	97	0.40	-2.3	4.2	8.9	-1.3	13.9	4.2	-5.6	25.9	0.5
-3Mx3Y/+3Mx5Y/-SFR2	-1.000/0.182/-0.223	1.01	100	1.02	-0.7	11.0	21.3	-1.7	36.3	11.0	-14.3	67.4	0.5
-3Mx3Y/+3Mx5Y/-3Mx20Y	-1.000/1.000/-0.333	0.31	98	0.26	-0.5	3.6	6.7	-1.7	11.3	3.6	-4.1	20.9	0.5
-3Mx3Y/-SFR2/+SFR6	-1.000/-0.214/0.137	1.02	100	1.02	-1.3	11.0	21.5	-1.7	36.5	11.0	-14.5	67.8	0.5

Note:
1. 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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Carry Efficient Bearish Trades Report

		6M	6M	Fed tightening		3M Carry/Slide			Proj PnL			Wtd Sprd	Return to
Trade	Wts	Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
-3Mx5Y	-1/	1.00	100	1.00	0.0	4.8	8.4	-1.6	29.8	4.8	-20.2	56.6	0.5
-3Mx3Y/+3Mx15Y/-3Mx30Y	-0.256/1.000/-1.000	0.19	93	0.12	-1.1	2.2	3.3	-1.7	7.0	2.2	-2.6	10.7	0.7
-SFR2/+SFR5/-SFR6	-0.221/1.000/-1.000	0.19	95	0.17	-1.5	2.1	4.2	-0.8	6.8	2.1	-2.5	11.5	0.6
-3Mx3Y/+3Mx10Y/-3Mx30Y	-0.432/1.000/-1.000	0.32	91	0.18	-1.5	3.0	4.7	-1.7	11.1	3.0	-5.1	18.9	0.6
-3Mx1Y/+SFR5/-SFR6	-0.256/1.000/-1.000	0.23	97	0.21	-1.4	2.3	4.2	-0.9	8.0	2.3	-3.5	13.8	0.6
-3Mx1Y/+SFR5	-1.000/0.293	0.67	83	0.53	-33.3	14.0	29.9	-1.5	30.7	14.0	-2.6	52.9	0.6
+3Mx1Y/-SFR2	0.282/-1.000	0.67	83	0.56	-29.8	13.5	29.5	-1.5	30.2	13.5	-3.3	52.2	0.6
-SFR2/+SFR3	-1.000/0.262	0.66	82	0.55	-33.1	14.4	31.4	-1.4	30.9	14.4	-2.0	53.4	0.6
-SFR3/+SFR5	-1.000/0.370	0.70	85	0.57	-23.0	11.0	24.0	-1.7	28.5	11.0	-6.6	49.4	0.6
-SFR2/+SFR5	-1.000/0.291	0.62	77	0.48	-39.2	15.9	35.4	-1.4	31.5	15.9	0.3	54.5	0.6
-SFR2/+SFR4	-1.000/0.271	0.64	79	0.52	-36.3	15.0	33.9	-1.4	31.0	15.0	-1.0	53.9	0.6
-3Mx1Y/+SFR3	-1.000/0.264	0.70	88	0.59	-27.2	12.6	25.9	-1.5	30.1	12.6	-5.0	52.4	0.6
-3Mx1Y/+SFR4	-1.000/0.273	0.68	85	0.56	-30.4	13.1	28.4	-1.5	30.2	13.1	-4.0	52.5	0.6
+3Mx2Y/-SFR2	0.299/-1.000	0.64	79	0.51	-35.2	14.8	32.7	-1.5	30.7	14.8	-1.1	53.5	0.6
-3Mx1Y/+3Mx2Y	-1.000/0.301	0.68	85	0.56	-29.4	13.0	27.1	-1.5	29.9	13.0	-4.0	52.2	0.6
-3Mx1Y/+REDS	-1.000/0.298	0.66	82	0.52	-33.9	14.1	30.1	-1.5	30.5	14.1	-2.3	53.2	0.6
-3Mx2Y/-GRNS/+SFR5	-1.000/-0.811/1.000	0.77	99	0.77	-2.9	5.3	10.2	-1.1	24.5	5.3	-13.9	43.0	0.6
+REDS/-SFR2	0.296/-1.000	0.61	76	0.48	-39.7	15.9	35.6	-1.4	31.3	15.9	0.6	54.8	0.6
-3Mx1Y/+SFR5/-SFR7	-0.411/1.000/-1.000	0.35	97	0.35	-2.6	3.1	6.5	-0.9	12.0	3.1	-5.8	21.0	0.6
-SFR3/+SFR4	-1.000/0.343	0.73	87	0.62	-19.4	9.8	22.1	-1.7	28.0	9.8	-8.3	49.2	0.6
+REDS/-SFR3	0.375/-1.000	0.69	84	0.56	-23.7	11.0	24.2	-1.7	28.3	11.0	-6.3	49.9	0.6
-3Mx2Y/+SFR5	-1.000/0.232	0.79	94	0.73	-13.1	9.0	17.8	-1.7	28.8	9.0	-10.9	50.9	0.6
-3Mx1Y/+3Mx3Y	-1.000/0.334	0.65	82	0.51	-31.6	13.5	28.6	-1.5	29.7	13.5	-2.7	52.5	0.6
+3Mx3Y/-SFR2	0.332/-1.000	0.61	75	0.47	-37.5	15.4	34.1	-1.5	30.5	15.4	0.3	54.0	0.6
-SFR2/+SFR5/-SFR7	-0.356/1.000/-1.000	0.28	95	0.28	-2.8	2.9	6.6	-0.8	10.0	2.9	-4.2	17.6	0.6
+3Mx2Y/-SFR3	0.380/-1.000	0.72	87	0.60	-18.1	9.6	20.5	-1.7	27.6	9.6	-8.4	49.1	0.6
-3Mx2Y/+REDS	-1.000/0.235	0.79	94	0.72	-13.5	9.0	18.0	-1.7	28.7	9.0	-10.7	51.1	0.6

Note:
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		6M	6M	Fed tightening		3M Carry/Slide			Proj PnL			Wtd Sprd	Return to
Trade	Wts	Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
-3Mx10Y	-1/	1.00	100	1.00	0.0	2.2	4.0	-1.6	27.2	2.2	-22.8	51.3	0.5
-SFR2/+SFR5/-SFR6	-0.201/1.000/-1.000	0.17	90	0.16	-1.0	1.8	3.5	-0.7	6.0	1.8	-2.4	10.3	0.6
-3Mx7Y/+3Mx15Y/-3Mx30Y	-1.000/1.000/-0.941	0.92	100	0.87	-0.2	3.4	5.4	-1.6	26.3	3.4	-19.5	45.4	0.6
-3Mx3Y/-3Mx30Y/+SFR5	-1.000/-0.938/0.695	1.12	99	1.00	-4.5	4.5	8.4	-1.1	32.6	4.5	-23.6	56.3	0.6
-3Mx5Y/+3Mx15Y/-3Mx30Y	-0.607/0.566/-1.000	0.99	100	0.91	-0.3	3.8	6.0	-1.6	28.6	3.8	-21.0	49.5	0.6
-3Mx1Y/+SFR5/-SFR6	-0.227/1.000/-1.000	0.20	91	0.19	-0.7	1.8	3.2	-0.7	6.9	1.8	-3.3	12.0	0.6
-3Mx2Y/-GRNS/+SFR5	-0.891/-1.000/1.000	0.89	97	0.92	-0.4	4.6	8.3	-1.0	26.9	4.6	-17.7	46.9	0.6
-3Mx1Y/-GRNS/+SFR5	-0.476/-1.000/1.000	0.42	95	0.45	-3.8	2.8	5.9	-0.6	13.4	2.8	-7.8	23.4	0.6
-3Mx3Y/+3Mx15Y/-3Mx30Y	-0.289/0.188/-1.000	1.03	99	0.90	-1.1	3.7	6.1	-1.7	29.4	3.7	-21.9	51.4	0.6
-3Mx30Y/-BLUE/+GOLD	-1.000/-0.450/1.000	0.34	84	0.15	-1.0	2.3	3.9	-1.8	10.8	2.3	-6.2	19.0	0.6
-3Mx5Y/+3Mx20Y/-3Mx30Y	-0.528/0.491/-1.000	0.99	100	0.92	-0.3	3.5	5.6	-1.6	28.3	3.5	-21.3	49.8	0.6
-3Mx3Y/+3Mx7Y/-3Mx30Y	-0.351/0.230/-1.000	1.03	99	0.89	-1.3	3.8	6.2	-1.7	29.6	3.8	-22.1	52.1	0.6
-3Mx3Y/+3Mx20Y/-3Mx30Y	-0.275/0.178/-1.000	1.02	99	0.91	-1.1	3.6	6.0	-1.7	29.2	3.6	-22.0	51.4	0.6
-3Mx5Y/+3Mx7Y/-3Mx30Y	-1.000/0.785/-0.847	1.00	100	0.91	-0.3	3.7	5.9	-1.6	28.7	3.7	-21.3	50.5	0.6
-3Mx3Y/+SFR6	-1.000/0.319	0.69	92	0.68	-8.6	6.1	11.8	-1.7	23.5	6.1	-11.2	41.4	0.6
-3Mx2Y/+SFR5	-1.000/0.387	0.60	85	0.55	-14.3	7.8	16.0	-1.6	22.8	7.8	-7.1	40.2	0.6
-3Mx3Y/+3Mx5Y/-3Mx30Y	-0.432/0.301/-1.000	1.04	99	0.90	-1.5	3.7	6.2	-1.7	29.8	3.7	-22.4	52.4	0.6
-3Mx3Y/+SFR5	-1.000/0.291	0.72	93	0.71	-6.3	5.8	10.8	-1.6	23.8	5.8	-12.3	42.0	0.6
-3Mx3Y/+SFR7	-1.000/0.347	0.67	90	0.64	-10.2	6.6	12.6	-1.7	23.3	6.6	-10.1	41.1	0.6
-3Mx3Y/-3Mx30Y/+GOLD	-0.243/-1.000/0.118	1.04	99	0.89	-1.4	3.7	6.1	-1.7	29.6	3.7	-22.3	52.2	0.6
-3Mx5Y/-3Mx30Y/+GOLD	-0.389/-1.000/0.270	1.03	99	0.88	-1.3	3.6	6.1	-1.7	29.4	3.6	-22.1	51.9	0.6
-3Mx3Y/-BLUE/+SFR5	-1.000/-0.587/0.628	0.96	99	1.02	0.0	4.1	7.1	-1.2	28.1	4.1	-19.9	49.7	0.6
-3Mx3Y/-3Mx30Y/+SFR6	-0.360/-1.000/0.175	1.09	99	0.96	-2.4	3.6	6.4	-1.8	30.9	3.6	-23.6	54.6	0.6
-3Mx1Y/+SFR5/-SFR7	-0.369/1.000/-1.000	0.32	93	0.33	-1.6	2.4	5.1	-0.8	10.5	2.4	-5.6	18.5	0.6
-3Mx3Y/-3Mx30Y/+BLUE	-0.247/-1.000/0.107	1.05	99	0.91	-1.7	3.6	6.0	-1.7	29.8	3.6	-22.7	52.9	0.6
-3Mx7Y/+3Mx20Y/-3Mx30Y	-0.832/0.825/-1.000	0.99	100	0.95	-0.1	3.2	5.2	-1.6	27.8	3.2	-21.5	49.3	0.6
-3Mx2Y/+3Mx15Y/-3Mx30Y	-0.176/0.029/-1.000	1.06	99	0.92	-1.7	3.6	6.1	-1.7	30.0	3.6	-22.9	53.3	0.6

Note:
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5. 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.
6. 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.

J.P. Morgan Securities Inc.
US Fixed Income Derivative Strategy

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Carry Efficient Bullish Trades Report

		6M	6M	Fed tightening		3M Carry/Slide			Proj PnL			Wtd Sprd	Return to
Trade	Wts	Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
3Mx2Y	1/	1.00	100	1.00	0.0	-10.7	-20.5	1.7	-35.7	-10.7	14.3	67.2	0.2
-3Mx1Y/+SFR3	-0.685/1.000	0.43	98	0.40	-5.2	-2.6	-5.5	0.7	-13.2	-2.6	8.0	26.0	0.3
-SFR2/+SFR3	-0.526/1.000	0.60	99	0.57	-5.2	-4.2	-7.9	0.7	-19.1	-4.2	10.7	37.4	0.3
+REDS/-SFR4	1.000/-0.011	1.05	99	1.10	-15.0	-7.0	-10.6	0.7	-33.1	-7.0	19.2	69.1	0.3
-3Mx3Y/+REDS	-0.014/1.000	1.04	99	1.10	-15.0	-7.0	-10.6	0.7	-33.1	-7.0	19.1	69.0	0.3
+REDS/-SFR5	1.000/-0.012	1.05	99	1.10	-14.9	-7.0	-10.7	0.7	-33.1	-7.0	19.1	69.0	0.3
+3Mx5Y/+3Mx15Y/-3Mx30Y	0.025/1.000/-1.000	0.10	80	0.17	-1.2	0.1	-0.5	1.6	-2.5	0.1	2.6	9.4	0.3
+3Mx1Y/-SFR2/+SFR3	0.617/-1.000/1.000	0.75	99	0.71	-5.2	-5.6	-10.0	0.7	-24.4	-5.6	13.1	47.8	0.3
+3Mx15Y/-3Mx30Y/+REDS	1.000/-1.000/0.024	0.10	80	0.17	-1.4	0.0	-0.6	1.4	-2.6	0.0	2.6	9.6	0.3
+3Mx3Y/+3Mx15Y/-3Mx30Y	0.040/1.000/-1.000	0.12	84	0.18	-1.3	-0.1	-0.9	1.7	-3.1	-0.1	2.8	10.3	0.3
-SFR4/+SFR5	-0.025/1.000	1.03	99	1.09	-13.3	-7.0	-11.3	0.7	-32.7	-7.0	18.7	69.6	0.3
-3Mx3Y/+SFR5	-0.031/1.000	1.02	99	1.08	-13.2	-7.0	-11.3	0.7	-32.6	-7.0	18.6	69.5	0.3
+3Mx10Y/-SFR2/+SFR3	0.345/-0.329/1.000	1.04	99	0.98	-3.3	-8.5	-16.9	1.4	-34.4	-8.5	17.4	66.5	0.3
+3Mx7Y/-SFR2/+SFR3	0.328/-0.344/1.000	1.03	100	0.99	-3.8	-8.6	-16.9	1.4	-34.3	-8.6	17.2	65.9	0.3
-3Mx1Y/+3Mx10Y/+SFR3	-0.372/0.421/1.000	1.04	99	0.98	-2.9	-8.6	-17.6	1.6	-34.6	-8.6	17.5	66.8	0.3
-SFR2/+SFR3/+SFR4	-0.537/1.000/0.387	1.01	99	0.98	-6.9	-8.3	-14.5	0.8	-33.6	-8.3	17.0	65.2	0.3
-3Mx1Y/+3Mx7Y/+SFR3	-0.392/0.405/1.000	1.04	99	1.00	-3.4	-8.7	-17.6	1.5	-34.6	-8.7	17.2	66.2	0.3
+3Mx15Y/-SFR2/+SFR3	0.364/-0.316/1.000	1.04	99	0.96	-3.0	-8.5	-17.1	1.4	-34.5	-8.5	17.5	67.1	0.3
-3Mx1Y/+SFR3/+SFR4	-0.705/1.000/0.550	1.01	99	0.98	-7.6	-8.4	-14.8	0.9	-33.7	-8.4	16.9	65.0	0.3
-3Mx3Y/+GRNS/+SFR3	-1.000/0.844/1.000	0.89	100	0.88	-3.8	-7.8	-15.6	1.5	-30.1	-7.8	14.6	56.2	0.3
-3Mx1Y/+3Mx15Y/+SFR3	-0.354/0.441/1.000	1.05	99	0.96	-2.6	-8.6	-17.8	1.6	-34.8	-8.6	17.5	67.6	0.3
-3Mx1Y/+GOLD/+SFR3	-0.306/0.365/1.000	1.05	99	1.01	-2.9	-8.7	-17.7	1.6	-34.9	-8.7	17.4	67.4	0.3
-3Mx1Y/+3Mx5Y/+SFR3	-0.420/0.400/1.000	1.03	100	1.00	-4.0	-8.8	-17.7	1.5	-34.5	-8.8	16.9	65.7	0.3
-SFR2/+SFR3/+SFR5	-0.406/1.000/0.281	1.01	100	0.98	-5.9	-8.4	-15.8	1.1	-33.6	-8.4	16.8	65.3	0.3
+REDS/-SFR2/+SFR3	0.263/-0.385/1.000	1.01	100	0.98	-5.6	-8.6	-16.2	1.2	-33.9	-8.6	16.7	65.0	0.3
-3Mx1Y/+SFR3/+SFR5	-0.484/1.000/0.363	1.01	100	0.99	-6.1	-8.5	-16.4	1.2	-33.6	-8.5	16.7	65.3	0.3
-3Mx1Y/+REDS/+SFR3	-0.451/0.334/1.000	1.01	100	0.98	-5.7	-8.7	-16.9	1.3	-34.0	-8.7	16.5	64.9	0.3

Note:
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		6M	6M	Fed tightening		3M Carry/Slide			Proj PnL			Wtd Sprd	Return to
Trade	Wts	Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
3Mx5Y	1/	1.00	100	1.00	0.0	-4.8	-8.4	1.6	-29.8	-4.8	20.2	56.6	0.4
-3Mx1Y/+SFR3	-0.872/1.000	0.25	90	0.23	-6.0	0.4	0.8	-0.1	-5.8	0.4	6.7	14.2	0.5
-SFR2/+SFR3	-0.754/1.000	0.40	93	0.37	-6.5	-0.1	1.0	-0.2	-10.1	-0.1	10.0	23.1	0.4
+3Mx1Y/-SFR2/+SFR3	0.284/-1.000/1.000	0.45	93	0.41	-6.6	-0.2	1.1	-0.2	-11.5	-0.2	11.0	26.0	0.4
-3Mx1Y/+SFR3/+SFR4	-1.000/1.000/0.247	0.41	92	0.39	-7.6	-0.2	0.5	-0.1	-10.4	-0.2	9.9	23.6	0.4
-3Mx1Y/+3Mx10Y/+SFR3	-0.786/0.756/1.000	1.03	99	0.95	-4.1	-2.6	-5.1	0.5	-28.2	-2.6	23.0	55.6	0.4
+3Mx10Y/-SFR2/+SFR3	0.594/-0.696/1.000	1.00	99	0.92	-4.9	-2.4	-3.6	0.2	-27.4	-2.4	22.6	54.4	0.4
+GOLD/-SFR2/+SFR3	0.532/-0.611/1.000	1.02	100	1.00	-4.8	-2.7	-4.0	0.2	-28.3	-2.7	22.9	55.5	0.4
-3Mx1Y/+GOLD/+SFR3	-0.668/0.656/1.000	1.05	99	1.04	-4.0	-2.9	-5.3	0.6	-29.2	-2.9	23.5	56.9	0.4
+3Mx15Y/-SFR2/+SFR3	0.628/-0.674/1.000	1.02	99	0.90	-4.4	-2.5	-3.9	0.2	-27.9	-2.5	22.9	55.6	0.4
-3Mx1Y/+3Mx7Y/+SFR3	-0.822/0.727/1.000	1.00	100	0.96	-5.0	-2.8	-5.2	0.5	-27.8	-2.8	22.2	54.0	0.4
-3Mx1Y/+3Mx15Y/+SFR3	-0.755/0.792/1.000	1.05	99	0.92	-3.4	-2.7	-5.4	0.6	-28.8	-2.7	23.4	57.2	0.4
+3Mx7Y/-SFR2/+SFR3	0.566/-0.721/1.000	0.98	99	0.93	-5.7	-2.6	-3.6	0.2	-27.0	-2.6	21.9	53.4	0.4
+3Mx15Y/-3Mx20Y	1.000/-0.867	0.14	99	0.15	-0.1	-0.1	-0.5	1.6	-3.7	-0.1	3.4	8.5	0.4
+3Mx10Y/+3Mx15Y/-3Mx20Y	1.000/0.384/-1.000	0.42	99	0.46	-0.1	-1.1	-2.4	1.6	-11.5	-1.1	9.3	23.9	0.4
+3Mx15Y/-3Mx30Y	1.000/-0.749	0.27	99	0.29	-0.3	-0.3	-0.9	1.6	-7.0	-0.3	6.5	16.8	0.4
-3Mx3Y/+GOLD/+SFR4	-1.000/1.000/0.973	0.99	97	0.98	-1.9	-3.0	-2.4	-0.1	-27.7	-3.0	21.6	56.1	0.4
+3Mx10Y/-3Mx20Y	1.000/-0.667	0.36	99	0.40	0.0	-1.1	-2.2	1.6	-10.1	-1.1	8.0	20.7	0.4
+3Mx10Y/+3Mx15Y/-3Mx30Y	1.000/0.566/-1.000	0.61	99	0.67	-0.3	-1.3	-3.0	1.6	-16.6	-1.3	14.0	36.5	0.4
+3Mx15Y/+3Mx20Y/-3Mx30Y	1.000/0.291/-1.000	0.31	99	0.34	-0.3	-0.3	-1.1	1.6	-8.1	-0.3	7.6	19.7	0.4
-3Mx2Y/+3Mx10Y/+SFR4	-0.911/0.940/1.000	1.04	99	0.96	-2.3	-3.5	-3.2	0.0	-29.6	-3.5	22.6	58.8	0.4
-SFR2/+SFR3/+SFR4	-1.000/1.000/0.548	0.80	94	0.75	-10.2	-1.8	0.6	-0.2	-21.7	-1.8	18.2	47.4	0.4
+3Mx10Y/-3Mx30Y	1.000/-0.576	0.46	99	0.51	-0.2	-1.2	-2.5	1.6	-12.7	-1.2	10.3	27.0	0.4
+3Mx2Y/-SFR2/+SFR3	0.629/-1.000/1.000	0.83	96	0.79	-7.9	-2.3	-2.4	0.0	-23.2	-2.3	18.5	48.3	0.4
+3Mx10Y/+3Mx20Y/-3Mx30Y	1.000/0.491/-1.000	0.53	99	0.59	-0.3	-1.2	-2.7	1.6	-14.5	-1.2	12.1	31.7	0.4
-3Mx2Y/+3Mx7Y/+SFR4	-1.000/0.966/0.999	1.02	100	0.97	-3.2	-3.7	-3.3	-0.1	-29.2	-3.7	21.8	57.2	0.4
+3Mx15Y/-3Mx30Y/+GOLD	1.000/-1.000/0.160	0.22	94	0.30	-1.0	0.2	-0.1	1.1	-5.3	0.2	5.7	14.9	0.4

Note:
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		6M	6M	Fed tightening		3M Carry/Slide			Proj PnL			Wtd Sprd	Return to
Trade	Wts	Beta	Corr	Beta	Mispricing	Current	6M Avg	ZScore	+25	0	-25	Std Dev	Risk Ratio
3Mx10Y	1/	1.00	100	1.00	0.0	-2.2	-4.0	1.6	-27.2	-2.2	22.8	51.3	0.4
-3Mx1Y/+SFR3	-0.906/1.000	0.21	79	0.21	-6.8	1.0	1.9	-0.2	-4.2	1.0	6.2	12.4	0.5
-SFR2/+SFR3	-0.802/1.000	0.35	84	0.33	-7.7	0.8	2.9	-0.3	-7.9	0.8	9.5	20.4	0.5
-3Mx1Y/+SFR3/+SFR4	-1.000/1.000/0.156	0.29	82	0.29	-8.1	0.8	2.2	-0.2	-6.5	0.8	8.1	17.5	0.5
+3Mx1Y/-SFR2/+SFR3	0.224/-1.000/1.000	0.38	84	0.36	-8.0	0.7	3.1	-0.3	-8.8	0.7	10.3	22.5	0.5
+3Mx15Y/-3Mx20Y	1.000/-0.609	0.39	100	0.39	-0.1	-0.6	-1.2	1.6	-10.4	-0.6	9.2	20.5	0.4
+3Mx15Y/-3Mx30Y	1.000/-0.414	0.59	100	0.59	-0.2	-0.8	-1.8	1.6	-15.5	-0.8	13.9	31.1	0.4
+3Mx15Y/+3Mx20Y/-3Mx30Y	1.000/0.860/-1.000	0.86	100	0.87	-0.3	-1.2	-2.6	1.6	-22.8	-1.2	20.4	46.0	0.4
+3Mx20Y/-3Mx30Y	1.000/-0.681	0.32	100	0.32	-0.2	-0.4	-0.9	1.6	-8.5	-0.4	7.6	17.4	0.4
-3Mx1Y/+SFR3/+SFR5	-1.000/1.000/0.306	0.46	86	0.46	-9.5	0.3	1.4	-0.2	-11.2	0.3	11.7	27.4	0.4
-SFR2/+SFR3/+SFR4	-1.000/1.000/0.370	0.58	85	0.56	-11.1	0.2	3.8	-0.4	-14.3	0.2	14.7	35.0	0.4
+3Mx15Y/-3Mx20Y/+BLUE	1.000/-1.000/0.135	0.17	93	0.21	-1.1	-0.1	-0.2	0.5	-4.3	-0.1	4.0	9.8	0.4
-SFR2/+SFR3/+SFR5	-0.917/1.000/0.422	0.71	87	0.70	-11.6	-0.2	2.4	-0.3	-18.0	-0.2	17.6	43.0	0.4
+3Mx15Y/-3Mx30Y/+BLUE	1.000/-1.000/0.297	0.37	93	0.47	-2.5	-0.2	-0.4	0.4	-9.4	-0.2	8.9	22.3	0.4
-3Mx20Y/+GRNS	-0.277/1.000	0.82	93	0.91	-10.7	-1.9	-1.0	-0.3	-22.5	-1.9	18.7	46.8	0.4
+3Mx15Y/-3Mx30Y/+GRNS	1.000/-1.000/0.333	0.42	90	0.51	-3.3	-0.6	-0.9	0.2	-11.1	-0.6	9.8	26.2	0.4
+3Mx20Y/-3Mx30Y/+GRNS	1.000/-1.000/0.181	0.23	90	0.28	-1.8	-0.3	-0.4	0.2	-6.0	-0.3	5.4	14.6	0.4
+3Mx1Y/-SFR2/+SFR4	0.524/-1.000/1.000	0.71	87	0.69	-9.7	-1.6	3.2	-0.5	-19.4	-1.6	16.1	44.7	0.4
-SFR2/+SFR4	-0.537/1.000	0.63	87	0.62	-9.2	-1.5	2.6	-0.5	-17.2	-1.5	14.2	39.7	0.4
-SFR2/+SFR4/+SFR5	-0.561/1.000/0.089	0.71	87	0.69	-10.0	-1.7	2.5	-0.4	-19.4	-1.7	15.9	44.5	0.4
+3Mx1Y/-SFR2/+SFR5	0.926/-1.000/0.661	0.71	89	0.71	-7.1	-1.8	0.2	-0.3	-19.6	-1.8	16.0	44.9	0.4
-3Mx1Y/+SFR4	-0.606/1.000	0.54	87	0.53	-8.5	-1.4	2.0	-0.4	-14.8	-1.4	12.0	34.0	0.4
-3Mx1Y/+SFR4/+SFR5	-0.668/1.000/0.201	0.70	87	0.70	-10.3	-1.8	1.7	-0.4	-19.3	-1.8	15.7	44.2	0.4
-SFR2/+SFR5	-0.223/0.817	0.70	89	0.72	-7.5	-1.9	-0.9	-0.2	-19.6	-1.9	15.7	44.6	0.4
-3Mx1Y/+SFR5	-0.266/0.861	0.70	89	0.72	-7.6	-2.0	-1.2	-0.1	-19.5	-2.0	15.6	44.4	0.4
-3Mx2Y/+SFR5	-0.578/1.000	0.51	88	0.53	-6.6	-1.1	0.1	-0.2	-13.9	-1.1	11.7	33.8	0.3
-3Mx2Y/+SFR4/+SFR5	-1.000/0.372/1.000	0.49	85	0.50	-8.2	-0.8	2.0	-0.4	-13.0	-0.8	11.5	33.7	0.3

Note:
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Carry Efficient Steepener Report

Trade	Wts	6M Beta	6M Corr	Fed tightening Beta	Mispricing	3M Carry/Slide Current	6M Avg	ZScore	Proj PnL +25	0	-25	Wtd Sprd Std Dev	Return to Risk Ratio	3M Carry/ Beta
2s10s	1/	1.00	100	1.00	0.0	-8.5	-16.6	1.7	16.5	-8.5	-33.5	32.8	0.5	-8.5
+3Mx10Y/-3Mx30Y/-GOLD	1.000/-1.000/-0.139	0.33	82	0.36	-1.6	-0.4	-1.6	1.7	7.7	-0.4	-8.6	11.3	0.7	-1.26
+3Mx15Y/-3Mx30Y/-GOLD	1.000/-1.000/-0.077	0.17	80	0.18	-1.1	0.2	-0.4	1.7	4.4	0.2	-4.0	6.5	0.7	1.11
+3Mx7Y/-3Mx30Y/-GOLD	1.000/-1.000/-0.201	0.53	86	0.59	-2.4	-1.6	-3.5	1.7	11.6	-1.6	-14.7	17.3	0.7	-2.98
+3Mx10Y/-3Mx30Y/-BLUE	1.000/-1.000/-0.122	0.29	80	0.31	-1.2	-0.3	-1.4	1.7	6.9	-0.3	-7.4	10.5	0.7	-0.88
-3Mx30Y/-SFR2/+SFR3	-0.744/-0.391/1.000	1.04	98	0.95	-5.2	-5.3	-11.2	1.2	20.6	-5.3	-31.3	31.2	0.7	-5.12
+3Mx7Y/-3Mx30Y/-BLUE	1.000/-1.000/-0.176	0.47	85	0.52	-1.9	-1.3	-3.2	1.7	10.4	-1.3	-13.1	15.8	0.7	-2.85
+3Mx10Y/-3Mx20Y/-GOLD	1.000/-1.000/-0.097	0.23	82	0.27	-0.9	-0.5	-1.4	1.7	5.3	-0.5	-6.4	8.2	0.6	-2.26
-3Mx30Y/+SFR3/+SFR7	-1.000/0.503/0.307	1.15	97	1.15	-4.2	-6.3	-13.1	1.6	22.6	-6.3	-35.1	34.8	0.6	-5.43
+3Mx15Y/-3Mx20Y/-3Mx30Y	1.000/-0.091/-1.000	0.16	73	0.18	-1.3	0.3	-0.1	1.6	4.4	0.3	-3.8	6.8	0.6	2.03
-3Mx1Y/-3Mx30Y/+SFR3	-0.432/-0.645/1.000	0.98	98	0.87	-4.4	-5.5	-12.3	1.4	18.9	-5.5	-30.0	29.4	0.6	-5.66
+3Mx15Y/-3Mx30Y	0.913/-1.000	0.16	73	0.17	-1.3	0.3	-0.1	1.6	4.2	0.3	-3.6	6.6	0.6	2.04
+3Mx5Y/-3Mx30Y/-GOLD	1.000/-1.000/-0.247	0.74	89	0.84	-3.3	-3.1	-6.1	1.7	15.5	-3.1	-21.6	24.1	0.6	-4.14
+3Mx10Y/-3Mx30Y	0.853/-1.000	0.28	75	0.32	-1.8	-0.1	-0.8	1.6	7.0	-0.1	-7.2	10.9	0.6	-0.34
-3Mx30Y/+SFR3/+SFR6	-1.000/0.452/0.345	1.16	97	1.17	-4.5	-6.3	-12.8	1.5	22.8	-6.3	-35.4	35.6	0.6	-5.42
-3Mx30Y/+GRNS/+SFR3	-1.000/0.303/0.540	1.11	97	1.11	-3.7	-6.3	-13.3	1.6	21.3	-6.3	-34.0	33.3	0.6	-5.74
+3Mx7Y/-3Mx30Y/-GRNS	1.000/-1.000/-0.149	0.41	83	0.44	-1.7	-1.2	-3.0	1.8	9.1	-1.2	-11.6	14.3	0.6	-2.96
-3Mx30Y/+REDS/+SFR3	-1.000/0.405/0.376	1.16	97	1.17	-4.5	-6.3	-12.5	1.5	22.7	-6.3	-35.2	35.5	0.6	-5.40
+3Mx10Y/-3Mx20Y/-3Mx30Y	1.000/-0.164/-1.000	0.32	75	0.36	-1.9	-0.1	-1.0	1.6	7.8	-0.1	-8.1	12.2	0.6	-0.47
-3Mx7Y/+3Mx10Y/-3Mx30Y	-0.138/1.000/-1.000	0.26	73	0.29	-1.6	0.0	-0.6	1.6	6.5	0.0	-6.4	10.2	0.6	0.17
-3Mx5Y/+3Mx7Y/-3Mx30Y	-0.191/1.000/-1.000	0.39	78	0.45	-2.3	-0.7	-1.7	1.6	9.1	-0.7	-10.4	14.3	0.6	-1.67
+3Mx10Y/-3Mx15Y/-3Mx30Y	1.000/-0.157/-1.000	0.31	75	0.35	-1.8	-0.2	-1.0	1.6	7.5	-0.2	-7.8	11.7	0.6	-0.56
+3Mx7Y/-3Mx30Y	0.800/-1.000	0.43	80	0.49	-2.5	-0.9	-2.1	1.6	9.8	-0.9	-11.6	15.3	0.6	-2.13
+3Mx5Y/-3Mx30Y/-BLUE	1.000/-1.000/-0.216	0.67	89	0.75	-2.7	-2.8	-5.7	1.7	14.1	-2.8	-19.6	22.1	0.6	-4.14
-3Mx30Y/+REDS/-SFR6	-1.000/1.000/-0.363	0.91	89	1.02	-5.6	-3.4	-5.6	0.7	19.5	-3.4	-26.2	30.6	0.6	-3.68
-3Mx20Y/-SFR2/+SFR3	-0.716/-0.369/1.000	1.00	98	0.91	-4.4	-5.8	-12.1	1.3	19.2	-5.8	-30.9	30.2	0.6	-5.84
+3Mx15Y/-3Mx30Y/-BLUE	1.000/-1.000/-0.067	0.15	77	0.15	-0.9	0.3	-0.3	1.7	4.0	0.3	-3.4	6.2	0.6	1.86

Note:
1. 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.
2. 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.
3. The risk of the weighted spread is calculated as the standard deviation of three month changes in the spread over the past 5 years.
4. 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.
5. 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.
6. 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.

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Carry Efficient Flatener Report

Trade	Wts	6M Beta	6M Corr	Fed tightening Beta	Fed tightening Mispricing	3M Carry/Slide Current	3M Carry/Slide 6M Avg	3M Carry/Slide ZScore	Proj PnL +25	Proj PnL 0	Proj PnL -25	Wtd Sprd Std Dev	Return to Risk Ratio	3M Carry/ Beta
2s10s	1/	1.00	100	1.00	0.0	8.5	16.6	-1.7	-16.5	8.5	33.5	32.8	1.0	8.5
+SFR5/-3Mx3Y/+3Mx7Y	0.338/-1.000/0.685	0.30	95	0.32	0.0	3.1	6.2	-1.3	-4.3	3.1	10.6	9.9	1.1	10.48
-SFR2/+3Mx1Y/+3Mx10Y	-1.000/0.287/0.658	0.90	92	0.73	1.1	11.9	26.7	-1.4	-10.6	11.9	34.5	32.8	1.1	13.23
+GOLD/-SFR2/+SFR3	0.501/-1.000/0.467	0.78	86	0.65	1.5	11.6	26.2	-1.3	-8.0	11.6	31.2	30.6	1.0	14.81
-SFR2/+BLUE/+3Mx3Y	-1.000/0.320/0.576	0.82	82	0.52	1.9	13.0	30.5	-1.4	-7.4	13.0	33.5	37.0	0.9	15.92
-3Mx1Y/+GRNS/+SFR3	-1.000/0.808/0.073	0.82	83	0.46	2.0	13.3	29.9	-1.4	-7.2	13.3	33.7	39.3	0.9	16.19

Note:
1. 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.
2. 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.
3. The risk of the weighted spread is calculated as the standard deviation of three month changes in the spread over the past 5 years.
4. 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.
5. 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.
6. 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)

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 Current	3M Carry/Slide 6M Avg	3M Carry/Slide ZScore	Wtd Sprd Std Dev	Risk Adj Carry
XCCY -C_BLUE/+C_2x2/+J_1Y	-0.902/1.000/1.000	9.28	5.78	2.52	10.82	3.34
XCCY +C_GRNS/-C_2x2/+J_1Y	1.000/-0.944/1.000	9.31	5.70	2.50	10.84	3.32
XCCY +C_REDS/+J_1Y	0.131/1.000	8.55	5.37	2.29	9.92	3.32
XCCY +C_REDS/+J_1Y/+J_2Y	0.228/1.000/1.000	13.72	9.23	1.96	19.86	3.18
XCCY +C_2Y/+J_1Y	0.128/1.000	8.33	5.46	2.14	9.15	3.16
XCCY +C_REDS/+J_1Y/+J_REDS	0.194/1.000/1.000	13.95	10.01	1.90	20.35	3.15
XCCY +C_GRNS/-C_2x2/+J_2Y	0.997/-1.000/1.000	5.87	3.79	1.93	10.42	3.12
XCCY -C_BLUE/+C_2x2/+J_2Y	-0.971/1.000/1.000	5.87	3.79	1.92	10.45	3.12
EUR +U_5Y/-E_1Y/-E_30Y	1.000/-1.000/-0.142	21.02	21.12	1.12	51.74	2.23
EUR -U_1Y/+U_2Y/-E_1Y	-0.268/1.000/-1.000	19.36	17.75	1.18	45.66	2.22

Eurodollar Curves and Butterflies

Trade	Wts	3M Carry/Slide Current	3M Carry/Slide 6M Avg	3M Carry/Slide ZScore	Wtd Sprd Std Dev	Risk Adj Carry
-SFR2/+SFR3/-SFR6/+SFR19	-1.000/1.000/-0.339/0.155	16.45	0.22	1.17	14.60	1.13
-SFR2/+SFR3/-SFR6/+SFR18	-1.000/1.000/-0.328/0.127	16.24	-0.09	1.16	14.46	1.12
-SFR2/+SFR3/-SFR6/+SFR17	-1.000/1.000/-0.321/0.110	16.10	-0.29	1.16	14.43	1.12
-SFR2/+SFR3/-SFR7/+SFR18	-1.000/1.000/-0.392/0.227	15.97	-0.96	1.17	14.90	1.07
-SFR2/+SFR3/-SFR17/+SFR19	-1.000/0.787/-0.996/1.000	18.32	4.96	1.17	17.43	1.05
-SFR2/+SFR3/-SFR5/-SFR18	-1.000/1.000/-0.217/-0.043	15.89	-0.34	1.17	15.24	1.04
-SFR2/+SFR3/-SFR7/+SFR19	-1.000/1.000/-0.416/0.286	16.34	-0.44	1.17	15.84	1.03
-SFR2/+SFR3/-SFR6/+SFR7	-1.000/1.000/-0.742/0.496	16.58	0.98	1.15	16.09	1.03

Swap Curves and Butterflies

Trade	Wts	3M Carry/Slide Current	3M Carry/Slide 6M Avg	3M Carry/Slide ZScore	Wtd Sprd Std Dev	Risk Adj Carry
-1Y/+2Y	-1.000/0.881	6.99	15.79	0.63	21.66	1.59
-1Y/+3Y	-1.000/0.923	9.11	20.78	0.54	29.22	1.58
-1Y/-2Y/+3Y	-1.000/-0.073/1.000	9.28	21.19	0.53	29.87	1.58
-1Y/+1x2	-1.000/0.892	12.23	28.41	0.58	42.75	1.56
-1Y/-REDS/+1x2	-1.000/-0.096/1.000	12.40	28.79	0.56	43.27	1.56
-1Y/-3Y/+1x2	-1.000/-0.112/1.000	12.61	29.34	0.58	44.39	1.56
-1Y/-2Y/+1x2	-1.000/-0.107/1.000	12.87	29.95	0.57	45.35	1.56
-1Y/-5Y/+1x2	-1.000/-0.128/1.000	12.34	28.82	0.58	43.77	1.56

Swap Spread Curves

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

USD/EUR Swap Curve

Trade	Wts	3M Carry/Slide Current	3M Carry/Slide 6M Avg	3M Carry/Slide ZScore	Wtd Sprd Std Dev	Risk Adj Carry
+U_5Y/-E_1Y/-E_30Y	1.000/-1.000/-0.142	21.02	21.12	1.12	51.74	2.23
-U_1Y/+U_2Y/-E_1Y	-0.268/1.000/-1.000	19.36	17.75	1.18	45.66	2.22
+U_REDS/-E_1Y/-E_5Y	1.000/-1.000/-0.560	20.88	21.79	1.08	64.31	2.20
+U_REDS/-E_1Y	0.718/-1.000	20.55	21.42	1.12	52.27	2.20
+U_2Y/-E_1Y	0.742/-1.000	17.73	13.97	1.23	42.51	2.19
+U_REDS/-E_1Y/-E_REDS	1.000/-1.000/-0.374	22.48	24.71	1.05	62.65	2.18
-U_2Y/+U_REDS/-E_1Y	-0.291/1.000/-1.000	21.65	24.34	1.09	56.77	2.17
+U_REDS/-E_1Y/-E_2Y	1.000/-1.000/-0.382	23.05	24.56	1.07	67.46	2.16

USD/CAD/JPY Swap Curve

Trade	Wts	3M Carry/Slide Current	3M Carry/Slide 6M Avg	3M Carry/Slide ZScore	Wtd Sprd Std Dev	Risk Adj Carry
-C_BLUE/+C_2x2/+J_1Y	-0.902/1.000/1.000	9.28	5.78	2.52	10.82	3.34
+C_GRNS/-C_2x2/+J_1Y	1.000/-0.944/1.000	9.31	5.70	2.50	10.84	3.32
+C_REDS/+J_1Y	0.131/1.000	8.55	5.37	2.29	9.92	3.32
+C_REDS/+J_1Y/+J_2Y	0.228/1.000/1.000	13.72	9.23	1.96	19.86	3.18
+C_2Y/+J_1Y	0.128/1.000	8.33	5.46	2.14	9.15	3.16
+C_REDS/+J_1Y/+J_REDS	0.194/1.000/1.000	13.95	10.01	1.90	20.35	3.15
+C_GRNS/-C_2x2/+J_2Y	0.997/-1.000/1.000	5.87	3.79	1.93	10.42	3.12
-C_BLUE/+C_2x2/+J_2Y	-0.971/1.000/1.000	5.87	3.79	1.92	10.45	3.12

Note:

1. Risk adjusted carry is expected return (assuming mean reversion of residual as well as carry/slide) divided by standard deviation.
2. 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.
3. A "+" indicates long position in yield curve trades, and a spread widening position in spread trades.

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SOFR Swap Curves and Butterflies Risk-adjusted Carry Report

		3M Carry/Slide				Wtd Sprd	Risk Adj		
Trade	Wts	Current	6M Avg	ZScore	Mispricing	Std Dev	Carry	2y beta	beta
+12Y/-25Y/-30Y/+10x2	0.918/-0.948/-1.000/1.000	3.163	3.518	0.949	-1.310	4.209	0.751	0.014	0.000
-1Y/+2Y	-1.000/0.881	6.987	0.779	1.722	-27.353	13.353	0.523	-0.024	0.000
-1Y/+3Y	-1.000/0.923	9.106	5.044	1.640	-37.063	18.479	0.493	-0.040	0.000
-1Y/-2Y/+3Y	-1.000/-0.073/1.000	9.282	5.389	1.634	-37.871	18.947	0.490	-0.042	0.000
-1Y/+2Y/+5Y	-1.000/0.042/1.000	11.095	9.115	1.565	-43.113	24.625	0.451	-0.067	0.000
-1Y/+1x2	-1.000/0.892	12.229	3.680	1.710	-54.510	27.182	0.450	-0.062	0.000
-1Y/+3Y/+5Y	-1.000/0.044/1.000	11.197	9.318	1.562	-43.580	24.906	0.450	-0.067	0.000
-1Y/-REDS/+1x2	-1.000/-0.096/1.000	12.404	4.596	1.697	-55.094	27.596	0.449	-0.064	0.000
-1Y/+5Y/+REDS	-1.000/1.000/0.038	11.278	8.887	1.574	-44.186	25.108	0.449	-0.068	0.000
-1Y/-5Y/+1x2	-1.000/-0.128/1.000	12.342	2.980	1.724	-55.796	27.518	0.449	-0.061	0.000
-1Y/+5Y	-0.952/1.000	10.759	9.071	1.559	-41.800	24.058	0.447	-0.066	0.000
-1Y/-3Y/+1x2	-1.000/-0.112/1.000	12.609	3.519	1.716	-56.628	28.230	0.447	-0.065	0.000
-1Y/-2Y/+1x2	-1.000/-0.107/1.000	12.866	4.039	1.709	-57.806	28.894	0.445	-0.067	0.000
-1Y/+REDS	-1.000/0.788	10.795	-3.733	1.814	-49.693	24.305	0.444	-0.045	0.000
-1Y/-2Y/+REDS	-1.000/-0.237/1.000	11.818	-4.947	1.826	-55.697	27.253	0.434	-0.051	0.000
-1Y/-3Y/+REDS	-1.000/-0.248/1.000	11.249	-6.099	1.838	-53.087	26.038	0.432	-0.047	0.000
-1Y/+2Y/+GRNS	-1.000/0.028/1.000	13.708	11.541	1.589	-59.982	32.092	0.427	-0.083	0.000
-1Y/+REDS/+GRNS	-1.000/0.025/1.000	13.830	11.399	1.594	-60.703	32.403	0.427	-0.083	0.000
-1Y/+3Y/+GRNS	-1.000/0.030/1.000	13.776	11.666	1.588	-60.296	32.298	0.427	-0.084	0.000
-1Y/+2Y/+7Y	-1.000/0.120/1.000	11.781	10.134	1.549	-43.286	27.621	0.427	-0.077	0.000
-1Y/+GRNS/+1x2	-1.000/1.000/0.029	13.877	11.622	1.591	-60.858	32.574	0.426	-0.085	0.000
-1Y/+7Y/+REDS	-1.000/1.000/0.107	12.297	9.530	1.576	-46.316	28.870	0.426	-0.079	0.000
-1Y/+5Y/+GRNS	-1.000/0.034/1.000	13.847	11.814	1.587	-60.516	32.519	0.426	-0.085	0.000
-1Y/+7Y/+GRNS	-1.000/0.037/1.000	13.886	11.884	1.586	-60.577	32.636	0.425	-0.085	0.000
-1Y/+GRNS	-0.968/1.000	13.482	11.512	1.587	-59.100	31.712	0.425	-0.082	0.000
-1Y/+3Y/+7Y	-1.000/0.125/1.000	12.068	10.727	1.543	-44.603	28.408	0.425	-0.078	0.000
-1Y/+10Y/+GRNS	-1.000/0.042/1.000	13.920	11.940	1.585	-60.617	32.781	0.425	-0.086	0.000
-1Y/+7Y/+1x2	-1.000/1.000/0.121	12.492	10.539	1.559	-46.969	29.506	0.423	-0.081	0.000
-1Y/+20Y/+GRNS	-1.000/0.050/1.000	13.929	11.976	1.584	-60.682	32.937	0.423	-0.085	0.000
-1Y/+25Y/+GRNS	-1.000/0.053/1.000	13.920	11.973	1.584	-60.705	32.979	0.422	-0.085	0.000
-1Y/+30Y/+GRNS	-1.000/0.055/1.000	13.915	11.974	1.583	-60.703	32.996	0.422	-0.085	0.000
-1Y/+5Y/+7Y	-1.000/0.142/1.000	12.366	11.337	1.534	-45.531	29.491	0.419	-0.082	0.000

Note:
1. 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.
2. Beta is calculated by regressing daily changes in the weighted spread against daily changes in the 3Mx2Y yield over the past six months.
3. The risk of the weighted spread is calculated as the standard deviation of three month changes in the spread over the past 5 years.
4. 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.
5. Correlation is calculated by regressing daily changes in the weighted spread against daily changes in the 3Mx2Y yield over the past six months.
6. 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.

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SOFR Implied and delivered directionality report - USD

			Directionality*; %										
	Implied vol; bp/day		Implied		Deliv	(Imp - Deliv)	Implied weights; %		Weighted curve**; bp			3M regression stats***	
Trades	Short	Long	Current	3M Lagged	Levels	Levels	Short	Long	3M fwd	Spot	3M Carry	Beta	Rsq
1s/3s	6.02	6.94	13 %	4 %	-0 %	-0 %	100 %	87 %	-77		10	4 %	5 %
1s/5s	6.02	6.82	12 %	-3 %	13 %	13 %	100 %	88 %	-78		12	1 %	0 %
1s/10s	6.02	6.24	4 %	-15 %	1 %	1 %	100 %	96 %	-48		14	-2 %	1 %
1s/30s	6.02	6.24	-5 %	-28 %	-18 %	-18 %	100 %	105 %	-31		15	-13 %	7 %
2s/5s	6.02	6.82	-0 %	-9 %	-5 %	-5 %	100 %	100 %	-16		6	-4 %	9 %
2s/7s	6.84	6.82	-0 %	-9 %	-11 %	-11 %	100 %	104 %	-4		7	-7 %	13 %
2s/10s	6.84	6.24	-4 %	-14 %	-19 %	-19 %	100 %	110 %	18		8	-9 %	16 %
2s/20s	6.84	6.24	-10 %	-22 %	-35 %	-35 %	100 %	115 %	42		9	-20 %	28 %
2s/30s	6.84	6.24	-19 %	-35 %	-43 %	-43 %	100 %	119 %	38		9	-23 %	25 %
3s/5s	6.84	6.82	-2 %	-8 %	-6 %	-6 %	100 %	102 %	-2		3	-4 %	30 %
3s/7s	6.94	6.58	-5 %	-13 %	-13 %	-13 %	100 %	105 %	10		4	-7 %	31 %
3s/10s	6.94	6.24	-11 %	-20 %	-21 %	-21 %	100 %	111 %	33		5	-10 %	30 %
3s/20s	6.94	5.95	-17 %	-27 %	-38 %	-38 %	100 %	117 %	57		6	-21 %	40 %
3s/30s	6.94	5.74	-21 %	-33 %	-46 %	-46 %	100 %	121 %	52		6	-25 %	35 %
5s/10s	6.94	6.24	-9 %	-11 %	-15 %	-15 %	100 %	109 %	34		2	-5 %	32 %
5s/20s	6.82	5.95	-15 %	-18 %	-31 %	-31 %	100 %	115 %	58		3	-16 %	45 %
5s/30s	6.82	5.74	-19 %	-24 %	-39 %	-39 %	100 %	119 %	53		3	-20 %	38 %
10s/30s	6.82	5.74	-9 %	-11 %	-22 %	-22 %	100 %	109 %	18		0	-13 %	45 %
TU/FV	7.31	7.16	-2 %	-8 %	14 %	14 %	100 %	102 %	12	1	10	17 %	61 %
TU/TY	7.31	6.82	-8 %	-18 %	8 %	8 %	100 %	108 %	40	29	12	15 %	47 %
FV/TY	7.16	6.82	-5 %	-9 %	-8 %	-8 %	100 %	105 %	26	25	1	-3 %	16 %
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 epxiry 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.

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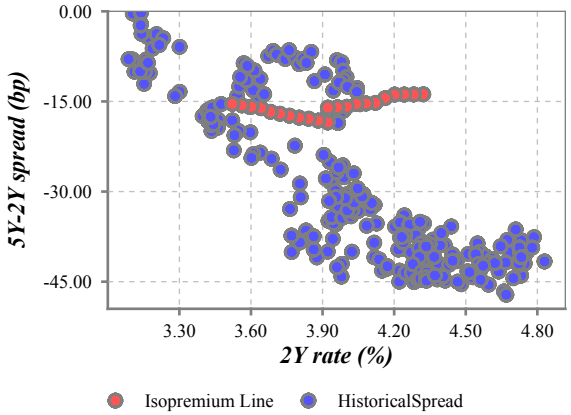
USD Swaption Conditional Curve Report (3M Expiry)

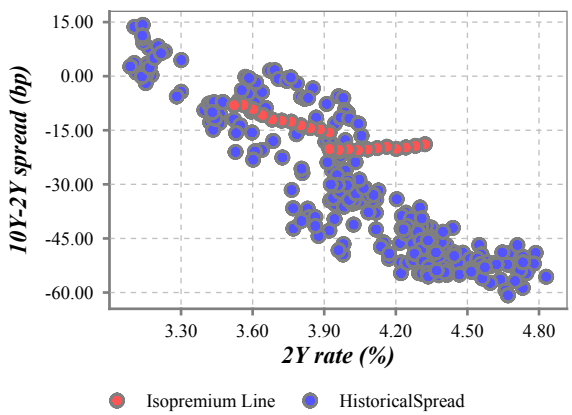
3Mx(2s/5s) Isopremium Line

Conditional Directionality: 6 % (pay), -8 % (rec), Lost Carry: 1.2 (bp)
Historical beta(R2): 1M -22 % (12 %) 3M -6 % (15 %) 1Y -25 % (55 %)
3Mx2Y vol: 6.84 bp/day, 3Mx5Y vol 6.82 bp/day



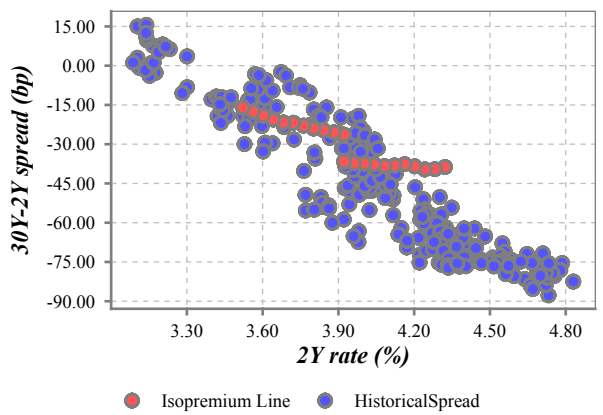
3Mx(2s/10s) Isopremium Line

Conditional Directionality: 3 % (pay), -19 % (rec), Lost Carry: -2.3 (bp)
Historical beta(R2): 1M -33 % (17 %) 3M -19 % (7 %) 1Y -42 % (73 %)
3Mx2Y vol: 6.84 bp/day, 3Mx10Y vol 6.24 bp/day



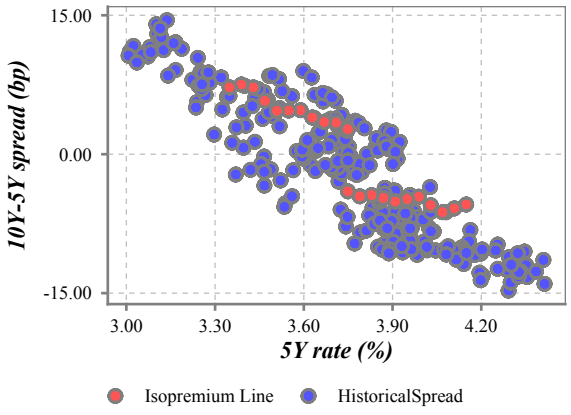
3Mx(2s/30s) Isopremium Line

Conditional Directionality: -5 % (pay), -26 % (rec), Lost Carry: -5.1 (bp)
Historical beta(R2): 1M -45 % (25 %) 3M -35 % (49 %) 1Y -58 % (83 %)
3Mx5Y vol: 6.84 bp/day, 3Mx10Y vol 5.74 bp/day



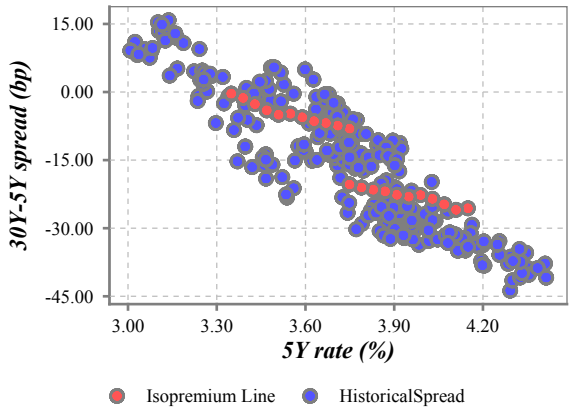
3Mx(5s/10s) Isopremium Line

Conditional Directionality: -4 % (pay), -11 % (rec), Lost Carry: -3.3 (bp)
Historical beta(R2): 1M -5 % (1 %) 3M -13 % (71 %) 1Y -20 % (76 %)
3Mx5Y vol: 6.82 bp/day, 3Mx10Y vol 6.24 bp/day



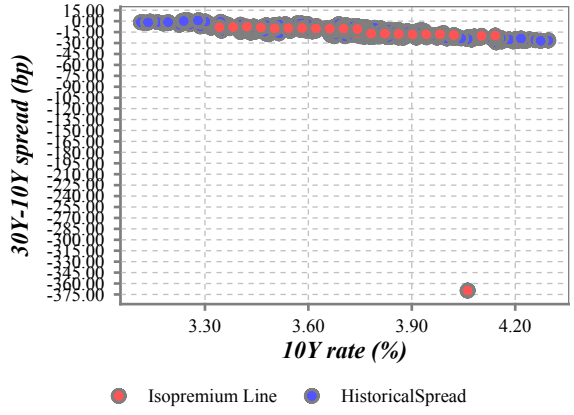
3Mx(5s/30s) Isopremium Line

Conditional Directionality: -13 % (pay), -19 % (rec), Lost Carry: -6.2 (bp)
Historical beta(R2): 1M -16 % (9 %) 3M -30 % (79 %) 1Y -40 % (81 %)
3Mx5Y vol: 6.82 bp/day, 3Mx30Y vol 5.74 bp/day



3Mx(10s/30s) Isopremium Line

Conditional Directionality: -8 % (pay), -6 % (rec), Lost Carry: -2.8 (bp)
Historical beta(R2): 1M -8 % (9 %) 3M -19 % (76 %) 1Y -24 % (74 %)
3Mx10Y vol: 6.24 bp/day, 3Mx30Y vol 5.74 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

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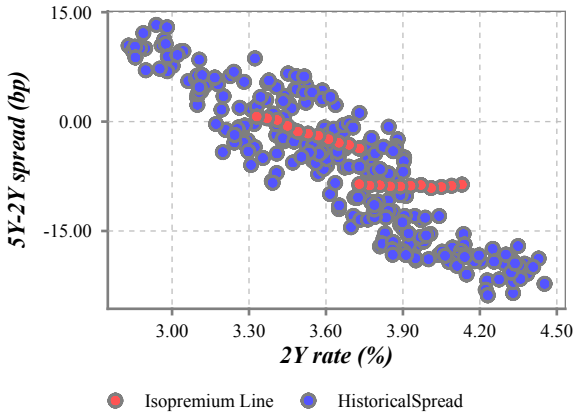
USD Swaption Conditional Curve Report (1Y Expiry)

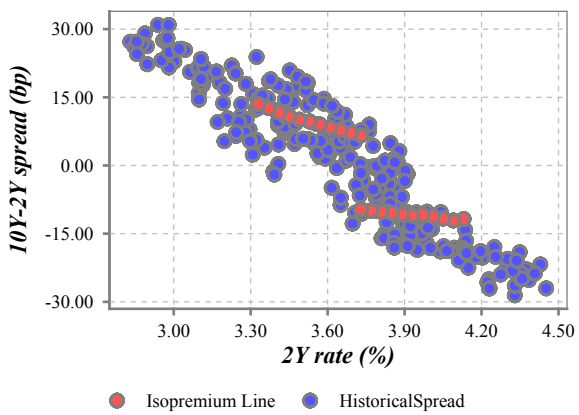
1Yx(2s/5s) Isopremium Line

Conditional Directionality: -0 % (pay), -11 % (rec), Lost Carry: -2.4 (bp)
Historical beta(R2): 1M -14 % (12 %) 3M -15 % (15 %) 1Y -22 % (55 %)
1Yx2Y vol: 7.30 bp/day, 1Yx5Y vol 6.85 bp/day



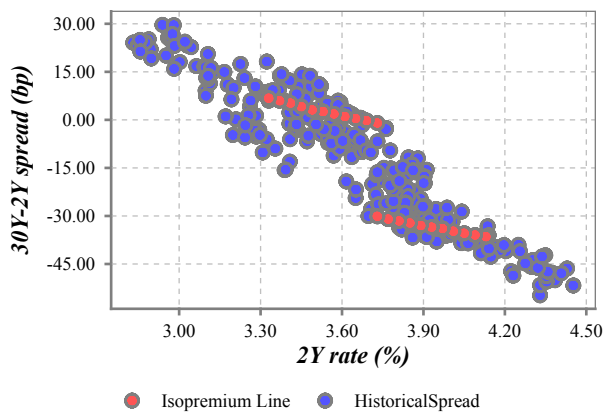
1Yx(2s/10s) Isopremium Line

Conditional Directionality: -5 % (pay), -17 % (rec), Lost Carry: -8.1 (bp)
Historical beta(R2): 1M -22 % (17 %) 3M -27 % (7 %) 1Y -37 % (73 %)
1Yx2Y vol: 7.30 bp/day, 1Yx10Y vol 6.40 bp/day



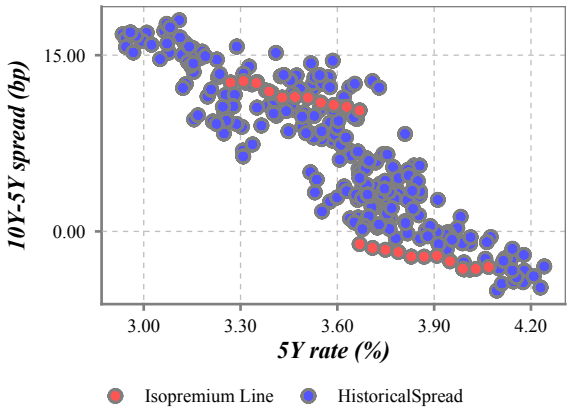
1Yx(2s/30s) Isopremium Line

Conditional Directionality: -16 % (pay), -19 % (rec), Lost Carry: -14.6 (bp)
Historical beta(R2): 1M -32 % (25 %) 3M -42 % (49 %) 1Y -52 % (83 %)
1Yx5Y vol: 7.30 bp/day, 1Yx10Y vol 5.82 bp/day



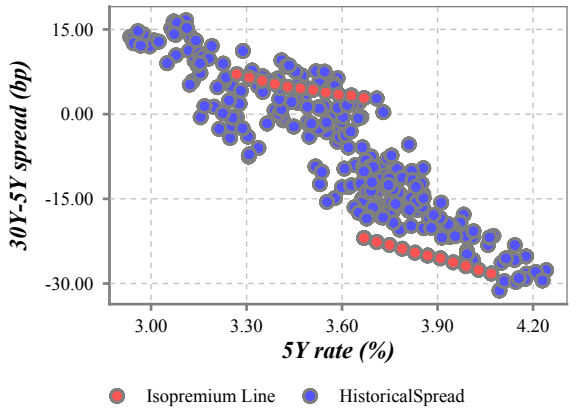
1Yx(5s/10s) Isopremium Line

Conditional Directionality: -5 % (pay), -6 % (rec), Lost Carry: -5.7 (bp)
Historical beta(R2): 1M -4 % (1 %) 3M -15 % (71 %) 1Y -18 % (76 %)
1Yx5Y vol: 6.85 bp/day, 1Yx10Y vol 6.40 bp/day



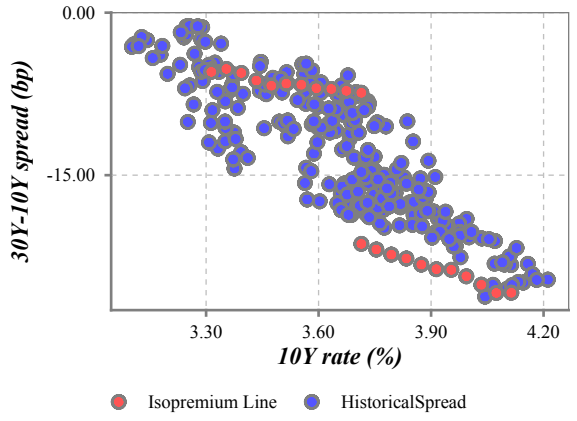
1Yx(5s/30s) Isopremium Line

Conditional Directionality: -16 % (pay), -11 % (rec), Lost Carry: -12.4 (bp)
Historical beta(R2): 1M -14 % (9 %) 3M -31 % (79 %) 1Y -36 % (81 %)
1Yx5Y vol: 6.85 bp/day, 1Yx30Y vol 5.82 bp/day



1Yx(10s/30s) Isopremium Line

Conditional Directionality: -11 % (pay), -5 % (rec), Lost Carry: -7.0 (bp)
Historical beta(R2): 1M -9 % (9 %) 3M -19 % (76 %) 1Y -21 % (74 %)
1Yx10Y vol: 6.40 bp/day, 1Yx30Y vol 5.82 bp/day



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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 Stpnr (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	4.276	4.069	-20.7	4.210	4.031	-18.0	5.63	6.91	0.509	-0.06	4%	-2.8	38	steepener	4.210	3.970	-24	3.3	6.0	7	0.35	32%	flattener	4.210	4.080	-13	7.7	5.0	1	0.02	0%
1m 1s/3s	1Mx1Y	1Mx3Y	4.276	3.980	-29.6	4.210	3.953	-25.8	5.63	7.04	0.346	-0.18	20%	-3.8	54	steepener	4.210	3.890	-32	2.4	6.2	6	0.40	24%	flattener	4.210	4.010	-20	9.6	5.8	1	-0.07	2%
1m 1s/5s	1Mx1Y	1Mx5Y	4.276	3.894	-38.2	4.210	3.877	-33.3	5.63	6.98	0.215	-0.34	43%	-4.9	67	steepener	4.210	3.820	-39	0.8	5.7	6	0.34	15%	flattener	4.210	3.930	-28	10.2	5.3	1	-0.23	14%
1m 1s/7s	1Mx1Y	1Mx7Y	4.276	3.870	-40.6	4.210	3.858	-35.3	5.63	6.75	0.159	-0.42	54%	-5.4	73	steepener	4.210	3.810	-40	-0.6	4.7	4	0.27	10%	flattener	4.210	3.900	-31	9.6	4.3	1	-0.31	25%
1m 1s/10s	1Mx1Y	1Mx10Y	4.276	3.874	-40.2	4.210	3.866	-34.4	5.63	6.43	0.118	-0.49	64%	-5.8	79	steepener	4.210	3.830	-38	-2.2	3.6	3	0.19	5%	flattener	4.210	3.900	-31	9.2	3.4	1	-0.39	36%
1m 1s/20s	1Mx1Y	1Mx20Y	4.276	3.895	-38.1	4.210	3.889	-32.1	5.63	6.17	0.070	-0.60	74%	-6.0	85	steepener	4.210	3.870	-34	-4.1	1.9	3	0.04	0%	flattener	4.210	3.910	-30	8.1	2.1	1	-0.50	51%
1m 1s/30s	1Mx1Y	1Mx30Y	4.276	3.728	-54.8	4.210	3.722	-48.9	5.63	5.98	0.055	-0.65	78%	-6.0	88	steepener	4.210	3.710	-50	-4.8	1.1	4	-0.02	0%	flattener	4.210	3.740	-47	7.8	1.9	1	-0.56	58%
1m 2s/3s	1Mx2Y	1Mx3Y	4.069	3.980	-8.9	4.031	3.953	-7.8	6.91	7.04	0.679	-0.10	36%	-1.1	20	steepener	4.031	3.951	-8	-0.9	0.2	2	0.00	0%	flattener	4.031	3.961	-7	1.9	0.8	1	-0.01	0%
1m 2s/5s	1Mx2Y	1Mx5Y	4.069	3.894	-17.5	4.031	3.877	-15.4	6.91	6.98	0.422	-0.24	58%	-2.1	39	steepener	4.031	3.871	-16	-1.5	0.6	4	-0.07	3%	flattener	4.031	3.881	-15	2.5	0.4	1	-0.12	13%
1m 2s/7s	1Mx2Y	1Mx7Y	4.069	3.870	-19.9	4.031	3.858	-17.3	6.91	6.75	0.312	-0.33	67%	-2.6	49	flattener	4.028	3.858	-17	2.9	0.3	92	-0.13	7%	steepener	4.038	3.858	-18	-1.9	0.7	97	-0.21	25%
1m 2s/10s	1Mx2Y	1Mx10Y	4.069	3.874	-19.5	4.031	3.866	-16.5	6.91	6.43	0.231	-0.41	74%	-3.0	59	flattener	4.016	3.866	-15	4.5	1.5	91	-0.19	14%	steepener	4.046	3.866	-18	-1.5	1.5	90	-0.29	37%
1m 2s/20s	1Mx2Y	1Mx20Y	4.069	3.895	-17.4	4.031	3.889	-14.2	6.91	6.17	0.138	-0.52	81%	-3.2	71	flattener	4.009	3.889	-12	5.4	2.2	87	-0.30	27%	steepener	4.059	3.889	-17	-0.4	2.8	84	-0.41	50%
1m 2s/30s	1Mx2Y	1Mx30Y	4.069	3.728	-34.1	4.031	3.722	-30.9	6.91	5.98	0.107	-0.57	83%	-3.2	77	flattener	4.002	3.722	-28	6.1	2.9	86	-0.35	31%	steepener	4.062	3.722	-34	-0.1	3.1	82	-0.47	55%
1m 3s/5s	1Mx3Y	1Mx5Y	3.980	3.894	-8.6	3.953	3.877	-7.6	7.04	6.98	0.622	-0.15	63%	-1.0	21	flattener	3.947	3.877	-7	1.6	0.6	92	-0.16	34%	steepener	3.957	3.877	-8	-0.6	0.4	96	-0.12	33%
1m 3s/7s	1Mx3Y	1Mx7Y	3.980	3.870	-11.0	3.953	3.858	-9.5	7.04	6.75	0.460	-0.24	71%	-1.6	32	flattener	3.938	3.858	-8	3.0	1.5	90	-0.24	40%	steepener	3.958	3.858	-10	-1.0	0.5	87	-0.21	44%
1m 3s/10s	1Mx3Y	1Mx10Y	3.980	3.874	-10.6	3.953	3.866	-8.7	7.04	6.43	0.340	-0.32	76%	-2.0	44	flattener	3.936	3.866	-7	3.6	1.7	86	-0.32	46%	steepener	3.976	3.866	-11	0.4	2.3	79	-0.31	53%
1m 3s/20s	1Mx3Y	1Mx20Y	3.980	3.895	-8.5	3.953	3.889	-6.4	7.04	6.17	0.203	-0.44	81%	-2.2	58	flattener	3.929	3.889	-4	4.5	2.4	80	-0.45	53%	steepener	3.979	3.889	-9	0.5	2.6	73	-0.44	61%
1m 3s/30s	1Mx3Y	1Mx30Y	3.980	3.728	-25.2	3.953	3.722	-23.1	7.04	5.98	0.158	-0.50	83%	-2.1	65	flattener	3.922	3.722	-20	5.2	3.1	79	-0.50	55%	steepener	3.992	3.722	-27	1.8	3.9	72	-0.50	66%
1m 5s/7s	1Mx5Y	1Mx7Y	3.894	3.870	-2.5	3.877	3.858	-1.9	6.98	6.75	0.740	-0.10	70%	-0.5	12	flattener	3.868	3.858	-1	1.5	0.9	83	-0.08	42%	steepener	3.888	3.858	-3	0.5	1.1	69	-0.07	28%
1m 5s/10s	1Mx5Y	1Mx10Y	3.894	3.874	-2.0	3.877	3.866	-1.1	6.98	6.43	0.547	-0.19	75%	-0.9	24	flattener	3.856	3.866	1	3.0	2.1	80	-0.16	47%	steepener	3.896	3.866	-3	1.0	1.9	65	-0.15	34%
1m 5s/20s	1Mx5Y	1Mx20Y	3.894	3.895	0.1	3.877	3.889	1.2	6.98	6.17	0.326	-0.33	78%	-1.1	40	flattener	3.849	3.889	4	3.9	2.8	74	-0.28	52%	steepener	3.909	3.889	-2	2.1	3.2	60	-0.27	41%
1m 5s/30s	1Mx5Y	1Mx30Y	3.894	3.728	-16.6	3.877	3.722	-15.5	6.98	5.98	0.254	-0.39	80%	-1.1	48	flattener	3.842	3.722	-12	4.6	3.5	73	-0.33	53%	steepener	3.912	3.722	-19	2.4	3.5	59	-0.32	46%
1m 7s/10s	1Mx7Y	1Mx10Y	3.870	3.874	0.4	3.858	3.866	0.8	6.75	6.43	0.739	-0.10	72%	-0.4	12	flattener	3.846	3.866	2	1.6	1.2	77	-0.09	48%	steepener	3.866	3.866	0	0.4	0.8	60	-0.08	33%
1m 7s/20s	1Mx7Y	1Mx20Y	3.870	3.895	2.5	3.858	3.889	3.1	6.75	6.17	0.440	-0.25	75%	-0.6	28	flattener	3.839	3.889	5	2.5	1.9	70	-0.22	50%	steepener	3.879	3.889	1	1.5	2.1	55	-0.21	38%
1m 7s/30s	1Mx7Y	1Mx30Y	3.870	3.728	-14.2	3.858	3.722	-13.6	6.75	5.98	0.343	-0.32	77%	-0.6	36	flattener	3.832	3.722	-11	3.2	2.6	69	-0.28	50%	steepener	3.882	3.722	-16	1.8	2.4	53	-0.27	45%
1m 10s/20s	1Mx10Y	1Mx20Y	3.874	3.895	2.1	3.866	3.889	2.3	6.43	6.17	0.596	-0.16	70%	-0.2	17	flattener	3.859	3.889	3	0.9	0.7	64	-0.15	49%	steepener	3.879	3.889	1	1.1	1.3	49	-0.14	36%
1m 10s/30s	1Mx10Y	1Mx30Y	3.874	3.728	-14.6	3.866	3.722	-14.4	6.43	5.98	0.464	-0.23	72%	-0.2	25	flattener	3.852	3.722	-13	1.6	1.4	65	-0.21	49%	steepener	3.882	3.722	-16	1.4	1.6	50	-0.21	45%
1m 20s/30s	1Mx20Y	1Mx30Y	3.895	3.728	-16.7	3.889	3.722	-16.7	6.17	5.98	0.779	-0.08	64%	0.0	9	flattener	3.882	3.722	-16	0.7	0.7	65	-0.07	40%	steepener	3.892	3.722	-17	0.3	0.3	52	-0.09	61%

*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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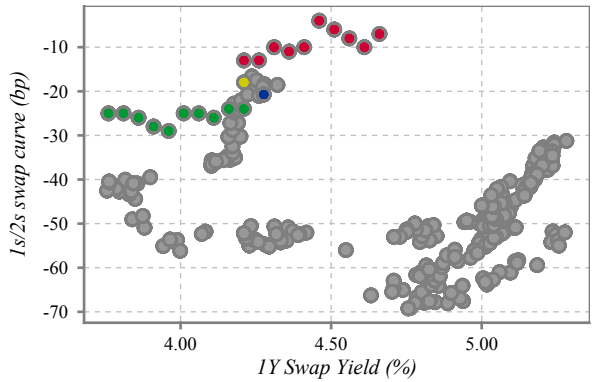
Conditional Isopremium Curve Trades Report - 1M Expiry

1m 1s/2s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
5.63	6.91	0.51	-0.06	4%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
0.35	32%	0.02	0%

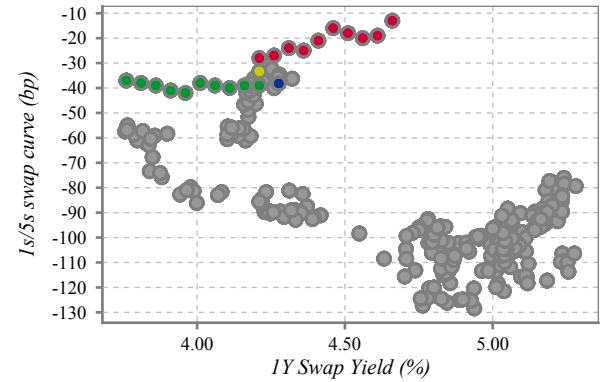


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 1s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
5.63	6.98	0.21	-0.34	43%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
0.34	15%	-0.23	14%

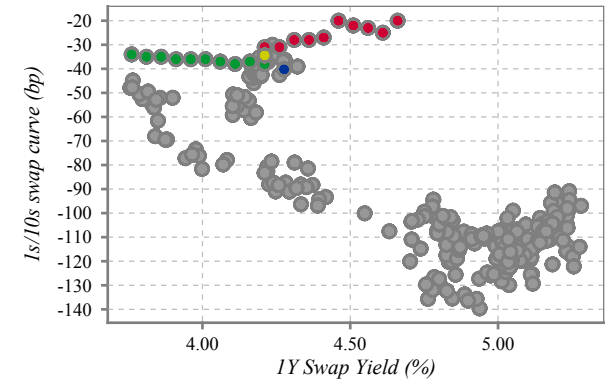


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 1s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
5.63	6.43	0.12	-0.49	64%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
0.19	5%	-0.39	36%

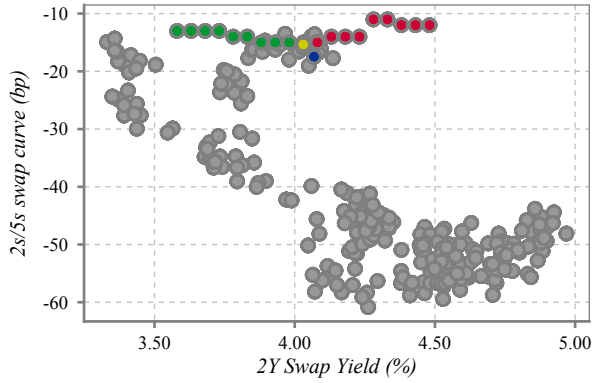


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 2s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.91	6.98	0.42	-0.24	58%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.07	3%	-0.12	13%

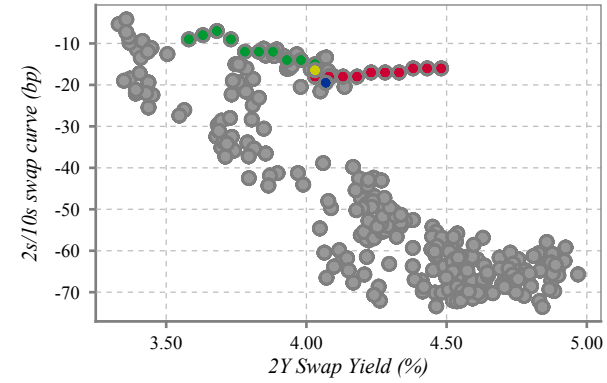


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 2s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.91	6.43	0.23	-0.41	74%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.19	14%	-0.29	37%

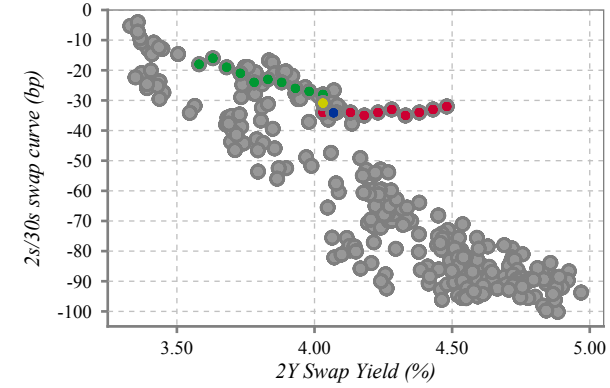


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 2s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.91	5.98	0.11	-0.57	83%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.35	31%	-0.47	55%



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 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 steepener or flattener 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 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 vols 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 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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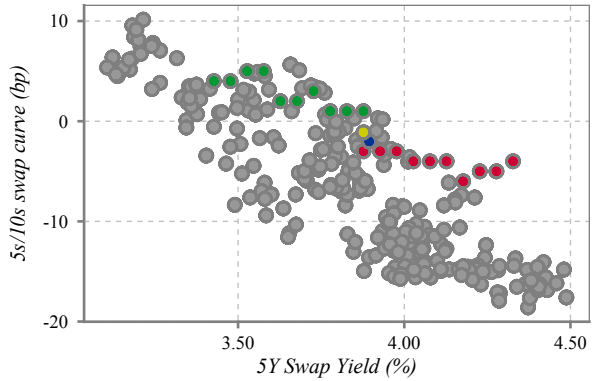
Conditional Isopremium Curve Trades Report - 1M Expiry

1m 5s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.98	6.43	0.55	-0.19	75%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.16	47%	-0.15	34%

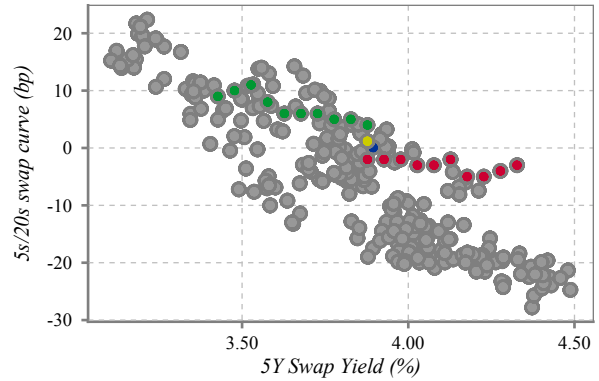


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 5s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.98	6.17	0.33	-0.33	78%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.28	52%	-0.27	41%

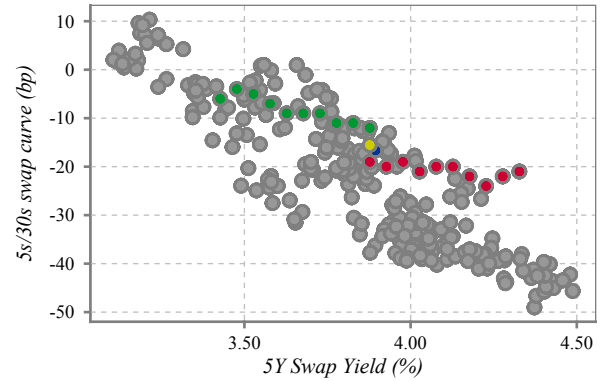


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 5s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.98	5.98	0.25	-0.39	80%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.33	53%	-0.32	46%

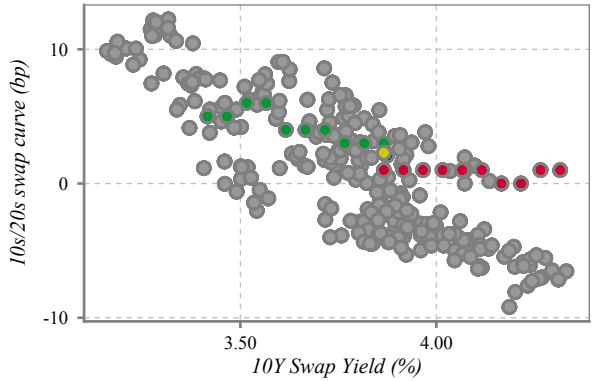


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 10s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.43	6.17	0.60	-0.16	70%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.15	49%	-0.14	36%

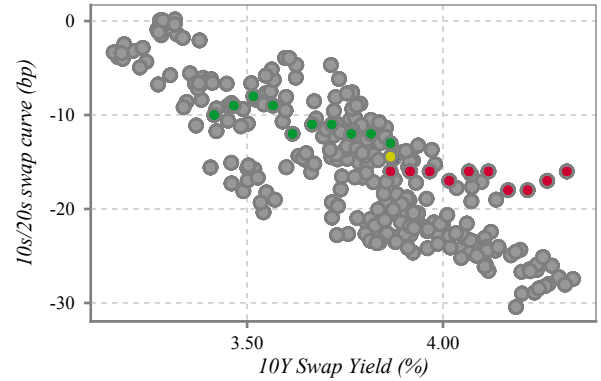


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 10s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.43	5.98	0.46	-0.23	72%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.21	49%	-0.21	45%

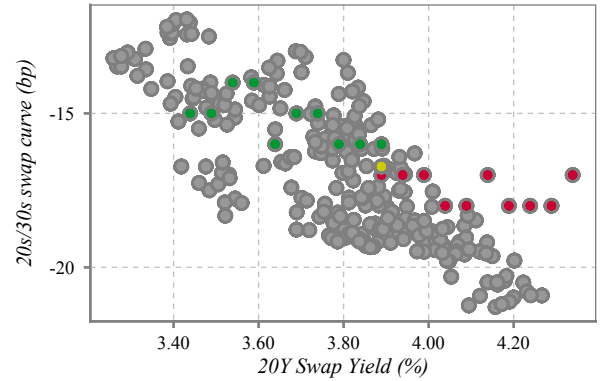


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

1m 20s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.17	5.98	0.78	-0.08	64%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.07	40%	-0.09	61%



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

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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 Stpnr (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
3m 1s/2s	3Mx1Y	3Mx2Y	4.276	4.069	-20.7	4.103	3.969	-13.4	6.28	7.06	0.512	-0.06	4%	-7.3	34	steepener	4.103	3.913	-19	-1.7	5.6	4	-0.19	12%	flattener	4.103	4.023	-8	12.7	5.4	1	-0.08	5%
3m 1s/3s	3Mx1Y	3Mx3Y	4.276	3.980	-29.6	4.103	3.908	-19.5	6.28	7.13	0.348	-0.18	20%	-10.1	50	steepener	4.103	3.843	-26	-3.6	6.5	2	-0.37	21%	flattener	4.103	3.963	-14	15.6	5.5	1	-0.21	18%
3m 1s/5s	3Mx1Y	3Mx5Y	4.276	3.894	-38.2	4.103	3.850	-25.3	6.28	6.95	0.216	-0.34	43%	-12.9	64	steepener	4.103	3.803	-30	-8.2	4.7	1	-0.54	32%	flattener	4.103	3.893	-21	17.2	4.3	1	-0.38	37%
3m 1s/7s	3Mx1Y	3Mx7Y	4.276	3.870	-40.6	4.103	3.839	-26.4	6.28	6.76	0.160	-0.42	54%	-14.3	72	steepener	4.103	3.803	-30	-10.6	3.6	1	-0.64	38%	flattener	4.103	3.873	-23	17.6	3.4	1	-0.46	48%
3m 1s/10s	3Mx1Y	3Mx10Y	4.276	3.874	-40.2	4.103	3.854	-24.8	6.28	6.49	0.118	-0.49	64%	-15.4	79	steepener	4.103	3.843	-26	-14.2	1.2	1	-0.72	44%	flattener	4.103	3.873	-23	17.2	1.8	1	-0.54	57%
3m 1s/20s	3Mx1Y	3Mx20Y	4.276	3.895	-38.1	4.103	3.879	-22.3	6.28	6.21	0.071	-0.60	74%	-15.8	89	flattener	4.099	3.879	-22	16.1	0.3	99	-0.85	52%	steepener	4.109	3.879	-23	-15.1	0.7	99	-0.64	68%
3m 1s/30s	3Mx1Y	3Mx30Y	4.276	3.728	-54.8	4.103	3.711	-39.2	6.28	6.02	0.055	-0.65	78%	-15.7	93	flattener	4.091	3.711	-38	16.8	1.2	99	-0.90	54%	steepener	4.121	3.711	-41	-13.8	1.8	99	-0.69	72%
3m 2s/3s	3Mx2Y	3Mx3Y	4.069	3.980	-8.9	3.969	3.908	-6.1	7.06	7.13	0.679	-0.10	36%	-2.8	19	steepener	3.969	3.899	-7	-1.9	0.9	1	0.00	0%	flattener	3.969	3.909	-6	2.9	0.1	1	-0.02	1%
3m 2s/5s	3Mx2Y	3Mx5Y	4.069	3.894	-17.5	3.969	3.850	-11.9	7.06	6.95	0.423	-0.24	58%	-5.6	38	flattener	3.960	3.850	-11	6.5	0.9	99	-0.06	2%	steepener	3.970	3.850	-12	-5.5	0.1	99	-0.14	16%
3m 2s/7s	3Mx2Y	3Mx7Y	4.069	3.870	-19.9	3.969	3.839	-13.0	7.06	6.76	0.313	-0.33	67%	-6.9	49	flattener	3.949	3.839	-11	8.9	2.0	99	-0.12	6%	steepener	3.989	3.839	-15	-4.9	2.0	99	-0.23	29%
3m 2s/10s	3Mx2Y	3Mx10Y	4.069	3.874	-19.5	3.969	3.854	-11.5	7.06	6.49	0.232	-0.41	74%	-8.0	59	flattener	3.934	3.854	-8	11.5	3.5	99	-0.19	13%	steepener	4.004	3.854	-15	-4.5	3.5	97	-0.31	40%
3m 2s/20s	3Mx2Y	3Mx20Y	4.069	3.895	-17.4	3.969	3.879	-8.9	7.06	6.21	0.138	-0.52	81%	-8.5	73	flattener	3.919	3.879	-4	13.4	4.9	95	-0.29	24%	steepener	4.019	3.879	-14	-3.4	5.1	89	-0.43	53%
3m 2s/30s	3Mx2Y	3Mx30Y	4.069	3.728	-34.1	3.969	3.711	-25.8	7.06	6.02	0.107	-0.57	83%	-8.3	79	flattener	3.911	3.711	-20	14.1	5.8	94	-0.34	28%	steepener	4.031	3.711	-32	-2.1	6.2	84	-0.49	58%
3m 3s/5s	3Mx3Y	3Mx5Y	3.980	3.894	-8.6	3.908	3.850	-5.8	7.13	6.95	0.623	-0.15	63%	-2.8	21	flattener	3.900	3.850	-5	3.6	0.8	99	-0.13	24%	steepener	3.920	3.850	-7	-1.6	1.2	99	-0.11	32%
3m 3s/7s	3Mx3Y	3Mx7Y	3.980	3.870	-11.0	3.908	3.839	-6.9	7.13	6.76	0.461	-0.24	71%	-4.1	33	flattener	3.889	3.839	-5	6.0	1.9	96	-0.21	31%	steepener	3.929	3.839	-9	-2.0	2.1	92	-0.20	43%
3m 3s/10s	3Mx3Y	3Mx10Y	3.980	3.874	-10.6	3.908	3.854	-5.4	7.13	6.49	0.341	-0.32	76%	-5.2	44	flattener	3.874	3.854	-2	8.6	3.4	94	-0.29	38%	steepener	3.944	3.854	-9	-1.6	3.6	86	-0.29	52%
3m 3s/20s	3Mx3Y	3Mx20Y	3.980	3.895	-8.5	3.908	3.879	-2.9	7.13	6.21	0.203	-0.44	81%	-5.7	59	flattener	3.859	3.879	2	10.5	4.9	88	-0.41	46%	steepener	3.959	3.879	-8	-0.5	5.1	77	-0.42	61%
3m 3s/30s	3Mx3Y	3Mx30Y	3.980	3.728	-25.2	3.908	3.711	-19.7	7.13	6.02	0.158	-0.50	83%	-5.5	66	flattener	3.851	3.711	-14	11.2	5.7	86	-0.46	48%	steepener	3.971	3.711	-26	0.8	6.3	72	-0.48	65%
3m 5s/7s	3Mx5Y	3Mx7Y	3.894	3.870	-2.5	3.850	3.839	-1.1	6.95	6.76	0.740	-0.10	70%	-1.3	12	flattener	3.839	3.839	0	2.5	1.1	88	-0.08	40%	steepener	3.859	3.839	-2	-0.5	0.9	75	-0.08	34%
3m 5s/10s	3Mx5Y	3Mx10Y	3.894	3.874	-2.0	3.850	3.854	0.4	6.95	6.49	0.547	-0.19	75%	-2.4	24	flattener	3.824	3.854	3	5.0	2.6	85	-0.16	46%	steepener	3.874	3.854	-2	0.0	2.4	69	-0.17	41%
3m 5s/20s	3Mx5Y	3Mx20Y	3.894	3.895	0.1	3.850	3.879	2.9	6.95	6.21	0.326	-0.33	78%	-2.9	41	flattener	3.809	3.879	7	6.9	4.1	79	-0.28	50%	steepener	3.889	3.879	-1	1.1	3.9	61	-0.30	47%
3m 5s/30s	3Mx5Y	3Mx30Y	3.894	3.728	-16.6	3.850	3.711	-13.9	6.95	6.02	0.254	-0.39	80%	-2.7	48	flattener	3.801	3.711	-9	7.6	4.9	78	-0.34	51%	steepener	3.901	3.711	-19	2.4	5.1	59	-0.36	52%
3m 7s/10s	3Mx7Y	3Mx10Y	3.870	3.874	0.4	3.839	3.854	1.5	6.76	6.49	0.739	-0.10	72%	-1.1	12	flattener	3.824	3.854	3	2.6	1.5	83	-0.08	45%	steepener	3.854	3.854	0	0.4	1.5	60	-0.08	31%
3m 7s/20s	3Mx7Y	3Mx20Y	3.870	3.895	2.5	3.839	3.879	4.0	6.76	6.21	0.441	-0.25	75%	-1.5	29	flattener	3.809	3.879	7	4.5	3.0	75	-0.21	48%	steepener	3.869	3.879	1	1.5	3.0	55	-0.19	36%
3m 7s/30s	3Mx7Y	3Mx30Y	3.870	3.728	-14.2	3.839	3.711	-12.8	6.76	6.02	0.343	-0.32	77%	-1.4	37	flattener	3.801	3.711	-9	5.2	3.8	74	-0.26	48%	steepener	3.881	3.711	-17	2.8	4.2	50	-0.25	43%
3m 10s/20s	3Mx10Y	3Mx20Y	3.874	3.895	2.1	3.854	3.879	2.5	6.49	6.21	0.596	-0.16	70%	-0.4	17	flattener	3.839	3.879	4	1.9	1.5	70	-0.15	48%	steepener	3.869	3.879	1	1.1	1.5	49	-0.14	37%
3m 10s/30s	3Mx10Y	3Mx30Y	3.874	3.728	-14.6	3.854	3.711	-14.3	6.49	6.02	0.464	-0.23	72%	-0.3	25	flattener	3.831	3.711	-12	2.6	2.3	68	-0.21	48%	steepener	3.881	3.711	-17	2.4	2.7	47	-0.21	46%
3m 20s/30s	3Mx20Y	3Mx30Y	3.895	3.728	-16.7	3.879	3.711	-16.8	6.21	6.02	0.778	-0.08	64%	0.1	9	flattener	3.871	3.711	-16	0.7	0.8	65	-0.07	38%	steepener	3.891	3.711	-18	1.3	1.2	40	-0.09	58%

*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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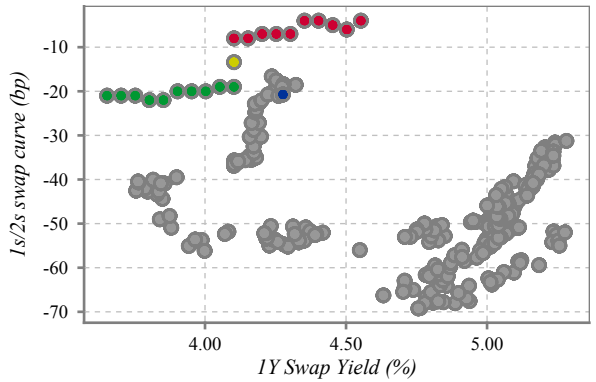
Conditional Isopremium Curve Trades Report - 3M Expiry

3m 1s/2s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.28	7.06	0.51	-0.06	4%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.19	12%	-0.08	5%

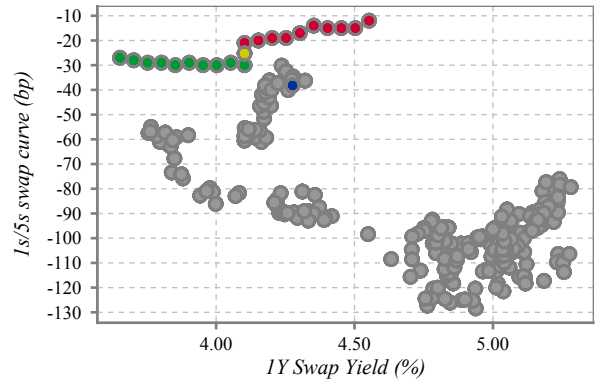


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 1s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.28	6.95	0.22	-0.34	43%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.54	32%	-0.38	37%

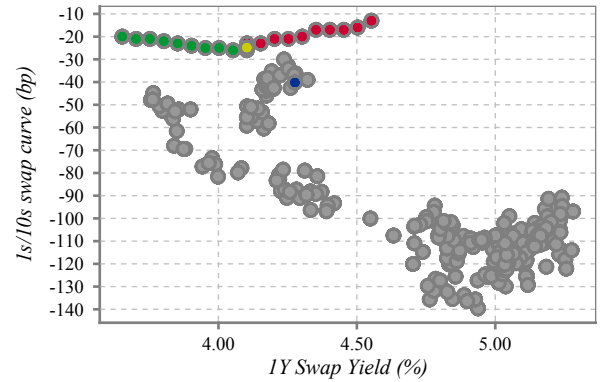


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 1s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.28	6.49	0.12	-0.49	64%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.72	44%	-0.54	57%

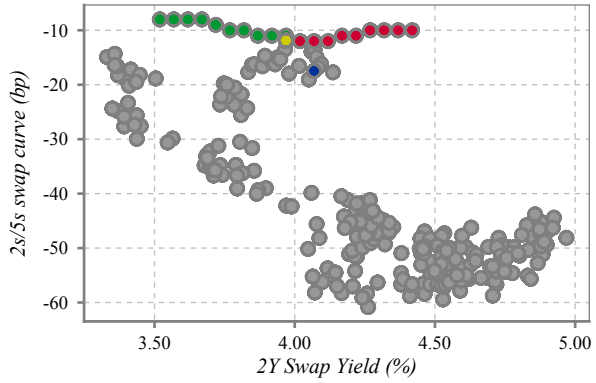


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 2s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.06	6.95	0.42	-0.24	58%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.06	2%	-0.14	16%

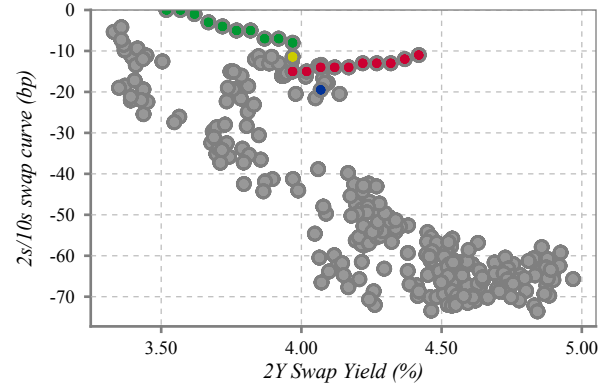


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 2s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.06	6.49	0.23	-0.41	74%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.19	13%	-0.31	40%

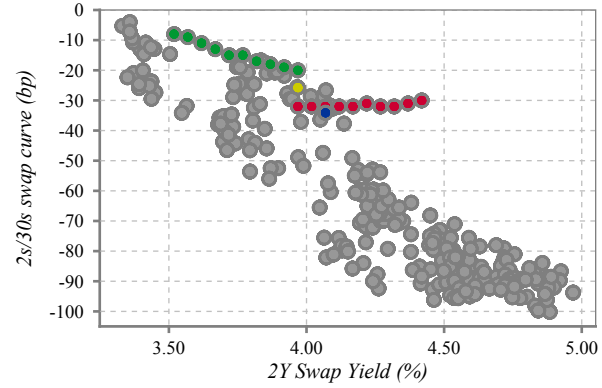


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 2s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.06	6.02	0.11	-0.57	83%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.34	28%	-0.49	58%



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 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 steepener or flattener 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 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 vols 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 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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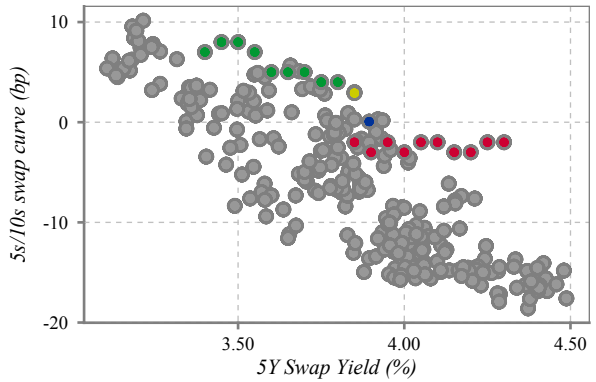
Conditional Isopremium Curve Trades Report - 3M Expiry

3m 5s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.95	6.49	0.55	-0.19	75%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.16	46%	-0.17	41%

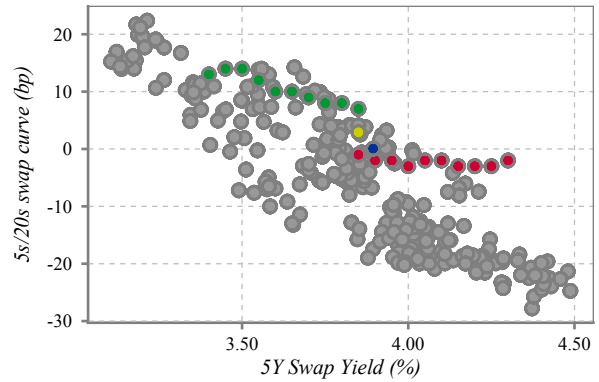


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 5s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.95	6.21	0.33	-0.33	78%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.28	50%	-0.30	47%

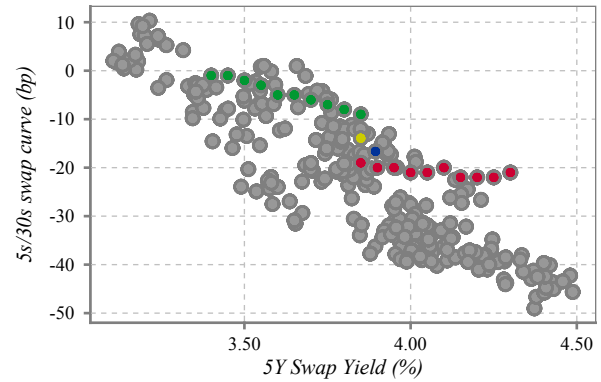


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 5s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.95	6.02	0.25	-0.39	80%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.34	51%	-0.36	52%

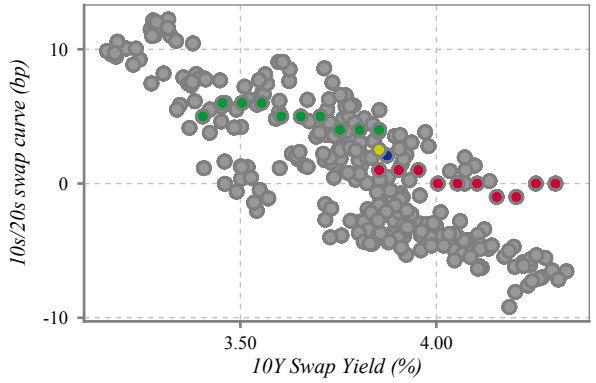


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 10s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.49	6.21	0.60	-0.16	70%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.15	48%	-0.14	37%

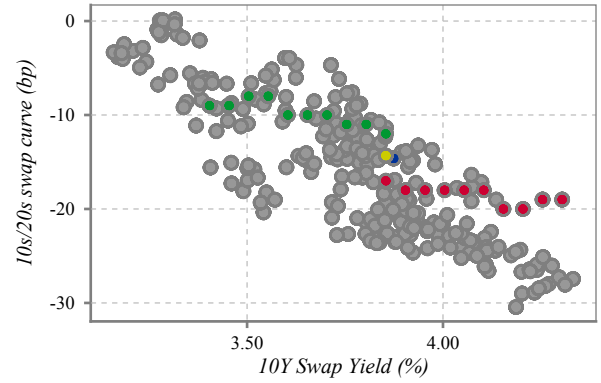


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 10s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.49	6.02	0.46	-0.23	72%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.21	48%	-0.21	46%

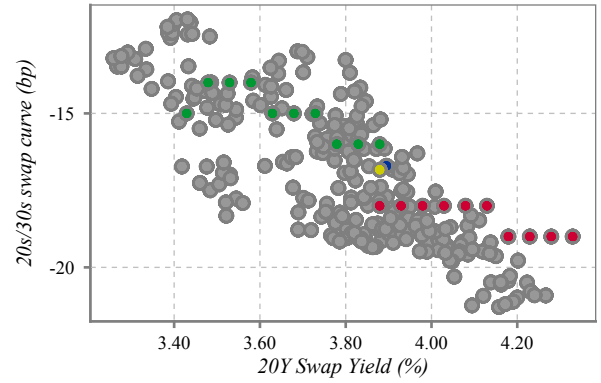


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

3m 20s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.21	6.02	0.78	-0.08	64%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.07	38%	-0.09	58%



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

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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 Stpnr (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
6m 1s/2s	6Mx1Y	6Mx2Y	4.276	4.069	-20.7	3.981	3.899	-8.2	7.00	7.26	0.509	-0.06	4%	-5.2	31	steepener	3.981	3.871	-11	-9.7	2.8	1	-0.61	59%	flattener	3.981	3.921	-6	14.7	2.2	1	-0.07	4%
6m 1s/3s	6Mx1Y	6Mx3Y	4.276	3.980	-29.6	3.981	3.857	-12.4	7.00	7.22	0.346	-0.18	20%	-7.1	47	steepener	3.981	3.831	-15	-14.6	2.6	1	-0.94	66%	flattener	3.981	3.881	-10	19.6	2.4	1	-0.20	17%
6m 1s/5s	6Mx1Y	6Mx5Y	4.276	3.894	-38.2	3.981	3.820	-16.1	7.00	6.94	0.215	-0.34	43%	-9.2	62	flattener	3.980	3.820	-16	22.2	0.1	99	-1.17	68%	steepener	3.990	3.820	-17	-21.2	0.9	99	-0.36	37%
6m 1s/7s	6Mx1Y	6Mx7Y	4.276	3.870	-40.6	3.981	3.818	-16.2	7.00	6.77	0.160	-0.42	54%	-10.1	72	flattener	3.958	3.818	-14	26.6	2.2	99	-1.28	70%	steepener	3.998	3.818	-18	-22.6	1.8	99	-0.44	48%
6m 1s/10s	6Mx1Y	6Mx10Y	4.276	3.874	-40.2	3.981	3.842	-13.9	7.00	6.53	0.118	-0.49	64%	-11.0	80	flattener	3.942	3.842	-10	30.2	3.9	99	-1.36	71%	steepener	4.022	3.842	-18	-22.2	4.1	99	-0.52	58%
6m 1s/20s	6Mx1Y	6Mx20Y	4.276	3.895	-38.1	3.981	3.868	-11.3	7.00	6.22	0.070	-0.60	74%	-11.0	92	flattener	3.918	3.868	-5	33.1	6.3	99	-1.48	73%	steepener	4.048	3.868	-18	-20.1	6.7	99	-0.62	69%
6m 1s/30s	6Mx1Y	6Mx30Y	4.276	3.728	-54.8	3.981	3.697	-28.3	7.00	6.01	0.055	-0.65	78%	-10.9	97	flattener	3.907	3.697	-21	33.8	7.3	99	-1.54	73%	steepener	4.067	3.697	-37	-17.8	8.7	99	-0.67	73%
6m 2s/3s	6Mx2Y	6Mx3Y	4.069	3.980	-8.9	3.899	3.857	-4.2	7.26	7.22	0.679	-0.10	36%	-1.9	17	flattener	3.897	3.857	-4	4.9	0.2	99	-0.05	4%	steepener	3.897	3.857	-4	-4.9	-0.2	99	-0.06	6%
6m 2s/5s	6Mx2Y	6Mx5Y	4.069	3.894	-17.5	3.899	3.820	-7.9	7.26	6.94	0.423	-0.24	58%	-3.9	36	flattener	3.870	3.820	-5	12.5	2.9	99	-0.14	12%	steepener	3.930	3.820	-11	-6.5	3.1	99	-0.20	24%
6m 2s/7s	6Mx2Y	6Mx7Y	4.069	3.870	-19.9	3.899	3.818	-8.0	7.26	6.77	0.313	-0.33	67%	-4.9	48	flattener	3.858	3.818	-4	15.9	4.0	99	-0.21	18%	steepener	3.938	3.818	-12	-7.9	4.0	99	-0.28	36%
6m 2s/10s	6Mx2Y	6Mx10Y	4.069	3.874	-19.5	3.899	3.842	-5.7	7.26	6.53	0.231	-0.41	74%	-5.8	59	flattener	3.842	3.842	0	19.5	5.7	99	-0.27	24%	steepener	3.962	3.842	-12	-7.5	6.3	98	-0.37	47%
6m 2s/20s	6Mx2Y	6Mx20Y	4.069	3.895	-17.4	3.899	3.868	-3.1	7.26	6.22	0.138	-0.52	81%	-5.8	73	flattener	3.818	3.868	5	22.4	8.1	99	-0.37	33%	steepener	3.988	3.868	-12	-5.4	8.9	89	-0.48	58%
6m 2s/30s	6Mx2Y	6Mx30Y	4.069	3.728	-34.1	3.899	3.697	-20.1	7.26	6.01	0.107	-0.57	83%	-5.6	80	flattener	3.797	3.697	-10	24.1	10.1	98	-0.41	35%	steepener	4.007	3.697	-31	-3.1	10.9	83	-0.54	62%
6m 3s/5s	6Mx3Y	6Mx5Y	3.980	3.894	-8.6	3.857	3.820	-3.7	7.22	6.94	0.623	-0.15	63%	-2.1	20	flattener	3.830	3.820	-1	7.6	2.7	99	-0.15	30%	steepener	3.880	3.820	-6	-2.6	2.3	99	-0.13	35%
6m 3s/7s	6Mx3Y	6Mx7Y	3.980	3.870	-11.0	3.857	3.818	-3.8	7.22	6.77	0.461	-0.24	71%	-3.1	32	flattener	3.818	3.818	0	11.0	3.8	99	-0.24	36%	steepener	3.898	3.818	-8	-3.0	4.2	92	-0.22	46%
6m 3s/10s	6Mx3Y	6Mx10Y	3.980	3.874	-10.6	3.857	3.842	-1.5	7.22	6.53	0.341	-0.32	76%	-3.9	44	flattener	3.802	3.842	4	14.6	5.5	99	-0.31	41%	steepener	3.912	3.842	-7	-3.6	5.5	88	-0.31	55%
6m 3s/20s	6Mx3Y	6Mx20Y	3.980	3.895	-8.5	3.857	3.868	1.1	7.22	6.22	0.203	-0.44	81%	-4.0	59	flattener	3.778	3.868	9	17.5	7.9	95	-0.44	47%	steepener	3.948	3.868	-8	-0.5	9.1	77	-0.44	63%
6m 3s/30s	6Mx3Y	6Mx30Y	3.980	3.728	-25.2	3.857	3.697	-15.9	7.22	6.01	0.158	-0.50	83%	-3.8	66	flattener	3.757	3.697	-6	19.2	9.9	94	-0.48	48%	steepener	3.957	3.697	-26	0.8	10.1	72	-0.50	67%
6m 5s/7s	6Mx5Y	6Mx7Y	3.894	3.870	-2.5	3.820	3.818	-0.1	6.94	6.77	0.741	-0.10	70%	-1.0	12	flattener	3.808	3.818	1	3.5	1.1	94	-0.08	39%	steepener	3.838	3.818	-2	-0.5	1.9	83	-0.09	38%
6m 5s/10s	6Mx5Y	6Mx10Y	3.894	3.874	-2.0	3.820	3.842	2.2	6.94	6.53	0.547	-0.19	75%	-1.8	24	flattener	3.782	3.842	6	8.0	3.8	95	-0.16	45%	steepener	3.852	3.842	-1	-1.0	3.2	73	-0.18	44%
6m 5s/20s	6Mx5Y	6Mx20Y	3.894	3.895	0.1	3.820	3.868	4.8	6.94	6.22	0.326	-0.33	78%	-1.9	40	flattener	3.758	3.868	11	10.9	6.2	88	-0.28	49%	steepener	3.878	3.868	-1	1.1	5.8	61	-0.31	50%
6m 5s/30s	6Mx5Y	6Mx30Y	3.894	3.728	-16.6	3.820	3.697	-12.2	6.94	6.01	0.254	-0.39	80%	-1.7	48	flattener	3.747	3.697	-5	11.6	7.2	84	-0.33	49%	steepener	3.897	3.697	-20	3.4	7.8	57	-0.38	55%
6m 7s/10s	6Mx7Y	6Mx10Y	3.870	3.874	0.4	3.818	3.842	2.3	6.77	6.53	0.739	-0.10	72%	-0.8	12	flattener	3.802	3.842	4	3.6	1.7	90	-0.09	46%	steepener	3.842	3.842	0	0.4	2.3	69	-0.09	36%
6m 7s/20s	6Mx7Y	6Mx20Y	3.870	3.895	2.5	3.818	3.868	4.9	6.77	6.22	0.441	-0.25	75%	-0.9	28	flattener	3.778	3.868	9	6.5	4.1	81	-0.21	48%	steepener	3.868	3.868	0	2.5	4.9	49	-0.22	41%
6m 7s/30s	6Mx7Y	6Mx30Y	3.870	3.728	-14.2	3.818	3.697	-12.1	6.77	6.01	0.343	-0.32	77%	-0.7	36	flattener	3.757	3.697	-6	8.2	6.1	79	-0.27	48%	steepener	3.887	3.697	-19	4.8	6.9	45	-0.29	47%
6m 10s/20s	6Mx10Y	6Mx20Y	3.874	3.895	2.1	3.842	3.868	2.6	6.53	6.22	0.596	-0.16	70%	-0.1	17	flattener	3.818	3.868	5	2.9	2.4	74	-0.15	47%	steepener	3.868	3.868	0	2.1	2.6	44	-0.14	37%
6m 10s/30s	6Mx10Y	6Mx30Y	3.874	3.728	-14.6	3.842	3.697	-14.4	6.53	6.01	0.464	-0.23	72%	0.1	25	flattener	3.797	3.697	-10	4.6	4.4	75	-0.21	46%	steepener	3.887	3.697	-19	4.4	4.6	40	-0.21	46%
6m 20s/30s	6Mx20Y	6Mx30Y	3.895	3.728	-16.7	3.868	3.697	-17.0	6.22	6.01	0.778	-0.08	64%	0.2	9	flattener	3.847	3.697	-15	1.7	2.0	75	-0.07	36%	steepener	3.887	3.697	-19	2.3	2.0	21	-0.09	56%

*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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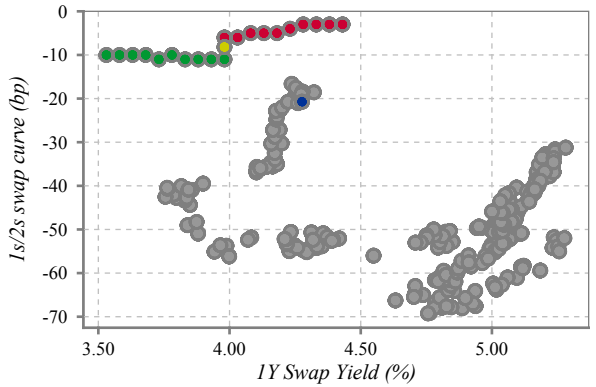
Conditional Isopremium Curve Trades Report - 6M Expiry

6m 1s/2s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.00	7.26	0.51	-0.06	4%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.61	59%	-0.07	4%

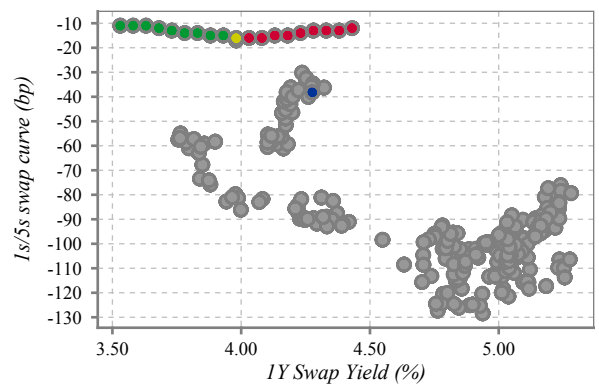


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 1s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.00	6.94	0.22	-0.34	43%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-1.17	68%	-0.36	37%

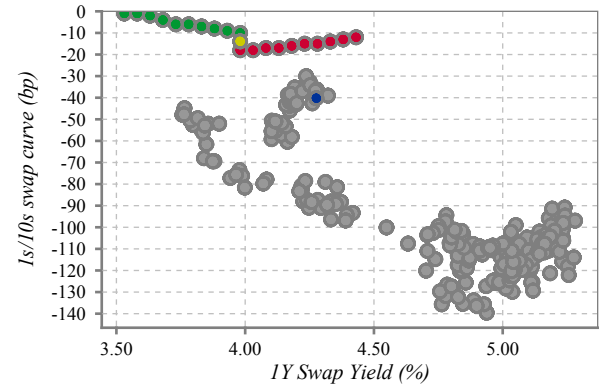


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 1s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.00	6.53	0.12	-0.49	64%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-1.36	71%	-0.52	58%

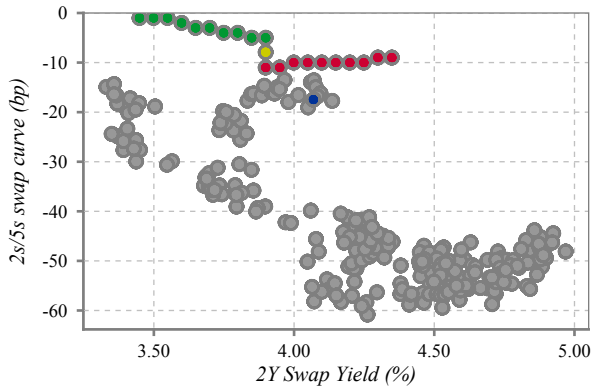


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 2s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.26	6.94	0.42	-0.24	58%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.14	12%	-0.20	24%

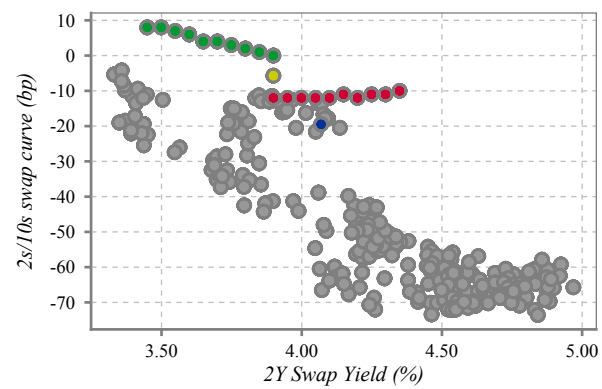


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 2s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.26	6.53	0.23	-0.41	74%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.27	24%	-0.37	47%

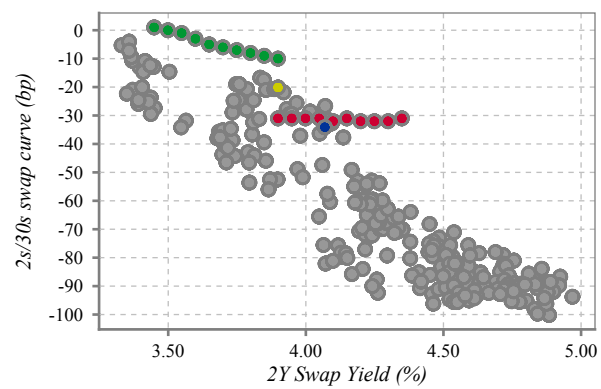


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 2s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.26	6.01	0.11	-0.57	83%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.41	35%	-0.54	62%



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 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 steepener or flattener 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 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 vols 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 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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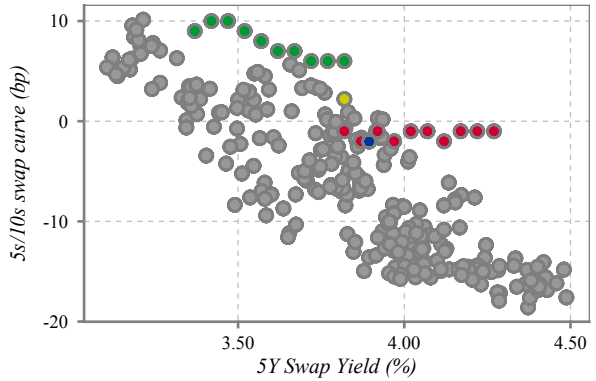
Conditional Isopremium Curve Trades Report - 6M Expiry

6m 5s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.94	6.53	0.55	-0.19	75%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.16	45%	-0.18	44%

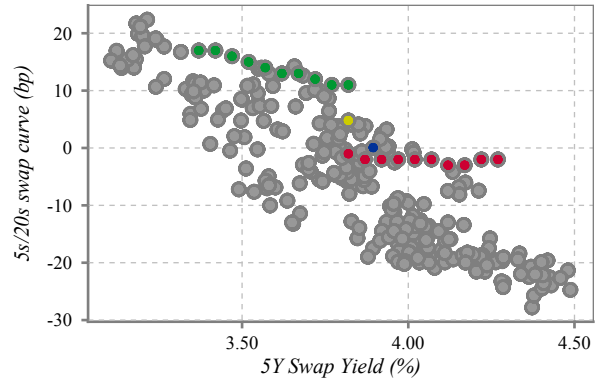


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 5s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.94	6.22	0.33	-0.33	78%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.28	49%	-0.31	50%

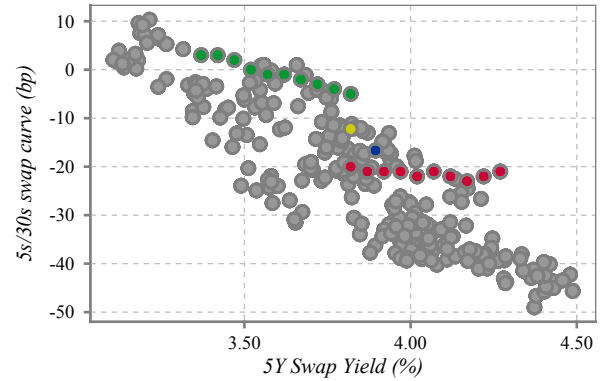


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 5s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.94	6.01	0.25	-0.39	80%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.33	49%	-0.38	55%

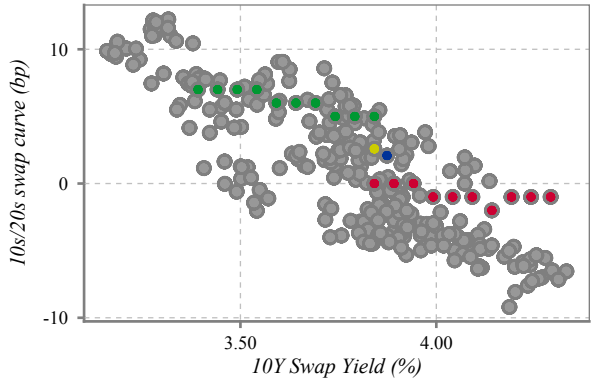


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 10s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.53	6.22	0.60	-0.16	70%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.15	47%	-0.14	37%

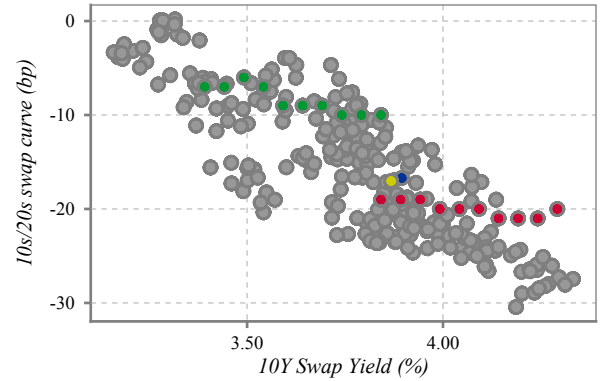


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 10s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.53	6.01	0.46	-0.23	72%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.21	46%	-0.21	46%

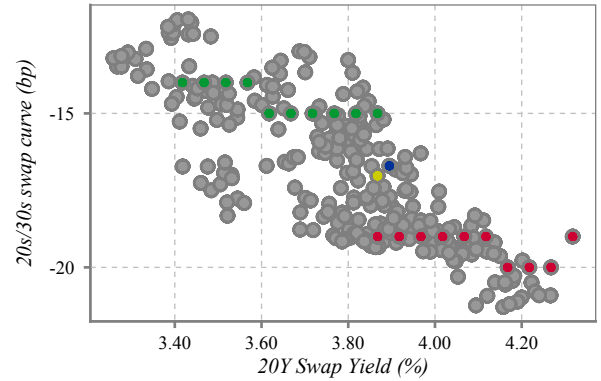


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

6m 20s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.22	6.01	0.78	-0.08	64%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.07	36%	-0.09	56%



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

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** 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 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 vols 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 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 - 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 Stpnr (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
9m 1s/2s	9Mx1Y	9Mx2Y	4.276	4.069	-20.7	3.901	3.853	-4.8	7.29	7.33	0.508	-0.06	4%	-3.3	28	steepener	3.901	3.851	-5	-15.7	0.2	1	-0.31	15%	flattener	3.901	3.861	-4	16.7	0.8	1	-0.06	3%
9m 1s/3s	9Mx1Y	9Mx3Y	4.276	3.980	-29.6	3.901	3.822	-7.9	7.29	7.24	0.346	-0.18	20%	-4.5	42	flattener	3.892	3.822	-7	22.6	0.9	99	-0.60	27%	steepener	3.902	3.822	-8	-21.6	0.1	99	-0.19	16%
9m 1s/5s	9Mx1Y	9Mx5Y	4.276	3.894	-38.2	3.901	3.800	-10.1	7.29	6.93	0.215	-0.34	43%	-6.0	58	flattener	3.860	3.800	-6	32.2	4.1	99	-0.91	35%	steepener	3.940	3.800	-14	-24.2	3.9	99	-0.35	36%
9m 1s/7s	9Mx1Y	9Mx7Y	4.276	3.870	-40.6	3.901	3.806	-9.5	7.29	6.76	0.159	-0.42	54%	-6.7	67	flattener	3.846	3.806	-4	36.6	5.5	99	-1.07	41%	steepener	3.956	3.806	-15	-25.6	5.5	99	-0.43	48%
9m 1s/10s	9Mx1Y	9Mx10Y	4.276	3.874	-40.2	3.901	3.836	-6.5	7.29	6.53	0.118	-0.49	64%	-7.4	77	flattener	3.826	3.836	1	41.2	7.5	99	-1.20	44%	steepener	3.986	3.836	-15	-25.2	8.5	99	-0.51	57%
9m 1s/20s	9Mx1Y	9Mx20Y	4.276	3.895	-38.1	3.901	3.859	-4.2	7.29	6.17	0.070	-0.60	74%	-7.1	89	flattener	3.789	3.859	7	45.1	11.2	99	-1.36	48%	steepener	4.019	3.859	-16	-22.1	11.8	99	-0.61	69%
9m 1s/30s	9Mx1Y	9Mx30Y	4.276	3.728	-54.8	3.901	3.686	-21.5	7.29	6.00	0.055	-0.65	78%	-6.8	96	flattener	3.776	3.686	-9	45.8	12.5	99	-1.41	48%	steepener	4.036	3.686	-35	-19.8	13.5	99	-0.66	73%
9m 2s/3s	9Mx2Y	9Mx3Y	4.069	3.980	-8.9	3.853	3.822	-3.0	7.33	7.24	0.681	-0.10	36%	-1.2	16	flattener	3.842	3.822	-2	6.9	1.0	99	-0.07	11%	steepener	3.862	3.822	-4	-4.9	1.0	99	-0.07	12%
9m 2s/5s	9Mx2Y	9Mx5Y	4.069	3.894	-17.5	3.853	3.800	-5.2	7.33	6.93	0.424	-0.24	58%	-2.7	34	flattener	3.810	3.800	-1	16.5	4.2	99	-0.18	20%	steepener	3.890	3.800	-9	-8.5	3.8	99	-0.22	31%
9m 2s/7s	9Mx2Y	9Mx7Y	4.069	3.870	-19.9	3.853	3.806	-4.6	7.33	6.76	0.314	-0.33	67%	-3.4	45	flattener	3.796	3.806	1	20.9	5.6	99	-0.24	27%	steepener	3.916	3.806	-11	-8.9	6.4	99	-0.31	42%
9m 2s/10s	9Mx2Y	9Mx10Y	4.069	3.874	-19.5	3.853	3.836	-1.7	7.33	6.53	0.232	-0.41	74%	-4.0	56	flattener	3.776	3.836	6	25.5	7.7	99	-0.31	32%	steepener	3.936	3.836	-10	-9.5	8.3	98	-0.39	52%
9m 2s/20s	9Mx2Y	9Mx20Y	4.069	3.895	-17.4	3.853	3.859	0.7	7.33	6.17	0.138	-0.52	81%	-3.8	70	flattener	3.739	3.859	12	29.4	11.3	99	-0.40	40%	steepener	3.979	3.859	-12	-5.4	12.7	87	-0.51	62%
9m 2s/30s	9Mx2Y	9Mx30Y	4.069	3.728	-34.1	3.853	3.686	-16.6	7.33	6.00	0.107	-0.57	83%	-3.5	77	flattener	3.726	3.686	-4	30.1	12.6	99	-0.44	41%	steepener	3.996	3.686	-31	-3.1	14.4	83	-0.57	66%
9m 3s/5s	9Mx3Y	9Mx5Y	3.980	3.894	-8.6	3.822	3.800	-2.2	7.24	6.93	0.622	-0.15	63%	-1.5	19	flattener	3.790	3.800	1	9.6	3.2	99	-0.15	31%	steepener	3.850	3.800	-5	-3.6	2.8	99	-0.13	34%
9m 3s/7s	9Mx3Y	9Mx7Y	3.980	3.870	-11.0	3.822	3.806	-1.6	7.24	6.76	0.461	-0.24	71%	-2.2	31	flattener	3.776	3.806	3	14.0	4.6	99	-0.23	36%	steepener	3.876	3.806	-7	-4.0	5.4	95	-0.22	45%
9m 3s/10s	9Mx3Y	9Mx10Y	3.980	3.874	-10.6	3.822	3.836	1.4	7.24	6.53	0.341	-0.32	76%	-2.9	42	flattener	3.756	3.836	8	18.6	6.6	99	-0.30	41%	steepener	3.896	3.836	-6	-4.6	7.4	89	-0.31	53%
9m 3s/20s	9Mx3Y	9Mx20Y	3.980	3.895	-8.5	3.822	3.859	3.7	7.24	6.17	0.203	-0.44	81%	-2.6	57	flattener	3.719	3.859	14	22.5	10.3	98	-0.41	46%	steepener	3.939	3.859	-8	-0.5	11.7	75	-0.43	61%
9m 3s/30s	9Mx3Y	9Mx30Y	3.980	3.728	-25.2	3.822	3.686	-13.6	7.24	6.00	0.158	-0.50	83%	-2.3	64	flattener	3.706	3.686	-2	23.2	11.6	96	-0.46	47%	steepener	3.956	3.686	-27	1.8	13.4	71	-0.49	65%
9m 5s/7s	9Mx5Y	9Mx7Y	3.894	3.870	-2.5	3.800	3.806	0.6	6.93	6.76	0.740	-0.10	70%	-0.7	12	flattener	3.786	3.806	2	4.5	1.4	98	-0.08	37%	steepener	3.816	3.806	-1	-1.5	1.6	83	-0.09	40%
9m 5s/10s	9Mx5Y	9Mx10Y	3.894	3.874	-2.0	3.800	3.836	3.6	6.93	6.53	0.547	-0.19	75%	-1.3	23	flattener	3.756	3.836	8	10.0	4.4	98	-0.16	43%	steepener	3.846	3.836	-1	-1.0	4.6	76	-0.18	47%
9m 5s/20s	9Mx5Y	9Mx20Y	3.894	3.895	0.1	3.800	3.859	5.9	6.93	6.17	0.326	-0.33	78%	-1.1	39	flattener	3.729	3.859	13	12.9	7.1	91	-0.28	47%	steepener	3.879	3.859	-2	2.1	7.9	60	-0.32	53%
9m 5s/30s	9Mx5Y	9Mx30Y	3.894	3.728	-16.6	3.800	3.686	-11.4	6.93	6.00	0.254	-0.39	80%	-0.8	46	flattener	3.706	3.686	-2	14.6	9.4	90	-0.33	47%	steepener	3.906	3.686	-22	5.4	10.6	52	-0.39	58%
9m 7s/10s	9Mx7Y	9Mx10Y	3.870	3.874	0.4	3.806	3.836	3.0	6.76	6.53	0.740	-0.10	72%	-0.6	11	flattener	3.786	3.836	5	4.6	2.0	95	-0.09	45%	steepener	3.836	3.836	0	0.4	3.0	69	-0.09	39%
9m 7s/20s	9Mx7Y	9Mx20Y	3.870	3.895	2.5	3.806	3.859	5.3	6.76	6.17	0.441	-0.25	75%	-0.4	27	flattener	3.749	3.859	11	8.5	5.7	86	-0.21	46%	steepener	3.869	3.859	-1	3.5	6.3	46	-0.23	44%
9m 7s/30s	9Mx7Y	9Mx30Y	3.870	3.728	-14.2	3.806	3.686	-12.0	6.76	6.00	0.343	-0.32	77%	-0.1	35	flattener	3.736	3.686	-5	9.2	7.0	82	-0.27	46%	steepener	3.886	3.686	-20	5.8	8.0	43	-0.29	50%
9m 10s/20s	9Mx10Y	9Mx20Y	3.874	3.895	2.1	3.836	3.859	2.3	6.53	6.17	0.596	-0.16	70%	0.2	16	flattener	3.799	3.859	6	3.9	3.7	80	-0.14	46%	steepener	3.879	3.859	-2	4.1	4.3	35	-0.14	37%
9m 10s/30s	9Mx10Y	9Mx30Y	3.874	3.728	-14.6	3.836	3.686	-15.0	6.53	6.00	0.464	-0.23	72%	0.5	24	flattener	3.786	3.686	-10	4.6	5.0	75	-0.21	45%	steepener	3.896	3.686	-21	6.4	6.0	32	-0.21	45%
9m 20s/30s	9Mx20Y	9Mx30Y	3.895	3.728	-16.7	3.859	3.686	-17.3	6.17	6.00	0.778	-0.08	64%	0.3	8	flattener	3.846	3.686	-16	0.7	1.3	65	-0.07	35%	steepener	3.876	3.686	-19	2.3	1.7	21	-0.09	53%

*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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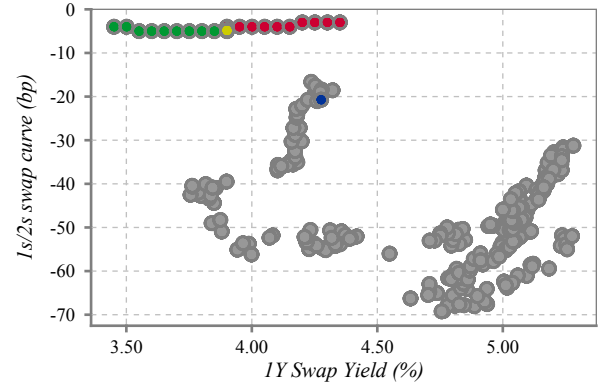
Conditional Isopremium Curve Trades Report - 9M Expiry

9m 1s/2s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.29	7.33	0.51	-0.06	4%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.31	15%	-0.06	3%

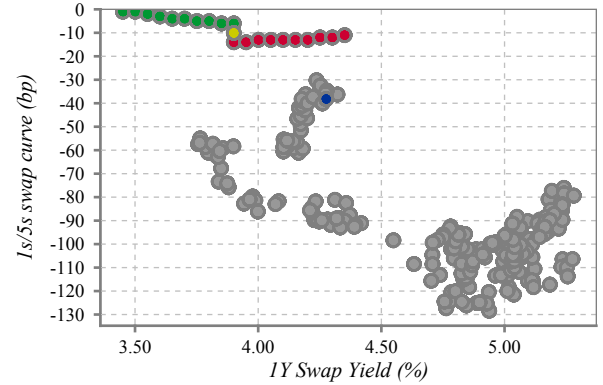


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 1s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.29	6.93	0.22	-0.34	43%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.91	35%	-0.35	36%

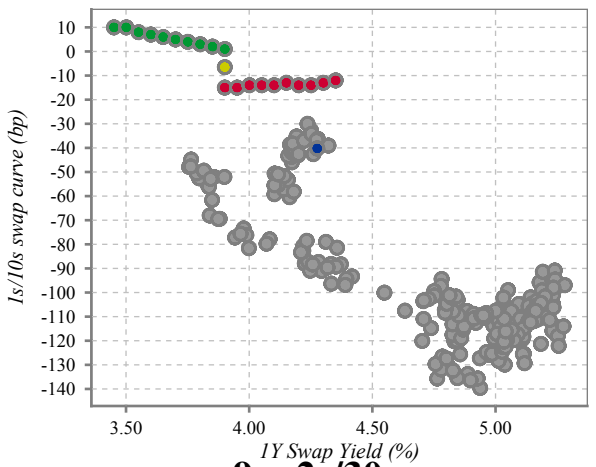


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 1s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.29	6.93	0.22	-0.34	43%

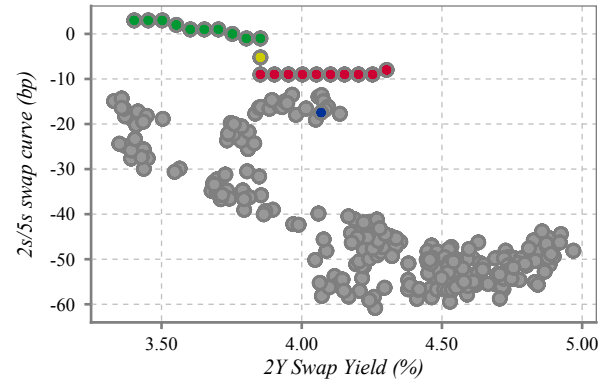
Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-1.20	44%	-0.51	57%



9m 2s/5s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.33	6.93	0.42	-0.24	58%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.18	20%	-0.22	31%

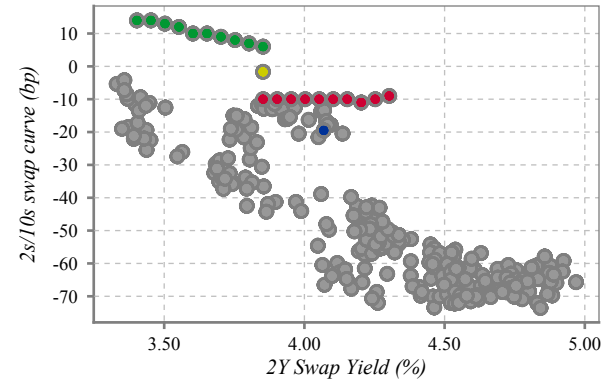


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 2s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.33	6.53	0.23	-0.41	74%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.31	32%	-0.39	52%

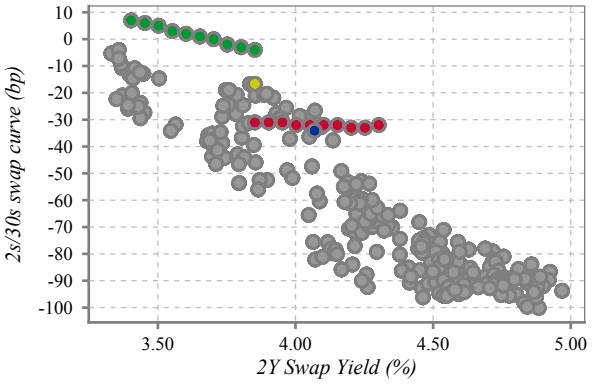


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 2s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
7.33	6.00	0.11	-0.57	83%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.44	41%	-0.57	66%



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 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 steepener or flattener 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 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 vols 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 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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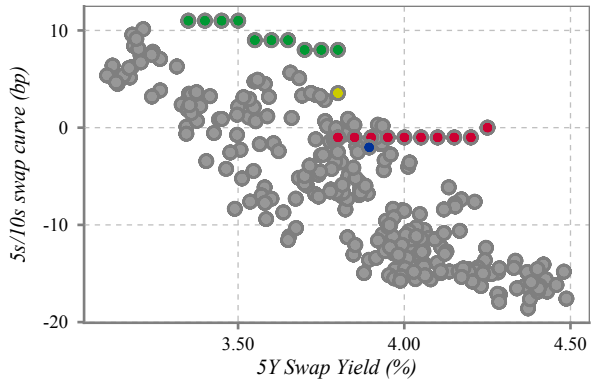
Conditional Isopremium Curve Trades Report - 9M Expiry

9m 5s/10s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.93	6.53	0.55	-0.19	75%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.16	43%	-0.18	47%

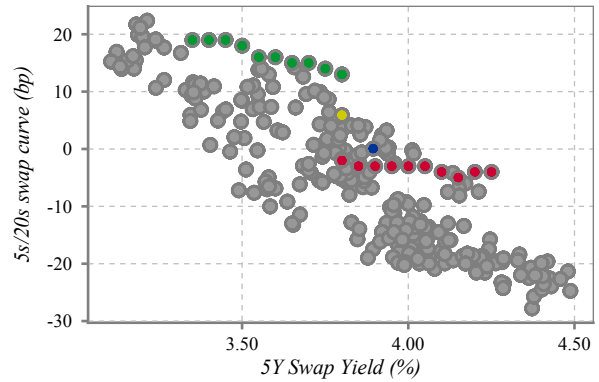


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 5s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.93	6.17	0.33	-0.33	78%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.28	47%	-0.32	53%

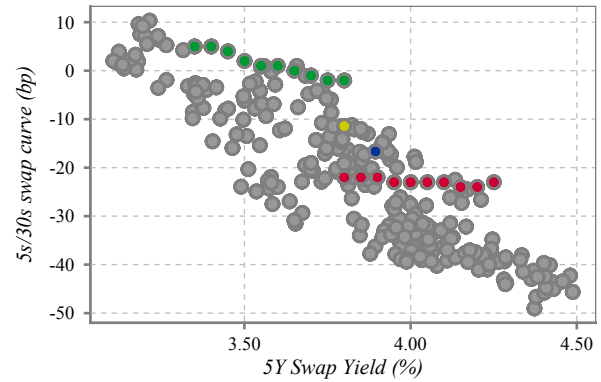


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 5s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.93	6.00	0.25	-0.39	80%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.33	47%	-0.39	58%

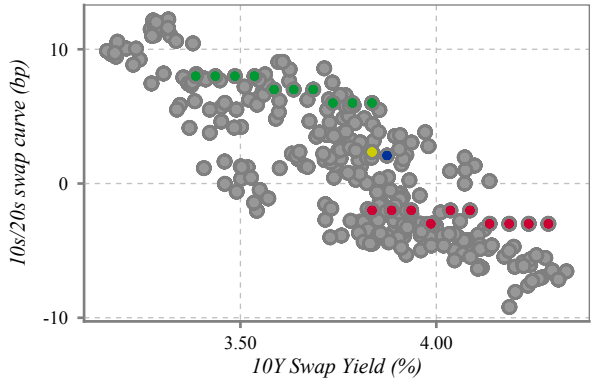


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 10s/20s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.53	6.17	0.60	-0.16	70%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.14	46%	-0.14	37%

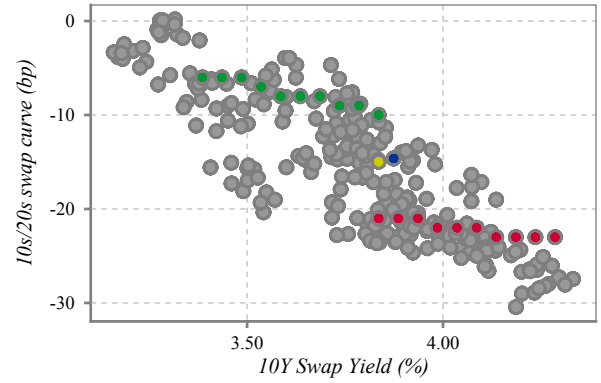


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 10s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.53	6.00	0.46	-0.23	72%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.21	45%	-0.21	45%

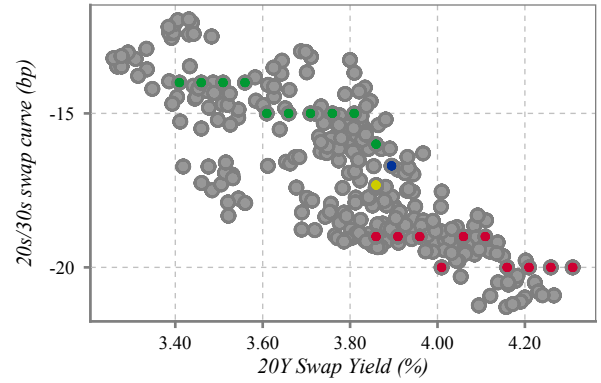


Historical spread Isopremium (Bull) Isopremium (Bear)
Spot ATMF

9m 20s/30s

Bpvol Left	Bpvol Right	Fwd Risk Ratio	1Y Beta	1Y Rsq
6.17	6.00	0.78	-0.08	64%

Beta below ATMF	Rsq below ATMF	Beta above ATMF	Rsq above ATMF
-0.07	35%	-0.09	53%



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

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US Interest Rate Derivatives Strategy

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Volatility Fair Value Model Report

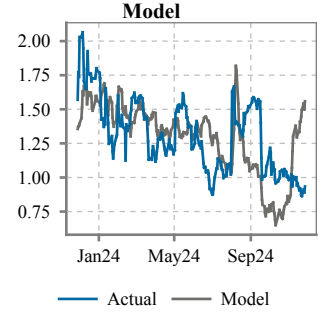
	Coefficients							Model Info.		Drivers Pt. 1	Current and Projected Bpvol				
Structure	Intercept	ATMF	Fed b/s	Log of market depth	2Y Real rates	Fwd guidance	Intercept Shift	Rsq	Std. Err.	Cur. ATMF	Cur. Bpvol	Modeled Ref. Vol	Modeled Deviation	Fair Value	Residual
6Mx1Y	-1.42	-0.75	0.09	-2.70	0.12	-0.05	-0.35	0.77	0.89	3.96	6.79	6.53	0.94	7.47	-0.68
1Yx1Y	-1.83	-0.43	0.19	-2.25	0.19	-0.04	-0.19	0.88	0.65	3.79	7.34	6.33	1.96	8.29	-0.96
2Yx1Y	-1.67	-0.16	0.20	-1.66	0.11	-0.04	-0.48	0.92	0.45	3.67	7.13	6.19	1.78	7.97	-0.84
3Yx1Y	-1.70	0.04	0.18	-1.25	0.02	-0.03	-0.52	0.92	0.37	3.61	6.85	6.13	1.46	7.59	-0.74
5Yx1Y	-1.46	0.12	0.10	-0.87	-0.06	-0.02	-0.39	0.91	0.27	3.65	6.53	6.17	0.79	6.96	-0.43
10Yx1Y	-0.51	-0.28	0.06	-0.34	-0.03	-0.01	0.03	0.81	0.16	3.88	5.89	6.44	-0.60	5.84	0.05
6Mx2Y	-1.17	-0.61	0.12	-2.45	0.21	-0.05	-0.50	0.86	0.68	3.84	7.12	6.39	1.53	7.91	-0.79
1Yx2Y	-1.55	-0.33	0.17	-2.00	0.18	-0.04	-0.37	0.91	0.52	3.73	7.30	6.26	1.88	8.14	-0.84
2Yx2Y	-1.67	-0.07	0.19	-1.45	0.09	-0.03	-0.50	0.92	0.41	3.64	7.01	6.16	1.61	7.77	-0.76
3Yx2Y	-1.80	0.13	0.15	-1.16	-0.02	-0.02	-0.52	0.91	0.35	3.61	6.75	6.12	1.29	7.41	-0.66
5Yx2Y	-1.39	0.10	0.09	-0.80	-0.06	-0.02	-0.35	0.91	0.25	3.67	6.43	6.19	0.62	6.81	-0.38
10Yx2Y	-0.43	-0.31	0.05	-0.30	-0.03	-0.01	0.04	0.80	0.16	3.90	5.81	6.46	-0.74	5.72	0.09
6Mx3Y	-1.12	-0.54	0.13	-2.23	0.20	-0.05	-0.52	0.89	0.57	3.77	7.10	6.31	1.55	7.86	-0.76
1Yx3Y	-1.66	-0.25	0.18	-1.82	0.14	-0.04	-0.42	0.92	0.45	3.69	7.18	6.22	1.74	7.95	-0.77
2Yx3Y	-1.91	0.03	0.18	-1.36	0.05	-0.02	-0.51	0.93	0.37	3.63	6.89	6.15	1.44	7.59	-0.70
3Yx3Y	-1.93	0.18	0.14	-1.11	-0.04	-0.02	-0.49	0.92	0.33	3.62	6.66	6.14	1.12	7.26	-0.60
5Yx3Y	-1.38	0.07	0.09	-0.76	-0.06	-0.02	-0.32	0.91	0.23	3.69	6.35	6.21	0.47	6.68	-0.32
10Yx3Y	-0.37	-0.33	0.05	-0.28	-0.04	-0.01	0.03	0.80	0.15	3.91	5.74	6.47	-0.86	5.61	0.13
6Mx5Y	-2.00	-0.20	0.17	-1.76	0.08	-0.02	-0.44	0.92	0.42	3.71	6.85	6.24	1.27	7.51	-0.66
1Yx5Y	-2.23	-0.02	0.18	-1.46	0.06	-0.01	-0.41	0.93	0.36	3.67	6.85	6.19	1.27	7.46	-0.61
2Yx5Y	-2.15	0.11	0.16	-1.18	0.00	-0.01	-0.44	0.92	0.32	3.64	6.66	6.16	1.06	7.22	-0.55
3Yx5Y	-1.88	0.11	0.13	-0.97	-0.03	-0.01	-0.39	0.92	0.27	3.65	6.49	6.17	0.76	6.93	-0.44
5Yx5Y	-1.32	-0.02	0.10	-0.64	-0.05	-0.01	-0.24	0.90	0.21	3.72	6.21	6.25	0.15	6.40	-0.19
10Yx5Y	-0.26	-0.38	0.04	-0.24	-0.03	-0.01	0.00	0.81	0.15	3.91	5.60	6.47	-1.09	5.39	0.21
6Mx7Y	-2.28	-0.11	0.18	-1.56	0.04	-0.01	-0.44	0.92	0.38	3.71	6.65	6.23	0.98	7.21	-0.56
1Yx7Y	-2.39	0.01	0.19	-1.30	0.03	-0.01	-0.38	0.93	0.33	3.68	6.66	6.20	0.98	7.18	-0.52
2Yx7Y	-2.17	0.07	0.17	-1.04	0.00	-0.01	-0.36	0.92	0.29	3.67	6.52	6.19	0.76	6.96	-0.44
3Yx7Y	-1.82	0.04	0.14	-0.86	-0.03	-0.01	-0.29	0.91	0.25	3.69	6.37	6.21	0.48	6.69	-0.33
5Yx7Y	-1.20	-0.10	0.10	-0.57	-0.04	-0.01	-0.16	0.88	0.19	3.77	6.12	6.30	-0.08	6.22	-0.11
10Yx7Y	-0.23	-0.42	0.04	-0.22	-0.02	-0.01	0.03	0.83	0.14	3.89	5.49	6.45	-1.20	5.25	0.24
6Mx10Y	-2.39	-0.14	0.21	-1.24	0.04	0.00	-0.37	0.90	0.36	3.73	6.37	6.26	0.49	6.75	-0.38
1Yx10Y	-2.30	-0.08	0.21	-1.01	0.04	0.00	-0.27	0.91	0.31	3.71	6.40	6.24	0.49	6.74	-0.33
2Yx10Y	-1.94	-0.07	0.18	-0.80	0.02	0.00	-0.21	0.90	0.26	3.72	6.32	6.25	0.32	6.57	-0.24
3Yx10Y	-1.58	-0.12	0.15	-0.65	0.00	-0.01	-0.15	0.89	0.23	3.75	6.19	6.28	0.06	6.34	-0.14
5Yx10Y	-1.00	-0.22	0.10	-0.45	-0.02	-0.01	-0.05	0.86	0.19	3.81	5.98	6.35	-0.39	5.96	0.02
10Yx10Y	-0.22	-0.48	0.05	-0.19	0.00	-0.01	0.08	0.86	0.13	3.83	5.34	6.37	-1.31	5.06	0.29
6Mx30Y	-1.96	-0.42	0.26	-0.77	0.07	0.01	-0.10	0.83	0.40	3.59	5.81	6.10	-0.28	5.83	-0.02
1Yx30Y	-1.85	-0.38	0.25	-0.59	0.08	0.00	0.00	0.85	0.33	3.57	5.82	6.08	-0.27	5.80	0.01
2Yx30Y	-1.50	-0.38	0.22	-0.42	0.07	0.00	0.11	0.84	0.28	3.53	5.76	6.04	-0.38	5.66	0.10
3Yx30Y	-1.29	-0.39	0.19	-0.30	0.06	0.00	0.18	0.83	0.25	3.50	5.66	6.01	-0.53	5.47	0.18
5Yx30Y	-1.02	-0.41	0.14	-0.18	0.06	0.00	0.26	0.81	0.20	3.44	5.49	5.94	-0.77	5.17	0.32
10Yx30Y	-0.60	-0.52	0.07	-0.04	0.07	0.00	0.32	0.81	0.15	3.20	4.92	5.70	-1.27	4.43	0.49

Drivers Pt. 2

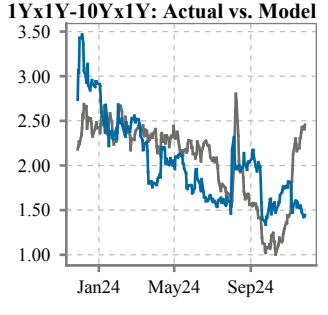
Fed b/s ($tn)	6.98
Market depth ($bn)	0.17
2Y Real rates (%)	1.45
Fwd guidance (# months)	0.00
Intcpt Shift	1.00

	Actual	Model	Residual
1Yx1Y-1Yx10Y	0.93	1.56	-0.62
1Yx1Y-10Yx1Y	1.45	2.46	-1.01

1Yx1Y-1Yx10Y Vol: Actual vs. Model



1Yx1Y-10Yx1Y: Actual vs. Model



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.

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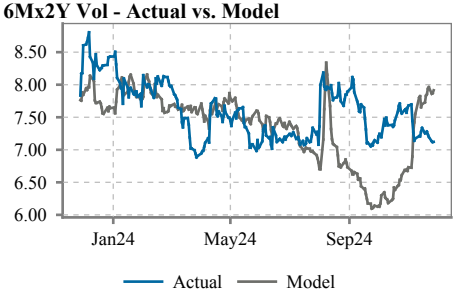
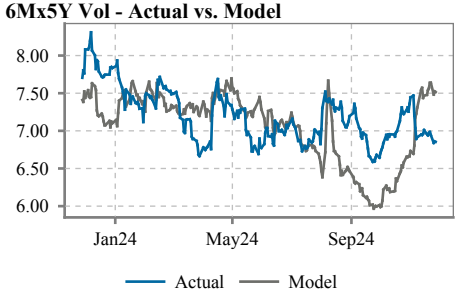
Volatility Fair Value Model Report

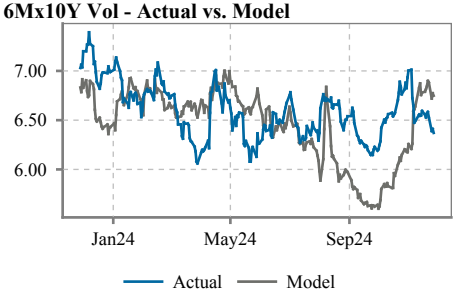
6Mx2Y Vol - Actual vs. Model



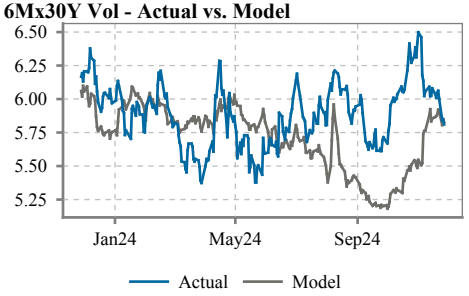
6Mx5Y Vol - Actual vs. Model



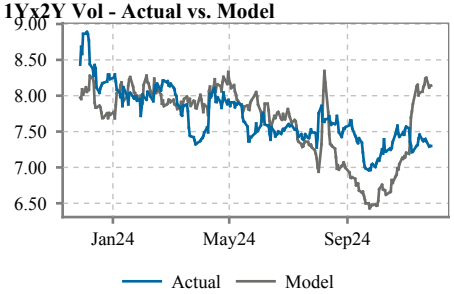
6Mx10Y Vol - Actual vs. Model



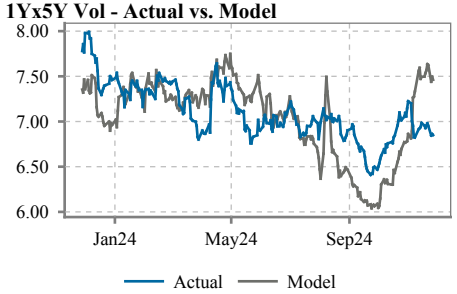
6Mx30Y Vol - Actual vs. Model



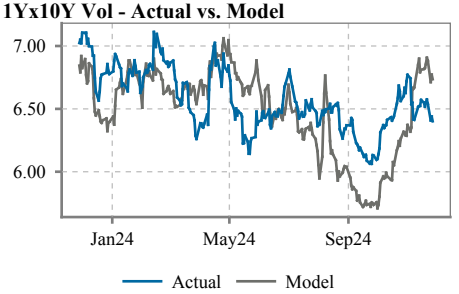
1Yx2Y Vol - Actual vs. Model



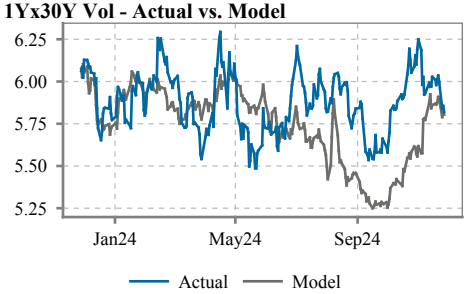
1Yx5Y Vol - Actual vs. Model



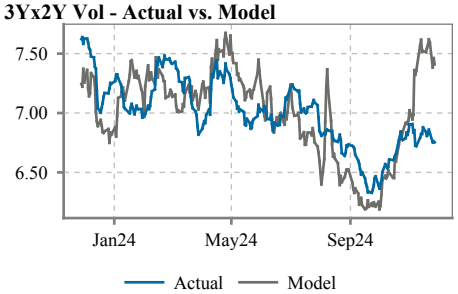
1Yx10Y Vol - Actual vs. Model



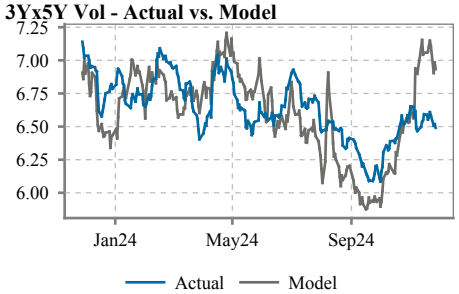
1Yx30Y Vol - Actual vs. Model



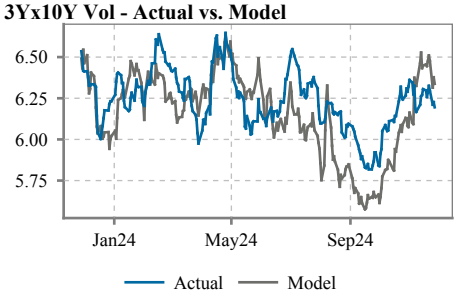
3Yx2Y Vol - Actual vs. Model



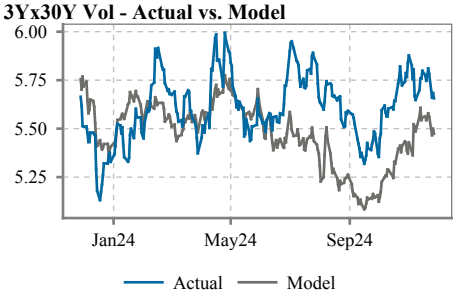
3Yx5Y Vol - Actual vs. Model



3Yx10Y Vol - Actual vs. Model



3Yx30Y Vol - Actual vs. Model



J.P. Morgan Securities LLC
US Fixed Income Derivatives Strategy

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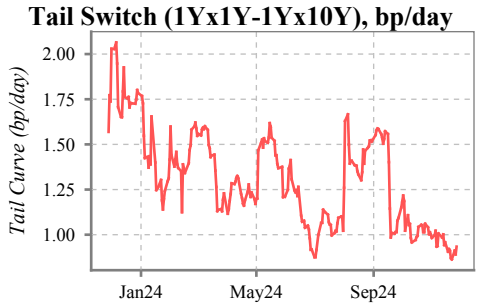
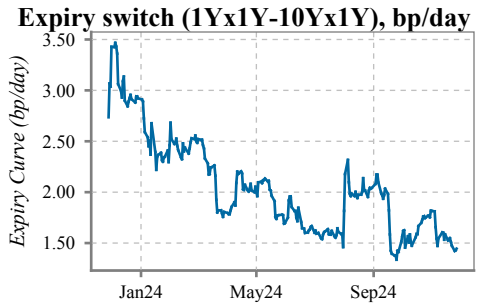
Swaption Volatility Curve Fair Value Model Report

	6M Regression Stats							1Y Regression Stats						
Vol Curve	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
1Yx2Y-2Yx30Y	0.29	0.47	0.63	73%	1.54	1.48	0.06	0.65	0.29	0.24	93%	1.54	1.45	0.10
9Mx2Y-1Yx30Y	0.13	0.82	0.37	92%	1.42	1.33	0.09	0.39	0.61	0.19	95%	1.42	1.32	0.10
6Mx2Y-1Yx30Y	0.22	1.13	-0.15	82%	1.30	1.22	0.08	0.30	0.86	-0.03	82%	1.30	1.21	0.10
9Mx1Y-1Yx30Y	0.04	1.21	0.06	85%	1.33	1.25	0.08	0.32	0.89	-0.06	93%	1.33	1.23	0.09
6Mx3Y-1Yx30Y	0.34	0.81	-0.04	84%	1.28	1.20	0.08	0.35	0.67	0.05	85%	1.28	1.19	0.09
9Mx2Y-2Yx30Y	0.36	0.64	0.28	90%	1.48	1.41	0.07	0.61	0.42	0.12	95%	1.48	1.39	0.09
9Mx3Y-1Yx30Y	0.24	0.62	0.31	90%	1.32	1.24	0.08	0.40	0.50	0.19	94%	1.32	1.23	0.09
6Mx5Y-1Yx30Y	0.51	0.24	0.00	78%	1.04	0.95	0.08	0.42	0.33	0.02	87%	1.04	0.94	0.09
6Mx2Y-2Yx30Y	0.46	0.95	-0.24	76%	1.37	1.31	0.06	0.52	0.66	-0.10	80%	1.37	1.27	0.09
9Mx1Y-2Yx30Y	0.28	1.03	-0.03	79%	1.39	1.33	0.06	0.54	0.70	-0.13	90%	1.39	1.30	0.09
6Mx3Y-2Yx30Y	0.57	0.63	-0.14	76%	1.34	1.28	0.06	0.57	0.48	-0.02	83%	1.34	1.25	0.09
9Mx3Y-2Yx30Y	0.47	0.44	0.22	88%	1.38	1.32	0.06	0.62	0.31	0.11	94%	1.38	1.29	0.09
1Yx3Y-2Yx30Y	0.37	0.25	0.58	69%	1.42	1.36	0.06	0.66	0.13	0.25	93%	1.42	1.33	0.09
6Mx5Y-2Yx30Y	0.74	0.06	-0.09	74%	1.10	1.04	0.06	0.64	0.14	-0.05	87%	1.10	1.01	0.09
1Yx2Y-3Yx30Y	0.49	0.27	0.63	76%	1.64	1.59	0.05	0.83	0.11	0.25	95%	1.64	1.55	0.09
9Mx2Y-9Mx30Y	-0.01	0.90	0.50	88%	1.41	1.33	0.09	0.37	0.61	0.22	92%	1.41	1.32	0.09
6Mx2Y-9Mx30Y	0.09	1.21	-0.03	89%	1.30	1.22	0.08	0.28	0.86	0.00	85%	1.30	1.21	0.09
9Mx1Y-9Mx30Y	-0.10	1.29	0.18	92%	1.32	1.25	0.08	0.29	0.89	-0.03	94%	1.32	1.23	0.09
6Mx3Y-9Mx30Y	0.20	0.89	0.08	91%	1.28	1.20	0.08	0.33	0.67	0.08	89%	1.28	1.19	0.09
9Mx3Y-9Mx30Y	0.10	0.70	0.44	86%	1.32	1.24	0.08	0.37	0.50	0.22	93%	1.32	1.23	0.09
9Mx2Y-3Yx30Y	0.57	0.45	0.28	89%	1.58	1.52	0.06	0.79	0.23	0.13	95%	1.58	1.49	0.09
6Mx5Y-9Mx30Y	0.37	0.32	0.12	81%	1.03	0.95	0.08	0.40	0.33	0.05	90%	1.03	0.94	0.09
6Mx2Y-3Yx30Y	0.66	0.75	-0.25	74%	1.47	1.41	0.05	0.71	0.48	-0.09	81%	1.47	1.38	0.09
9Mx1Y-3Yx30Y	0.48	0.83	-0.04	77%	1.49	1.44	0.05	0.72	0.51	-0.12	90%	1.49	1.40	0.09
6Mx3Y-3Yx30Y	0.78	0.44	-0.14	75%	1.44	1.39	0.05	0.76	0.29	-0.01	84%	1.44	1.36	0.09
10Yx10Y-1Yx30Y	-0.82	0.76	-0.08	66%	-0.48	-0.55	0.07	-0.75	0.77	-0.20	92%	-0.48	-0.56	0.09
9Mx3Y-3Yx30Y	0.68	0.25	0.22	87%	1.48	1.43	0.05	0.80	0.12	0.13	94%	1.48	1.40	0.09
5Yx1Y-1Yx2Y	-0.64	-0.01	0.25	77%	-0.76	-0.69	-0.07	-0.51	-0.07	0.12	87%	-0.76	-0.68	-0.09
1Yx3Y-3Yx30Y	0.58	0.06	0.58	73%	1.52	1.47	0.05	0.84	-0.05	0.26	94%	1.52	1.43	0.09
6Mx5Y-3Yx30Y	0.95	-0.14	-0.09	73%	1.20	1.14	0.06	0.83	-0.05	-0.04	88%	1.20	1.11	0.09
9Mx2Y-6Mx30Y	-0.25	1.06	0.69	74%	1.43	1.32	0.11	0.35	0.60	0.27	79%	1.43	1.34	0.08
6Mx2Y-6Mx30Y	-0.15	1.36	0.17	93%	1.31	1.21	0.10	0.27	0.85	0.05	89%	1.31	1.23	0.08
9Mx1Y-6Mx30Y	-0.34	1.44	0.38	94%	1.33	1.24	0.10	0.28	0.88	0.02	87%	1.33	1.25	0.08
6Mx3Y-6Mx30Y	-0.04	1.05	0.27	93%	1.29	1.19	0.10	0.32	0.66	0.13	91%	1.29	1.21	0.08
5Yx1Y-1Yx3Y	-0.73	0.20	0.30	72%	-0.64	-0.57	-0.08	-0.52	0.09	0.11	84%	-0.64	-0.56	-0.08





* 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.

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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
9Mx10Y-3Yx10Y	9Mx10Y	3Yx10Y	6.40	6.19	1.09	-0.38	-0.24	-0.14	88%	0.78	1.56	1.64	-0.08	63%	1.10	-0.42	-0.28	-0.14	62%
1Yx10Y-3Yx10Y	1Yx10Y	3Yx10Y	6.40	6.19	1.09	-0.33	-0.24	-0.09	94%	0.92	0.72	0.79	-0.06	86%	1.17	-0.84	-0.72	-0.12	72%
1Yx15Y-3Yx15Y	1Yx15Y	3Yx15Y	6.22	5.96	1.14	-0.58	-0.49	-0.09	94%	0.96	0.50	0.56	-0.06	85%	1.05	-0.07	0.05	-0.12	63%
1Yx3Y-3Yx3Y	1Yx3Y	3Yx3Y	7.18	6.66	0.91	1.10	1.20	-0.10	71%	0.63	2.95	3.04	-0.08	55%	1.14	-0.40	-0.29	-0.11	74%
15Mx2Y-3Yx2Y	15Mx2Y	3Yx2Y	7.23	6.75	0.86	1.45	1.54	-0.09	71%	0.66	2.78	2.87	-0.09	65%	1.11	-0.29	-0.18	-0.10	78%
15Mx15Y-3Yx15Y	15Mx15Y	3Yx15Y	6.19	5.96	1.13	-0.56	-0.48	-0.07	96%	0.98	0.34	0.40	-0.05	90%	1.06	-0.15	-0.04	-0.10	70%
15Mx10Y-3Yx10Y	15Mx10Y	3Yx10Y	6.38	6.19	1.09	-0.35	-0.28	-0.07	96%	0.95	0.52	0.58	-0.05	90%	1.16	-0.82	-0.72	-0.10	78%
1Yx20Y-3Yx20Y	1Yx20Y	3Yx20Y	5.97	5.78	1.17	-0.78	-0.69	-0.09	94%	0.99	0.24	0.30	-0.06	85%	0.89	0.85	0.94	-0.09	57%
15Mx3Y-3Yx3Y	15Mx3Y	3Yx3Y	7.11	6.66	0.94	0.83	0.91	-0.08	80%	0.71	2.36	2.43	-0.07	71%	1.14	-0.47	-0.38	-0.09	80%
1Yx7Y-3Yx7Y	1Yx7Y	3Yx7Y	6.66	6.37	1.10	-0.35	-0.27	-0.08	91%	0.84	1.31	1.36	-0.05	77%	1.20	-0.99	-0.90	-0.09	78%
9Mx15Y-2Yx15Y	9Mx15Y	2Yx15Y	6.20	6.11	1.08	-0.40	-0.26	-0.14	91%	0.87	0.91	1.00	-0.09	70%	0.99	0.13	0.22	-0.09	67%
1Yx30Y-3Yx30Y	1Yx30Y	3Yx30Y	5.82	5.66	1.23	-1.13	-1.03	-0.10	93%	1.07	-0.24	-0.18	-0.06	84%	0.76	1.53	1.62	-0.09	51%
9Mx7Y-2Yx7Y	9Mx7Y	2Yx7Y	6.65	6.52	0.98	0.29	0.42	-0.13	86%	0.69	2.18	2.26	-0.09	54%	1.04	-0.13	-0.04	-0.09	76%
9Mx10Y-2Yx10Y	9Mx10Y	2Yx10Y	6.40	6.32	1.02	-0.06	0.06	-0.12	93%	0.80	1.34	1.41	-0.07	73%	1.06	-0.31	-0.22	-0.09	82%
18Mx10Y-3Yx10Y	18Mx10Y	3Yx10Y	6.36	6.19	1.09	-0.37	-0.32	-0.05	97%	0.97	0.32	0.36	-0.04	94%	1.16	-0.80	-0.72	-0.08	83%
18Mx2Y-3Yx2Y	18Mx2Y	3Yx2Y	7.15	6.75	0.90	1.06	1.13	-0.07	83%	0.75	2.10	2.17	-0.07	81%	1.12	-0.42	-0.34	-0.08	85%
1Yx2Y-2Yx2Y	1Yx2Y	2Yx2Y	7.30	7.01	0.87	1.22	1.31	-0.08	69%	0.65	2.75	2.84	-0.09	54%	1.02	0.13	0.21	-0.08	84%
1Yx5Y-3Yx5Y	1Yx5Y	3Yx5Y	6.85	6.49	1.12	-0.42	-0.35	-0.07	87%	0.79	1.69	1.74	-0.04	69%	1.19	-0.89	-0.82	-0.08	79%
15Mx7Y-3Yx7Y	15Mx7Y	3Yx7Y	6.62	6.37	1.10	-0.39	-0.32	-0.07	93%	0.88	0.99	1.03	-0.04	85%	1.19	-0.95	-0.87	-0.08	83%
15Mx20Y-3Yx20Y	15Mx20Y	3Yx20Y	5.95	5.78	1.15	-0.72	-0.65	-0.08	96%	1.01	0.14	0.19	-0.05	89%	0.92	0.64	0.73	-0.08	66%
18Mx15Y-3Yx15Y	18Mx15Y	3Yx15Y	6.16	5.96	1.12	-0.54	-0.48	-0.06	97%	1.00	0.19	0.23	-0.04	94%	1.07	-0.22	-0.14	-0.08	78%
15Mx30Y-3Yx30Y	15Mx30Y	3Yx30Y	5.80	5.66	1.21	-1.01	-0.93	-0.08	95%	1.07	-0.25	-0.20	-0.05	88%	0.80	1.27	1.35	-0.08	61%
9Mx20Y-2Yx20Y	9Mx20Y	2Yx20Y	6.01	5.89	1.12	-0.61	-0.47	-0.14	91%	0.92	0.56	0.64	-0.09	71%	0.93	0.53	0.60	-0.07	59%
21Mx15Y-3Yx15Y	21Mx15Y	3Yx15Y	6.13	5.96	1.12	-0.53	-0.48	-0.04	98%	1.03	0.00	0.03	-0.03	97%	1.08	-0.33	-0.26	-0.07	86%
18Mx3Y-3Yx3Y	18Mx3Y	3Yx3Y	7.03	6.66	0.97	0.54	0.61	-0.07	88%	0.79	1.76	1.82	-0.05	84%	1.14	-0.54	-0.47	-0.07	87%
9Mx7Y-21Mx7Y	9Mx7Y	21Mx7Y	6.65	6.55	0.99	0.18	0.30	-0.12	89%	0.75	1.72	1.80	-0.08	62%	1.06	-0.26	-0.18	-0.07	82%
9Mx15Y-21Mx15Y	9Mx15Y	21Mx15Y	6.20	6.13	1.08	-0.45	-0.32	-0.12	93%	0.91	0.63	0.71	-0.08	75%	1.03	-0.10	-0.03	-0.07	75%
9Mx10Y-21Mx10Y	9Mx10Y	21Mx10Y	6.40	6.34	1.03	-0.13	-0.03	-0.11	94%	0.84	1.07	1.13	-0.06	77%	1.07	-0.37	-0.31	-0.07	87%
15Mx5Y-3Yx5Y	15Mx5Y	3Yx5Y	6.80	6.49	1.12	-0.46	-0.40	-0.06	91%	0.85	1.31	1.34	-0.03	79%	1.18	-0.85	-0.79	-0.07	84%
9Mx30Y-2Yx30Y	9Mx30Y	2Yx30Y	5.82	5.76	1.15	-0.79	-0.68	-0.11	93%	1.00	0.06	0.12	-0.06	74%	0.91	0.60	0.67	-0.07	62%
18Mx7Y-3Yx7Y	18Mx7Y	3Yx7Y	6.59	6.37	1.10	-0.43	-0.38	-0.05	95%	0.93	0.67	0.71	-0.03	91%	1.18	-0.90	-0.84	-0.07	88%
18Mx30Y-3Yx30Y	18Mx30Y	3Yx30Y	5.79	5.66	1.18	-0.90	-0.83	-0.06	97%	1.07	-0.27	-0.23	-0.04	93%	0.85	1.00	1.07	-0.07	73%
18Mx20Y-3Yx20Y	18Mx20Y	3Yx20Y	5.93	5.78	1.14	-0.67	-0.61	-0.06	97%	1.02	0.03	0.07	-0.04	93%	0.95	0.44	0.51	-0.07	75%
1Yx15Y-2Yx15Y	1Yx15Y	2Yx15Y	6.22	6.11	1.03	-0.11	-0.04	-0.07	97%	0.94	0.48	0.53	-0.05	92%	1.08	-0.37	-0.31	-0.06	86%
1Yx10Y-2Yx10Y	1Yx10Y	2Yx10Y	6.40	6.32	1.00	0.05	0.11	-0.06	97%	0.91	0.67	0.72	-0.05	92%	1.10	-0.55	-0.48	-0.06	90%

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.

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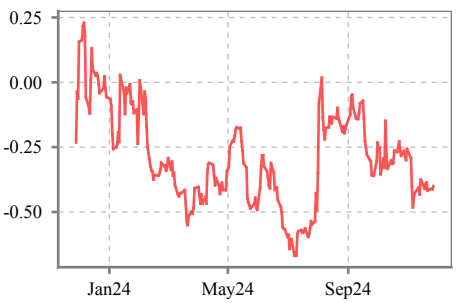
Swaption Volatility Weighted Expiry Switch Report

9Mx10Y-1.1*3Yx10Y

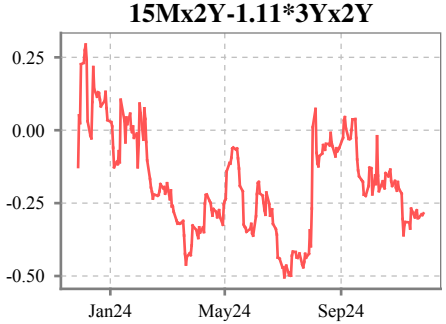
1Yx10Y-1.17*3Yx10Y

1Yx15Y-1.05*3Yx15Y

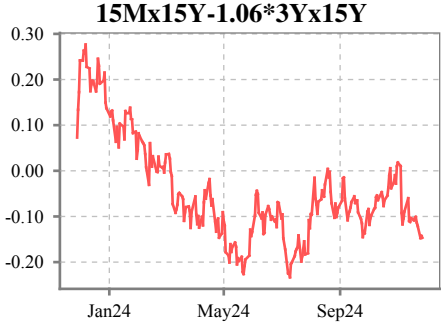
1Yx3Y-1.14*3Yx3Y



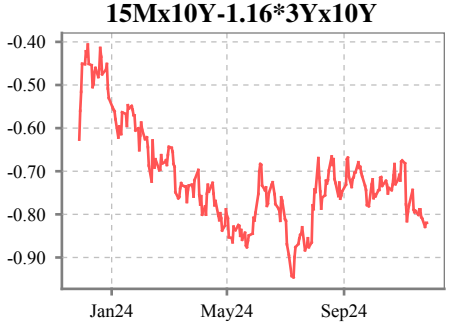
15Mx2Y-1.11*3Yx2Y



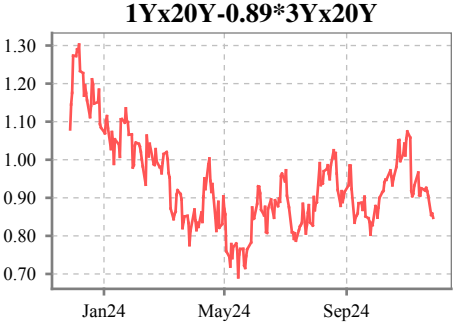
15Mx15Y-1.06*3Yx15Y



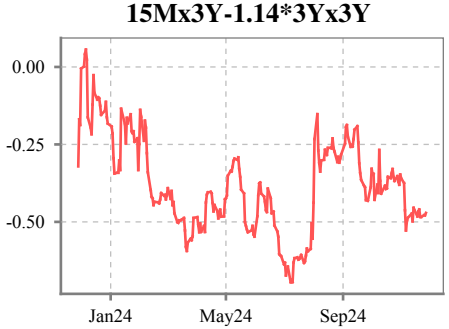
15Mx10Y-1.16*3Yx10Y



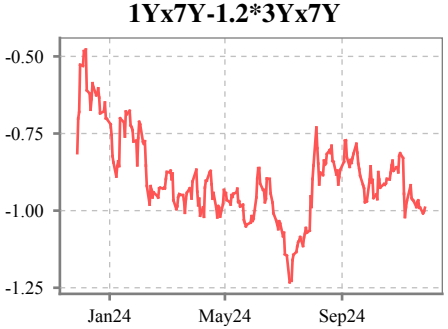
1Yx20Y-0.89*3Yx20Y



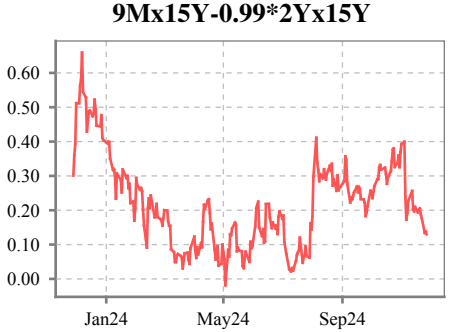
15Mx3Y-1.14*3Yx3Y



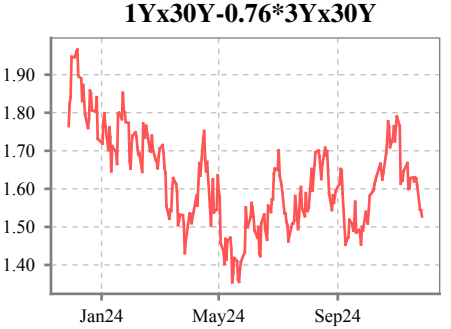
1Yx7Y-1.2*3Yx7Y



9Mx15Y-0.99*2Yx15Y



1Yx30Y-0.76*3Yx30Y



Note: * For more info on construction, please refer to the footnote on the previous page. The weighted expiry switch uses the 1Y regression beta.

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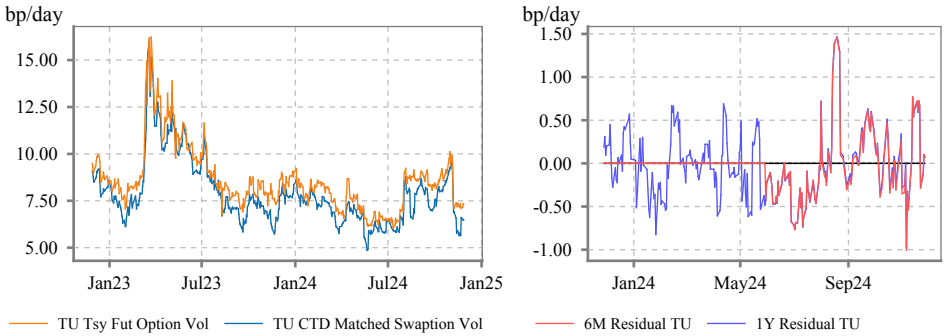
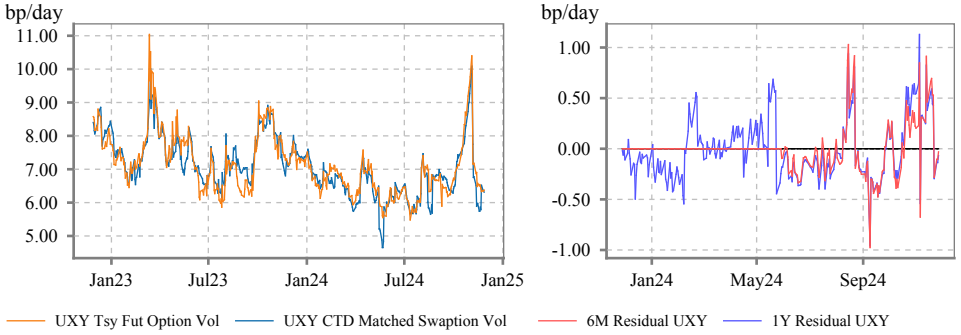
Treasury Future Options vs. CTD Matched Swaption Report

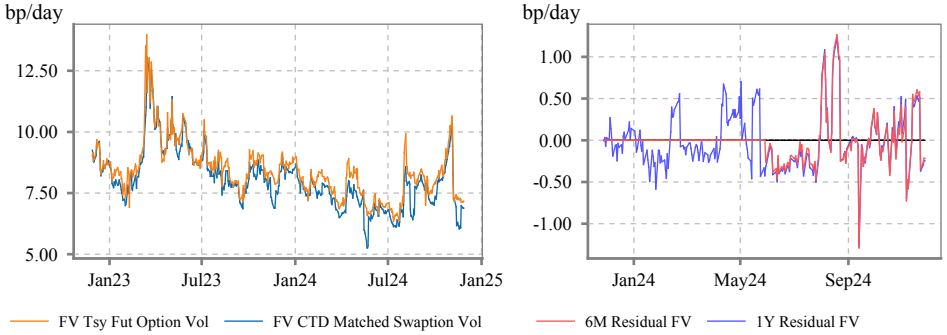
2-year note contract (TU)



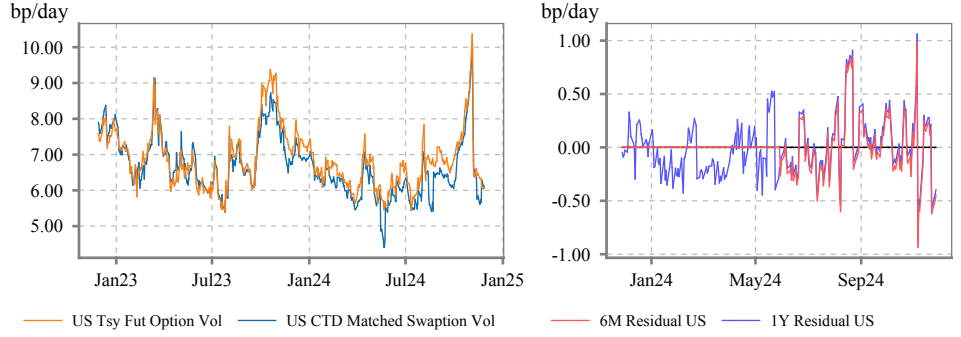
Ultra-10 year note contract (UXY)



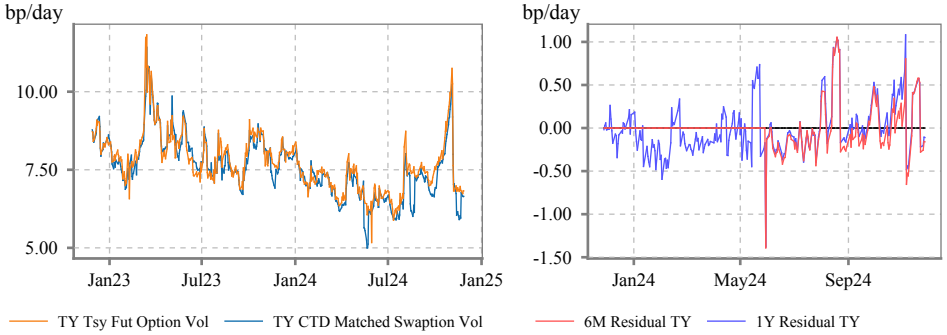
5-year note contract (FV)



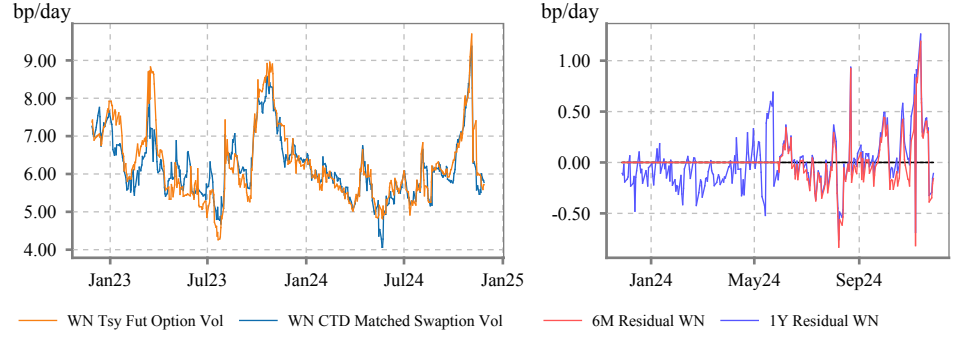
"Classic" Bond contract (US)



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.

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	1.22	0.93	0.82	0.48	6.47	7.31	7.25	0.07
FV	1.23	0.89	0.80	0.41	6.88	7.16	7.38	-0.22
TY	0.55	0.97	0.85	0.36	6.65	6.82	6.98	-0.16
UXY	0.12	1.00	0.87	0.34	6.31	6.38	6.41	-0.03
US	1.05	0.90	0.85	0.32	6.07	6.06	6.51	-0.45
WN	0.25	0.97	0.88	0.31	5.78	5.72	5.87	-0.16

1Y Regression Stats

	Intercept	Beta	Rsq	StdErr	Curr CTD Matched Swpn Vol	Curr Tsy Fut Impl Vol	Fair Val.	Residual
TU	1.38	0.91	0.81	0.41	6.47	7.31	7.25	0.07
FV	1.59	0.85	0.80	0.35	6.88	7.16	7.41	-0.25
TY	1.09	0.88	0.82	0.32	6.65	6.82	6.93	-0.11
UXY	0.91	0.88	0.83	0.31	6.31	6.38	6.44	-0.07
US	1.05	0.89	0.85	0.28	6.07	6.06	6.46	-0.40
WN	0.55	0.91	0.86	0.27	5.78	5.72	5.82	-0.11

6M Treasury Future Option Implied Volatility Stats

	TU	FV	TY	UXY	US	WN
mean	7.8	7.7	7.3	6.7	6.8	6.2
std	1.1	0.9	0.9	0.9	0.8	0.9
min	6.0	6.3	5.2	5.5	5.4	4.9
25%	6.6	7.1	6.7	6.2	6.3	5.6
50%	8.3	7.6	7.2	6.5	6.7	6.0
75%	8.8	8.2	7.6	7.0	7.0	6.3
max	10.1	10.6	10.7	10.4	10.4	9.7
z-score	-0.5	-0.6	-0.5	-0.4	-0.9	-0.5

1Y Treasury Future Option Implied Volatility Stats

	TU	FV	TY	UXY	US	WN
mean	7.8	7.8	7.3	6.7	6.7	6.0
std	0.9	0.8	0.8	0.7	0.7	0.7
min	6.0	6.3	5.2	5.5	5.4	4.8
25%	7.0	7.2	6.8	6.3	6.2	5.6
50%	8.0	7.9	7.3	6.7	6.6	5.9
75%	8.6	8.3	7.6	7.0	7.0	6.2
max	10.1	10.6	10.7	10.4	10.4	9.7
z-score	-0.5	-0.9	-0.6	-0.5	-0.9	-0.4

6M CTD Matched Swaption Implied Volatility Stats

	TU	FV	TY	UXY	US	WN
mean	7.1	7.3	7.0	6.6	6.4	6.1
std	1.1	0.9	0.9	0.9	0.9	0.9
min	5.6	6.0	5.9	5.7	5.4	5.2
25%	6.0	6.6	6.4	6.0	5.8	5.5
50%	6.9	7.1	6.7	6.4	6.2	5.8
75%	8.1	7.9	7.4	6.8	6.5	6.2
max	9.7	10.3	10.2	10.1	9.8	9.4
z-score	-0.6	-0.5	-0.4	-0.4	-0.4	-0.3

1Y CTD Matched Swaption Implied Volatility Stats

	TU	FV	TY	UXY	US	WN
mean	7.1	7.4	7.0	6.6	6.3	5.9
std	0.9	0.8	0.8	0.8	0.7	0.7
min	4.9	5.3	5.0	4.7	4.4	4.1
25%	6.4	6.8	6.5	6.1	5.8	5.5
50%	7.1	7.4	7.0	6.6	6.3	5.9
75%	7.8	7.9	7.4	6.9	6.6	6.2
max	9.7	10.3	10.2	10.1	9.8	9.4
z-score	-0.7	-0.6	-0.5	-0.4	-0.3	-0.2

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.

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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 Rsq	1Y Left Wt	1Y Right Wt	1Y Wtd Vol Fly Cur.	1Y Mean	1Y Mispricing	50/50 Wtd Fly 1Y Rsq
1Yx30Y	3Yx2Y	5Yx15Y	-0.75	2.84	-5.17	-4.91	-0.26	84%	1.45	2.80	-17.71	-17.33	-0.38	75%
1Yx30Y	3Yx2Y	7Yx5Y	-0.24	2.22	-5.12	-4.92	-0.20	88%	1.37	2.92	-18.62	-18.24	-0.38	79%
9Mx30Y	3Yx3Y	5Yx15Y	-0.45	2.28	-3.75	-3.54	-0.21	87%	1.09	2.85	-16.02	-15.65	-0.36	72%
9Mx30Y	3Yx2Y	5Yx10Y	-0.40	2.14	-3.70	-3.50	-0.21	86%	0.64	2.93	-14.52	-14.17	-0.36	77%
1Yx30Y	3Yx3Y	7Yx7Y	-0.31	2.31	-5.11	-4.90	-0.21	87%	1.59	2.43	-16.85	-16.50	-0.35	74%
1Yx30Y	3Yx2Y	5Yx10Y	-0.52	2.33	-4.14	-3.93	-0.22	83%	0.75	2.70	-13.80	-13.45	-0.34	76%
9Mx20Y	3Yx2Y	7Yx7Y	-0.23	2.37	-5.84	-5.61	-0.23	88%	1.60	2.89	-19.85	-19.51	-0.34	80%
1Yx30Y	3Yx3Y	5Yx15Y	-0.63	2.55	-4.31	-4.08	-0.22	83%	1.30	2.26	-13.89	-13.58	-0.31	70%
9Mx20Y	2Yx2Y	5Yx10Y	-0.13	2.00	-4.13	-3.92	-0.21	75%	1.39	2.79	-18.07	-17.76	-0.30	82%
9Mx20Y	3Yx2Y	5Yx15Y	-0.36	2.44	-5.05	-4.82	-0.23	83%	1.33	2.63	-16.33	-16.02	-0.30	76%
5Yx2Y	9Mx20Y	10Yx5Y	-0.31	2.79	-7.60	-7.31	-0.29	82%	1.82	2.57	-20.12	-19.82	-0.30	62%
9Mx20Y	2Yx3Y	5Yx15Y	-0.14	2.11	-4.33	-4.13	-0.20	76%	1.67	2.51	-17.54	-17.25	-0.29	79%
5Yx2Y	9Mx20Y	10Yx7Y	-0.19	2.62	-7.13	-6.85	-0.28	82%	1.83	2.35	-18.65	-18.37	-0.29	62%
9Mx20Y	3Yx2Y	5Yx10Y	-0.27	2.10	-4.15	-3.94	-0.20	83%	0.88	2.39	-12.84	-12.56	-0.27	77%
5Yx2Y	9Mx15Y	7Yx10Y	-0.52	2.74	-6.17	-5.89	-0.28	70%	1.55	2.32	-17.12	-16.88	-0.25	60%
9Mx15Y	3Yx2Y	7Yx7Y	-0.16	2.34	-6.00	-5.78	-0.22	86%	1.36	2.14	-14.25	-14.02	-0.23	79%
9Mx15Y	3Yx2Y	5Yx15Y	-0.23	2.36	-5.36	-5.14	-0.22	80%	1.20	1.98	-12.09	-11.87	-0.21	75%

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 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.

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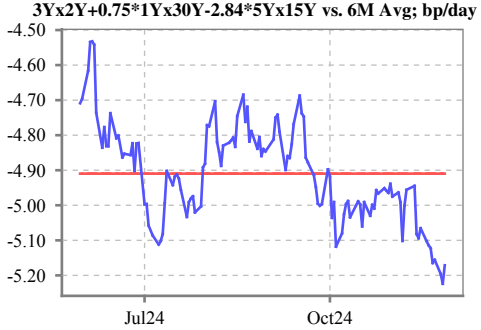
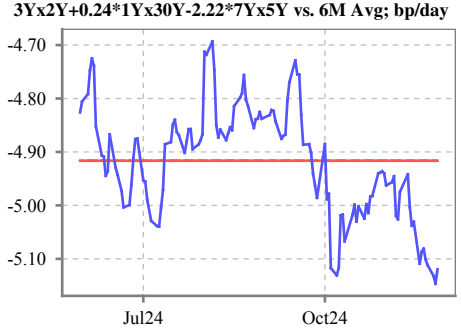
Weighted "Level" and "Curve" Neutral Swaption Butterfly Mispricing Report

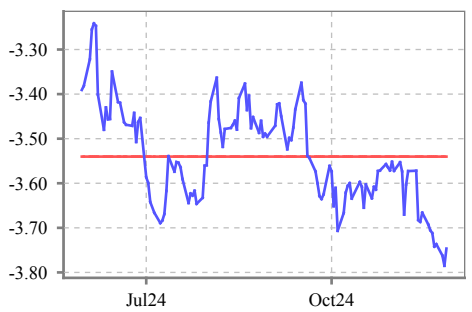
3Yx2Y+0.75*1Yx30Y-2.84*5Yx15Y vs. 6M Avg; bp/day



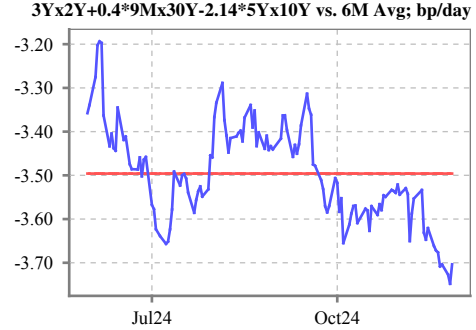
3Yx2Y+0.24*1Yx30Y-2.22*7Yx5Y vs. 6M Avg; bp/day



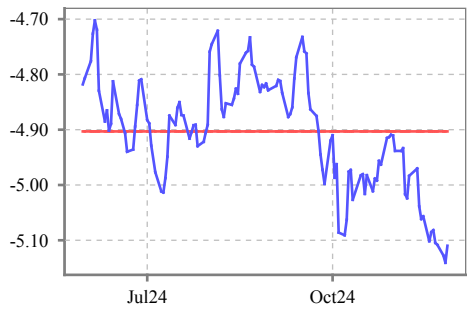
3Yx3Y+0.45*9Mx30Y-2.28*5Yx15Y vs. 6M Avg; bp/day



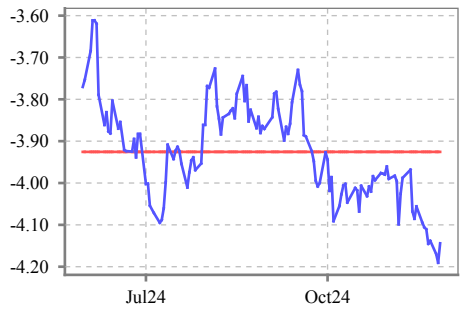
3Yx2Y+0.4*9Mx30Y-2.14*5Yx10Y vs. 6M Avg; bp/day



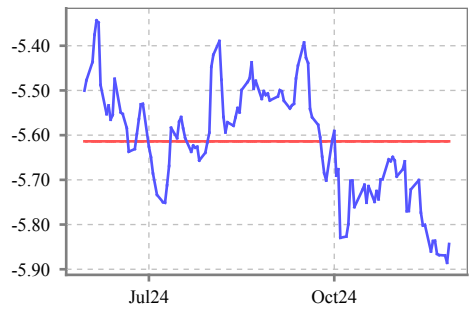
3Yx3Y+0.31*1Yx30Y-2.31*7Yx7Y vs. 6M Avg; bp/day



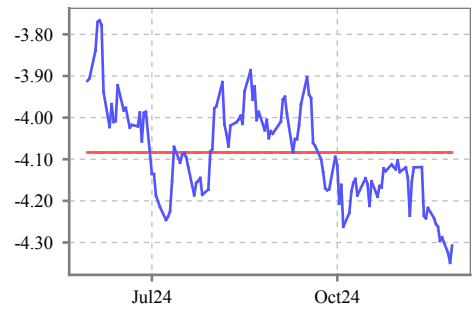
3Yx2Y+0.52*1Yx30Y-2.33*5Yx10Y vs. 6M Avg; bp/day



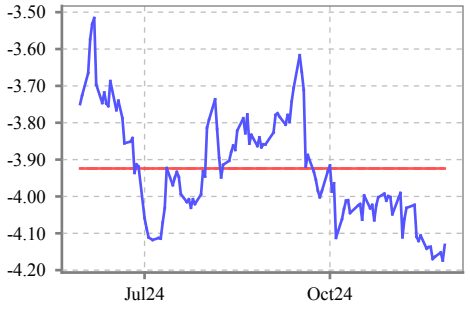
3Yx2Y+0.23*9Mx20Y-2.37*7Yx7Y vs. 6M Avg; bp/day



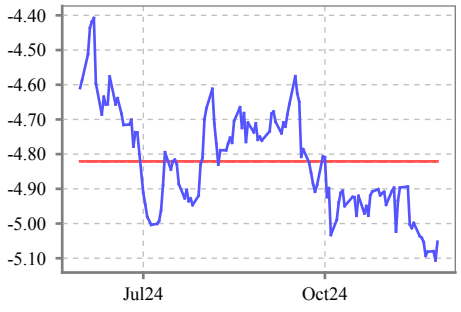
3Yx3Y+0.63*1Yx30Y-2.55*5Yx15Y vs. 6M Avg; bp/day



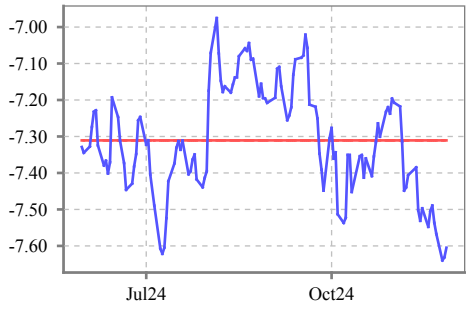
2Yx2Y+0.13*9Mx20Y-2.0*5Yx10Y vs. 6M Avg; bp/day



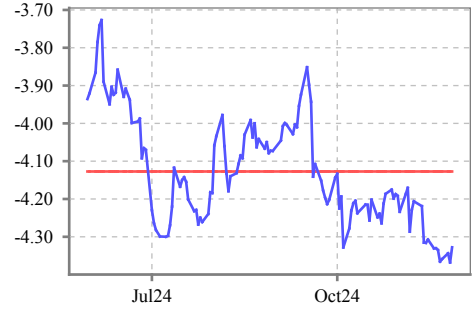
3Yx2Y+0.36*9Mx20Y-2.44*5Yx15Y vs. 6M Avg; bp/day



9Mx20Y+0.31*5Yx2Y-2.79*10Yx5Y vs. 6M Avg; bp/day



2Yx3Y+0.14*9Mx20Y-2.11*5Yx15Y vs. 6M Avg; bp/day



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 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.

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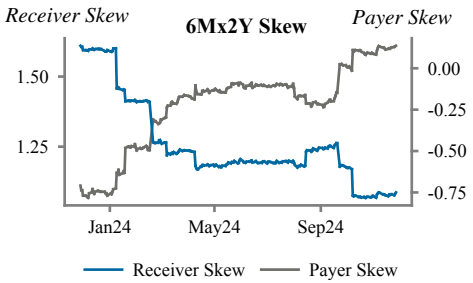
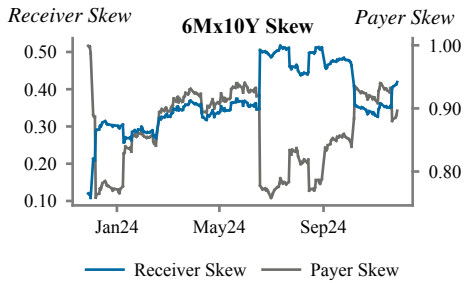
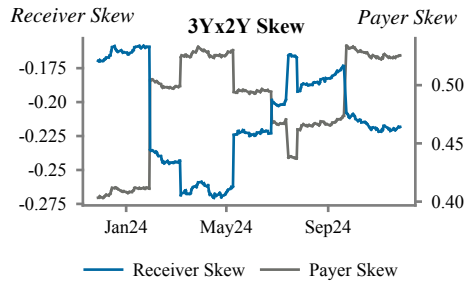
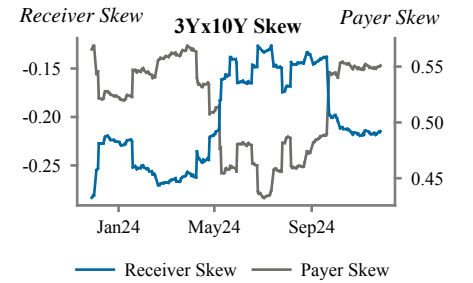
Skew FV Model Report

							Expected decrease in implied volatility for -100bp move				Expected increase in implied volatility for +100bp move			
Structure	ATMF rate	ATM bp vol	ATM - 100bp Vol	ATM+ 100bp vol	Rec. Skew	Pay. Skew	Skew Impl.	Lognormal	Parametrized	Empirical	Skew Impl.	Lognormal	Parametrized	Empirical
3Mx2Y	3.92	6.84	8.42	7.12	1.58	0.28	3.15	-1.74	-1.19	-0.74	0.56	1.74	1.45	0.77
3Mx5Y	3.75	6.82	7.86	7.61	1.04	0.79	2.08	-1.82	-1.13	-1.11	1.59	1.82	1.41	0.90
3Mx10Y	3.74	6.24	6.99	7.37	0.75	1.13	1.49	-1.67	-1.12	-0.41	2.26	1.67	1.41	0.76
3Mx30Y	3.61	5.74	6.40	6.97	0.66	1.23	1.33	-1.59	-1.07	-0.84	2.46	1.59	1.38	0.53
6Mx2Y	3.84	7.12	8.21	7.26	1.09	0.14	2.17	-1.85	-1.16	-0.20	0.27	1.85	1.43	0.69
6Mx5Y	3.71	6.85	7.51	7.37	0.66	0.52	1.32	-1.85	-1.11	-0.66	1.04	1.85	1.40	0.84
6Mx10Y	3.73	6.37	6.79	7.27	0.42	0.90	0.84	-1.71	-1.12	-0.47	1.79	1.71	1.41	0.77
6Mx30Y	3.59	5.81	6.06	6.88	0.25	1.07	0.50	-1.62	-1.07	-0.94	2.13	1.62	1.38	0.63
1Yx2Y	3.73	7.30	7.83	7.43	0.53	0.13	1.05	-1.96	-1.12	-0.33	0.27	1.96	1.41	0.58
1Yx5Y	3.67	6.85	7.02	7.37	0.17	0.52	0.34	-1.87	-1.10	-0.73	1.04	1.87	1.39	0.68
1Yx10Y	3.71	6.40	6.48	7.08	0.08	0.68	0.16	-1.72	-1.11	-0.47	1.36	1.72	1.40	0.74
1Yx30Y	3.57	5.82	5.78	6.65	-0.04	0.83	-0.08	-1.63	-1.06	-0.94	1.66	1.63	1.37	0.64
3Yx2Y	3.61	6.75	6.53	7.28	-0.22	0.53	-0.44	-1.87	-1.07	-0.69	1.05	1.87	1.38	0.51
3Yx5Y	3.65	6.49	6.22	7.05	-0.28	0.56	-0.55	-1.78	-1.09	-0.71	1.12	1.78	1.39	0.64
3Yx10Y	3.75	6.19	5.98	6.75	-0.21	0.55	-0.43	-1.65	-1.12	-0.63	1.10	1.65	1.41	0.52
3Yx30Y	3.50	5.66	5.39	6.25	-0.27	0.59	-0.54	-1.61	-1.03	-0.48	1.19	1.61	1.36	0.57
5Yx2Y	3.67	6.43	6.15	6.92	-0.28	0.49	-0.56	-1.75	-1.09	-0.27	0.98	1.75	1.39	0.40
5Yx5Y	3.72	6.21	5.93	6.70	-0.28	0.49	-0.57	-1.67	-1.12	-0.29	0.97	1.67	1.41	0.35
5Yx10Y	3.81	5.98	5.69	6.50	-0.29	0.52	-0.58	-1.57	-1.15	-0.46	1.04	1.57	1.42	0.45
5Yx30Y	3.44	5.49	5.22	5.98	-0.27	0.49	-0.54	-1.59	-1.01	-0.25	0.99	1.59	1.34	0.44









* 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.

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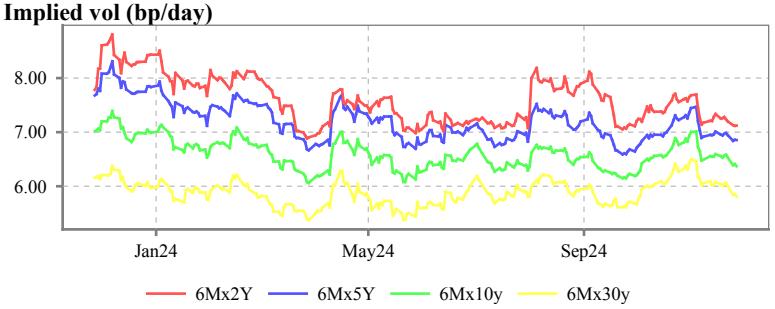
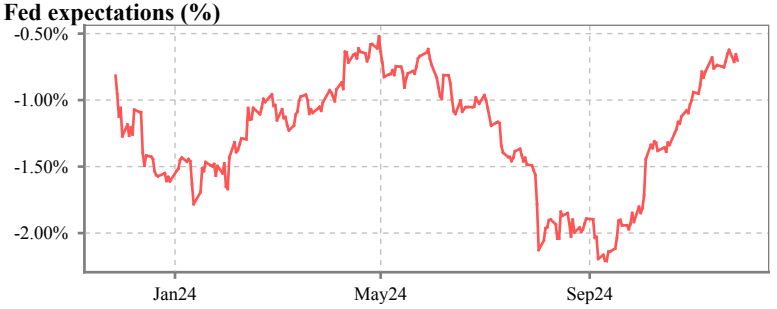
SOFR Short Gamma Returns Model Report

	Coefficient				1-Month ahead projection (bp/notional)			
	6mx2y	6mx5y	6mx10y	6mx30y	6mx2y	6mx5y	6mx10y	6mx30y
Ex-ante implied vol (bp/day)	30.0	68.5	130.5	231.4	7.1	6.9	6.4	5.8
Monthly chg in market depth ($mm)	0.1	0.1	0.2	0.7	0.0	0.0	0.0	0.0
Ex-ante 2-yr real yields (%)	-21.6	-26.3	-11.8	-20.0	1.6	1.6	1.6	1.6
Ex-ante Fed expectations (%)	26.1	20.4	10.4	50.8	-0.7	-0.7	-0.7	-0.7
const	-144.0	-397.6	-802.1	-1242.5				
R-squared	70%	73%	82%	79%				
Standard Error	6.2	10.1	12.4	27.1				
Projection					15.7	14.2	2.3	33.8
Normalized Projection					2.5	1.4	0.2	1.2

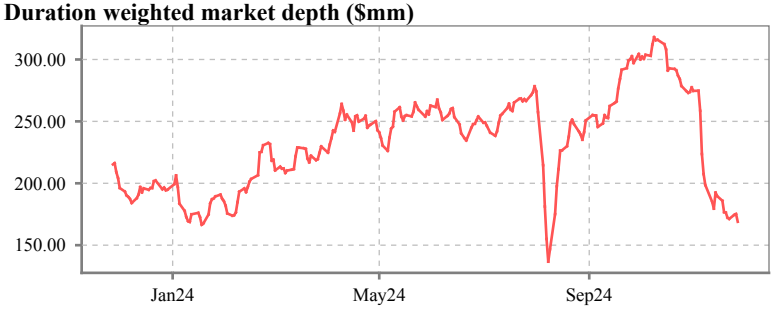
Implied vol (bp/day)



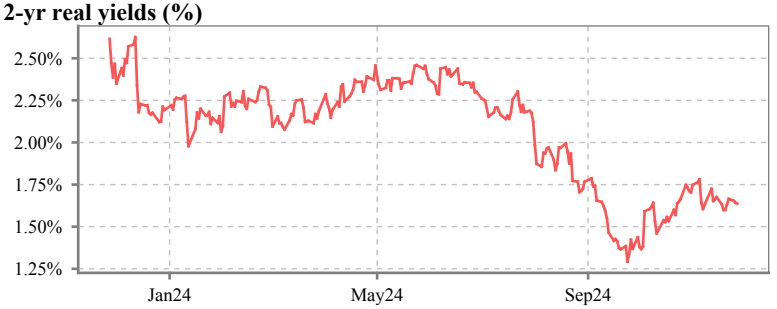
Fed expectations (%)



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.

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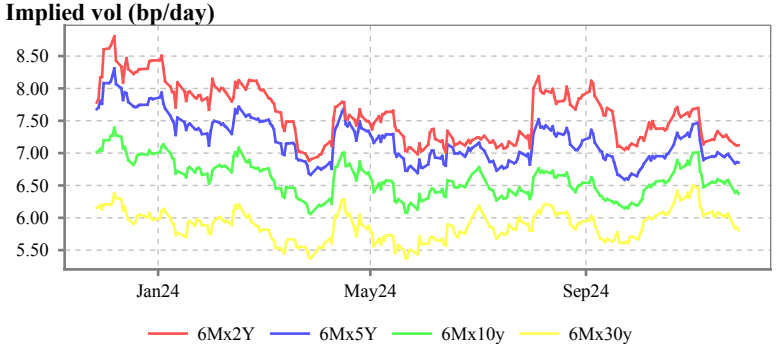
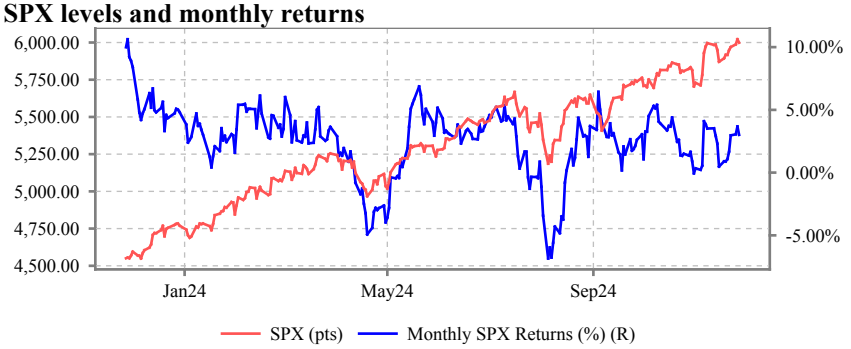
SOFR Short Gamma Returns with SPX Driver Model Report

	Coefficient				1-Month ahead projection (bp/notional)			
	6mx2y	6mx5y	6mx10y	6mx30y	6mx2y	6mx5y	6mx10y	6mx30y
Ex-ante implied vol (bp/day)	26.9	67.4	134.5	210.5	7.1	6.9	6.4	5.8
Pct chg in SP (%)	0.5	1.1	2.5	8.4	0.0	0.0	0.0	0.0
Ex-ante ATMF (%)	3.6	-4.8	4.0	72.9	3.8	3.7	3.7	3.6
Ex-ante 1st/5th OIS curve (%)	26.9	19.4	-27.6	-96.6	-0.5	-0.5	-0.5	-0.5
const	-187.6	-436.2	-916.5	-1609.7				
R-squared	64%	71%	78%	63%				
Standard Error	6.8	10.5	13.9	36.3				
Projection					3.7	-2.5	-29.9	-73.8
Normalized Projection					0.5	-0.2	-2.1	-2.0

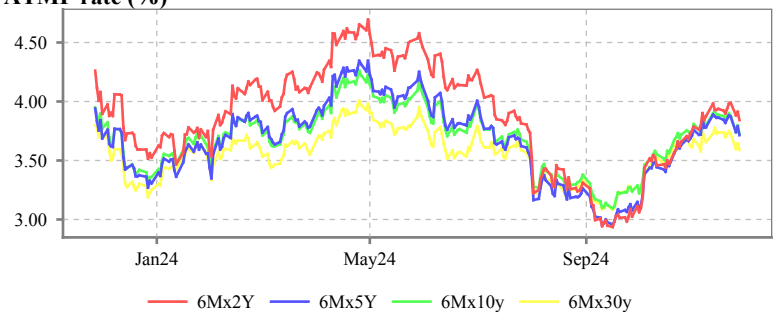
Implied vol (bp/day)



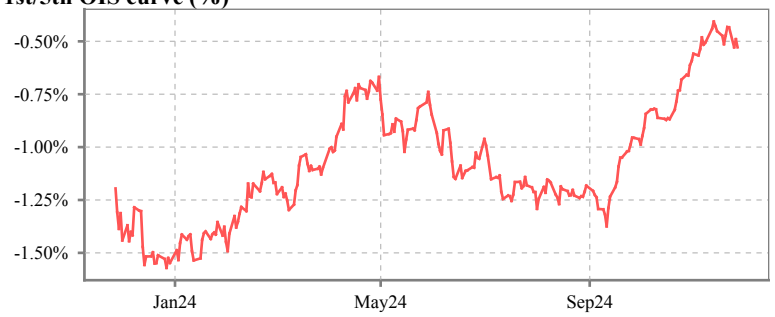
SPX levels and monthly returns



ATMF rate (%)



1st/5th OIS curve (%)



Note: Short gamma returns are rolling monthly returns of short ATMF 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.

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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	12.33	0.13	32.54	16.59	-4.59	16.92
6Mx5Y	20.89	0.03	31.35	39.35	-2.70	23.60
6Mx10Y	27.81	-0.03	28.75	72.00	3.54	24.28
6Mx30Y	53.21	-0.08	27.29	155.26	21.38	31.84

* 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**	0.1	0.2	0.3	0.9	0.0	0.0	0.0	0.0
Ex-ante percent yield vol (%)	2.9	8.3	15.8	30.3	29.4	29.2	27.1	25.6
Ex-ante constant maturity 1st/5th SOFR curve (bp)	0.8	1.4	1.8	3.2	-50.1	-50.1	-50.1	-50.1
const	-8.4	-116.1	-260.4	-478.3				
Std. Err.	10.4	16.8	22.5	44.2				
R2	67%	69%	70%	65%				
1 Month Ahead Projection					33.9	55.8	76.1	140.5
Normalized Projection***					3.2	3.3	3.4	3.2

* 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

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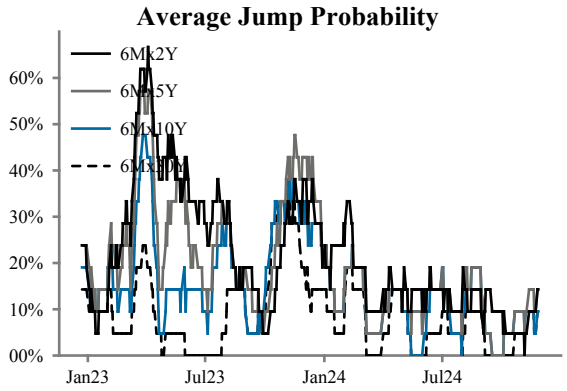
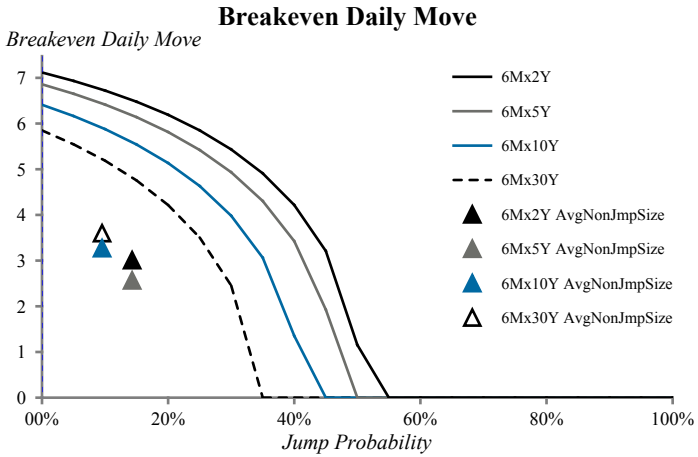
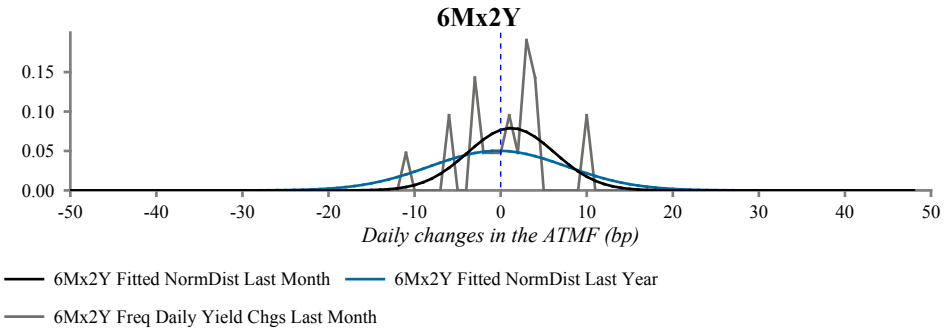
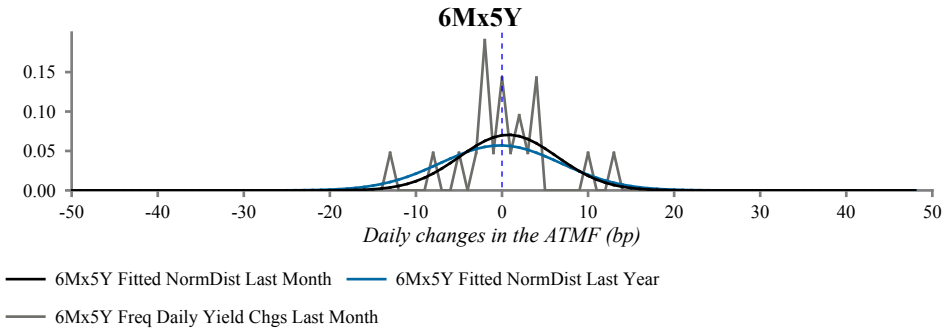
SOFR Jump Risk Report

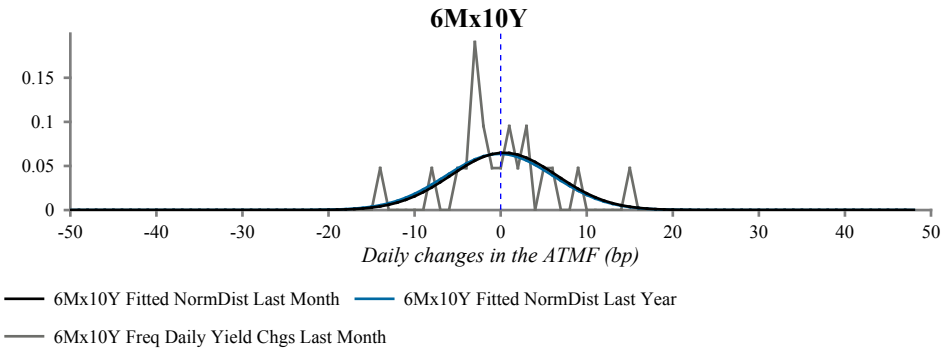
	6Mx2Y	6Mx5Y	6Mx10Y	6Mx30Y
Current Implied Vol (bp/day)	7.12	6.86	6.41	5.85
Average jump size (bp/day)	10.56	12.39	14.73	14.92
Average jump prob*	0.14	0.14	0.10	0.10
Average non-jump size** (bp/day)	3.01	2.57	3.27	3.60
Average non-jump prob	0.86	0.86	0.90	0.90
Implied vol from jumps (bp/day)	4.87	5.25	5.51	5.74

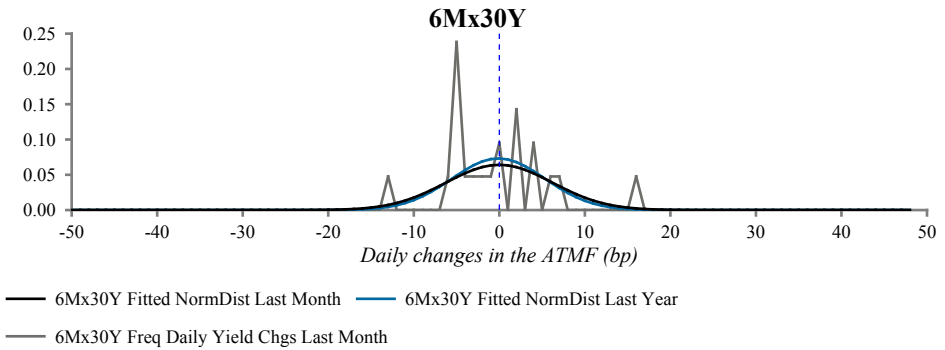












* Average jump probability is based on a jump size of 10bp. Jump size is calculated on absolute value of yield changes for all.

** 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.

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Short-Dated SOFR Swaption Volatility Report

Options on 1yr Swaps

	Implied Vol.		5d	20d	Historical BP Vol.		
Mat	%	bp	Chg	Chg	10d	20d	60d
1m	20.28	5.37	-0.28	-2.26	2.45	3.39	4.97
3m	23.31	6.02	-0.27	-1.22	*1dc	1wc	2wc
6m	27.13	6.79	-0.23	-0.66	3.39	1.98	1.21
12m	30.64	7.34	-0.13	-0.34			

Options on 2yr Swaps

	Implied Vol.		5d	20d	Historical BP Vol.		
Mat	%	bp	Chg	Chg	10d	20d	60d
1m	26.29	6.62	-0.33	-2.11	3.68	4.36	5.56
3m	27.65	6.84	-0.23	-1.06	*1dc	1wc	2wc
6m	29.36	7.12	-0.16	-0.50	4.36	2.71	2.30
12m	31.00	7.30	-0.09	-0.19			

Options on 5yr Swaps

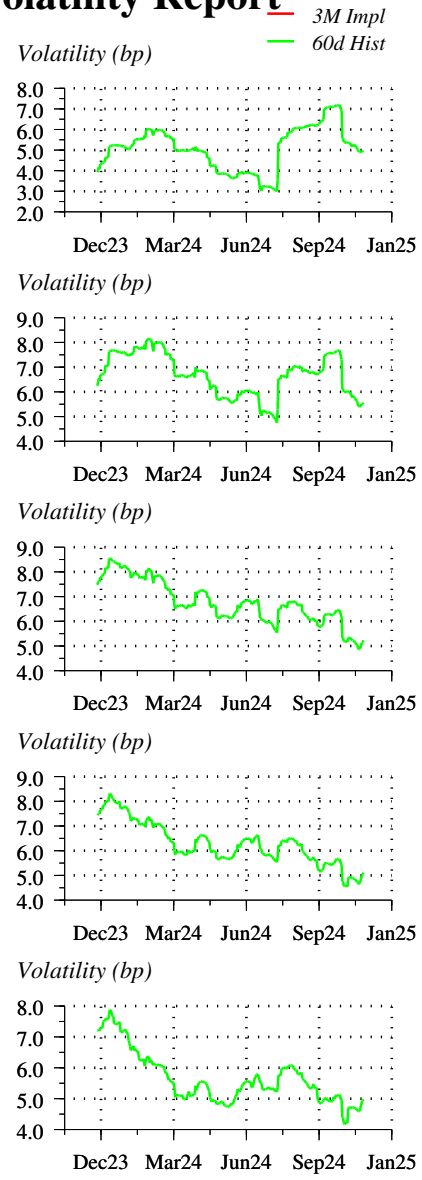
	Implied Vol.		5d	20d	Historical BP Vol.		
Mat	%	bp	Chg	Chg	10d	20d	60d
1m	28.47	6.79	-0.26	-1.90	4.73	5.42	5.23
3m	28.83	6.82	-0.16	-0.86	*1dc	1wc	2wc
6m	29.23	6.85	-0.12	-0.46	5.42	3.42	3.33
12m	29.58	6.85	-0.11	-0.25			

Options on 10yr Swaps

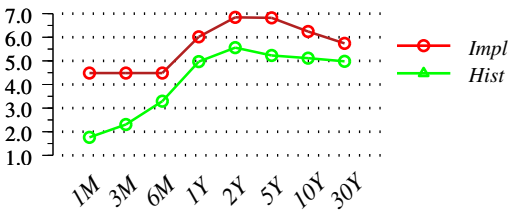
	Implied Vol.		5d	20d	Historical BP Vol.		
Mat	%	bp	Chg	Chg	10d	20d	60d
1m	25.62	6.07	-0.46	-2.28	5.27	6.11	5.11
3m	26.43	6.24	-0.30	-1.00	*1dc	1wc	2wc
6m	27.07	6.37	-0.20	-0.51	6.11	3.67	3.23
12m	27.30	6.40	-0.15	-0.27			

Options on 30yr Swaps

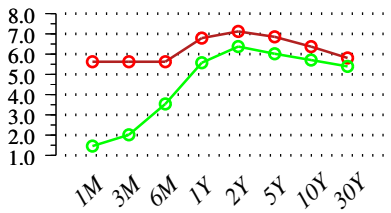
	Implied Vol.		5d	20d	Historical BP Vol.		
Mat	%	bp	Chg	Chg	10d	20d	60d
1m	24.54	5.60	-0.48	-2.21	5.06	6.32	4.98
3m	25.23	5.74	-0.33	-1.02	*1dc	1wc	2wc
6m	25.64	5.81	-0.24	-0.58	6.32	3.76	2.80
12m	25.84	5.82	-0.19	-0.34			



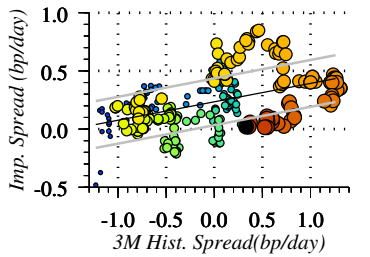
Maturity Structure of 3M Vol.



Maturity Structure of 6M Vol.

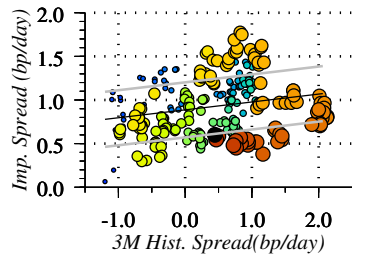


3Mx2Y - 3Mx5Y



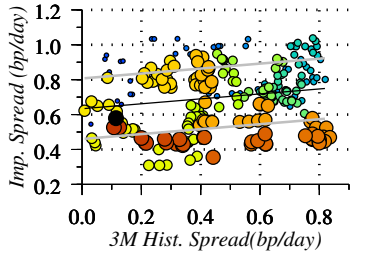
Y = 0.1584 X1 + 0.2342 (adjR2 = 0.1990)

3Mx2Y - 3Mx10Y



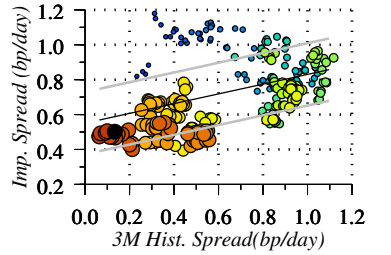
Y = 0.0904 X1 + 0.8867 (adjR2 = 0.0437)

3Mx5Y - 3Mx10Y



Y = 0.1417 X1 + 0.6334 (adjR2 = 0.0269)

3Mx10y - 3Mx30Y



Y = 0.2794 X1 + 0.5508 (adjR2 = 0.1551)

	Hist Vol.		Implied Vol.	
Mat/Und	hold	curr	hold	curr
3mx1y	3.69	4.97	4.68	6.02
3mx2y	4.84	5.56	5.40	6.84
3mx5y	5.55	5.23	5.70	6.82
3mx10y	5.57	5.11	5.59	6.24
3mx30y	5.19	4.98	5.22	5.74

1.Historical BP Vol. is calculated the 10-day, 20-day, and 60-daystandard deviations of daily spot SOFR rate changes on the tenor specified in the table.
2.Regression of difference in 3M implieds vs difference in 3M historicals.
3.*One-month realized BP Vol. over 1-day, 1-week and 2-week change.

SOFR Receiver Swaption 3M Carry Report

		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)								
CCY	Mat	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
	6m	0.6	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.8	0.6	0.5	0.4	0.3	0.3	0.1	0.1	0.1	-89.1	-82.3	-82.8	-84.4	-86.4	-89.4	-92.9	-93.4	-93.2
	9m	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7	0.6	0.5	0.5	0.4	0.4	0.1	0.3	0.2	-39.3	-38.8	-41.4	-45.8	-50.4	-55.1	-62.1	-65.1	-69.6
	1y	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.0	-0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.1	0.3	0.2	-16.0	-15.2	-21.0	-26.1	-30.5	-34.6	-39.9	-43.8	-47.7
USD	2y	-0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.0	0.3	0.2	6.5	-3.2	-4.2	-5.4	-6.5	-8.0	-9.9	-12.5	-11.1
	3y	0.0	-0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.1	0.0	0.1	0.1	0.2	0.2	-0.1	0.2	0.1	6.9	12.5	2.7	-1.3	-3.8	-3.4	-2.6	-3.1	1.3
	4y	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.1	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.1	0.1	-0.1	0.1	0.0	-131.1	65.6	18.1	8.0	4.3	0.3	-1.5	1.8	25.3
	5y	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-18.1	-37.7	44.2	14.7	8.6	2.3	0.6	9.1	-61.7
	6m	-14.6	-12.3	-11.5	-10.8	-10.0	-9.0	-8.1	-7.5	-7.2	-16.2	-13.0	-11.9	-10.9	-10.0	-8.7	-7.4	-6.7	-6.5	-11.0	-9.7	-9.2	-8.7	-8.2	-7.6	-8.7	-6.4	-6.2	-55.3	-44.1	-41.5	-39.3	-37.7	-35.2	-33.0	-31.5	-31.6
	9m	-10.6	-9.6	-8.6	-8.1	-7.6	-6.9	-6.3	-6.0	-5.9	-11.1	-10.0	-8.9	-8.3	-7.7	-6.8	-6.0	-5.6	-5.6	-9.0	-8.2	-7.5	-7.1	-6.7	-6.2	-6.8	-5.4	-5.3	-31.3	-27.4	-25.2	-24.1	-23.3	-21.8	-20.6	-20.3	-20.6
	1y	-8.6	-7.6	-6.8	-6.5	-6.1	-5.5	-5.1	-4.9	-4.9	-8.8	-7.9	-7.0	-6.6	-6.1	-5.5	-5.0	-4.7	-4.7	-7.7	-6.7	-6.1	-5.8	-5.5	-5.1	-5.5	-4.6	-4.5	-21.3	-18.8	-17.3	-16.7	-16.1	-15.0	-14.5	-14.4	-14.8
GBP	2y	-5.4	-4.5	-4.0	-3.8	-3.5	-3.1	-2.6	-2.6	-2.8	-5.6	-4.7	-4.1	-3.8	-3.5	-3.0	-2.4	-2.5	-2.7	-4.8	-4.2	-3.7	-3.5	-3.3	-3.0	-3.0	-2.5	-2.7	-9.6	-8.3	-7.6	-7.2	-6.8	-6.1	-5.4	-5.6	-6.1
	3y	-3.1	-2.8	-2.5	-2.2	-1.9	-1.6	-1.5	-1.7	-1.9	-3.2	-2.8	-2.4	-2.1	-1.8	-1.4	-1.3	-1.5	-1.8	-2.9	-2.7	-2.4	-2.2	-2.0	-1.7	-1.4	-1.8	-2.0	-4.8	-4.4	-4.0	-3.7	-3.3	-2.7	-2.7	-3.2	-3.7
	4y	-1.6	-1.2	-1.0	-0.9	-0.9	-0.7	-0.8	-1.2	-1.3	-1.5	-1.1	-0.9	-0.8	-0.7	-0.5	-0.5	-1.0	-1.2	-1.6	-1.3	-1.1	-1.0	-1.0	-0.9	-0.5	-1.3	-1.4	-2.3	-1.8	-1.5	-1.4	-1.4	-1.2	-1.2	-2.0	-2.3
	5y	-0.5	-0.3	-0.1	-0.1	0.0	-0.1	-0.3	-0.7	-0.8	-0.4	-0.2	0.1	0.1	0.2	0.1	-0.1	-0.6	-0.7	-0.6	-0.4	-0.2	-0.2	-0.2	-0.3	0.1	-0.8	-0.9	-0.7	-0.4	-0.1	-0.1	-0.1	-0.2	-0.5	-1.2	-1.3
	6m	-11.8	-8.8	-7.7	-7.2	-6.9	-6.5	-6.1	-6.2	-6.3	-14.2	-9.2	-7.5	-6.8	-6.4	-5.7	-5.2	-5.5	-5.5	-7.8	-6.6	-6.0	-5.7	-5.6	-5.3	-5.7	-4.9	-4.8	-53.5	-38.7	-34.5	-33.2	-32.1	-31.0	-30.8	-32.4	-33.1
	9m	-7.5	-5.8	-5.1	-5.0	-4.8	-4.6	-4.5	-4.7	-4.8	-7.8	-5.7	-4.8	-4.6	-4.3	-4.1	-3.8	-4.3	-4.5	-6.1	-5.2	-4.6	-4.5	-4.4	-4.2	-4.1	-4.1	-4.1	-26.9	-20.7	-18.7	-18.7	-18.0	-17.9	-18.0	-19.8	-20.7
	1y	-4.3	-3.7	-3.8	-3.7	-3.6	-3.6	-3.6	-4.0	-4.0	-3.9	-3.3	-3.3	-3.3	-3.1	-3.1	-3.1	-3.8	-3.8	-4.1	-3.6	-3.6	-3.6	-3.5	-3.4	-3.1	-3.6	-3.6	-13.4	-11.4	-11.9	-12.1	-11.7	-11.9	-12.4	-14.5	-14.8
EUR	2y	-1.3	-1.8	-1.9	-1.8	-1.9	-1.9	-2.1	-2.7	-2.8	-0.9	-1.5	-1.7	-1.6	-1.7	-1.6	-1.8	-2.6	-2.7	-1.4	-1.8	-1.9	-1.8	-2.0	-1.9	-1.6	-2.6	-2.6	-2.9	-4.0	-4.4	-4.3	-4.5	-4.5	-5.2	-7.0	-7.3
	3y	-1.6	-1.6	-1.4	-1.4	-1.4	-1.4	-1.6	-2.2	-2.3	-1.5	-1.4	-1.2	-1.2	-1.2	-1.2	-1.4	-2.1	-2.2	-1.6	-1.6	-1.4	-1.4	-1.5	-1.5	-1.2	-2.1	-2.2	-3.0	-3.0	-2.7	-2.8	-2.8	-2.9	-3.3	-4.7	-4.9
	4y	-1.0	-0.7	-0.8	-0.8	-0.9	-1.0	-1.2	-1.7	-1.8	-0.9	-0.5	-0.6	-0.7	-0.8	-0.8	-1.0	-1.7	-1.7	-1.1	-0.8	-0.9	-0.9	-1.0	-1.1	-0.8	-1.7	-1.7	-1.7	-1.3	-1.4	-1.5	-1.7	-1.8	-2.2	-3.3	-3.4
	5y	-0.3	-0.4	-0.5	-0.5	-0.6	-0.7	-1.0	-1.4	-1.4	-0.1	-0.2	-0.3	-0.3	-0.4	-0.6	-0.9	-1.4	-1.4	-0.4	-0.5	-0.5	-0.6	-0.7	-0.8	-0.6	-1.4	-1.4	-0.4	-0.6	-0.8	-0.8	-0.9	-1.2	-1.7	-2.5	-2.6

SOFR Swap and Swaption Receiver 3M Carry Report

		Swap 3M Carry A+0 (bp of yield)									ATMF Swap Rate									ATMF Swaption Vol (abp)								
CCY	Mat	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
	6m	-12.9	-8.2	-6.1	-4.7	-3.6	-2.4	-1.5	-1.3	-1.5	3.96	3.84	3.77	3.73	3.71	3.71	3.73	3.76	3.59	108	113	112	110	109	105	101	96	92
	9m	-9.7	-6.2	-4.6	-3.5	-2.6	-1.7	-0.9	-1.0	-1.3	3.86	3.78	3.73	3.70	3.69	3.69	3.72	3.75	3.58	113	115	113	111	109	105	101	95	92
	1y	-7.1	-4.7	-3.4	-2.5	-1.8	-1.1	-0.5	-0.8	-1.1	3.79	3.73	3.69	3.67	3.67	3.68	3.71	3.74	3.57	116	116	114	111	108	105	101	95	92
USD	2y	-2.1	-1.4	-0.8	-0.4	-0.2	0.1	0.4	-0.4	-0.8	3.67	3.64	3.63	3.63	3.64	3.67	3.72	3.72	3.53	113	111	109	107	106	103	100	93	91
	3y	-0.7	-0.2	0.2	0.4	0.5	0.6	0.7	-0.3	-0.7	3.61	3.61	3.62	3.64	3.65	3.69	3.75	3.71	3.50	109	107	106	104	103	101	98	92	90
	4y	0.4	0.7	0.8	0.9	0.9	1.0	0.8	-0.4	-0.7	3.61	3.63	3.65	3.67	3.68	3.73	3.78	3.70	3.47	105	104	103	102	101	99	96	90	88
	5y	1.1	1.0	1.0	1.0	1.0	1.0	0.6	-0.5	-0.8	3.65	3.67	3.69	3.71	3.72	3.77	3.81	3.68	3.44	103	102	101	100	98	97	95	89	87
	6m	-12.0	-7.9	-6.5	-5.2	-4.2	-2.7	-1.3	-0.8	-1.0	4.10	4.00	3.92	3.86	3.82	3.79	3.82	3.96	3.91	100	106	105	102	99	96	91	88	85
	9m	-7.5	-5.8	-4.9	-4.0	-3.2	-1.9	-0.7	-0.5	-0.7	4.02	3.94	3.87	3.82	3.79	3.77	3.81	3.95	3.91	105	108	106	102	100	97	93	90	86
	1y	-4.8	-4.5	-3.7	-3.0	-2.4	-1.2	-0.3	-0.3	-0.5	3.97	3.89	3.83	3.79	3.76	3.76	3.81	3.95	3.90	108	109	105	102	100	97	94	90	87
GBP	2y	-4.2	-3.2	-2.4	-1.7	-1.1	-0.2	0.4	0.1	-0.3	3.82	3.75	3.72	3.70	3.70	3.73	3.82	3.95	3.89	110	108	104	101	99	97	93	90	87
	3y	-2.3	-1.5	-0.8	-0.3	0.2	0.7	1.0	0.3	-0.1	3.69	3.67	3.66	3.67	3.69	3.75	3.85	3.96	3.88	108	105	102	100	97	95	92	88	86
	4y	-0.6	0.0	0.4	0.9	1.1	1.5	1.4	0.4	0.0	3.65	3.65	3.66	3.69	3.73	3.80	3.90	3.98	3.88	105	102	99	97	96	94	91	88	85
	5y	0.5	0.9	1.5	1.6	1.7	1.8	1.4	0.4	0.0	3.66	3.67	3.71	3.75	3.79	3.87	3.96	3.99	3.88	102	99	95	94	94	92	90	87	84
	6m	-12.9	-5.1	-3.1	-2.3	-1.5	-0.8	-0.4	-1.0	-1.1	2.03	2.04	2.07	2.09	2.11	2.15	2.21	2.20	1.99	82	85	83	80	78	76	72	70	68
	9m	-4.0	-1.1	-0.3	0.0	0.3	0.5	0.7	-0.5	-0.7	2.00	2.03	2.06	2.08	2.11	2.16	2.22	2.20	1.98	83	85	82	80	78	76	72	70	69
	1y	0.4	1.4	1.2	1.2	1.2	1.2	1.1	-0.2	-0.4	2.00	2.04	2.08	2.10	2.12	2.17	2.23	2.19	1.98	84	85	83	81	78	76	73	70	69
EUR	2y	2.5	1.7	1.4	1.5	1.4	1.3	1.1	-0.3	-0.5	2.09	2.11	2.13	2.15	2.18	2.22	2.27	2.18	1.96	83	84	82	80	78	76	74	71	70
	3y	0.9	0.9	1.1	1.1	1.1	1.1	0.8	-0.6	-0.6	2.14	2.15	2.18	2.20	2.22	2.26	2.31	2.16	1.93	82	82	80	79	77	75	75	71	70
	4y	0.9	1.3	1.2	1.1	1.1	1.0	0.7	-0.7	-0.7	2.16	2.20	2.22	2.24	2.26	2.30	2.34	2.13	1.90	80	80	79	77	76	75	74	71	70
	5y	1.7	1.3	1.2	1.2	1.1	0.9	0.4	-0.7	-0.8	2.23	2.25	2.27	2.29	2.31	2.34	2.36	2.10	1.87	79	79	77	76	75	75	74	70	69

Notes: GBP and EUR structures currently do not reflect a risk free rate.

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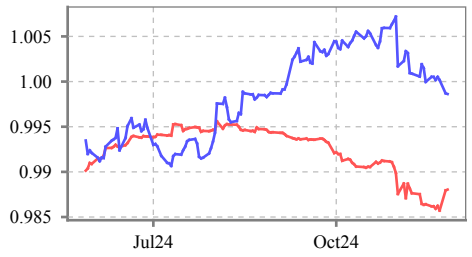
Derivatives Strategy

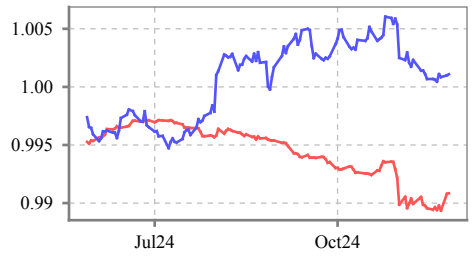
Swaption Triad Correlation Report

Structures	dep	Y vol	X1 vol	X2 vol	Beta X1	Beta X2	Standard Error	Implied corr from relationship	Realized Correlation			Fair Value			Mispricing			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	Mispricing using current realized	Mispricing using Past 1Y min	Mispricing using Past 1Y max				
6Mx2Y/6Mx5Y/6Mx10Y	10Y	6.41	7.12	6.86	-0.55	1.50	0.72	1.01	0.93	0.93	0.98	6.85	6.85	6.57	0.44	0.44	0.16	0.55	-1.50	2.40	-2.74
6Mx2Y/6Mx10Y/6Mx5Y	5Y	6.86	7.12	6.41	0.39	0.63	0.46	1.02	0.82	0.81	0.94	6.51	6.51	6.73	0.35	0.35	0.13	-0.39	-0.63	-0.94	-0.34
6Mx5Y/6Mx10Y/6Mx2Y	2Y	7.12	6.86	6.41	2.29	-1.34	1.12	1.01	0.96	0.96	0.99	7.90	7.99	7.44	0.78	0.87	0.33	-2.28	1.36	-0.96	0.31
6Mx2Y/6Mx5Y/6Mx30Y	30Y	5.85	7.12	6.86	-0.93	1.77	1.55	0.99	0.93	0.93	0.98	6.64	6.64	6.05	0.79	0.79	0.20	0.87	-1.70	8.19	-6.73
6Mx2Y/6Mx30Y/6Mx5Y	5Y	6.86	7.12	5.85	0.57	0.47	0.80	0.99	0.65	0.62	0.88	6.28	6.23	6.66	0.57	0.63	0.19	-0.57	-0.46	-1.35	-0.12
6Mx5Y/6Mx30Y/6Mx2Y	2Y	7.12	6.86	5.85	1.60	-0.68	1.33	1.00	0.86	0.83	0.95	7.93	8.08	7.40	0.81	0.96	0.28	-1.57	0.66	-0.66	0.07
6Mx2Y/6Mx10Y/6Mx30Y	30Y	5.85	7.12	6.41	-0.31	1.23	0.81	0.95	0.82	0.81	0.94	6.24	6.25	5.88	0.39	0.40	0.03	0.28	-1.21	2.64	-2.61
6Mx2Y/6Mx30Y/6Mx10Y	10Y	6.41	7.12	5.85	0.28	0.78	0.65	0.91	0.65	0.62	0.88	6.04	6.00	6.36	0.37	0.41	0.05	-0.26	-0.77	-1.14	-0.35
6Mx10Y/6Mx30Y/6Mx2Y	2Y	7.12	6.41	5.85	2.88	-2.07	2.09	0.99	0.96	0.95	0.99	7.90	8.25	7.17	0.78	1.13	0.05	-2.65	1.79	-0.61	0.19
6Mx5Y/6Mx10Y/6Mx30Y	30Y	5.85	6.86	6.41	-0.84	1.77	0.61	0.98	0.96	0.96	0.99	6.04	6.09	5.75	0.19	0.24	0.10	0.77	-1.73	3.05	-3.74
6Mx5Y/6Mx30Y/6Mx10Y	10Y	6.41	6.86	5.85	0.50	0.53	0.34	0.91	0.86	0.83	0.95	6.32	6.27	6.47	0.09	0.14	0.06	-0.49	-0.52	-0.90	-0.24
6Mx10Y/6Mx30Y/6Mx5Y	5Y	6.86	6.41	5.85	1.89	-0.95	0.65	0.97	0.96	0.95	0.99	6.95	7.07	6.70	0.09	0.21	0.16	-1.84	0.86	-1.01	0.22

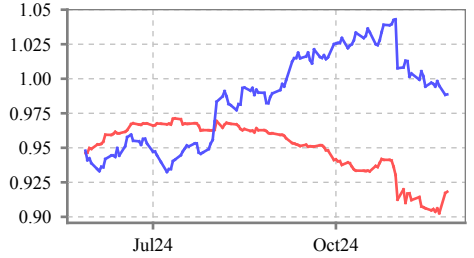
imp corr 6Mx15Y/6Mx30Y/6Mx2Y vs corr 6Mx15Y/6Mx30Y/6Mx2Y



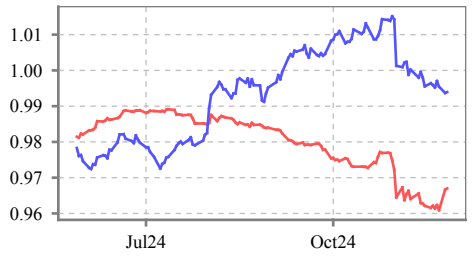
imp corr 6Mx7Y/6Mx10Y/6Mx2Y vs corr 6Mx7Y/6Mx10Y/6Mx2Y



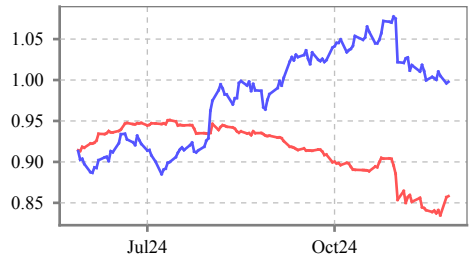
imp corr 6Mx7Y/6Mx30Y/6Mx2Y vs corr 6Mx7Y/6Mx30Y/6Mx2Y



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



imp corr 6Mx5Y/6Mx30Y/6Mx2Y vs corr 6Mx5Y/6Mx30Y/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 fist 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.

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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	3.92	3.95	80.53	92.11	11.77	0.77	1.74	1.26	7.57	-115823.21	4408.11
3Mx3Y	3.83	3.85	120.38	136.90	17.35	0.90	1.81	1.36	8.16	-165126.87	5230.89
3Mx5Y	3.75	3.76	190.45	214.92	27.92	0.90	1.82	1.36	8.68	-244696.97	5091.36
3Mx7Y	3.73	3.74	248.15	280.73	37.73	0.93	1.76	1.35	8.42	-325828.84	4643.73
3Mx10Y	3.74	3.75	319.37	362.62	51.16	0.76	1.67	1.21	7.58	-432504.33	3604.46
3Mx15Y	3.79	3.79	427.81	485.28	70.34	0.78	1.61	1.19	7.45	-574707.61	3566.97
3Mx30Y	3.61	3.61	637.83	722.06	111.10	0.53	1.59	1.06	6.61	-842229.13	5960.76
6Mx2Y	3.84	3.86	117.29	126.01	16.47	0.69	1.85	1.27	10.81	-87145.45	5329.12
6Mx3Y	3.77	3.79	172.79	184.74	24.34	0.78	1.88	1.33	11.33	-119477.18	6145.00
6Mx5Y	3.71	3.72	268.12	286.16	39.12	0.84	1.85	1.34	12.10	-180497.86	5818.73
6Mx7Y	3.71	3.71	351.57	375.43	52.87	0.86	1.79	1.33	11.76	-238619.33	5175.01
6Mx10Y	3.73	3.73	456.64	488.13	71.68	0.77	1.71	1.24	10.98	-314917.16	3760.65
6Mx15Y	3.78	3.78	610.22	651.70	98.56	0.81	1.64	1.22	10.81	-414855.36	3920.18
6Mx30Y	3.59	3.60	905.15	966.94	155.78	0.63	1.62	1.13	9.96	-617842.71	8237.54
1Yx2Y	3.73	3.74	168.78	172.90	23.12	0.58	1.96	1.27	15.43	-41272.74	3779.97
1Yx3Y	3.69	3.70	245.22	251.04	34.16	0.66	1.94	1.30	15.88	-58219.62	4166.26
1Yx5Y	3.67	3.67	375.70	385.13	54.86	0.68	1.87	1.27	16.24	-94262.82	3347.35
1Yx7Y	3.68	3.68	493.87	506.55	74.16	0.68	1.81	1.25	15.83	-126770.45	2492.51
1Yx10Y	3.71	3.71	643.38	660.26	100.51	0.74	1.72	1.23	15.62	-168816.32	950.59
1Yx15Y	3.77	3.77	858.66	880.84	138.16	0.74	1.65	1.20	15.16	-221796.93	1549.11
1Yx30Y	3.57	3.57	1271.79	1305.52	218.57	0.64	1.63	1.13	14.36	-337232.09	8070.23
3Yx2Y	3.61	3.61	252.47	253.31	37.39	0.51	1.87	1.19	27.81	-8395.43	1.16
3Yx3Y	3.62	3.62	366.22	367.49	54.97	0.57	1.84	1.20	27.49	-12673.64	-644.62
3Yx5Y	3.65	3.65	573.39	575.51	88.35	0.64	1.78	1.21	27.13	-21228.64	-2013.99
3Yx7Y	3.69	3.69	759.41	762.27	119.31	0.55	1.73	1.14	25.37	-28544.92	-3341.21
3Yx10Y	3.75	3.74	1000.69	1004.52	161.53	0.52	1.65	1.09	24.07	-38366.91	-4488.30
3Yx15Y	3.77	3.77	1323.22	1328.07	221.85	0.49	1.58	1.03	22.81	-48428.25	-1845.35
3Yx30Y	3.50	3.51	1995.45	2003.33	352.80	0.57	1.61	1.09	24.10	-78770.03	9280.53
5Yx2Y	3.67	3.66	287.19	287.32	44.68	0.40	1.75	1.08	30.37	-1274.44	-1508.49
5Yx3Y	3.69	3.68	419.06	419.24	65.96	0.39	1.72	1.06	29.85	-1738.45	-2327.76
5Yx5Y	3.72	3.72	658.50	658.79	105.97	0.35	1.67	1.01	28.51	-2890.80	-3871.94
5Yx7Y	3.77	3.77	874.56	874.93	143.02	0.36	1.62	0.99	27.99	-3762.89	-4797.82
5Yx10Y	3.81	3.81	1157.18	1157.68	193.48	0.45	1.57	1.01	28.49	-4922.68	-4129.22
5Yx15Y	3.78	3.78	1524.38	1525.04	265.83	0.43	1.52	0.97	27.41	-6551.04	379.18
5Yx30Y	3.44	3.44	2335.30	2336.40	425.35	0.44	1.59	1.02	29.04	-10946.89	12000.09

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.

"1m 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.

"1m 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.

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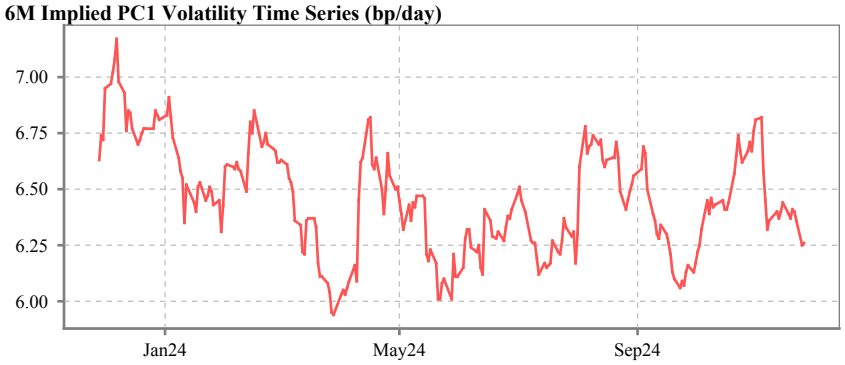
Long PC1 trades (expiry 6M)

6M Implied Principal Components

	2Y	3Y	5Y	7Y	10Y	20Y	30Y
PC1	6.61	6.74	6.79	6.56	6.27	5.58	5.25
PC2	2.56	1.67	0.51	-0.39	-1.21	-2.08	-2.45



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	1.30	-100	18	-0.12	-0.73	124	-131	-6	11.862	-1186	212	-72	0.81	0.67
2Y	5Y	-1	24.34	-100	1026	-0.12	-0.26	124	-2695	-2570	0.040	-4	41	-102	159.82	-0.71
2Y	10Y	-1	4.07	-100	94	-0.12	-0.46	124	-434	-310	0.333	-33	31	-103	19.00	-0.11
2Y	7Y	-1	40.68	-100	1270	-0.12	-0.35	124	-4437	-4313	0.025	-2	31	-106	264.21	-0.64
2Y	3Y	-1	2.36	-100	160	-0.12	-0.18	124	-282	-158	0.701	-70	112	-111	9.61	-0.89
2Y	30Y	1	-0.90	100	-10	-0.12	-0.90	-124	86	-38	3.364	336	-32	-128	1.83	-0.84
3Y	10Y	-1	1.73	-100	59	-0.18	-0.46	177	-272	-95	1.500	-150	88	-143	3.98	0.38
3Y	5Y	-1	10.33	-100	643	-0.18	-0.26	177	-1689	-1512	0.100	-10	64	-151	63.74	-0.70
3Y	7Y	-1	17.26	-100	796	-0.18	-0.35	177	-2781	-2604	0.060	-6	48	-156	108.03	-0.62
3Y	20Y	1	-0.55	100	-11	-0.18	-0.73	-177	82	-95	1.755	175	-20	-167	3.73	-0.95
3Y	30Y	1	-0.38	100	-6	-0.18	-0.90	-177	54	-123	1.367	137	-8	-168	4.86	-0.96
5Y	20Y	1	-0.05	100	-2	-0.26	-0.73	-263	13	-250	0.973	97	-2	-243	6.53	-0.74
5Y	10Y	1	-0.17	100	-9	-0.26	-0.46	-263	42	-220	1.102	110	-10	-243	5.79	-0.76
5Y	30Y	1	-0.04	100	-1	-0.26	-0.90	-263	8	-254	0.959	96	-1	-244	6.64	-0.74
5Y	7Y	-1	1.67	-100	124	-0.26	-0.35	263	-432	-170	1.552	-155	192	-264	4.29	-0.46
7Y	30Y	1	-0.02	100	-1	-0.35	-0.90	-349	7	-343	0.991	99	-1	-339	6.54	-0.66
7Y	20Y	1	-0.03	100	-1	-0.35	-0.73	-349	10	-339	1.000	100	-1	-339	6.47	-0.66
7Y	10Y	1	-0.10	100	-7	-0.35	-0.46	-349	34	-315	1.077	108	-8	-340	6.03	-0.67
10Y	20Y	1	-0.32	100	-19	-0.46	-0.73	-463	139	-324	1.398	140	-27	-453	4.46	-0.49
10Y	30Y	1	-0.22	100	-10	-0.46	-0.90	-463	92	-371	1.236	124	-13	-458	5.11	-0.49
20Y	30Y	1	-0.69	100	-54	-0.73	-0.90	-731	484	-247	3.417	342	-184	-845	2.03	-0.53

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.

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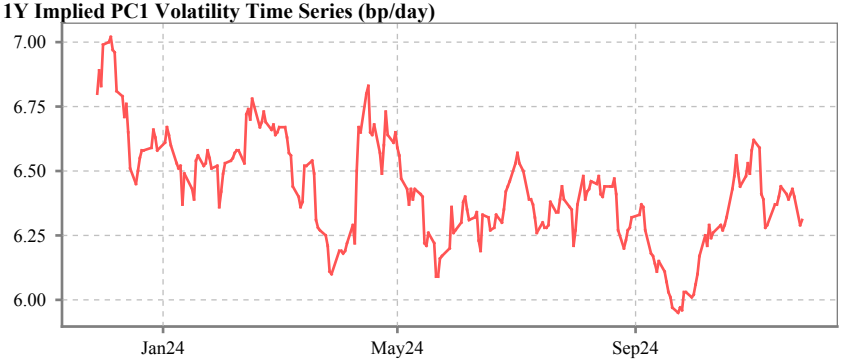
Long PC1 trades (expiry 1Y)

1Y Implied Principal Components

	2Y	3Y	5Y	7Y	10Y	20Y	30Y
PC1	6.78	6.80	6.80	6.55	6.27	5.58	5.25
PC2	2.63	1.65	0.45	-0.44	-1.28	-2.09	-2.45

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	20Y	-1	1.30	-100	18	-0.07	-0.41	74	-73	1	14.588	-1459	260	21	0.50	0.66
5Y	7Y	1	-1.01	100	-75	-0.16	-0.21	-159	158	-2	29.761	2976	-2235	-50	0.08	-0.49
2Y	10Y	-1	3.73	-100	86	-0.07	-0.27	74	-236	-162	0.382	-38	33	-62	16.74	0.27
2Y	5Y	-1	32.19	-100	1358	-0.07	-0.16	74	-2165	-2091	0.030	-3	41	-63	213.54	-0.18
2Y	7Y	-1	32.64	-100	1020	-0.07	-0.21	74	-2142	-2068	0.031	-3	32	-64	210.81	-0.10
2Y	3Y	-1	2.51	-100	170	-0.07	-0.11	74	-184	-109	0.641	-64	109	-70	10.71	-0.44
2Y	30Y	1	-0.93	100	-10	-0.07	-0.54	-74	53	-22	3.275	327	-32	-71	1.87	-0.67
3Y	10Y	-1	1.49	-100	51	-0.11	-0.27	108	-139	-31	2.372	-237	120	-73	2.41	0.65
3Y	5Y	-1	12.84	-100	798	-0.11	-0.16	108	-1273	-1165	0.079	-8	63	-92	80.91	-0.17
3Y	7Y	-1	13.02	-100	600	-0.11	-0.21	108	-1260	-1152	0.082	-8	49	-94	79.82	-0.08
3Y	30Y	1	-0.37	100	-6	-0.11	-0.54	-108	31	-77	1.345	134	-8	-103	5.02	-0.63
3Y	20Y	1	-0.52	100	-10	-0.11	-0.41	-108	43	-65	1.682	168	-18	-109	4.07	-0.69
5Y	30Y	1	-0.03	100	-1	-0.16	-0.54	-159	4	-156	0.958	96	-1	-149	6.69	-0.20
5Y	20Y	1	-0.04	100	-1	-0.16	-0.41	-159	5	-154	0.969	97	-1	-149	6.62	-0.20
5Y	10Y	1	-0.12	100	-6	-0.16	-0.27	-159	17	-142	1.049	105	-7	-149	6.11	-0.22
7Y	30Y	1	-0.03	100	-1	-0.21	-0.54	-210	5	-205	1.004	100	-1	-206	6.52	-0.12
7Y	20Y	1	-0.04	100	-2	-0.21	-0.41	-210	7	-203	1.015	102	-2	-206	6.44	-0.12
7Y	10Y	1	-0.11	100	-8	-0.21	-0.27	-210	23	-187	1.103	110	-9	-206	5.95	-0.14
10Y	30Y	1	-0.25	100	-11	-0.27	-0.54	-274	61	-213	1.278	128	-15	-272	4.99	0.03
10Y	20Y	1	-0.35	100	-21	-0.27	-0.41	-274	85	-189	1.466	147	-30	-278	4.35	0.03
20Y	30Y	1	-0.71	100	-55	-0.41	-0.54	-410	297	-113	3.473	347	-192	-393	1.83	0.02

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
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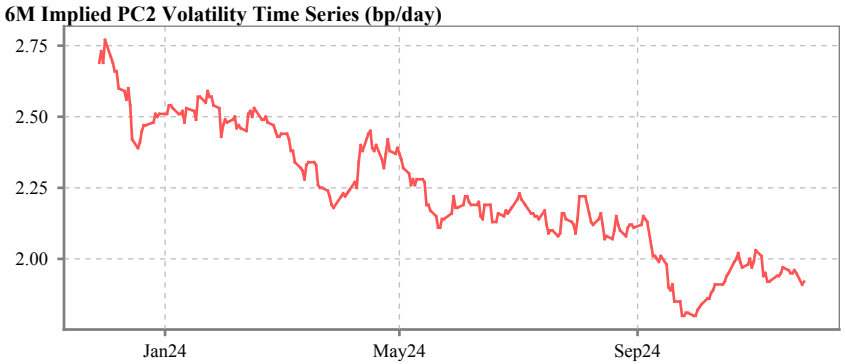
Long PC2 trades (expiry 6M)

6M Implied Principal Components

	2Y	3Y	5Y	7Y	10Y	20Y	30Y
PC1	6.61	6.74	6.79	6.56	6.27	5.58	5.25
PC2	2.56	1.67	0.51	-0.39	-1.21	-2.08	-2.45



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
5Y	7Y	1	-1.04	100	-77	-0.26	-0.35	-263	270	7	122.938	12294	-9498	903	-0.10	-0.54
2Y	30Y	-1	1.30	-100	14	-0.12	-0.90	124	-124	0	4.335	-433	60	1	0.48	0.66
3Y	30Y	-1	1.36	-100	21	-0.18	-0.90	177	-192	-15	1.761	-176	38	-26	0.84	0.56
3Y	20Y	-1	1.25	-100	25	-0.18	-0.73	177	-185	-8	3.532	-353	90	-30	0.53	0.65
2Y	3Y	1	-0.96	100	-65	-0.12	-0.18	-124	115	-10	3.196	320	-207	-31	0.32	-0.84
2Y	7Y	1	-0.95	100	-30	-0.12	-0.35	-124	104	-21	1.943	194	-58	-40	0.77	-0.83
2Y	10Y	1	-1.00	100	-23	-0.12	-0.46	-124	107	-18	2.515	252	-58	-45	0.70	-0.80
2Y	5Y	1	-0.91	100	-38	-0.12	-0.26	-124	101	-24	1.971	197	-76	-46	0.87	-0.84
5Y	30Y	-1	1.43	-100	36	-0.26	-0.90	263	-323	-61	1.235	-124	44	-75	1.48	0.22
7Y	10Y	-1	1.05	-100	78	-0.35	-0.46	349	-359	-10	8.124	-812	631	-80	0.07	0.56
3Y	7Y	1	-0.99	100	-46	-0.18	-0.35	-177	160	-17	4.745	475	-217	-80	0.47	-0.82
7Y	30Y	-1	1.37	-100	47	-0.35	-0.90	349	-418	-69	1.276	-128	59	-88	1.32	0.13
5Y	20Y	-1	1.32	-100	43	-0.26	-0.73	263	-313	-50	1.959	-196	84	-98	1.15	0.30
2Y	20Y	1	-1.20	100	-16	-0.12	-0.73	-124	120	-4	23.874	2387	-392	-103	-0.18	-0.72
3Y	5Y	1	-0.95	100	-59	-0.18	-0.26	-177	156	-21	4.927	493	-292	-104	0.57	-0.85
20Y	30Y	-1	1.08	-100	84	-0.73	-0.90	731	-756	-25	4.402	-440	370	-108	0.25	-0.02
7Y	20Y	-1	1.26	-100	55	-0.35	-0.73	349	-405	-55	2.012	-201	111	-111	1.00	0.20
10Y	30Y	-1	1.30	-100	60	-0.46	-0.90	463	-539	-76	1.592	-159	96	-121	1.19	-0.10
5Y	10Y	-1	1.10	-100	60	-0.26	-0.46	263	-278	-15	8.312	-831	499	-124	0.18	0.55
3Y	10Y	1	-1.05	100	-36	-0.18	-0.46	-177	165	-12	11.312	1131	-402	-139	0.40	-0.77
10Y	20Y	-1	1.20	-100	71	-0.46	-0.73	463	-521	-58	2.813	-281	201	-165	0.88	-0.17

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
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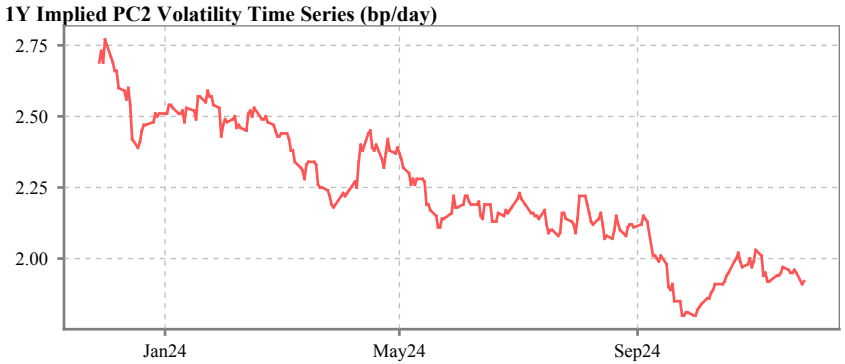
Long PC2 trades (expiry 1Y)

1Y Implied Principal Components

	2Y	3Y	5Y	7Y	10Y	20Y	30Y
PC1	6.78	6.80	6.80	6.55	6.27	5.58	5.25
PC2	2.63	1.65	0.45	-0.44	-1.28	-2.09	-2.45



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	20Y	-1	1.24	-100	25	-0.11	-0.41	108	-103	5	3.357	-336	84	16	0.28	0.58
2Y	30Y	-1	1.34	-100	14	-0.07	-0.54	74	-76	-2	4.241	-424	60	-8	0.52	0.54
2Y	3Y	1	-0.98	100	-66	-0.07	-0.11	-74	72	-3	3.072	307	-204	-9	0.28	-1.06
3Y	30Y	-1	1.37	-100	21	-0.11	-0.54	108	-115	-7	1.742	-174	37	-12	0.82	0.42
2Y	7Y	1	-0.98	100	-31	-0.07	-0.21	-74	64	-10	1.932	193	-59	-20	0.75	-0.99
7Y	10Y	-1	1.05	-100	78	-0.21	-0.27	210	-213	-3	7.464	-746	580	-21	0.09	0.50
2Y	5Y	1	-0.94	100	-39	-0.07	-0.16	-74	63	-12	1.930	193	-76	-22	0.88	-1.06
2Y	10Y	1	-1.03	100	-24	-0.07	-0.27	-74	65	-9	2.588	259	-61	-24	0.67	-0.90
7Y	20Y	-1	1.24	-100	54	-0.21	-0.41	210	-224	-13	2.026	-203	110	-27	0.77	0.13
5Y	20Y	-1	1.30	-100	42	-0.16	-0.41	159	-173	-14	1.933	-193	82	-27	0.94	0.23
10Y	20Y	-1	1.18	-100	70	-0.27	-0.41	274	-288	-14	2.925	-293	205	-40	0.65	-0.18
5Y	10Y	-1	1.10	-100	60	-0.16	-0.27	159	-165	-6	7.101	-710	427	-40	0.23	0.50
5Y	30Y	-1	1.43	-100	36	-0.16	-0.54	159	-193	-34	1.241	-124	45	-42	1.50	0.11
7Y	30Y	-1	1.36	-100	46	-0.21	-0.54	210	-249	-39	1.300	-130	60	-51	1.30	0.03
3Y	7Y	1	-1.00	100	-46	-0.11	-0.21	-108	97	-11	5.089	509	-235	-56	0.49	-0.95
3Y	5Y	1	-0.96	100	-59	-0.11	-0.16	-108	95	-13	5.076	508	-302	-66	0.62	-1.06
10Y	30Y	-1	1.30	-100	60	-0.27	-0.54	274	-321	-47	1.655	-166	99	-77	1.15	-0.16
3Y	10Y	1	-1.05	100	-36	-0.11	-0.27	-108	98	-10	16.056	1606	-575	-156	0.40	-0.83
2Y	20Y	1	-1.22	100	-17	-0.07	-0.41	-74	68	-6	29.117	2912	-485	-178	0.00	-0.69
20Y	30Y	-1	1.10	-100	85	-0.41	-0.54	410	-457	-47	4.498	-450	384	-213	0.43	-0.13
5Y	7Y	-1	1.05	-100	78	-0.16	-0.21	159	-163	-3	1852.122	-185212	143608	-6400	0.14	0.48

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
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†Adjusted notional is calculated as notional times multiplier; similar for adjusted carry
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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 / 30Y	1.00	-0.90	1.83	3Y / 10Y	-1.00	1.73	3.98	-0.80	5.15	71	-0.13	0.07	-0.86	5.40	66	-0.14	0.06	0.02	68
2Y / 7Y	-0.02	1.00	6.49	2Y / 10Y	-0.25	1.00	4.66	0.89	2.42	73	-0.09	0.07	0.93	2.24	62	-0.11	0.07	0.03	68
3Y / 30Y	1.00	-0.38	4.86	5Y / 30Y	1.00	-0.04	6.64	0.70	0.35	47	-0.12	0.10	0.88	-0.88	63	-0.09	0.06	0.05	55
3Y / 20Y	1.00	-0.55	3.73	5Y / 30Y	1.00	-0.04	6.64	0.54	0.28	31	-0.13	0.10	0.74	-1.10	51	-0.09	0.07	0.06	41
3Y / 20Y	1.00	-0.55	3.73	5Y / 20Y	1.00	-0.05	6.53	0.55	0.25	32	-0.13	0.10	0.76	-1.12	52	-0.09	0.07	0.06	42
2Y / 20Y	-1.00	1.30	0.81	3Y / 10Y	-1.00	1.73	3.98	1.00	-3.25	91	0.08	0.04	1.02	-3.36	87	0.09	0.04	0.01	89
3Y / 30Y	1.00	-0.38	4.86	5Y / 20Y	1.00	-0.05	6.53	0.71	0.33	48	-0.12	0.10	0.89	-0.89	64	-0.08	0.06	0.05	56
3Y / 30Y	1.00	-0.38	4.86	5Y / 10Y	1.00	-0.17	5.79	0.84	0.10	53	-0.12	0.10	1.01	-0.93	68	-0.08	0.06	0.05	61
3Y / 20Y	1.00	-0.55	3.73	5Y / 10Y	1.00	-0.17	5.79	0.67	-0.02	37	-0.12	0.11	0.87	-1.21	57	-0.08	0.07	0.06	47
2Y / 3Y	-0.42	1.00	4.08	5Y / 7Y	-1.00	1.67	4.29	0.64	1.43	52	-0.08	0.08	0.81	0.70	53	-0.08	0.07	0.06	52
5Y / 30Y	1.00	-0.04	6.64	10Y / 20Y	1.00	-0.32	4.46	1.27	1.02	81	-0.05	0.08	1.42	0.35	76	-0.07	0.07	0.06	78
5Y / 20Y	1.00	-0.05	6.53	10Y / 20Y	1.00	-0.32	4.46	1.25	1.01	80	-0.05	0.08	1.40	0.35	76	-0.07	0.07	0.06	78
5Y / 10Y	1.00	-0.17	5.79	10Y / 20Y	1.00	-0.32	4.46	1.08	1.01	75	-0.05	0.08	1.23	0.35	71	-0.07	0.07	0.06	73
2Y / 10Y	-0.25	1.00	4.66	3Y / 10Y	-1.00	1.73	3.98	0.61	2.30	86	-0.07	0.03	0.55	2.54	75	-0.07	0.03	0.02	80
2Y / 3Y	-0.42	1.00	4.08	20Y / 30Y	1.00	-0.69	2.03	1.59	0.93	62	-0.08	0.16	1.88	0.33	58	-0.07	0.14	0.12	60
2Y / 3Y	-0.42	1.00	4.08	10Y / 30Y	1.00	-0.22	5.11	0.59	1.12	58	-0.08	0.07	0.72	0.47	56	-0.07	0.06	0.05	57
2Y / 3Y	-0.42	1.00	4.08	10Y / 20Y	1.00	-0.32	4.46	0.67	1.15	57	-0.08	0.07	0.82	0.49	55	-0.07	0.07	0.06	56
5Y / 30Y	1.00	-0.04	6.64	20Y / 30Y	1.00	-0.69	2.03	2.96	0.69	84	-0.05	0.17	3.24	0.13	79	-0.06	0.15	0.12	81
5Y / 30Y	1.00	-0.04	6.64	10Y / 30Y	1.00	-0.22	5.11	1.12	0.97	81	-0.05	0.07	1.25	0.32	77	-0.06	0.06	0.05	79
5Y / 20Y	1.00	-0.05	6.53	20Y / 30Y	1.00	-0.69	2.03	2.90	0.69	83	-0.05	0.17	3.18	0.13	78	-0.06	0.15	0.12	81
5Y / 20Y	1.00	-0.05	6.53	10Y / 30Y	1.00	-0.22	5.11	1.10	0.97	80	-0.05	0.07	1.23	0.32	76	-0.06	0.06	0.05	78
5Y / 10Y	1.00	-0.17	5.79	20Y / 30Y	1.00	-0.69	2.03	2.52	0.72	79	-0.05	0.17	2.81	0.14	74	-0.06	0.15	0.12	76
5Y / 10Y	1.00	-0.17	5.79	10Y / 30Y	1.00	-0.22	5.11	0.95	0.97	75	-0.05	0.07	1.08	0.32	71	-0.06	0.06	0.05	73
3Y / 5Y	-0.10	1.00	6.17	5Y / 7Y	-1.00	1.67	4.29	1.19	1.09	81	-0.03	0.07	1.32	0.56	77	-0.06	0.06	0.05	79
2Y / 10Y	-0.25	1.00	4.66	20Y / 30Y	1.00	-0.69	2.03	2.84	-1.16	86	0.06	0.15	2.53	-0.52	80	0.06	0.11	0.12	83
2Y / 10Y	-0.25	1.00	4.66	10Y / 30Y	1.00	-0.22	5.11	1.11	-1.07	88	0.06	0.05	1.01	-0.55	83	0.06	0.04	0.04	86
2Y / 10Y	-0.25	1.00	4.66	10Y / 20Y	1.00	-0.32	4.46	1.27	-1.05	89	0.06	0.06	1.16	-0.55	84	0.06	0.05	0.04	86
2Y / 10Y	-0.25	1.00	4.66	7Y / 30Y	1.00	-0.02	6.54	0.81	-0.68	70	0.08	0.07	0.64	0.42	59	0.06	0.05	0.05	64
2Y / 10Y	-0.25	1.00	4.66	7Y / 20Y	1.00	-0.03	6.47	0.81	-0.67	70	0.08	0.07	0.64	0.44	58	0.06	0.05	0.05	64
2Y / 10Y	-0.25	1.00	4.66	7Y / 10Y	1.00	-0.10	6.03	0.86	-0.61	68	0.08	0.08	0.67	0.54	56	0.06	0.05	0.06	62

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.

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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 (%)
3Y / 30Y	1.00	-0.37	5.02	7Y / 30Y	1.00	-0.03	6.52	0.53	1.62	51	-0.03	0.07	0.66	0.80	51	-0.08	0.06	0.04	51
3Y / 30Y	1.00	-0.37	5.02	7Y / 20Y	1.00	-0.04	6.44	0.53	1.62	51	-0.03	0.07	0.67	0.80	51	-0.08	0.06	0.04	51
3Y / 30Y	1.00	-0.37	5.02	7Y / 10Y	1.00	-0.11	5.95	0.58	1.59	52	-0.03	0.07	0.73	0.76	52	-0.08	0.06	0.04	52
3Y / 20Y	1.00	-0.52	4.07	5Y / 30Y	1.00	-0.03	6.69	0.43	1.23	46	-0.03	0.06	0.57	0.34	53	-0.08	0.05	0.04	50
3Y / 20Y	1.00	-0.52	4.07	5Y / 20Y	1.00	-0.04	6.62	0.43	1.23	47	-0.03	0.06	0.58	0.34	53	-0.08	0.05	0.04	50
3Y / 20Y	1.00	-0.52	4.07	5Y / 10Y	1.00	-0.12	6.11	0.48	1.19	49	-0.03	0.06	0.63	0.30	55	-0.08	0.05	0.04	52
3Y / 30Y	1.00	-0.37	5.02	5Y / 30Y	1.00	-0.03	6.69	0.56	1.33	62	-0.03	0.06	0.69	0.46	65	-0.07	0.05	0.04	63
3Y / 30Y	1.00	-0.37	5.02	5Y / 20Y	1.00	-0.04	6.62	0.56	1.33	62	-0.03	0.06	0.70	0.46	65	-0.07	0.05	0.04	64
3Y / 30Y	1.00	-0.37	5.02	5Y / 10Y	1.00	-0.12	6.11	0.61	1.29	64	-0.03	0.06	0.76	0.43	67	-0.07	0.05	0.04	65
2Y / 5Y	-0.03	1.00	6.63	2Y / 10Y	-0.27	1.00	4.48	1.09	1.75	77	-0.01	0.08	1.03	2.09	62	-0.07	0.07	0.02	69
3Y / 5Y	-0.08	1.00	6.30	3Y / 30Y	1.00	-0.37	5.02	1.03	1.06	58	0.05	0.11	0.86	1.94	61	0.06	0.06	0.03	60
2Y / 10Y	-0.27	1.00	4.48	5Y / 30Y	1.00	-0.03	6.69	0.69	-0.17	74	0.02	0.05	0.58	0.52	59	0.06	0.04	0.04	67
2Y / 10Y	-0.27	1.00	4.48	5Y / 20Y	1.00	-0.04	6.62	0.70	-0.16	74	0.02	0.05	0.59	0.54	59	0.06	0.04	0.04	67
2Y / 10Y	-0.27	1.00	4.48	5Y / 10Y	1.00	-0.12	6.11	0.74	-0.07	72	0.03	0.06	0.61	0.67	56	0.06	0.05	0.04	64
2Y / 10Y	-0.27	1.00	4.48	3Y / 5Y	-0.08	1.00	6.30	0.74	-0.18	77	0.02	0.05	0.64	0.43	63	0.06	0.04	0.04	70
2Y / 7Y	-0.03	1.00	6.46	2Y / 10Y	-0.27	1.00	4.48	1.11	1.49	86	-0.01	0.06	1.07	1.72	77	-0.06	0.05	0.01	81
2Y / 5Y	-0.03	1.00	6.63	3Y / 30Y	1.00	-0.37	5.02	1.09	1.11	59	0.05	0.12	0.91	2.02	62	0.06	0.06	0.04	61
2Y / 30Y	1.00	-0.93	1.87	5Y / 7Y	1.00	-1.01	0.08	5.53	1.43	76	-0.02	0.41	5.21	1.48	74	-0.05	0.28	0.33	75
2Y / 20Y	-1.00	1.30	0.50	5Y / 7Y	1.00	-1.01	0.08	-5.33	0.91	53	0.05	0.65	-4.98	0.88	64	0.05	0.34	0.31	58
2Y / 10Y	-0.27	1.00	4.48	7Y / 30Y	1.00	-0.03	6.52	0.77	-0.56	84	0.02	0.04	0.70	-0.15	74	0.05	0.04	0.03	79
2Y / 10Y	-0.27	1.00	4.48	7Y / 20Y	1.00	-0.04	6.44	0.78	-0.55	84	0.02	0.04	0.71	-0.14	74	0.05	0.04	0.03	79
2Y / 10Y	-0.27	1.00	4.48	7Y / 10Y	1.00	-0.11	5.95	0.84	-0.52	83	0.02	0.05	0.76	-0.08	72	0.05	0.04	0.03	78
2Y / 10Y	-0.27	1.00	4.48	3Y / 7Y	-0.08	1.00	6.13	0.82	-0.54	87	0.02	0.04	0.76	-0.22	78	0.05	0.04	0.02	83
2Y / 3Y	-0.40	1.00	4.27	20Y / 30Y	1.00	-0.71	1.83	2.07	0.51	84	-0.03	0.12	2.03	0.61	75	-0.05	0.11	0.10	79
2Y / 3Y	-0.40	1.00	4.27	10Y / 30Y	1.00	-0.25	4.99	0.71	0.74	81	-0.03	0.05	0.72	0.72	72	-0.05	0.04	0.03	76
2Y / 3Y	-0.40	1.00	4.27	10Y / 20Y	1.00	-0.35	4.35	0.81	0.77	80	-0.03	0.05	0.82	0.74	72	-0.05	0.05	0.03	76
5Y / 30Y	1.00	-0.03	6.69	20Y / 30Y	1.00	-0.71	1.83	3.85	-0.33	94	-0.03	0.12	3.64	0.06	87	-0.04	0.13	0.15	91
5Y / 30Y	1.00	-0.03	6.69	10Y / 30Y	1.00	-0.25	4.99	1.34	0.04	92	-0.02	0.05	1.31	0.18	86	-0.04	0.05	0.04	89
5Y / 30Y	1.00	-0.03	6.69	10Y / 20Y	1.00	-0.35	4.35	1.52	0.09	92	-0.02	0.06	1.50	0.21	86	-0.04	0.06	0.04	89
5Y / 20Y	1.00	-0.04	6.62	20Y / 30Y	1.00	-0.71	1.83	3.81	-0.33	94	-0.03	0.12	3.60	0.06	87	-0.04	0.13	0.15	91

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.

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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	1.30	0.48	7Y / 30Y	-1.00	1.37	1.32	1.92	-2.32	88	0.26	0.09	1.31	-1.41	54	0.17	0.11	0.21	71
2Y / 20Y	1.00	-1.20	-0.18	7Y / 20Y	-1.00	1.26	1.00	-2.33	2.41	86	-0.25	0.12	-1.71	1.70	51	-0.16	0.15	0.19	69
2Y / 30Y	-1.00	1.30	0.48	7Y / 20Y	-1.00	1.26	1.00	2.69	-2.45	91	0.23	0.11	2.14	-1.81	67	0.15	0.14	0.17	79
2Y / 30Y	-1.00	1.30	0.48	5Y / 30Y	-1.00	1.43	1.48	1.52	-1.99	91	0.23	0.06	1.18	-1.40	66	0.14	0.08	0.11	79
2Y / 20Y	1.00	-1.20	-0.18	5Y / 20Y	-1.00	1.32	1.15	-1.71	2.00	90	-0.22	0.07	-1.42	1.58	64	-0.13	0.10	0.08	77
3Y / 30Y	-1.00	1.36	0.84	7Y / 30Y	-1.00	1.37	1.32	1.72	-1.61	92	0.18	0.06	1.29	-0.98	69	0.12	0.08	0.15	81
2Y / 30Y	-1.00	1.30	0.48	5Y / 20Y	-1.00	1.32	1.15	1.96	-1.97	93	0.20	0.07	1.70	-1.59	77	0.12	0.08	0.07	85
3Y / 20Y	-1.00	1.25	0.53	7Y / 20Y	-1.00	1.26	1.00	2.03	-1.68	91	0.17	0.08	1.60	-1.19	65	0.11	0.11	0.14	78
3Y / 20Y	-1.00	1.25	0.53	5Y / 30Y	-1.00	1.43	1.48	1.14	-1.33	92	0.17	0.04	0.88	-0.88	64	0.11	0.06	0.09	78
3Y / 30Y	-1.00	1.36	0.84	7Y / 20Y	-1.00	1.26	1.00	2.41	-1.73	94	0.16	0.08	2.05	-1.32	81	0.10	0.09	0.11	88
3Y / 30Y	-1.00	1.36	0.84	5Y / 30Y	-1.00	1.43	1.48	1.36	-1.31	95	0.15	0.04	1.13	-0.92	80	0.09	0.05	0.07	88
3Y / 20Y	-1.00	1.25	0.53	5Y / 20Y	-1.00	1.32	1.15	1.48	-1.32	94	0.14	0.05	1.29	-1.04	77	0.09	0.06	0.05	85
2Y / 10Y	1.00	-1.00	0.70	5Y / 7Y	1.00	-1.04	-0.10	5.56	1.43	90	-0.17	0.24	5.29	1.32	74	-0.09	0.28	0.16	82
2Y / 10Y	1.00	-1.00	0.70	3Y / 30Y	-1.00	1.36	0.84	-0.83	1.55	92	-0.15	0.03	-0.83	1.49	68	-0.09	0.05	0.03	80
2Y / 7Y	1.00	-0.95	0.77	5Y / 7Y	1.00	-1.04	-0.10	4.17	1.36	84	-0.17	0.24	3.88	1.25	61	-0.09	0.28	0.16	72
2Y / 10Y	1.00	-1.00	0.70	7Y / 10Y	-1.00	1.05	0.07	-3.81	1.15	90	-0.16	0.16	-3.60	1.05	75	-0.08	0.19	0.11	83
2Y / 10Y	1.00	-1.00	0.70	5Y / 10Y	-1.00	1.10	0.18	-2.20	1.26	90	-0.17	0.09	-2.09	1.16	75	-0.08	0.11	0.06	83
2Y / 7Y	1.00	-0.95	0.77	7Y / 10Y	-1.00	1.05	0.07	-2.86	1.15	84	-0.16	0.16	-2.65	1.05	62	-0.08	0.19	0.11	73
2Y / 7Y	1.00	-0.95	0.77	5Y / 10Y	-1.00	1.10	0.18	-1.65	1.23	84	-0.17	0.09	-1.54	1.13	62	-0.08	0.11	0.06	73
2Y / 7Y	1.00	-0.95	0.77	3Y / 30Y	-1.00	1.36	0.84	-0.63	1.46	88	-0.15	0.03	-0.62	1.38	59	-0.08	0.05	0.02	73
5Y / 30Y	-1.00	1.43	1.48	10Y / 20Y	-1.00	1.20	0.88	3.21	-1.45	85	0.09	0.17	2.41	-0.73	73	0.07	0.13	0.28	79
3Y / 30Y	-1.00	1.36	0.84	5Y / 20Y	-1.00	1.32	1.15	1.75	-1.28	96	0.12	0.04	1.58	-1.05	89	0.07	0.05	0.04	93
5Y / 30Y	-1.00	1.43	1.48	10Y / 30Y	-1.00	1.30	1.19	1.91	-0.87	90	0.08	0.08	1.40	-0.24	76	0.06	0.07	0.19	83
5Y / 20Y	-1.00	1.32	1.15	10Y / 30Y	-1.00	1.30	1.19	1.45	-0.66	85	0.08	0.08	0.92	0.00	59	0.06	0.07	0.19	72
5Y / 20Y	-1.00	1.32	1.15	10Y / 20Y	-1.00	1.20	0.88	2.43	-1.09	80	0.08	0.16	1.59	-0.32	56	0.06	0.13	0.29	68
3Y / 10Y	1.00	-1.05	0.40	5Y / 10Y	-1.00	1.10	0.18	-1.81	0.83	93	-0.11	0.06	-1.73	0.76	82	-0.06	0.07	0.04	88
3Y / 10Y	1.00	-1.05	0.40	5Y / 7Y	1.00	-1.04	-0.10	4.57	0.97	93	-0.11	0.16	4.39	0.90	82	-0.06	0.19	0.10	88
3Y / 10Y	1.00	-1.05	0.40	3Y / 30Y	-1.00	1.36	0.84	-0.67	1.06	94	-0.10	0.02	-0.68	1.03	74	-0.06	0.04	0.02	84
3Y / 7Y	1.00	-0.99	0.47	5Y / 10Y	-1.00	1.10	0.18	-1.23	0.80	87	-0.11	0.06	-1.16	0.73	68	-0.06	0.07	0.04	77
3Y / 7Y	1.00	-0.99	0.47	5Y / 7Y	1.00	-1.04	-0.10	3.11	0.90	87	-0.11	0.16	2.92	0.82	67	-0.06	0.19	0.11	77

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.

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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	1.34	0.52	10Y / 30Y	-1.00	1.30	1.15	2.33	-2.32	74	0.15	0.18	1.63	-1.51	62	0.15	0.12	0.26	68
2Y / 30Y	-1.00	1.34	0.52	10Y / 20Y	-1.00	1.18	0.65	4.53	-2.57	71	0.16	0.37	3.08	-1.62	60	0.15	0.23	0.53	65
2Y / 30Y	-1.00	1.34	0.52	20Y / 30Y	-1.00	1.10	0.43	5.65	-2.04	76	0.14	0.41	4.08	-1.37	64	0.14	0.28	0.61	70
2Y / 20Y	1.00	-1.22	0.00	7Y / 30Y	-1.00	1.36	1.30	-1.48	2.06	81	-0.13	0.09	-1.09	1.55	67	-0.12	0.07	0.17	74
2Y / 10Y	1.00	-1.03	0.67	7Y / 20Y	-1.00	1.24	0.77	-1.84	2.21	74	-0.13	0.14	-1.26	1.76	51	-0.12	0.11	0.26	63
3Y / 30Y	-1.00	1.37	0.82	20Y / 30Y	-1.00	1.10	0.43	5.02	-1.44	80	0.10	0.33	3.88	-0.95	71	0.11	0.22	0.46	75
3Y / 30Y	-1.00	1.37	0.82	10Y / 30Y	-1.00	1.30	1.15	2.07	-1.69	78	0.11	0.14	1.55	-1.09	69	0.11	0.09	0.20	73
3Y / 30Y	-1.00	1.37	0.82	10Y / 20Y	-1.00	1.18	0.65	4.03	-1.92	75	0.12	0.30	2.94	-1.20	67	0.11	0.19	0.42	71
3Y / 20Y	-1.00	1.24	0.28	20Y / 30Y	-1.00	1.10	0.43	3.78	-1.44	69	0.10	0.33	2.63	-0.95	53	0.11	0.22	0.46	61
3Y / 20Y	-1.00	1.24	0.28	10Y / 30Y	-1.00	1.30	1.15	1.55	-1.62	67	0.11	0.14	1.05	-1.04	51	0.11	0.09	0.20	59
2Y / 30Y	-1.00	1.34	0.52	7Y / 30Y	-1.00	1.36	1.30	1.84	-1.99	88	0.12	0.09	1.47	-1.50	81	0.11	0.06	0.16	85
2Y / 20Y	1.00	-1.22	0.00	7Y / 20Y	-1.00	1.24	0.77	-2.36	1.93	85	-0.11	0.13	-1.86	1.54	76	-0.11	0.09	0.22	81
2Y / 20Y	1.00	-1.22	0.00	5Y / 30Y	-1.00	1.43	1.50	-1.22	1.94	85	-0.12	0.07	-0.96	1.55	75	-0.11	0.05	0.12	80
2Y / 10Y	1.00	-1.03	0.67	5Y / 20Y	-1.00	1.30	0.94	-1.36	2.07	78	-0.12	0.09	-1.04	1.76	62	-0.11	0.07	0.16	70
2Y / 30Y	-1.00	1.34	0.52	5Y / 30Y	-1.00	1.43	1.50	1.49	-1.82	90	0.10	0.06	1.26	-1.46	87	0.10	0.04	0.10	89
2Y / 7Y	1.00	-0.98	0.75	5Y / 20Y	-1.00	1.30	0.94	-1.01	1.81	69	-0.10	0.09	-0.72	1.53	51	-0.10	0.06	0.13	60
3Y / 20Y	-1.00	1.24	0.28	7Y / 30Y	-1.00	1.36	1.30	1.27	-1.46	85	0.09	0.07	0.99	-1.10	75	0.09	0.05	0.12	80
3Y / 10Y	1.00	-1.05	0.40	7Y / 20Y	-1.00	1.24	0.77	-1.49	1.64	78	-0.09	0.10	-1.07	1.31	56	-0.09	0.09	0.20	67
3Y / 10Y	1.00	-1.05	0.40	5Y / 30Y	-1.00	1.43	1.50	-0.76	1.63	76	-0.09	0.06	-0.54	1.31	53	-0.09	0.05	0.10	64
2Y / 30Y	-1.00	1.34	0.52	7Y / 20Y	-1.00	1.24	0.77	2.88	-1.80	90	0.10	0.12	2.41	-1.43	87	0.09	0.08	0.19	89
2Y / 20Y	1.00	-1.22	0.00	5Y / 20Y	-1.00	1.30	0.94	-1.72	1.71	86	-0.10	0.09	-1.44	1.45	83	-0.09	0.06	0.12	84
3Y / 30Y	-1.00	1.37	0.82	7Y / 30Y	-1.00	1.36	1.30	1.63	-1.39	92	0.08	0.06	1.37	-1.05	88	0.08	0.05	0.11	90
3Y / 20Y	-1.00	1.24	0.28	5Y / 30Y	-1.00	1.43	1.50	1.04	-1.36	90	0.08	0.05	0.87	-1.09	83	0.08	0.04	0.08	86
3Y / 10Y	1.00	-1.05	0.40	5Y / 20Y	-1.00	1.30	0.94	-1.11	1.53	83	-0.08	0.07	-0.88	1.31	67	-0.08	0.06	0.12	75
2Y / 10Y	1.00	-1.03	0.67	3Y / 30Y	-1.00	1.37	0.82	-0.76	1.37	89	-0.08	0.03	-0.65	1.28	73	-0.08	0.04	0.06	81
2Y / 7Y	1.00	-0.98	0.75	3Y / 30Y	-1.00	1.37	0.82	-0.60	1.32	85	-0.08	0.03	-0.48	1.22	67	-0.08	0.03	0.06	76
3Y / 20Y	-1.00	1.24	0.28	7Y / 20Y	-1.00	1.24	0.77	2.02	-1.35	90	0.08	0.09	1.67	-1.08	84	0.07	0.07	0.16	87
3Y / 7Y	1.00	-1.00	0.49	5Y / 20Y	-1.00	1.30	0.94	-0.75	1.27	73	-0.07	0.06	-0.55	1.08	56	-0.07	0.04	0.09	65
2Y / 30Y	-1.00	1.34	0.52	5Y / 20Y	-1.00	1.30	0.94	2.07	-1.51	89	0.08	0.09	1.82	-1.27	89	0.07	0.06	0.10	89
2Y / 30Y	-1.00	1.34	0.52	3Y / 7Y	1.00	-1.00	0.49	-2.39	1.79	92	-0.10	0.09	-2.31	1.72	78	-0.07	0.11	0.08	85

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.

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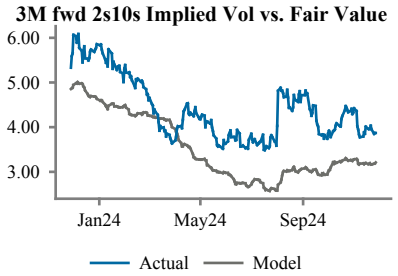
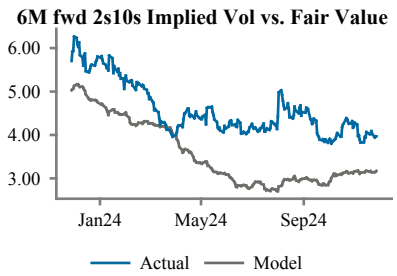
YCSO Vol Relative Value Report

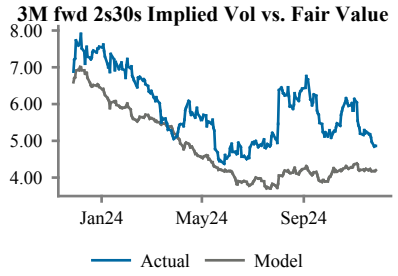
Curve	Curve-yield beta	Std. Err.	Actual YCSO Vol	Fair Value	Residual	Rsq	Curve-yield beta stddev
3M fwd 2s5s	-0.16	3.90	2.36	2.08	0.28	34 %	0.05
3M fwd 2s10s	-0.29	5.68	3.87	3.21	0.66	43 %	0.04
3M fwd 2s30s	-0.42	6.83	4.86	4.20	0.66	53 %	0.03
3M fwd 5s10s	-0.12	2.14	1.67	1.27	0.40	49 %	0.00
3M fwd 5s30s	-0.26	3.83	3.46	2.45	1.01	57 %	0.02
3M fwd 10s30s	-0.13	1.92	1.99	1.26	0.73	59 %	0.02
6M fwd 2s5s	-0.18	3.61	2.52	2.04	0.48	42 %	0.03
6M fwd 2s10s	-0.29	5.33	3.97	3.17	0.80	48 %	0.03
6M fwd 2s30s	-0.42	6.52	5.19	4.20	1.00	57 %	0.02
6M fwd 5s10s	-0.12	2.04	1.88	1.24	0.64	51 %	0.00
6M fwd 5s30s	-0.25	3.69	3.67	2.42	1.26	58 %	0.02
6M fwd 10s30s	-0.13	1.86	2.10	1.24	0.85	60 %	0.02
9M fwd 2s5s	-0.17	3.35	2.58	1.94	0.64	44 %	0.02
9M fwd 2s10s	-0.28	5.03	4.09	3.04	1.05	49 %	0.02
9M fwd 2s30s	-0.41	6.25	5.26	4.07	1.19	56 %	0.01
9M fwd 5s10s	-0.11	1.94	1.95	1.19	0.75	50 %	0.00
9M fwd 5s30s	-0.24	3.55	3.66	2.35	1.31	58 %	0.02
9M fwd 10s30s	-0.13	1.79	2.13	1.22	0.91	60 %	0.01
1Y fwd 2s5s	-0.16	3.10	2.62	1.79	0.82	41 %	0.01
1Y fwd 2s10s	-0.26	4.71	4.12	2.84	1.28	46 %	0.01
1Y fwd 2s30s	-0.38	5.95	5.31	3.86	1.45	54 %	0.01
1Y fwd 5s10s	-0.11	1.84	1.96	1.13	0.84	48 %	0.00
1Y fwd 5s30s	-0.23	3.42	3.64	2.26	1.38	56 %	0.02
1Y fwd 10s30s	-0.12	1.74	2.14	1.18	0.96	58 %	0.01

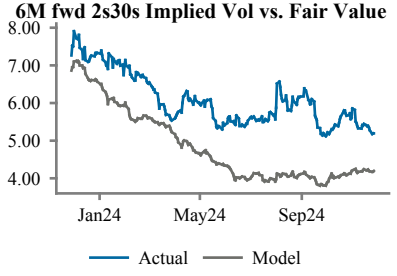
Front end bp vol (bp/day)

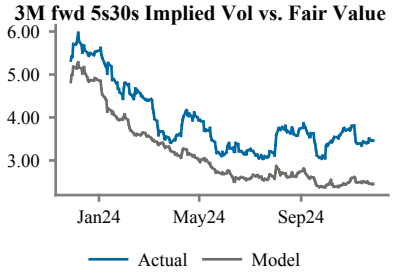
	2024-11-27
3Mx2Y bpvol	6.84
6Mx2Y bpvol	7.12
9Mx2Y bpvol	7.24
1Yx2Y bpvol	7.30

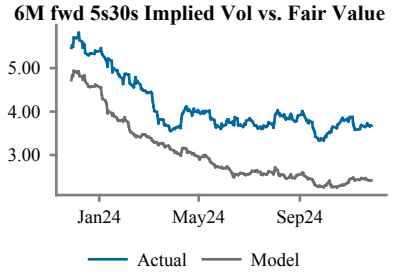


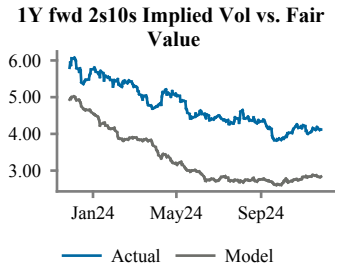


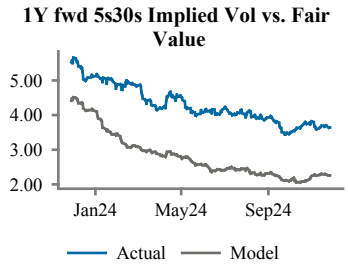


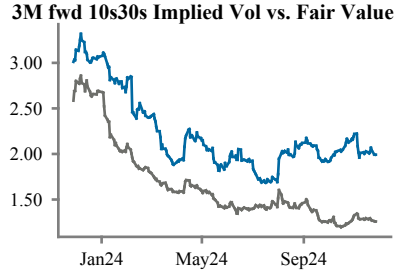


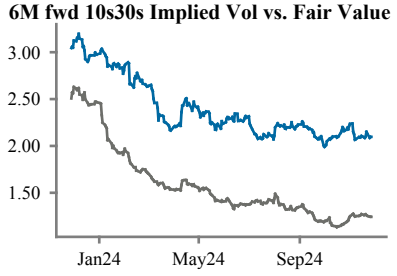












* Curve-yield beta is defined as the beta of weekly changes of curve against weekly changes in the front end yield (we use 2Y swap rates) for a 6M regression period. For example, for a 6M fwd 2s/10s structure, we would regress weekly changes of the 6M fwd 2s10s curve against weekly changes in 6Mx2Y swap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

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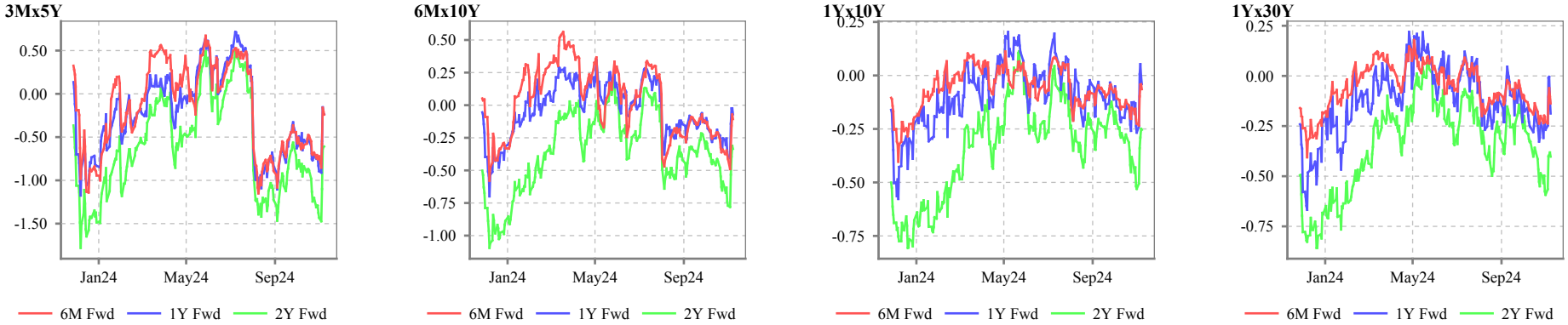
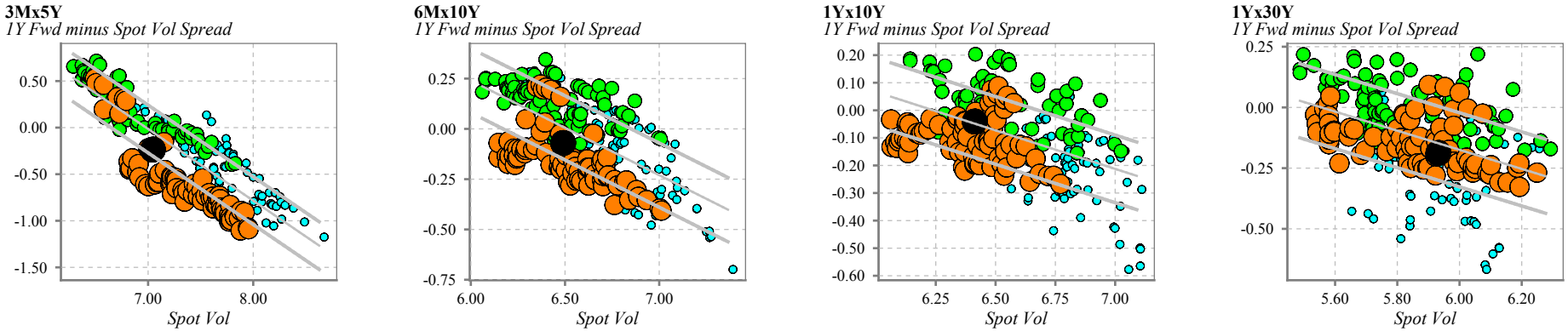
Long Dated Forward Volatility Report

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
6Mx5Yx5Y	5Yx5Y	0.86	0.0	0.7	0.0
6Mx5Yx10Y	5Yx10Y	0.90	0.0	0.5	0.0
1Yx5Yx5Y	5Yx5Y	0.79	0.0	1.1	0.0
1Yx5Yx30Y	5Yx30Y	0.98	0.0	-0.1	0.0
6Mx1Yx10Y	1Yx10Y	0.82	0.0	1.1	0.0
1Yx1Yx10Y	1Yx10Y	0.71	0.0	1.8	0.0
6Mx6Mx10Y	6Mx10Y	0.68	0.0	2.1	0.0
1Yx6Mx10Y	6Mx10Y	0.62	0.0	2.4	0.0

*Beta Weighted, vols are in dbp

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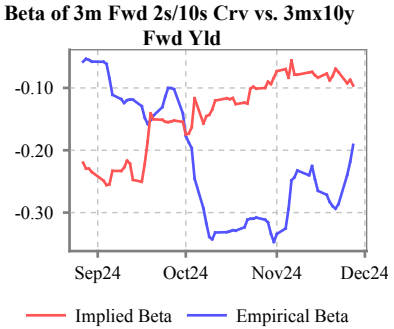
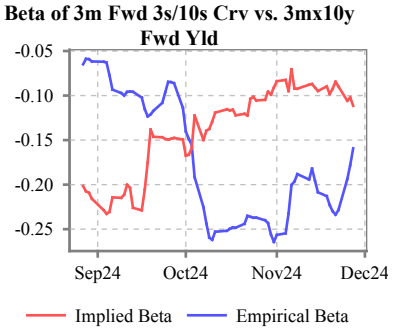
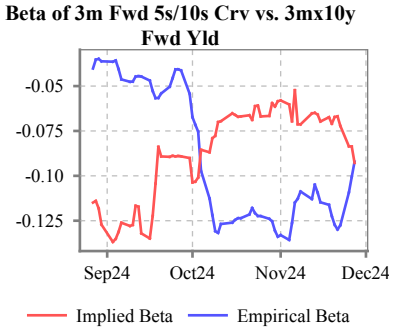
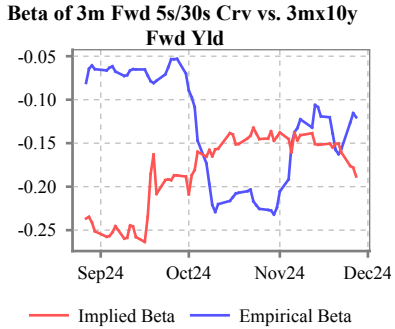
Derivatives Strategy

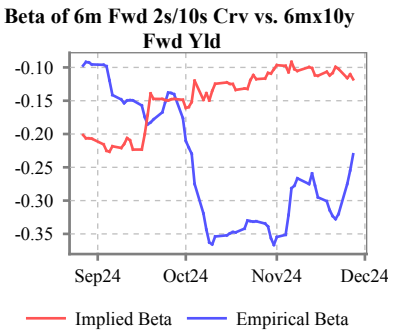
Synthetic Conditional Curve Trade Report

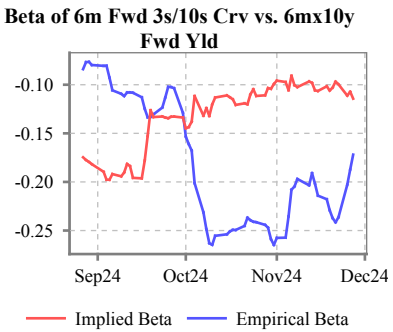


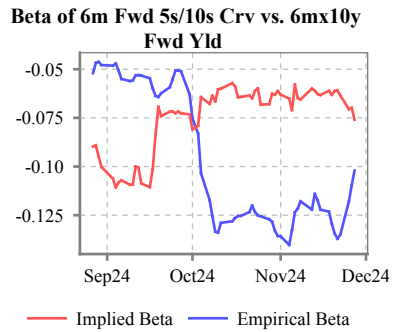


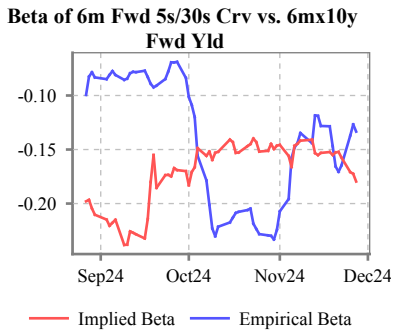












Desired Trade									Replacement for Left Leg							Net Premium	
Expiry	Left	Right	Type	Bpvol(L)	Bpvol (R)	Left Notl	Right Notl	Net Premium	Expiry	YCSO	Imp Vol	Beta (Left)	Notional	Type	Premium	Modified trade	Fwd Sprd Eq (bp)
3m	2y	5Y	REC	6.84	6.82	-100	44.6	$22291	3m	10s/30s	2.0	-0.13	-1470	Cap	5.1	$(323851)	-16.4
3m	2y	7Y	REC	6.84	6.58	-100	32.4	$-1063	3m	10s/30s	2.0	-0.13	-1470	Cap	5.1	$(347204)	-17.6
3m	2y	10Y	REC	6.84	6.24	-100	23.9	$-21568	3m	10s/30s	2.0	-0.13	-1470	Cap	5.1	$(367710)	-18.6
3m	2y	30Y	REC	6.84	5.74	-100	11.0	$-52520	3m	10s/30s	2.0	-0.13	-1470	Cap	5.1	$(398661)	-20.2
3m	3y	10Y	REC	6.94	6.24	-100	35.2	$-39832	3m	10s/30s	2.0	-0.14	-2104	Cap	5.1	$(509517)	-17.5
3m	5y	10Y	REC	6.82	6.24	-100	53.5	$-98281	3m	10s/30s	2.0	-0.14	-3172	Cap	5.1	$(761905)	-17.2
3m	5y	30Y	REC	6.82	5.74	-100	24.6	$-167639	3m	10s/30s	2.0	-0.14	-3172	Cap	5.1	$(831264)	-18.8
6m	2y	5Y	REC	7.12	6.85	-100	44.6	$11963	6m	10s/30s	2.1	-0.13	-1520	Cap	8.1	$(625765)	-31.6
6m	2y	7Y	REC	7.12	6.65	-100	32.4	$-16482	6m	10s/30s	2.1	-0.13	-1520	Cap	8.1	$(654210)	-33.0
6m	2y	10Y	REC	7.12	6.37	-100	23.9	$-40897	6m	10s/30s	2.1	-0.13	-1520	Cap	8.1	$(678625)	-34.3
6m	2y	30Y	REC	7.12	5.81	-100	11.0	$-88830	6m	10s/30s	2.1	-0.13	-1520	Cap	8.1	$(726558)	-36.7
6m	3y	10Y	REC	7.10	6.37	-100	35.2	$-59552	6m	10s/30s	2.1	-0.14	-2149	Cap	8.1	$(926107)	-31.7
6m	5y	10Y	REC	6.85	6.37	-100	53.5	$-118414	6m	10s/30s	2.1	-0.14	-3211	Cap	8.1	$(1363798)	-30.7
6m	5y	30Y	REC	6.85	5.81	-100	24.6	$-225793	6m	10s/30s	2.1	-0.14	-3211	Cap	8.1	$(1471176)	-33.2

+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 caculated as 1-(3mx2y/3mx10y) implied bpvol ratio for 3m fwd 2s/10s plot.

*Empirical beta is caculated 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 theYCSO underlying's forward spread v.s weekly change of desired trade's left leg forward rate.

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