

Global Interest Rate Volatility Analytics Package

For Business: September 16, 2024

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European Rates Strategy

USD Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	7.8	1.0	1.9	6.0	6.4	6.7	23.9	0.4	6.2	20 %
3M	7.9	0.5	1.8	6.8	7.7	7.7	17.9	2.8	7.9	42 %
6M	7.7	0.2	1.6	7.0	8.1	8.1	15.0	6.2	9.8	80 %
1Y	7.8	-0.1	-0.1	6.2	7.5	7.7	12.4	8.4	10.7	100 %

Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	8.1	0.1	1.3	6.0	6.8	7.0	22.0	1.1	7.7	38 %
3M	8.1	-0.2	1.3	6.0	7.3	7.3	15.8	4.2	8.7	57 %
6M	7.7	-0.2	0.9	5.9	7.2	7.5	12.9	6.5	9.6	87 %
1Y	7.4	-0.2	-1.0	5.3	6.6	7.0	11.2	8.1	9.9	100 %

Options on 5Y swaps

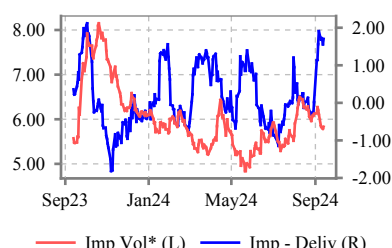
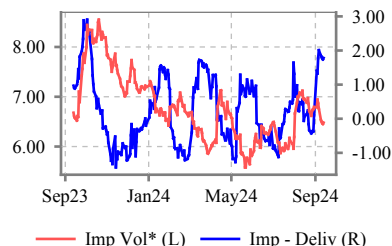
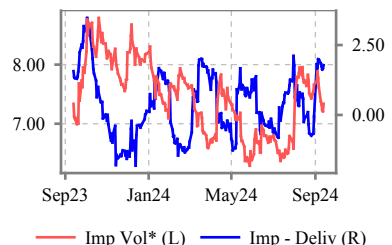
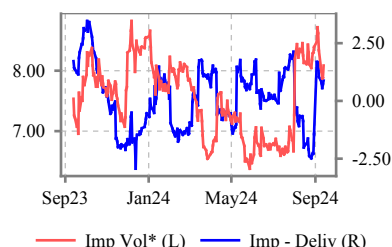
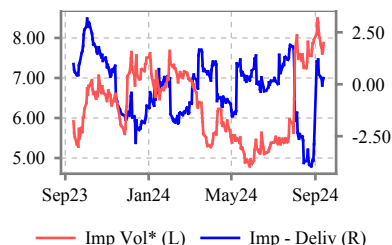
Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	7.1	-0.3	0.3	4.4	5.5	6.1	15.1	3.0	7.7	63 %
3M	7.3	-0.4	0.6	4.4	5.6	6.2	11.4	5.0	8.1	68 %
6M	7.0	-0.3	-0.4	4.4	5.5	6.3	10.5	6.3	8.5	94 %
1Y	6.7	-0.3	-1.6	4.2	5.2	6.1	9.7	7.4	8.7	100 %

Options on 10Y swaps

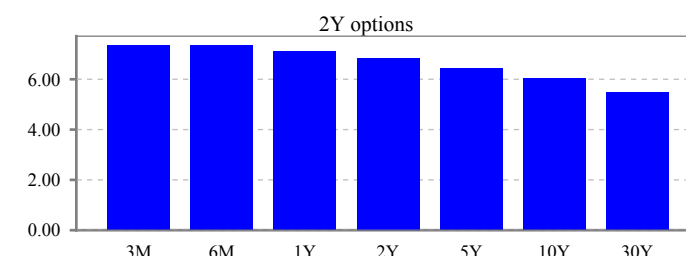
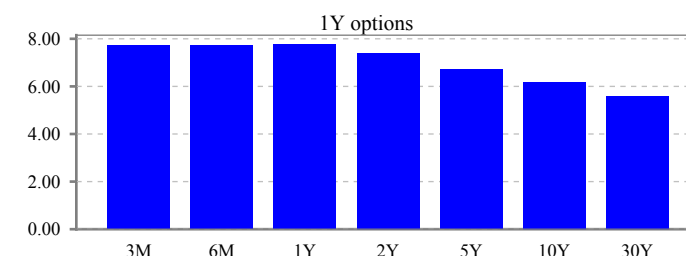
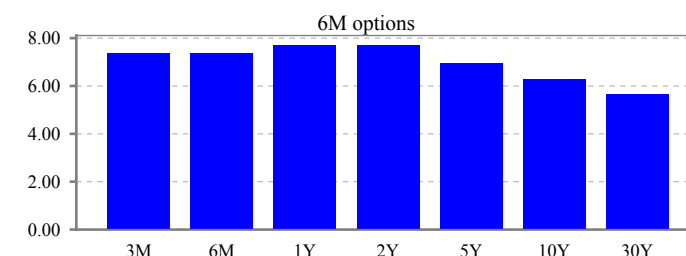
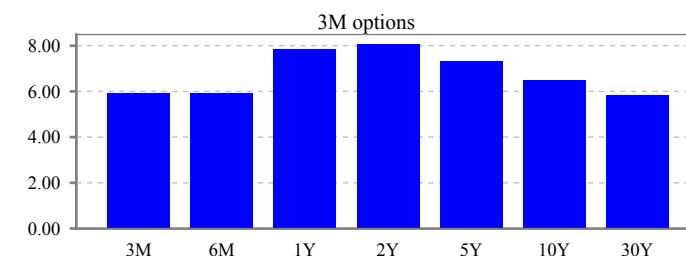
Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	-0.5	-0.3	3.9	4.6	5.7	11.4	3.5	7.0	71 %
3M	6.5	-0.5	0.3	3.9	4.7	5.7	9.4	5.2	7.3	74 %
6M	6.3	-0.3	-0.9	3.9	4.7	5.8	9.0	6.0	7.5	94 %
1Y	6.2	-0.3	-1.6	3.9	4.5	5.7	8.4	6.7	7.6	100 %

Options on 30Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.3	-0.6	-0.3	3.8	4.1	5.4	8.8	3.6	5.9	67 %
3M	5.8	-0.5	0.4	3.8	4.1	5.4	7.8	4.4	6.0	57 %
6M	5.7	-0.4	-0.6	3.8	4.1	5.4	7.1	5.0	6.2	71 %
1Y	5.6	-0.4	-1.4	3.8	4.1	5.4	6.8	5.8	6.2	100 %



Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

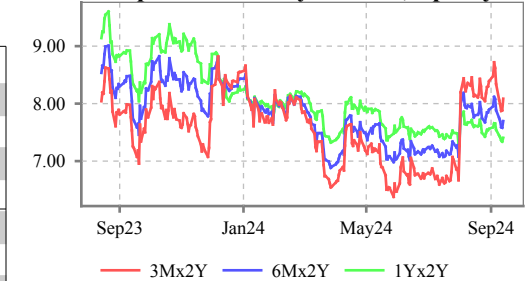
Derivatives Strategy

USD Swaptions – Outright ATM and OTM payers & receivers

Structure	ATMF Receiver				25-delta Receiver				10-delta Receiver			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	3.10	8.09	48.5	0.0	2.73	8.72	0.0	0.0	2.23	9.65	0.0	0.0
3Mx3Y	3.03	7.95	70.4	0.0	2.66	8.52	0.0	0.0	2.18	9.37	0.0	0.0
3Mx5Y	3.03	7.34	105.4	0.0	2.66	7.75	0.0	0.0	2.26	8.39	0.0	0.0
3Mx10Y	3.14	6.48	172.7	0.0	2.79	6.59	0.0	0.0	2.47	6.88	0.0	0.0
3Mx30Y	3.14	5.83	348.5	0.0	2.80	5.92	0.0	0.0	2.50	6.19	0.0	0.0
6Mx2Y	2.95	7.70	64.3	0.0	2.45	8.25	0.0	0.0	1.71	9.30	0.0	0.0
6Mx3Y	2.94	7.52	93.0	0.0	2.44	8.00	0.0	0.0	1.74	8.91	0.0	0.0
6Mx5Y	2.98	6.97	139.6	0.0	2.49	7.27	0.0	0.0	1.94	7.85	0.0	0.0
6Mx10Y	3.12	6.29	233.5	0.0	2.66	6.38	0.0	0.0	2.20	6.70	0.0	0.0
6Mx30Y	3.12	5.68	472.2	0.0	2.66	5.70	0.0	0.0	2.26	5.92	0.0	0.0
1Yx2Y	2.86	7.41	87.1	0.0	2.15	7.89	0.0	0.0	1.16	8.80	0.0	0.0
1Yx3Y	2.89	7.20	125.5	0.0	2.18	7.60	0.0	0.0	1.23	8.39	0.0	0.0
1Yx5Y	2.96	6.72	189.1	0.0	2.26	6.93	0.0	0.0	1.40	7.49	0.0	0.0
1Yx10Y	3.13	6.19	322.9	0.0	2.45	6.20	0.0	0.0	1.69	6.55	0.0	0.0
1Yx30Y	3.11	5.60	654.6	0.0	2.43	5.56	0.0	0.0	1.72	5.82	0.0	0.0

Structure	ATMF Payer				25-delta Payer				10-delta Payer			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	3.10	8.09	48.5	0.0	3.53	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx3Y	3.03	7.95	70.4	0.0	3.45	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx5Y	3.03	7.34	105.4	0.0	3.40	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx10Y	3.14	6.48	172.7	0.0	3.45	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx30Y	3.14	5.83	348.5	0.0	3.39	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx2Y	2.95	7.70	64.3	0.0	3.50	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx3Y	2.94	7.52	93.0	0.0	3.47	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx5Y	2.98	6.97	139.6	0.0	3.45	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx10Y	3.12	6.29	233.5	0.0	3.52	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx30Y	3.12	5.68	472.2	0.0	3.45	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx2Y	2.86	7.41	87.1	0.0	3.58	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx3Y	2.89	7.20	125.5	0.0	3.58	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx5Y	2.96	6.72	189.1	0.0	3.58	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx10Y	3.13	6.19	322.9	0.0	3.64	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx30Y	3.11	5.60	654.6	0.0	3.51	0.00	0.0	0.0	0.00	0.00	0.0	0.0

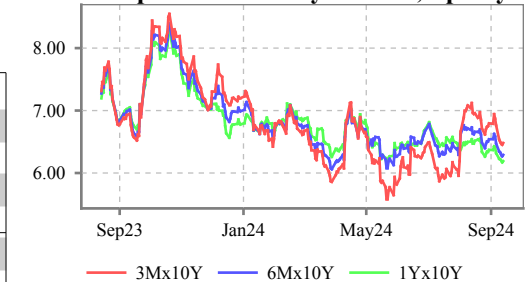
ATMF implied vol on 2-year tails; bp/day



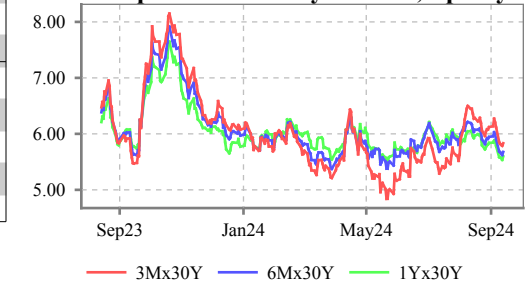
ATMF implied vol on 5-year tails; bp/day



ATMF implied vol on 10-year tails; bp/day



ATMF implied vol on 30-year tails; bp/day

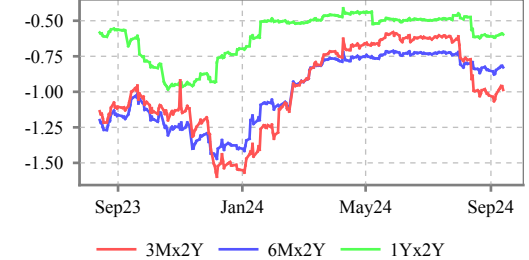


Derivatives Strategy

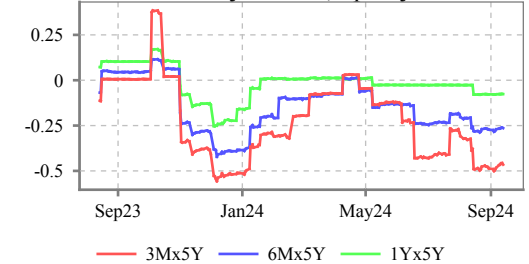
USD Swaptions – Spreads and 1x2s

Structure	Spot Yield			ATMF Yield	25-delta receiver spread				Premium-neutral receiver 1x2s			
	Current	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	3.66	5.24	3.66	3.10	2.73	0	23.9	-2.1	N/A	0	46	0.6
3Mx3Y	3.49	5.02	3.49	3.03	2.66	0	35.8	-1.7	N/A	0	47	1.6
3Mx5Y	3.41	4.77	3.40	3.03	2.66	0	57.1	-1.3	N/A	0	48	2.2
3Mx10Y	3.48	4.61	3.46	3.14	2.79	0	104.3	-1.3	N/A	0	52	2.6
3Mx30Y	3.45	4.34	3.42	3.14	2.80	0	217.9	-1.1	N/A	0	53	2.5
6Mx2Y	3.66	5.24	3.66	2.95	2.45	0	32.3	-1.4	N/A	0	47	1.1
6Mx3Y	3.49	5.02	3.49	2.94	2.44	0	48.7	-1.2	N/A	0	48	1.6
6Mx5Y	3.41	4.77	3.40	2.98	2.49	0	78.6	-0.9	N/A	0	50	1.9
6Mx10Y	3.48	4.61	3.46	3.12	2.66	0	142.3	-0.8	N/A	0	52	2.2
6Mx30Y	3.45	4.34	3.42	3.12	2.66	0	306.9	-0.9	N/A	0	55	2.0
1Yx2Y	3.66	5.24	3.66	2.86	2.15	0	45.7	-0.5	N/A	0	48	1.6
1Yx3Y	3.49	5.02	3.49	2.89	2.18	0	69.2	-0.4	N/A	0	49	1.6
1Yx5Y	3.41	4.77	3.40	2.96	2.26	0	111.7	-0.4	N/A	0	51	1.8
1Yx10Y	3.48	4.61	3.46	3.13	2.45	0	205.9	-0.3	N/A	0	54	1.8
1Yx30Y	3.45	4.34	3.42	3.11	2.43	0	447.0	-0.5	N/A	0	57	1.4

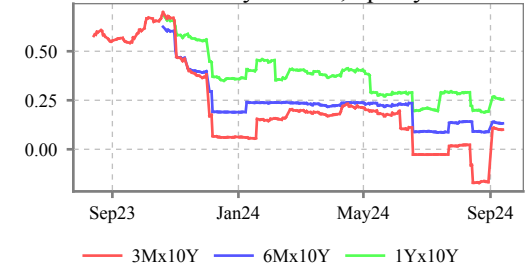
25-delta skew for 2-year tails; bp/day



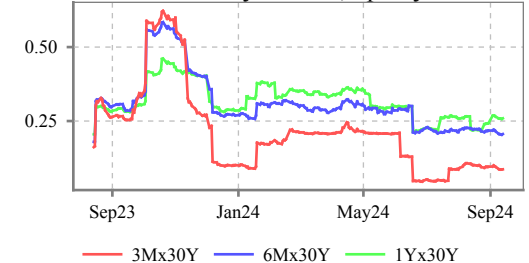
25-delta skew for 5-year tails; bp/day



25-delta skew for 10-year tails; bp/day



25-delta skew for 30-year tails; bp/day



Structure	Spot Yield			ATMF Yield	25-delta payer spread				Premium-neutral payer 1x2s			
	Spot	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	3.66	5.24	3.66	3.10	3.53	0	31.2	1.5	N/A	0	-54	8.3
3Mx3Y	3.49	5.02	3.49	3.03	3.45	0	44.2	0.7	N/A	0	-53	6.6
3Mx5Y	3.41	4.77	3.40	3.03	3.40	1	62.5	0.1	N/A	0	-52	4.9
3Mx10Y	3.48	4.61	3.46	3.14	3.45	0	92.6	-0.1	N/A	0	-48	3.8
3Mx30Y	3.45	4.34	3.42	3.14	3.39	0	178.5	-0.1	N/A	0	-47	3.3
6Mx2Y	3.66	5.24	3.66	2.95	3.50	0	40.9	0.7	N/A	0	-53	5.0
6Mx3Y	3.49	5.02	3.49	2.94	3.47	0	57.1	0.3	N/A	0	-52	4.1
6Mx5Y	3.41	4.77	3.40	2.98	3.45	3	80.1	-0.2	N/A	0	-50	3.2
6Mx10Y	3.48	4.61	3.46	3.12	3.52	5	120.4	-0.3	N/A	0	-48	2.6
6Mx30Y	3.45	4.34	3.42	3.12	3.45	2	223.0	-0.2	N/A	0	-45	2.4
1Yx2Y	3.66	5.24	3.66	2.86	3.58	0	52.3	-0.1	N/A	0	-52	2.1
1Yx3Y	3.49	5.02	3.49	2.89	3.58	3	72.2	-0.2	N/A	0	-51	1.7
1Yx5Y	3.41	4.77	3.40	2.96	3.58	6	101.9	-0.2	N/A	0	-49	1.5
1Yx10Y	3.48	4.61	3.46	3.13	3.64	8	155.0	-0.2	N/A	0	-46	1.4
1Yx30Y	3.45	4.34	3.42	3.11	3.51	6	279.7	-0.1	N/A	0	-43	1.5

US Fixed Income Derivatives Strategy

SOFR Implied and delivered directionality report - USD

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

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

Delivered directionality is defined as: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. 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.

European Rates Strategy

EUR Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	3.9	-0.7	0.8	4.0	3.2	3.3	14.7	0.6	4.3	48 %
3M	4.4	-0.2	1.1	4.8	4.0	3.9	11.3	1.0	5.8	61 %
6M	4.8	-0.1	0.9	5.2	4.4	4.4	10.8	4.0	7.4	90 %
1Y	5.1	-0.2	-0.7	5.2	4.3	4.6	10.8	5.8	8.5	100 %

Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	4.4	-0.5	-0.2	4.6	3.7	3.7	13.6	1.2	5.7	68 %
3M	4.8	-0.2	0.2	4.8	4.0	4.1	11.8	2.1	6.7	78 %
6M	5.1	-0.2	-0.3	5.0	4.2	4.3	11.1	4.9	7.7	95 %
1Y	5.2	-0.4	-2.0	4.8	4.0	4.3	10.2	5.6	8.2	100 %

Options on 5Y swaps

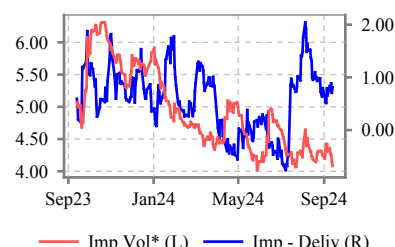
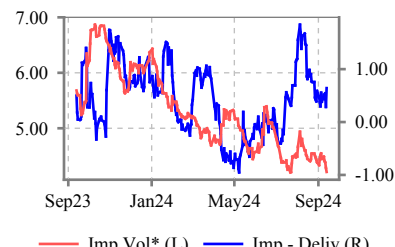
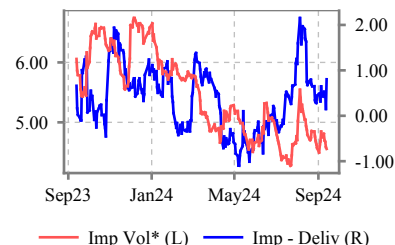
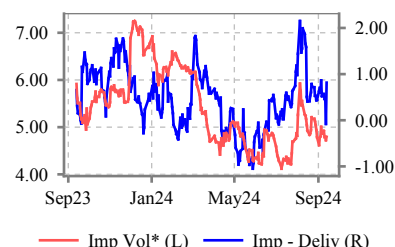
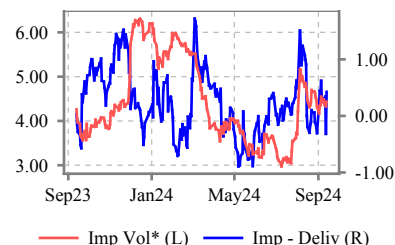
Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	4.2	-0.3	-1.2	4.2	3.7	3.7	14.2	1.8	6.2	83 %
3M	4.6	-0.3	-1.1	4.2	3.8	3.9	11.2	2.8	6.7	90 %
6M	4.7	-0.3	-1.6	4.3	3.8	4.0	10.2	4.8	7.2	100 %
1Y	4.9	-0.4	-2.6	4.2	3.8	3.9	9.2	5.3	7.4	100 %

Options on 10Y swaps

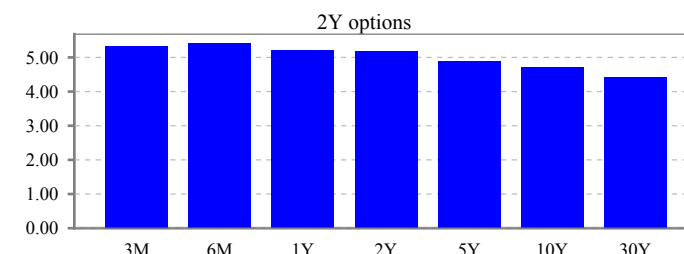
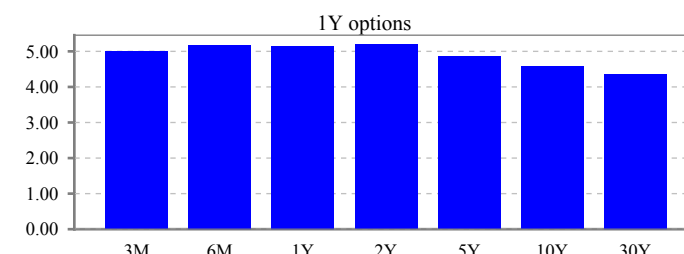
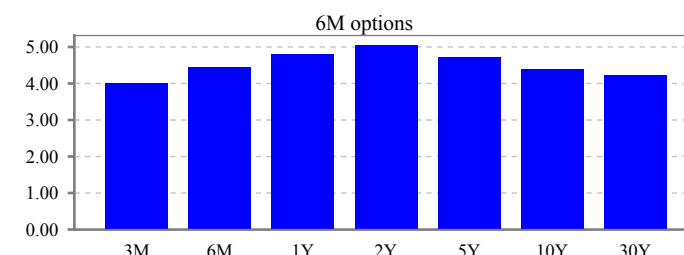
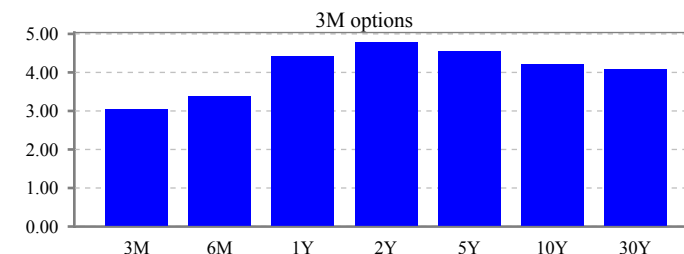
Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	3.9	-0.2	-1.5	3.8	3.5	3.6	11.8	1.9	5.8	86 %
3M	4.2	-0.3	-1.7	3.8	3.6	3.6	9.3	3.0	6.1	89 %
6M	4.4	-0.3	-2.2	3.8	3.6	3.7	9.0	4.1	6.5	98 %
1Y	4.6	-0.4	-2.5	3.8	3.6	3.7	8.2	5.0	6.7	100 %

Options on 30Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	3.8	-0.2	-1.5	3.3	3.3	3.2	9.6	2.3	5.1	82 %
3M	4.1	-0.1	-1.4	3.4	3.3	3.2	7.6	3.0	5.4	86 %
6M	4.2	-0.2	-1.7	3.4	3.3	3.3	7.3	4.1	5.6	95 %
1Y	4.4	-0.2	-2.0	3.4	3.3	3.3	6.9	4.4	5.8	100 %



Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

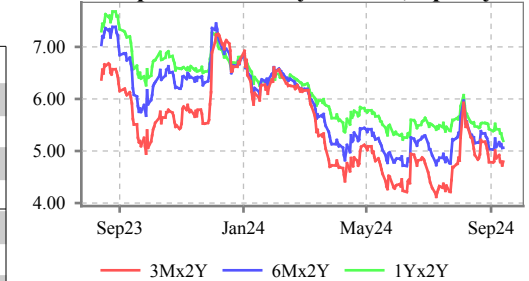
Derivatives Strategy

EUR Swaptions – Outright ATM and OTM payers & receivers

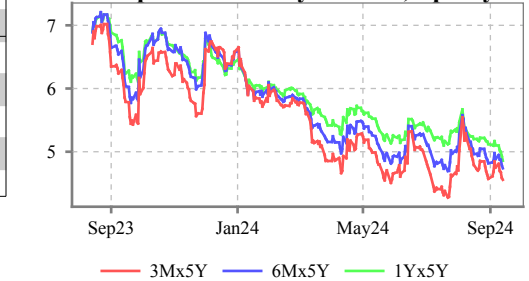
Structure	Strike	ATMF Receiver				25-delta Receiver				10-delta Receiver			
		Imp Vol	Premium	1M carry		Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	2.28	4.80	29.6	0.0		2.06	5.12	0.0	0.0	1.78	5.67	0.0	0.0
3Mx3Y	2.24	4.77	43.7	0.0		2.01	5.06	0.0	0.0	1.74	5.57	0.0	0.0
3Mx5Y	2.26	4.56	68.2	0.0		2.03	4.79	0.0	0.0	1.77	5.21	0.0	0.0
3Mx10Y	2.38	4.21	119.5	0.0		2.16	4.30	0.0	0.0	1.93	4.55	0.0	0.0
3Mx30Y	2.26	4.08	278.8	0.0		2.04	4.22	0.0	0.0	1.80	4.52	0.0	0.0
6Mx2Y	2.15	5.06	43.3	0.0		1.81	5.36	0.0	0.0	1.42	5.87	0.0	0.0
6Mx3Y	2.16	4.97	63.1	0.0		1.81	5.24	0.0	0.0	1.43	5.71	0.0	0.0
6Mx5Y	2.22	4.74	98.4	0.0		1.88	4.95	0.0	0.0	1.52	5.35	0.0	0.0
6Mx10Y	2.37	4.39	172.3	0.0		2.03	4.46	0.0	0.0	1.72	4.70	0.0	0.0
6Mx30Y	2.25	4.22	399.0	0.0		1.91	4.36	0.0	0.0	1.59	4.64	0.0	0.0
1Yx2Y	2.08	5.19	62.6	0.0		1.57	5.41	0.0	0.0	1.03	5.86	0.0	0.0
1Yx3Y	2.13	5.08	90.9	0.0		1.63	5.27	0.0	0.0	1.09	5.69	0.0	0.0
1Yx5Y	2.21	4.86	141.9	0.0		1.72	5.01	0.0	0.0	1.21	5.38	0.0	0.0
1Yx10Y	2.38	4.58	252.7	0.0		1.89	4.60	0.0	0.0	1.43	4.82	0.0	0.0
1Yx30Y	2.23	4.36	580.4	0.0		1.73	4.46	0.0	0.0	1.26	4.74	0.0	0.0

Structure	Strike	ATMF Payer				25-delta Payer				10-delta Payer			
		Imp Vol	Premium	1M carry		Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	2.28	4.80	29.6	0.0		2.53	0.00	0.0	0.0	4.74	7.21	0.0	0.0
3Mx3Y	2.24	4.77	43.7	0.0		2.48	0.00	0.0	0.0	4.68	7.27	0.0	0.0
3Mx5Y	2.26	4.56	68.2	0.0		2.49	0.00	0.0	0.0	4.81	7.39	0.0	0.0
3Mx10Y	2.38	4.21	119.5	0.0		2.60	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx30Y	2.26	4.08	278.8	0.0		2.46	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx2Y	2.15	5.06	43.3	0.0		2.52	0.00	0.0	0.0	3.94	6.08	0.0	0.0
6Mx3Y	2.16	4.97	63.1	0.0		2.52	0.00	0.0	0.0	3.96	6.10	0.0	0.0
6Mx5Y	2.22	4.74	98.4	0.0		2.56	0.00	0.0	0.0	4.06	6.08	0.0	0.0
6Mx10Y	2.37	4.39	172.3	0.0		2.67	0.00	0.0	0.0	4.30	6.21	0.0	0.0
6Mx30Y	2.25	4.22	399.0	0.0		2.51	0.00	0.0	0.0	4.26	6.02	0.0	0.0
1Yx2Y	2.08	5.19	62.6	0.0		2.58	6.45	0.0	0.0	3.92	6.08	0.0	0.0
1Yx3Y	2.13	5.08	90.9	0.0		2.61	6.40	0.0	0.0	3.97	6.01	0.0	0.0
1Yx5Y	2.21	4.86	141.9	0.0		2.67	6.30	0.0	0.0	4.06	5.88	0.0	0.0
1Yx10Y	2.38	4.58	252.7	0.0		2.79	0.00	0.0	0.0	4.28	5.92	0.0	0.0
1Yx30Y	2.23	4.36	580.4	0.0		2.60	0.00	0.0	0.0	4.12	5.61	0.0	0.0

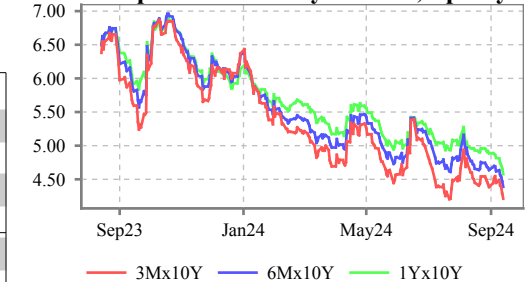
ATMF implied vol on 2-year tails; bp/day



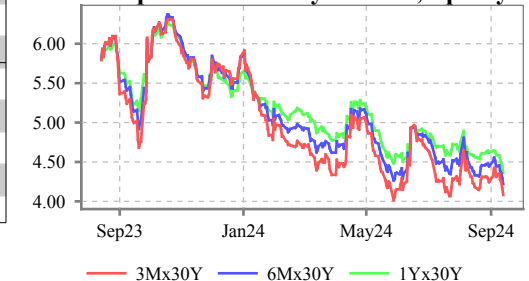
ATMF implied vol on 5-year tails; bp/day



ATMF implied vol on 10-year tails; bp/day



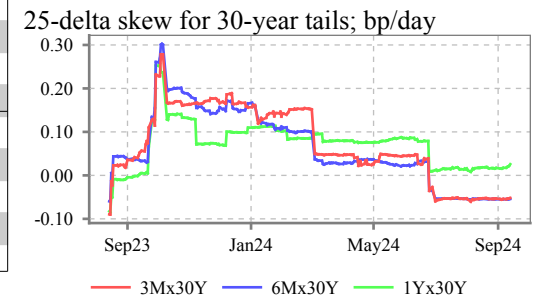
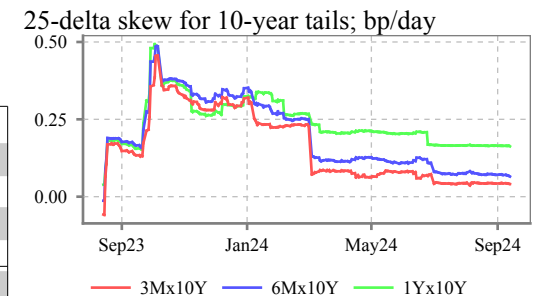
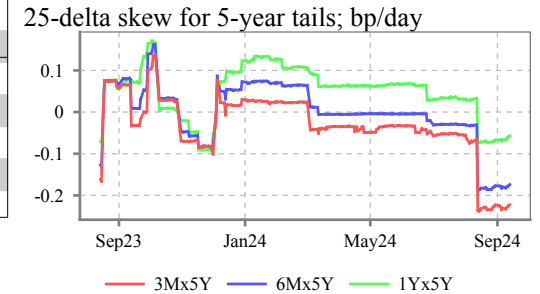
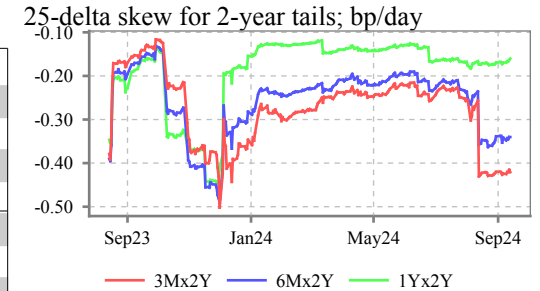
ATMF implied vol on 30-year tails; bp/day



Derivatives Strategy

EUR Swaptions – Spreads and 1x2s

Structure	Spot Yield			ATMF Yield	25-delta receiver spread				Premium-neutral receiver 1x2s			
	Current	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	2.47	3.41	2.41	2.28	2.06	0	14.7	-1.6	N/A	0	47	1.8
3Mx3Y	2.35	3.22	2.29	2.24	2.01	0	22.4	-1.3	N/A	0	47	2.4
3Mx5Y	2.31	3.02	2.26	2.26	2.03	0	36.9	-1.2	N/A	0	48	2.7
3Mx10Y	2.41	2.92	2.36	2.38	2.16	0	69.6	-1.2	N/A	0	51	2.9
3Mx30Y	2.28	2.62	2.23	2.26	2.04	0	162.3	-1.1	N/A	0	52	3.0
6Mx2Y	2.47	3.41	2.41	2.15	1.81	0	22.6	-1.3	N/A	0	48	0.9
6Mx3Y	2.35	3.22	2.29	2.16	1.81	0	33.8	-1.0	N/A	0	48	1.3
6Mx5Y	2.31	3.02	2.26	2.22	1.88	0	54.9	-0.9	N/A	0	49	1.6
6Mx10Y	2.41	2.92	2.36	2.37	2.03	0	103.3	-0.7	N/A	0	52	1.8
6Mx30Y	2.28	2.62	2.23	2.25	1.91	0	240.6	-0.7	N/A	0	53	1.7
1Yx2Y	2.47	3.41	2.41	2.08	1.57	0	34.6	-0.5	N/A	0	50	1.3
1Yx3Y	2.35	3.22	2.29	2.13	1.63	0	51.1	-0.3	N/A	0	50	1.5
1Yx5Y	2.31	3.02	2.26	2.21	1.72	0	82.0	-0.3	N/A	0	51	1.6
1Yx10Y	2.41	2.92	2.36	2.38	1.89	0	157.6	-0.3	N/A	0	53	1.7
1Yx30Y	2.28	2.62	2.23	2.23	1.73	0	369.6	-0.4	N/A	0	55	1.3



Structure	Spot Yield			ATMF Yield	25-delta payer spread				Premium-neutral payer 1x2s			
	Spot	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	2.47	3.41	2.41	2.28	2.53	3	18.4	0.9	N/A	0	-53	7.8
3Mx3Y	2.35	3.22	2.29	2.24	2.48	6	26.6	0.1	N/A	0	-53	6.1
3Mx5Y	2.31	3.02	2.26	2.26	2.49	14	40.0	-0.6	N/A	0	-52	4.8
3Mx10Y	2.41	2.92	2.36	2.38	2.60	25	64.5	-0.7	N/A	0	-49	3.7
3Mx30Y	2.28	2.62	2.23	2.26	2.46	52	150.2	-0.7	N/A	0	-48	3.6
6Mx2Y	2.47	3.41	2.41	2.15	2.52	5	26.0	1.0	N/A	0	-52	4.8
6Mx3Y	2.35	3.22	2.29	2.16	2.52	11	37.2	0.2	N/A	0	-52	3.5
6Mx5Y	2.31	3.02	2.26	2.22	2.56	26	56.3	-0.2	N/A	0	-51	2.9
6Mx10Y	2.41	2.92	2.36	2.37	2.67	35	92.2	-0.3	N/A	0	-48	2.2
6Mx30Y	2.28	2.62	2.23	2.25	2.51	79	212.5	-0.2	N/A	0	-47	2.2
1Yx2Y	2.47	3.41	2.41	2.08	2.58	6	35.4	-0.1	N/A	0	-50	1.7
1Yx3Y	2.35	3.22	2.29	2.13	2.61	22	50.8	-0.2	N/A	0	-50	1.4
1Yx5Y	2.31	3.02	2.26	2.21	2.67	30	77.3	-0.2	N/A	0	-49	1.3
1Yx10Y	2.41	2.92	2.36	2.38	2.79	72	127.3	-0.2	N/A	0	-47	1.3
1Yx30Y	2.28	2.62	2.23	2.23	2.60	97	281.4	-0.1	N/A	0	-45	1.5

European Rates Strategy

Implied and delivered directionality report - EUR

			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	Rsqr		
1s/3s	4.4	4.8	7 %	28 %	-9 %	16 %	100 %	93 %	-44	-69	25	-16 %	64 %		
1s/5s	4.4	4.6	3 %	31 %	-32 %	35 %	100 %	97 %	-32	-62	30	-35 %	74 %		
1s/10s	4.4	4.2	-5 %	31 %	-70 %	65 %	100 %	105 %	-1	-34	33	-65 %	72 %		
1s/30s	4.4	4.1	-9 %	26 %	-120 %	112 %	100 %	109 %	-6	-40	34	-112 %	62 %		
2s/5s	4.8	4.6	-5 %	7 %	-35 %	30 %	100 %	105 %	9	-3	12	-30 %	83 %		
2s/7s	4.8	4.4	-8 %	8 %	-55 %	46 %	100 %	108 %	21	7	14	-46 %	81 %		
2s/10s	4.8	4.2	-14 %	9 %	-75 %	61 %	100 %	114 %	43	28	16	-61 %	76 %		
2s/20s	4.8	4.1	-16 %	4 %	-109 %	93 %	100 %	116 %	56	40	16	-93 %	68 %		
2s/30s	4.8	4.1	-17 %	1 %	-126 %	109 %	100 %	117 %	38	21	16	-109 %	61 %		
3s/5s	4.8	4.6	-5 %	3 %	-22 %	17 %	100 %	105 %	12	7	5	-17 %	83 %		
3s/7s	4.8	4.4	-8 %	4 %	-39 %	32 %	100 %	108 %	24	17	7	-32 %	81 %		
3s/10s	4.8	4.2	-13 %	4 %	-58 %	45 %	100 %	113 %	46	38	9	-45 %	75 %		
3s/20s	4.8	4.1	-16 %	-1 %	-89 %	74 %	100 %	116 %	59	50	9	-74 %	66 %		
3s/30s	4.8	4.1	-17 %	-4 %	-105 %	88 %	100 %	117 %	41	31	9	-88 %	60 %		
5s/10s	4.6	4.2	-8 %	1 %	-30 %	22 %	100 %	108 %	33	29	3	-22 %	74 %		
5s/20s	4.6	4.1	-11 %	-4 %	-57 %	46 %	100 %	111 %	45	41	4	-46 %	65 %		
5s/30s	4.6	4.1	-12 %	-7 %	-71 %	59 %	100 %	112 %	27	23	4	-59 %	58 %		
10s/30s	4.2	4.1	-3 %	-9 %	-33 %	30 %	100 %	103 %	-5	-5	1	-30 %	56 %		
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr	
1s/2s/3s	4.4	4.8	4.8	4 %	10 %	6 %	-2 %	100 %	52 %	-26	-19	6	2 %	40 %	
1s/3s/5s	4.4	4.8	4.6	6 %	13 %	5 %	1 %	100 %	53 %	-40	-29	11	-1 %	5 %	
2s/5s/7s	4.8	4.6	4.4	-1 %	4 %	-11 %	10 %	100 %	49 %	-6	-1	5	-10 %	80 %	
2s/5s/10s	4.8	4.6	4.2	1 %	4 %	-6 %	7 %	100 %	51 %	-15	-11	4	-7 %	74 %	
2s/7s/12s	4.8	4.4	4.2	-1 %	5 %	-19 %	17 %	100 %	49 %	-8	-2	6	-17 %	80 %	
2s/10s/30s	4.8	4.2	4.1	-5 %	10 %	-24 %	18 %	100 %	47 %	16	23	7	-17 %	68 %	
3s/7s/15s	4.8	4.4	4.2	-1 %	4 %	-8 %	7 %	100 %	50 %	-6	-3	3	-7 %	77 %	
5s/10s/30s	4.6	4.2	4.1	-3 %	5 %	-1 %	-1 %	100 %	49 %	17	18	1	1 %	11 %	
10s/20s/30s	4.2	4.1	4.1	-1 %	-2 %	-6 %	5 %	100 %	50 %	13	13	0	-5 %	57 %	

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions.

Delivered directionality is defined as: Curves: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. Flies: Delivered directionality is defined as the 3M beta obtained from regressing the 50:50 fly with the body of the fly

** Curves weighted by the implied weights listed in the adjacent column. Flies weighted by the implied weights listed in the adjacent column. These weights make the fly premium-neutral at inception.

*** Carry for curve flatteners and long body in the fly

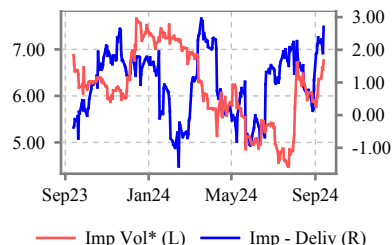
**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

European Rates Strategy

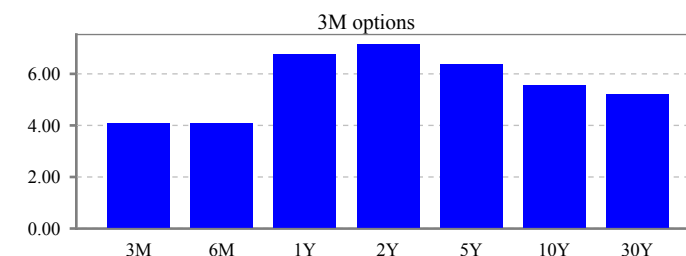
GBP Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	0.9	1.9	3.6	3.3	3.6	23.8	1.8	6.2	41 %
3M	6.8	0.5	2.1	4.4	4.1	4.2	16.3	3.2	7.8	50 %
6M	7.1	0.4	1.4	5.0	4.6	4.8	14.3	5.5	9.5	82 %
1Y	7.2	0.2	-0.2	5.1	4.8	5.2	13.4	7.7	11.2	100 %

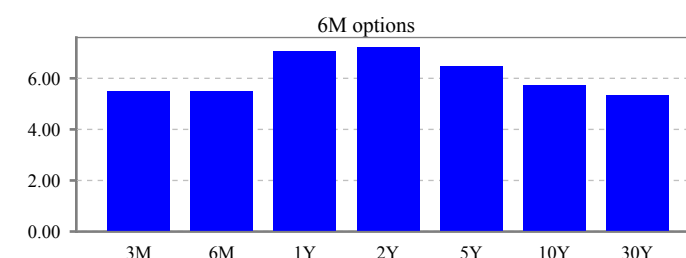
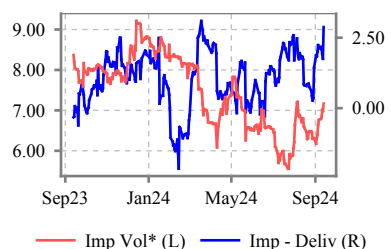


Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



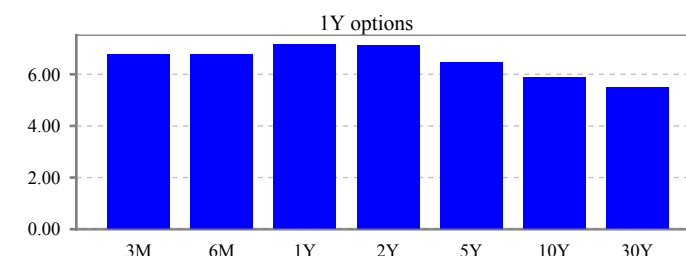
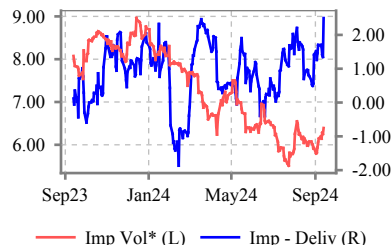
Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.5	0.8	0.6	4.2	3.9	4.3	24.5	2.6	7.7	58 %
3M	7.2	0.6	1.1	4.6	4.3	4.6	17.0	3.7	8.8	68 %
6M	7.2	0.4	0.6	4.8	4.5	4.9	14.6	5.8	9.8	85 %
1Y	7.1	0.3	-0.5	4.7	4.4	5.0	12.6	7.6	10.7	100 %



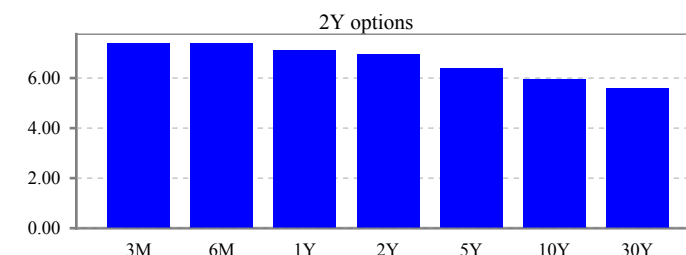
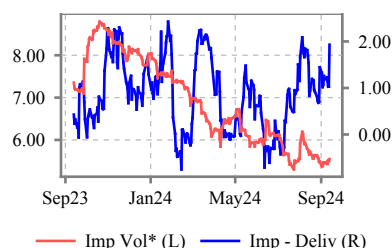
Options on 5Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	0.5	-0.2	4.0	3.8	4.4	22.5	3.0	7.5	71 %
3M	6.4	0.3	-0.1	4.2	3.9	4.5	15.3	3.9	8.1	78 %
6M	6.5	0.2	-0.5	4.2	3.9	4.6	12.8	5.5	8.6	85 %
1Y	6.5	0.1	-0.8	4.2	3.9	4.6	10.7	6.8	9.0	100 %



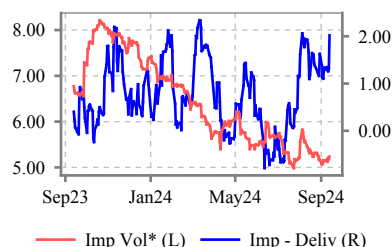
Options on 10Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.3	0.3	-0.8	3.7	3.6	4.3	21.3	3.1	7.0	79 %
3M	5.5	-0.1	-1.2	3.8	3.6	4.3	14.6	4.1	7.5	85 %
6M	5.7	-0.1	-1.4	3.8	3.6	4.4	12.2	5.3	7.9	92 %
1Y	5.9	-0.2	-1.7	3.8	3.6	4.4	10.2	6.2	8.4	100 %



Options on 30Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.0	0.3	-0.6	3.4	3.2	4.0	26.3	3.2	6.8	79 %
3M	5.2	-0.1	-1.1	3.4	3.2	4.1	17.2	4.1	7.2	85 %
6M	5.4	-0.1	-1.3	3.4	3.2	4.1	13.5	4.9	7.6	94 %
1Y	5.5	-0.1	-1.6	3.4	3.2	4.1	10.7	5.8	8.4	100 %



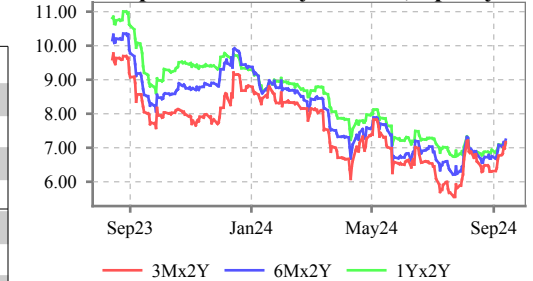
* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

Derivatives Strategy

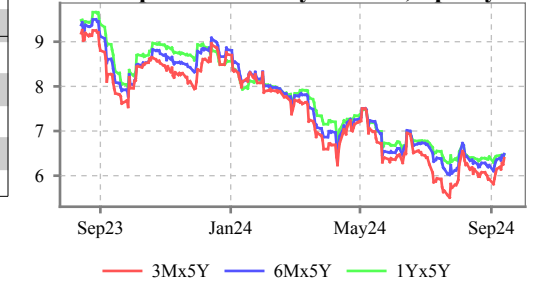
GBP Swaptions – Outright ATM and OTM payers & receivers

Structure	ATMF Receiver				25-delta Receiver				10-delta Receiver			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	3.57	7.17	43.2	0.0	3.26	7.86	0.0	0.0	2.82	9.05	0.0	0.0
3Mx3Y	3.45	6.93	61.6	0.0	3.14	7.54	0.0	0.0	2.72	8.59	0.0	0.0
3Mx5Y	3.35	6.39	91.9	0.0	3.04	6.84	0.0	0.0	2.66	7.62	0.0	0.0
3Mx10Y	3.40	5.55	147.6	0.0	3.11	5.65	0.0	0.0	2.81	6.01	0.0	0.0
3Mx30Y	3.59	5.24	303.8	0.0	3.30	5.44	0.0	0.0	3.01	5.89	0.0	0.0
6Mx2Y	3.42	7.24	60.4	0.0	2.96	7.83	0.0	0.0	2.37	8.83	0.0	0.0
6Mx3Y	3.35	6.98	85.9	0.0	2.89	7.50	0.0	0.0	2.33	8.39	0.0	0.0
6Mx5Y	3.29	6.48	128.8	0.0	2.84	6.86	0.0	0.0	2.33	7.54	0.0	0.0
6Mx10Y	3.38	5.74	211.0	0.0	2.95	5.84	0.0	0.0	2.54	6.19	0.0	0.0
6Mx30Y	3.57	5.36	429.6	0.0	3.15	5.57	0.0	0.0	2.74	6.01	0.0	0.0
1Yx2Y	3.27	7.13	82.7	0.0	2.60	7.56	0.0	0.0	1.96	8.19	0.0	0.0
1Yx3Y	3.24	6.85	117.4	0.0	2.57	7.22	0.0	0.0	1.96	7.78	0.0	0.0
1Yx5Y	3.23	6.47	179.3	0.0	2.57	6.73	0.0	0.0	1.99	7.17	0.0	0.0
1Yx10Y	3.38	5.90	301.9	0.0	2.73	5.96	0.0	0.0	2.22	6.23	0.0	0.0
1Yx30Y	3.56	5.50	612.6	0.0	2.92	5.68	0.0	0.0	2.40	6.04	0.0	0.0

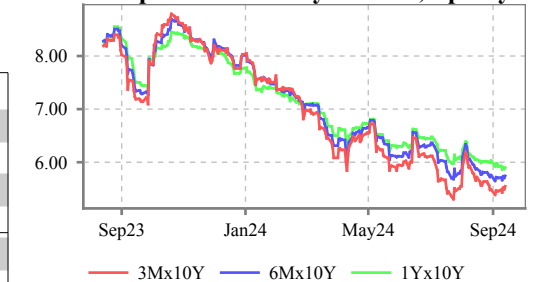
ATMF implied vol on 2-year tails; bp/day



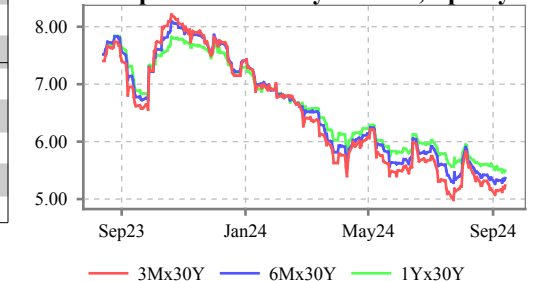
ATMF implied vol on 5-year tails; bp/day



ATMF implied vol on 10-year tails; bp/day



ATMF implied vol on 30-year tails; bp/day

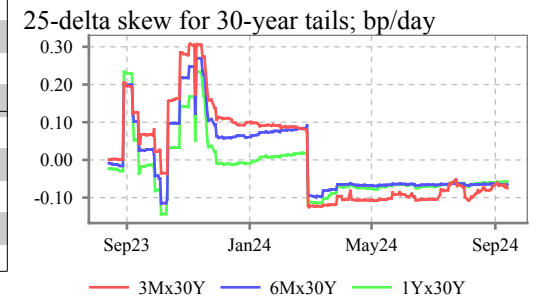
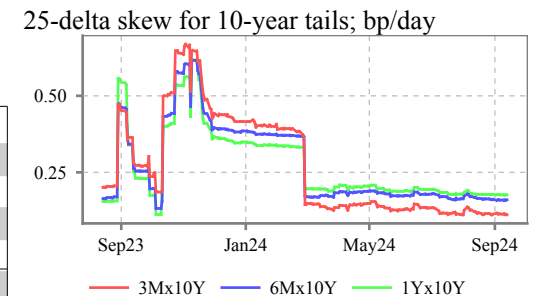
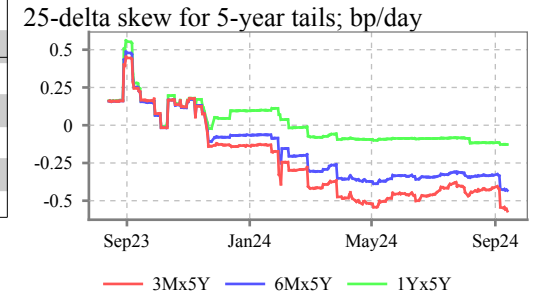
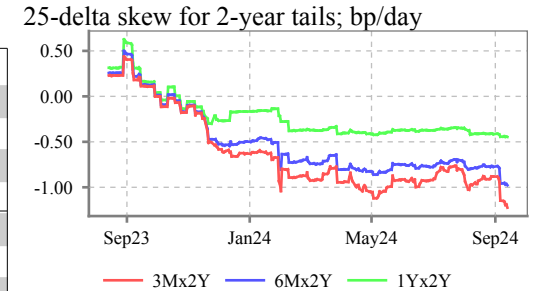


Structure	ATMF Payer				25-delta Payer				10-delta Payer			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	3.57	7.17	43.2	0.0	3.97	7.04	0.0	0.0	5.24	6.80	0.0	0.0
3Mx3Y	3.45	6.93	61.6	0.0	3.84	7.61	0.0	0.0	5.18	7.13	0.0	0.0
3Mx5Y	3.35	6.39	91.9	0.0	3.69	0.00	0.0	0.0	5.20	7.73	0.0	0.0
3Mx10Y	3.40	5.55	147.6	0.0	3.65	0.00	0.0	0.0	5.52	9.54	0.0	0.0
3Mx30Y	3.59	5.24	303.8	0.0	3.82	0.00	0.0	0.0	5.84	8.98	0.0	0.0
6Mx2Y	3.42	7.24	60.4	0.0	3.96	6.93	0.0	0.0	5.07	6.88	0.0	0.0
6Mx3Y	3.35	6.98	85.9	0.0	3.86	7.19	0.0	0.0	5.02	7.02	0.0	0.0
6Mx5Y	3.29	6.48	128.8	0.0	3.74	7.67	0.0	0.0	5.03	7.25	0.0	0.0
6Mx10Y	3.38	5.74	211.0	0.0	3.74	0.00	0.0	0.0	5.29	8.12	0.0	0.0
6Mx30Y	3.57	5.36	429.6	0.0	3.90	0.00	0.0	0.0	5.48	7.41	0.0	0.0
1Yx2Y	3.27	7.13	82.7	0.0	3.95	7.91	0.0	0.0	5.26	7.68	0.0	0.0
1Yx3Y	3.24	6.85	117.4	0.0	3.89	7.86	0.0	0.0	5.22	7.57	0.0	0.0
1Yx5Y	3.23	6.47	179.3	0.0	3.82	7.89	0.0	0.0	5.21	7.51	0.0	0.0
1Yx10Y	3.38	5.90	301.9	0.0	3.86	0.00	0.0	0.0	5.38	7.51	0.0	0.0
1Yx30Y	3.56	5.50	612.6	0.0	4.00	0.00	0.0	0.0	5.49	6.77	0.0	0.0

Derivatives Strategy

GBP Swaptions – Spreads and 1x2s

Structure	Spot Yield			ATMF Yield	25-delta receiver spread				Premium-neutral receiver 1x2s			
	Current	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	3.76	4.79	3.76	3.57	3.26	0	20.1	-2.4	N/A	0	43	3.0
3Mx3Y	3.58	4.56	3.58	3.45	3.14	0	30.0	-2.1	N/A	0	44	3.4
3Mx5Y	3.43	4.27	3.42	3.35	3.04	0	47.9	-1.8	N/A	0	47	3.6
3Mx10Y	3.44	4.10	3.42	3.40	3.11	0	88.0	-1.6	N/A	0	52	3.6
3Mx30Y	3.60	4.10	3.59	3.59	3.30	0	178.6	-1.4	N/A	0	52	3.5
6Mx2Y	3.76	4.79	3.76	3.42	2.96	0	29.6	-1.4	N/A	0	45	1.2
6Mx3Y	3.58	4.56	3.58	3.35	2.89	0	43.6	-1.3	N/A	0	46	1.6
6Mx5Y	3.43	4.27	3.42	3.29	2.84	0	69.4	-1.1	N/A	0	48	1.9
6Mx10Y	3.44	4.10	3.42	3.38	2.95	0	126.7	-0.9	N/A	0	52	2.3
6Mx30Y	3.60	4.10	3.59	3.57	3.15	0	258.6	-0.8	N/A	0	53	2.2
1Yx2Y	3.76	4.79	3.76	3.27	2.60	0	43.6	-0.8	N/A	0	48	1.0
1Yx3Y	3.58	4.56	3.58	3.24	2.57	0	63.6	-0.7	N/A	0	49	1.2
1Yx5Y	3.43	4.27	3.42	3.23	2.57	0	102.2	-0.6	N/A	0	51	1.5
1Yx10Y	3.44	4.10	3.42	3.38	2.73	0	186.8	-0.4	N/A	0	54	1.8
1Yx30Y	3.60	4.10	3.59	3.56	2.92	0	388.4	-0.4	N/A	0	55	1.5



Structure	Spot Yield			ATMF Yield	25-delta payer spread				Premium-neutral payer 1x2s			
	Spot	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	3.76	4.79	3.76	3.57	3.97	6	28.4	0.1	N/A	0	-57	9.1
3Mx3Y	3.58	4.56	3.58	3.45	3.84	8	39.3	-0.5	N/A	0	-56	7.6
3Mx5Y	3.43	4.27	3.42	3.35	3.69	15	55.5	-0.6	N/A	0	-53	6.2
3Mx10Y	3.44	4.10	3.42	3.40	3.65	20	75.5	-0.7	N/A	0	-48	4.6
3Mx30Y	3.60	4.10	3.59	3.59	3.82	41	157.6	-0.8	N/A	0	-48	4.1
6Mx2Y	3.76	4.79	3.76	3.42	3.96	6	38.7	0.6	N/A	0	-55	5.1
6Mx3Y	3.58	4.56	3.58	3.35	3.86	10	53.7	0.2	N/A	0	-54	4.4
6Mx5Y	3.43	4.27	3.42	3.29	3.74	24	76.2	-0.3	N/A	0	-52	3.6
6Mx10Y	3.44	4.10	3.42	3.38	3.74	28	105.2	-0.4	N/A	0	-48	2.8
6Mx30Y	3.60	4.10	3.59	3.57	3.90	64	215.2	-0.4	N/A	0	-47	2.5
1Yx2Y	3.76	4.79	3.76	3.27	3.95	5	47.1	0.2	N/A	0	-52	2.4
1Yx3Y	3.58	4.56	3.58	3.24	3.89	16	65.5	0.1	N/A	0	-51	2.2
1Yx5Y	3.43	4.27	3.42	3.23	3.82	28	95.7	0.0	N/A	0	-49	2.0
1Yx10Y	3.44	4.10	3.42	3.38	3.86	69	145.2	-0.2	N/A	0	-46	1.6
1Yx30Y	3.60	4.10	3.59	3.56	4.00	89	288.2	-0.2	N/A	0	-45	1.6

European Rates Strategy

Implied and delivered directionality report - GBP

	Implied vol; bp/day			Directionality*; %				(Imp - Deliv)	Implied weights; %		Weighted curve**; bp			3M regression stats****	
				Implied		Deliv									
Trades	Short	Long	Current	3M Lagged	Levels	Levels	Short	Long	3M fwd	Spot	3M Carry***	Beta	Rsqr		
1s/3s	6.8	6.9	2 %	23 %	-17 %	19 %	100 %	98 %	-48	-71	23	-19 %	43 %		
1s/5s	6.8	6.4	-6 %	21 %	-41 %	35 %	100 %	106 %	-30	-58	28	-35 %	42 %		
1s/10s	6.8	5.5	-22 %	15 %	-69 %	47 %	100 %	122 %	31	-2	33	-47 %	33 %		
1s/30s	6.8	5.2	-29 %	9 %	-99 %	70 %	100 %	129 %	79	45	35	-70 %	31 %		
2s/5s	7.2	6.4	-12 %	-1 %	-40 %	28 %	100 %	112 %	19	8	11	-28 %	51 %		
2s/7s	7.2	6.1	-18 %	-4 %	-56 %	37 %	100 %	118 %	39	25	14	-37 %	47 %		
2s/10s	7.2	5.5	-29 %	-8 %	-68 %	39 %	100 %	129 %	84	68	17	-39 %	36 %		
2s/20s	7.2	5.4	-33 %	-13 %	-89 %	56 %	100 %	133 %	122	104	18	-56 %	36 %		
2s/30s	7.2	5.2	-37 %	-17 %	-98 %	61 %	100 %	137 %	136	117	19	-61 %	31 %		
3s/5s	6.9	6.4	-8 %	-2 %	-23 %	15 %	100 %	108 %	18	13	5	-15 %	54 %		
3s/7s	6.9	6.1	-14 %	-5 %	-38 %	23 %	100 %	114 %	38	30	8	-23 %	48 %		
3s/10s	6.9	5.5	-25 %	-10 %	-49 %	24 %	100 %	125 %	81	71	10	-24 %	33 %		
3s/20s	6.9	5.4	-28 %	-14 %	-68 %	40 %	100 %	128 %	118	106	12	-40 %	33 %		
3s/30s	6.9	5.2	-32 %	-18 %	-76 %	44 %	100 %	132 %	131	119	12	-44 %	28 %		
5s/10s	6.4	5.5	-15 %	-8 %	-22 %	7 %	100 %	115 %	58	53	5	-7 %	15 %		
5s/20s	6.4	5.4	-18 %	-12 %	-38 %	20 %	100 %	118 %	92	85	6	-20 %	24 %		
5s/30s	6.4	5.2	-22 %	-16 %	-46 %	23 %	100 %	122 %	104	97	7	-23 %	21 %		
10s/30s	5.5	5.2	-6 %	-8 %	-22 %	16 %	100 %	106 %	40	38	2	-16 %	32 %		
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr	
1s/2s/3s	6.8	7.2	6.9	5 %	11 %	5 %	-1 %	100 %	52 %	-32	-26	6	1 %	11 %	
1s/3s/5s	6.8	6.9	6.4	5 %	13 %	2 %	3 %	100 %	53 %	-44	-34	10	-4 %	19 %	
2s/5s/7s	7.2	6.4	6.1	-3 %	1 %	-15 %	11 %	100 %	48 %	-3	1	4	-11 %	51 %	
2s/5s/10s	7.2	6.4	5.5	1 %	4 %	-10 %	11 %	100 %	50 %	-19	-15	3	-11 %	52 %	
2s/7s/12s	7.2	6.1	5.5	-5 %	1 %	-22 %	17 %	100 %	48 %	-7	-2	6	-17 %	50 %	
2s/10s/30s	7.2	5.5	5.2	-12 %	-0 %	-25 %	13 %	100 %	45 %	14	21	7	-11 %	25 %	
3s/7s/15s	6.9	6.1	5.5	-2 %	1 %	-10 %	8 %	100 %	49 %	-9	-7	2	-8 %	41 %	
5s/10s/30s	6.4	5.5	5.2	-5 %	-0 %	-1 %	-4 %	100 %	48 %	8	10	2	4 %	47 %	
10s/20s/30s	5.5	5.4	5.2	0 %	0 %	-4 %	4 %	100 %	50 %	9	10	1	-4 %	40 %	

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions.

Delivered directionality is defined as: Curves: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. Flies: Delivered directionality is defined as the 3M beta obtained from regressing the 50:50 fly with the body of the fly

** Curves weighted by the implied weights listed in the adjacent column. Flies weighted by the implied weights listed in the adjacent column. These weights make the fly premium-neutral at inception.

*** Carry for curve flatteners and long body in the fly

**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

Japan Rates Strategy

JPY Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	1.6	-0.8	-0.5	0.8	1.0	1.9	3.2	0.1	0.8	10 %
3M	2.1	-0.6	-0.4	0.8	1.1	2.3	2.4	0.2	1.0	4 %
6M	2.6	-0.4	-0.5	1.0	1.4	2.6	2.1	0.4	1.4	0 %
1Y	2.7	-0.2	-1.0	1.4	1.7	3.1	2.5	1.3	2.0	0 %

Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	1.9	-0.7	-0.4	1.1	1.3	2.5	4.0	0.2	1.2	17 %
3M	2.3	-0.6	-0.4	1.2	1.5	2.7	2.8	0.3	1.5	16 %
6M	2.6	-0.3	-0.6	1.3	1.6	2.9	2.4	0.5	1.8	0 %
1Y	2.8	-0.2	-1.1	1.6	1.7	3.1	2.7	1.4	2.2	0 %

Options on 5Y swaps

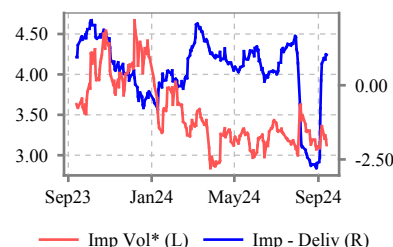
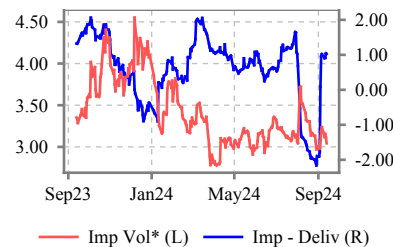
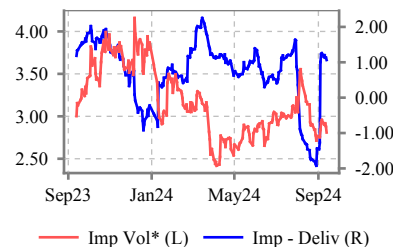
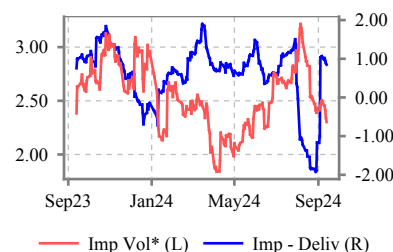
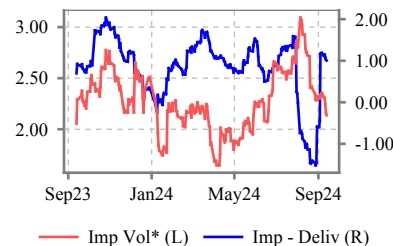
Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	2.6	-0.5	0.1	1.7	1.7	2.9	4.8	0.3	1.9	19 %
3M	2.8	-0.4	-0.3	1.8	1.7	3.0	3.9	0.6	2.1	23 %
6M	2.9	-0.2	-0.8	1.8	1.8	3.0	3.2	0.8	2.3	12 %
1Y	2.9	-0.1	-1.3	2.0	1.9	3.2	3.2	1.7	2.7	44 %

Options on 10Y swaps

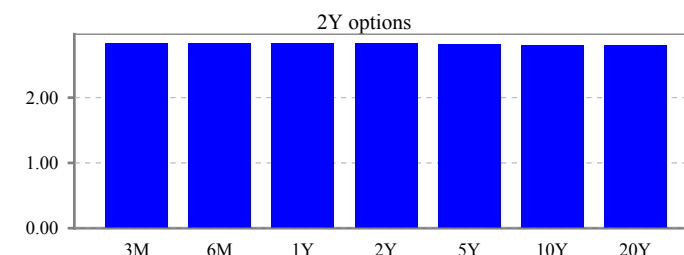
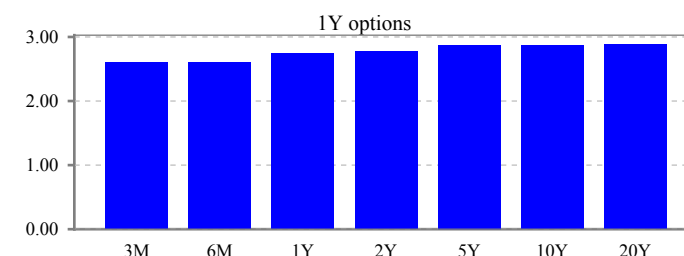
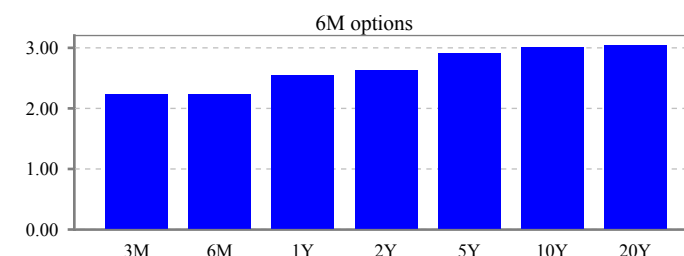
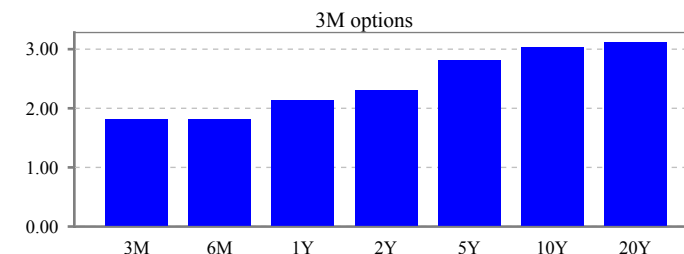
Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	3.0	-0.3	0.2	2.1	2.0	3.2	6.0	0.4	2.4	24 %
3M	3.0	-0.3	-0.5	2.2	2.0	3.3	4.7	0.7	2.6	28 %
6M	3.0	-0.1	-1.3	2.2	2.1	3.3	3.8	1.0	2.8	38 %
1Y	2.9	-0.2	-1.8	2.3	2.1	3.4	3.6	2.0	3.0	74 %

Options on 20Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	3.1	-0.2	0.3	2.1	2.1	3.6	7.3	0.5	2.7	27 %
3M	3.1	-0.2	-0.5	2.1	2.1	3.6	4.7	0.9	2.8	29 %
6M	3.1	-0.1	-1.3	2.1	2.1	3.7	3.9	1.4	3.0	44 %
1Y	2.9	-0.1	-1.9	2.1	2.2	3.8	3.7	2.2	3.2	79 %



Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



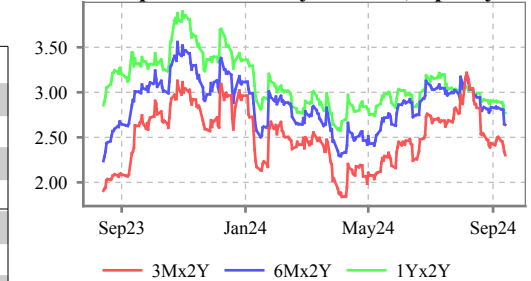
* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

Derivatives Strategy

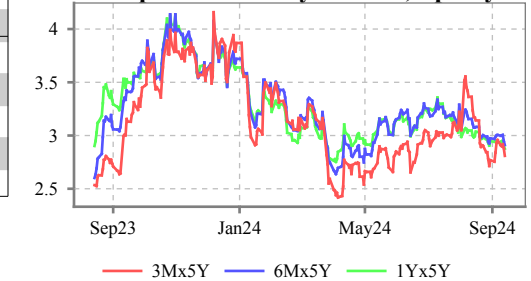
JPY Swaptions – Outright ATM and OTM payers & receivers

Structure	ATMF Receiver				25-delta Receiver				10-delta Receiver			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	0.49	2.30	14.2	0.0	0.34	2.12	0.0	0.0	0.27	2.03	0.0	0.0
3Mx3Y	0.54	2.47	22.8	0.0	0.38	2.30	0.0	0.0	0.30	2.21	0.0	0.0
3Mx5Y	0.62	2.81	43.0	0.0	0.45	2.67	0.0	0.0	0.33	2.60	0.0	0.0
3Mx10Y	0.91	3.04	91.1	0.0	0.73	2.92	0.0	0.0	0.58	2.88	0.0	0.0
3Mx20Y	1.43	3.13	173.7	0.0	1.25	3.04	0.0	0.0	1.08	3.01	0.0	0.0
6Mx2Y	0.53	2.64	22.7	0.0	0.32	2.36	0.0	0.0	0.15	2.25	0.0	0.0
6Mx3Y	0.57	2.73	35.0	0.0	0.35	2.45	0.0	0.0	0.18	2.33	0.0	0.0
6Mx5Y	0.64	2.91	61.9	0.0	0.42	2.65	0.0	0.0	0.23	2.52	0.0	0.0
6Mx10Y	0.94	3.01	125.0	0.0	0.70	2.82	0.0	0.0	0.51	2.74	0.0	0.0
6Mx20Y	1.45	3.05	234.9	0.0	1.21	2.95	0.0	0.0	1.01	2.91	0.0	0.0
1Yx2Y	0.58	2.77	34.2	0.0	0.26	2.41	0.0	0.0	0.09	2.28	0.0	0.0
1Yx3Y	0.61	2.80	51.7	0.0	0.29	2.47	0.0	0.0	0.11	2.35	0.0	0.0
1Yx5Y	0.69	2.88	87.6	0.0	0.36	2.60	0.0	0.0	0.15	2.49	0.0	0.0
1Yx10Y	1.00	2.86	170.1	0.0	0.66	2.65	0.0	0.0	0.45	2.57	0.0	0.0
1Yx20Y	1.50	2.88	316.8	0.0	1.16	2.75	0.0	0.0	0.91	2.71	0.0	0.0

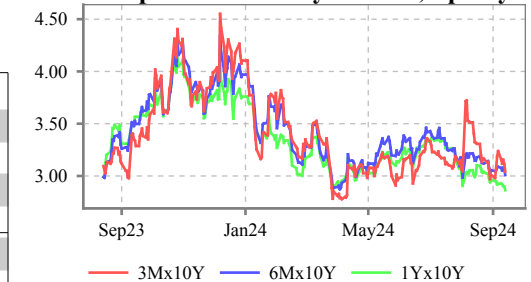
ATMF implied vol on 2-year tails; bp/day



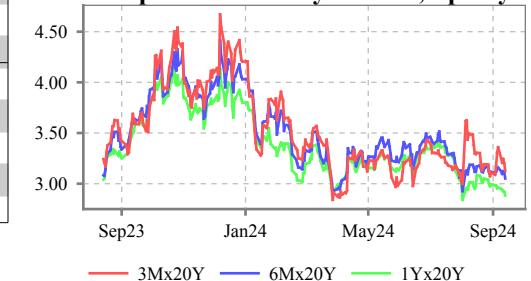
ATMF implied vol on 5-year tails; bp/day



ATMF implied vol on 10-year tails; bp/day



ATMF implied vol on 20-year tails; bp/day

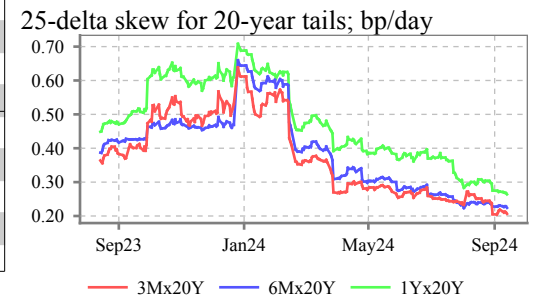
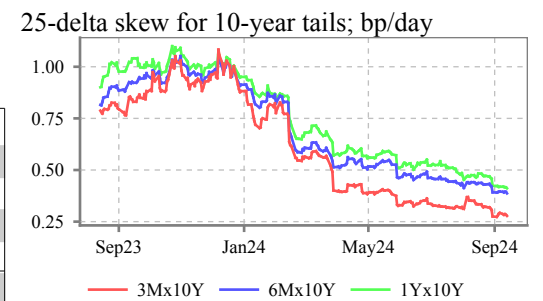
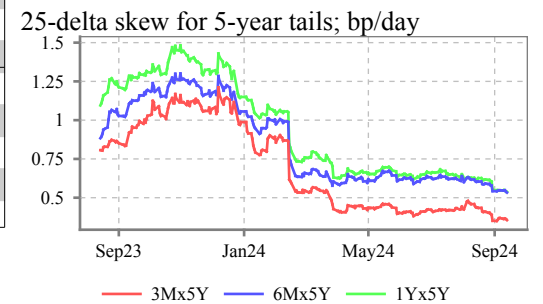
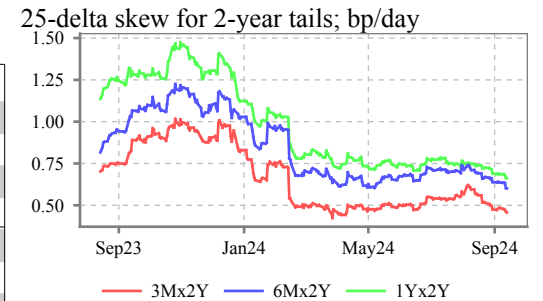


Structure	ATMF Payer				25-delta Payer				10-delta Payer			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	0.49	2.30	14.2	0.0	0.63	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx3Y	0.54	2.47	22.8	0.0	0.69	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx5Y	0.62	2.81	43.0	0.0	0.78	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx10Y	0.91	3.04	91.1	0.0	1.08	0.00	0.0	0.0	0.00	0.00	0.0	0.0
3Mx20Y	1.43	3.13	173.7	0.0	1.60	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx2Y	0.53	2.64	22.7	0.0	0.70	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx3Y	0.57	2.73	35.0	0.0	0.74	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx5Y	0.64	2.91	61.9	0.0	0.83	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx10Y	0.94	3.01	125.0	0.0	1.14	0.00	0.0	0.0	0.00	0.00	0.0	0.0
6Mx20Y	1.45	3.05	234.9	0.0	1.66	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx2Y	0.58	2.77	34.2	0.0	0.79	0.00	0.0	0.0	2.72	5.40	0.0	0.0
1Yx3Y	0.61	2.80	51.7	0.0	0.83	0.00	0.0	0.0	2.72	5.29	0.0	0.0
1Yx5Y	0.69	2.88	87.6	0.0	0.93	0.00	0.0	0.0	2.76	5.08	0.0	0.0
1Yx10Y	1.00	2.86	170.1	0.0	1.24	0.00	0.0	0.0	2.99	4.44	0.0	0.0
1Yx20Y	1.50	2.88	316.8	0.0	1.75	0.00	0.0	0.0	3.47	4.07	0.0	0.0

Derivatives Strategy

JPY Swaptions – Spreads and 1x2s

Structure	Spot Yield			ATMF Yield	25-delta receiver spread				Premium-neutral receiver 1x2s			
	Current	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	0.45	0.54	0.25	0.49	0.34	16	8.3	N/A	N/A	0	56	N/A
3Mx3Y	0.51	0.62	0.33	0.54	0.38	11	13.5	N/A	N/A	0	55	N/A
3Mx5Y	0.59	0.72	0.48	0.62	0.45	0	25.9	N/A	N/A	0	54	N/A
3Mx10Y	0.88	1.10	0.78	0.91	0.73	0	55.4	N/A	N/A	0	53	N/A
3Mx20Y	1.41	1.63	1.24	1.43	1.25	1	106.3	N/A	N/A	0	53	N/A
6Mx2Y	0.45	0.54	0.25	0.53	0.32	13	15.4	N/A	N/A	0	58	N/A
6Mx3Y	0.51	0.62	0.33	0.57	0.35	4	24.0	N/A	N/A	0	57	N/A
6Mx5Y	0.59	0.72	0.48	0.64	0.42	0	43.2	N/A	N/A	0	56	N/A
6Mx10Y	0.88	1.10	0.78	0.94	0.70	0	86.1	N/A	N/A	0	55	N/A
6Mx20Y	1.41	1.63	1.24	1.45	1.21	0	158.0	N/A	N/A	0	54	N/A
1Yx2Y	0.45	0.54	0.25	0.58	0.26	2	25.0	N/A	N/A	0	59	N/A
1Yx3Y	0.51	0.62	0.33	0.61	0.29	0	37.4	N/A	N/A	0	58	N/A
1Yx5Y	0.59	0.72	0.48	0.69	0.36	0	62.1	N/A	N/A	0	57	N/A
1Yx10Y	0.88	1.10	0.78	1.00	0.66	0	118.5	N/A	N/A	0	56	N/A
1Yx20Y	1.41	1.63	1.24	1.50	1.16	0	216.0	N/A	N/A	0	55	N/A



Structure	Spot Yield			ATMF Yield	25-delta payer spread				Premium-neutral payer 1x2s			
	Spot	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	0.45	0.54	0.25	0.49	0.63	100	6.4	N/A	N/A	0	-44	N/A
3Mx3Y	0.51	0.62	0.33	0.54	0.69	100	10.6	N/A	N/A	0	-45	N/A
3Mx5Y	0.59	0.72	0.48	0.62	0.78	100	21.1	N/A	N/A	0	-46	N/A
3Mx10Y	0.88	1.10	0.78	0.91	1.08	96	46.7	N/A	N/A	0	-47	N/A
3Mx20Y	1.41	1.63	1.24	1.43	1.60	29	90.5	N/A	N/A	0	-47	N/A
6Mx2Y	0.45	0.54	0.25	0.53	0.70	100	9.3	N/A	N/A	0	-42	N/A
6Mx3Y	0.51	0.62	0.33	0.57	0.74	100	14.9	N/A	N/A	0	-43	N/A
6Mx5Y	0.59	0.72	0.48	0.64	0.83	100	27.9	N/A	N/A	0	-44	N/A
6Mx10Y	0.88	1.10	0.78	0.94	1.14	100	62.2	N/A	N/A	0	-45	N/A
6Mx20Y	1.41	1.63	1.24	1.45	1.66	100	123.7	N/A	N/A	0	-46	N/A
1Yx2Y	0.45	0.54	0.25	0.58	0.79	100	13.1	N/A	N/A	0	-41	N/A
1Yx3Y	0.51	0.62	0.33	0.61	0.83	100	20.5	N/A	N/A	0	-42	N/A
1Yx5Y	0.59	0.72	0.48	0.69	0.93	100	37.5	N/A	N/A	0	-43	N/A
1Yx10Y	0.88	1.10	0.78	1.00	1.24	100	81.1	N/A	N/A	0	-44	N/A
1Yx20Y	1.41	1.63	1.24	1.50	1.75	100	160.1	N/A	N/A	0	-45	N/A

Japan Rates Strategy

Implied and delivered directionality report - JPY

			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	Rsqr	
1s/3s	2.1	2.5	13 %	15 %	66 %	-52 %	100 %	87 %	5	8	-3	52 %	30 %	
1s/5s	2.1	2.8	24 %	24 %	102 %	-78 %	100 %	76 %	5	9	-4	78 %	58 %	
1s/10s	2.1	3.0	30 %	32 %	117 %	-87 %	100 %	70 %	22	26	-4	87 %	80 %	
1s/20s	2.1	3.1	32 %	34 %	118 %	-87 %	100 %	68 %	56	60	-5	87 %	81 %	
2s/5s	2.3	2.8	18 %	18 %	61 %	-43 %	100 %	82 %	1	3	-2	43 %	40 %	
2s/7s	2.3	2.9	21 %	21 %	79 %	-58 %	100 %	79 %	8	10	-2	58 %	59 %	
2s/10s	2.3	3.0	24 %	26 %	87 %	-63 %	100 %	76 %	19	21	-2	63 %	66 %	
2s/20s	2.3	3.1	26 %	28 %	90 %	-64 %	100 %	74 %	56	59	-3	64 %	68 %	
3s/5s	2.5	2.8	12 %	11 %	31 %	-19 %	100 %	88 %	0	1	-1	19 %	24 %	
3s/7s	2.5	2.9	15 %	15 %	51 %	-37 %	100 %	85 %	7	8	-1	37 %	46 %	
3s/10s	2.5	3.0	19 %	20 %	63 %	-44 %	100 %	81 %	20	20	-1	44 %	55 %	
3s/20s	2.5	3.1	21 %	22 %	67 %	-46 %	100 %	79 %	59	60	-2	46 %	56 %	
5s/10s	2.8	3.0	8 %	10 %	34 %	-26 %	100 %	92 %	22	22	0	26 %	50 %	
5s/20s	2.8	3.1	10 %	13 %	39 %	-29 %	100 %	90 %	67	68	-1	29 %	46 %	
10s/20s	3.0	3.1	3 %	3 %	5 %	-2 %	100 %	97 %	48	49	-1	2 %	2 %	
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr
1s/2s/3s	2.1	2.3	2.5	-0 %	-0 %	9 %	-9 %	100 %	50 %	2	1	0	9 %	66 %
1s/3s/5s	2.1	2.5	2.8	-0 %	1 %	24 %	-24 %	100 %	50 %	3	2	-1	24 %	74 %
2s/5s/7s	2.3	2.8	2.9	7 %	6 %	21 %	-13 %	100 %	54 %	-3	-4	-1	14 %	49 %
2s/5s/10s	2.3	2.8	3.0	5 %	3 %	15 %	-10 %	100 %	53 %	-11	-12	-1	11 %	57 %
2s/7s/12s	2.3	2.9	3.1	8 %	6 %	31 %	-23 %	100 %	54 %	-9	-10	-1	25 %	66 %
2s/10s/20s	2.3	3.0	3.1	11 %	10 %	42 %	-32 %	100 %	56 %	-16	-17	-1	35 %	68 %
3s/7s/15s	2.5	2.9	3.1	4 %	3 %	17 %	-13 %	100 %	52 %	-18	-19	0	13 %	53 %
5s/10s/20s	2.8	3.0	3.1	2 %	3 %	16 %	-13 %	100 %	51 %	-15	-14	0	14 %	56 %

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions.

Delivered directionality is defined as: Curves: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. Flies: Delivered directionality is defined as the 3M beta obtained from regressing the 50:50 fly with the body of the fly

** Curves weighted by the implied weights listed in the adjacent column. Flies weighted by the implied weights listed in the adjacent column. These weights make the fly premium-neutral at inception.

*** Carry for curve flatteners and long body in the fly

**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

European Rates Strategy

AUD Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.5	0.6	2.4	3.5	3.5	4.5	13.0	1.5	5.5	43 %
3M	5.9	0.2	2.0	4.5	4.5	5.3	11.0	3.3	6.7	51 %
6M	6.1	0.1	1.8	5.3	5.2	6.1	10.4	5.1	7.8	67 %
1Y	6.0	0.0	0.5	4.8	5.4	6.2	9.8	6.2	8.2	100 %

Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.5	0.7	2.7	4.0	4.3	5.3	12.2	2.3	6.5	45 %
3M	6.5	0.1	2.1	4.5	4.9	5.7	10.5	4.1	7.2	57 %
6M	6.3	0.1	1.5	4.9	5.3	6.1	10.2	5.5	7.8	81 %
1Y	6.1	0.1	0.5	4.8	5.5	6.1	9.7	6.6	8.3	100 %

Options on 5Y swaps

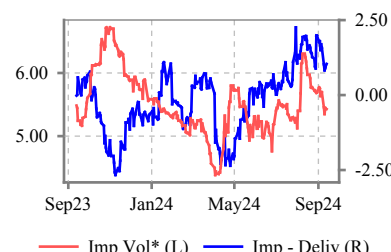
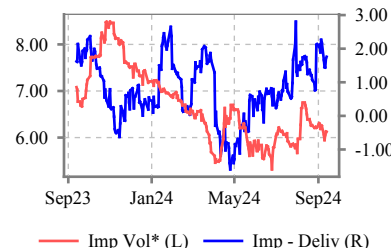
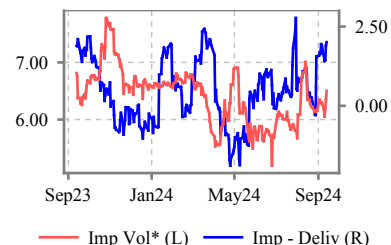
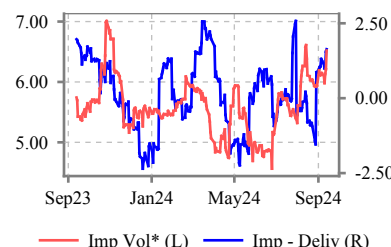
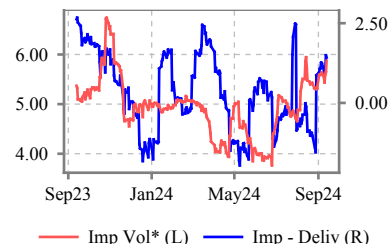
Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.8	0.3	2.0	4.3	4.3	5.1	11.5	2.9	6.8	49 %
3M	6.5	-0.2	1.2	4.4	4.5	5.3	10.1	4.7	7.2	62 %
6M	6.2	-0.2	0.2	4.6	4.6	5.3	9.7	5.7	7.5	88 %
1Y	5.9	-0.3	-0.8	4.6	4.6	5.2	8.8	6.4	7.7	100 %

Options on 10Y swaps

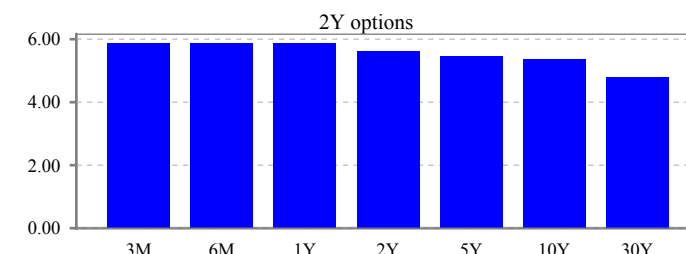
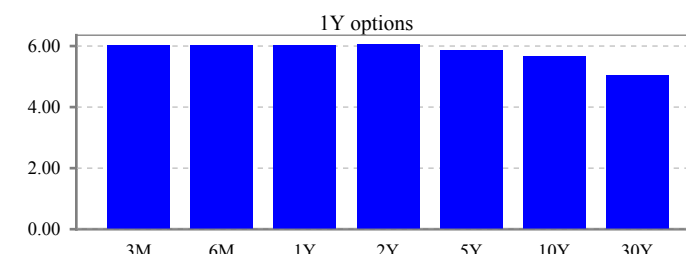
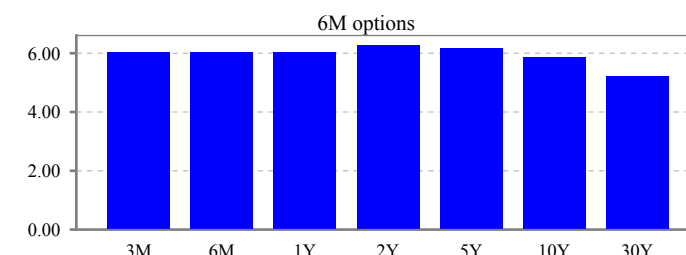
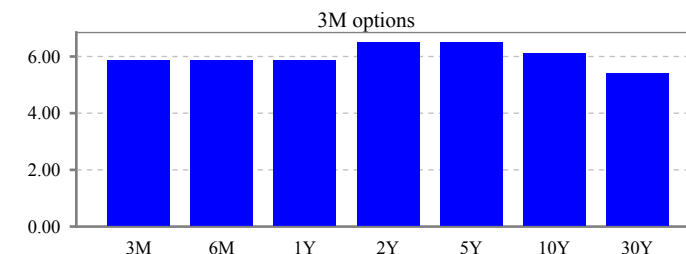
Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.4	0.0	0.9	4.6	4.3	4.7	10.9	3.0	6.6	52 %
3M	6.1	-0.4	0.2	4.7	4.4	4.8	9.4	4.7	6.8	74 %
6M	5.9	-0.4	-0.7	4.8	4.4	4.9	9.2	5.5	7.1	89 %
1Y	5.7	-0.4	-1.5	4.9	4.5	4.8	8.4	6.2	7.4	100 %

Options on 30Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.7	-0.2	0.7	4.7	4.3	4.4	10.1	3.0	6.1	57 %
3M	5.4	-0.6	0.2	4.8	4.4	4.5	8.3	4.4	6.3	83 %
6M	5.2	-0.6	-0.5	4.8	4.4	4.5	8.2	5.2	6.5	100 %
1Y	5.0	-0.4	-1.0	4.9	4.4	4.5	7.4	6.0	6.7	100 %



Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



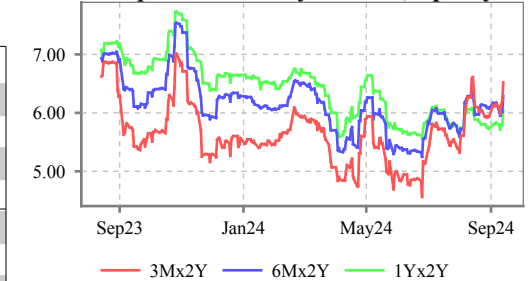
* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

Derivatives Strategy

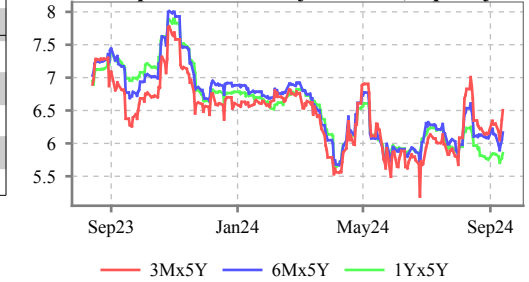
AUD Swaptions – Outright ATM and OTM payers & receivers

Structure	ATMF Receiver				25-delta Receiver				10-delta Receiver			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	3.58	6.52	39.6	0.0	3.26	6.82	0.0	0.0	2.90	7.36	0.0	0.0
3Mx3Y	3.53	6.57	58.9	0.0	3.19	6.83	0.0	0.0	2.84	7.32	0.0	0.0
3Mx5Y	3.59	6.50	94.1	0.0	3.25	6.66	0.0	0.0	2.91	7.05	0.0	0.0
3Mx10Y	3.91	6.12	162.2	0.0	3.56	6.15	0.0	0.0	3.26	6.34	0.0	0.0
3Mx30Y	3.97	5.43	306.6	0.0	3.65	5.30	0.0	0.0	3.39	5.33	0.0	0.0
6Mx2Y	3.45	6.29	52.7	0.0	3.02	6.57	0.0	0.0	2.53	7.10	0.0	0.0
6Mx3Y	3.45	6.23	77.0	0.0	3.02	6.46	0.0	0.0	2.54	6.94	0.0	0.0
6Mx5Y	3.57	6.16	123.0	0.0	3.12	6.30	0.0	0.0	2.67	6.67	0.0	0.0
6Mx10Y	3.90	5.86	214.1	0.0	3.45	5.88	0.0	0.0	3.05	6.07	0.0	0.0
6Mx30Y	3.96	5.23	407.1	0.0	3.52	5.10	0.0	0.0	3.20	5.12	0.0	0.0
1Yx2Y	3.36	6.05	71.0	0.0	2.76	6.29	0.0	0.0	2.18	6.68	0.0	0.0
1Yx3Y	3.41	5.98	103.8	0.0	2.81	6.18	0.0	0.0	2.25	6.53	0.0	0.0
1Yx5Y	3.59	5.85	163.3	0.0	2.98	5.96	0.0	0.0	2.45	6.23	0.0	0.0
1Yx10Y	3.94	5.65	288.2	0.0	3.30	5.67	0.0	0.0	2.81	5.81	0.0	0.0
1Yx30Y	3.96	5.04	548.4	0.0	3.33	4.92	0.0	0.0	2.90	4.93	0.0	0.0

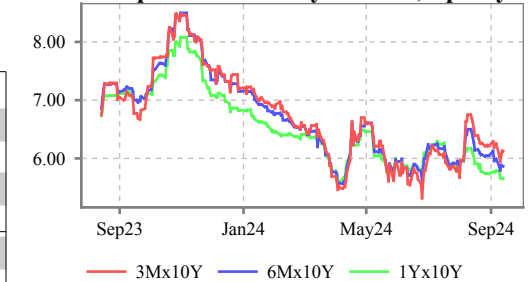
ATMF implied vol on 2-year tails; bp/day



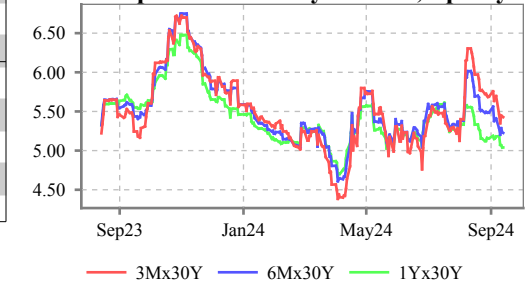
ATMF implied vol on 5-year tails; bp/day



ATMF implied vol on 10-year tails; bp/day



ATMF implied vol on 30-year tails; bp/day

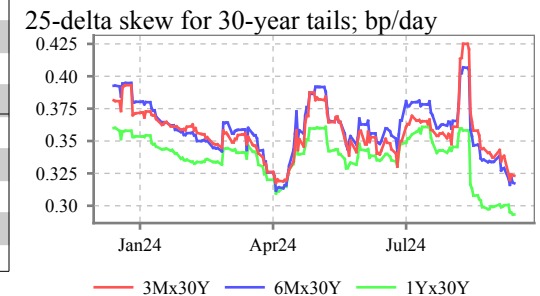
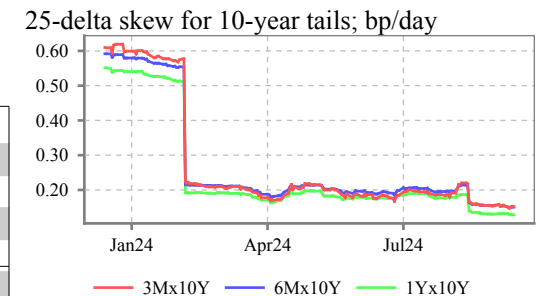
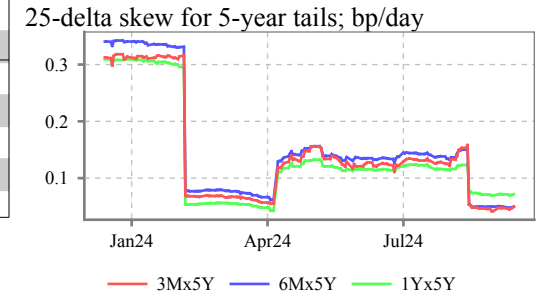
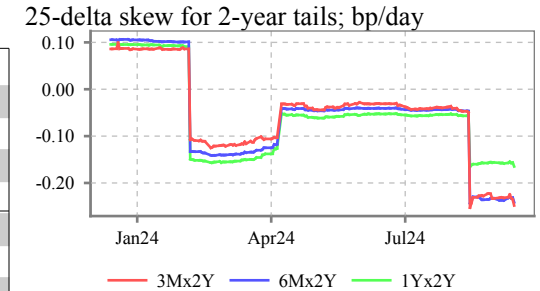


Structure	ATMF Payer				25-delta Payer				10-delta Payer			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	3.58	6.52	39.6	0.0	3.92	0.00	0.0	0.0	5.37	7.73	0.0	0.0
3Mx3Y	3.53	6.57	58.9	0.0	3.87	0.00	0.0	0.0	5.33	8.03	0.0	0.0
3Mx5Y	3.59	6.50	94.1	0.0	3.92	0.00	0.0	0.0	5.44	8.51	0.0	0.0
3Mx10Y	3.91	6.12	162.2	0.0	4.21	0.00	0.0	0.0	5.75	7.67	0.0	0.0
3Mx30Y	3.97	5.43	306.6	0.0	4.22	0.00	0.0	0.0	5.98	7.35	0.0	0.0
6Mx2Y	3.45	6.29	52.7	0.0	3.89	7.42	0.0	0.0	5.23	7.07	0.0	0.0
6Mx3Y	3.45	6.23	77.0	0.0	3.89	7.62	0.0	0.0	5.25	7.20	0.0	0.0
6Mx5Y	3.57	6.16	123.0	0.0	3.98	8.08	0.0	0.0	5.40	7.53	0.0	0.0
6Mx10Y	3.90	5.86	214.1	0.0	4.30	7.33	0.0	0.0	5.69	6.90	0.0	0.0
6Mx30Y	3.96	5.23	407.1	0.0	4.29	0.00	0.0	0.0	5.79	6.48	0.0	0.0
1Yx2Y	3.36	6.05	71.0	0.0	3.95	6.93	0.0	0.0	5.32	6.69	0.0	0.0
1Yx3Y	3.41	5.98	103.8	0.0	3.99	7.04	0.0	0.0	5.39	6.75	0.0	0.0
1Yx5Y	3.59	5.85	163.3	0.0	4.13	0.00	0.0	0.0	5.59	6.89	0.0	0.0
1Yx10Y	3.94	5.65	288.2	0.0	4.45	6.67	0.0	0.0	5.88	6.41	0.0	0.0
1Yx30Y	3.96	5.04	548.4	0.0	4.37	0.00	0.0	0.0	5.87	5.95	0.0	0.0

Derivatives Strategy

AUD Swaptions – Spreads and 1x2s

Structure	Spot Yield			ATMF Yield	25-delta receiver spread				Premium-neutral receiver 1x2s			
	Current	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	3.77	4.61	3.77	3.58	3.26	0	21.6	-2.4	N/A	0	49	2.6
3Mx3Y	3.64	4.53	3.64	3.53	3.19	0	32.8	-1.8	N/A	0	50	3.1
3Mx5Y	3.64	4.53	3.64	3.59	3.25	0	54.6	-1.6	N/A	0	51	3.8
3Mx10Y	3.92	4.75	3.92	3.91	3.56	0	100.0	-1.4	N/A	0	52	3.9
3Mx30Y	3.99	4.69	3.99	3.97	3.65	0	203.6	-1.5	N/A	0	54	3.4
6Mx2Y	3.77	4.61	3.77	3.45	3.02	0	28.8	-1.1	N/A	0	49	0.7
6Mx3Y	3.64	4.53	3.64	3.45	3.02	0	43.1	-0.9	N/A	0	50	1.2
6Mx5Y	3.64	4.53	3.64	3.57	3.12	0	71.8	-0.6	N/A	0	51	1.9
6Mx10Y	3.92	4.75	3.92	3.90	3.45	0	133.8	-0.6	N/A	0	52	2.1
6Mx30Y	3.99	4.69	3.99	3.96	3.52	0	275.8	-0.7	N/A	0	55	1.8
1Yx2Y	3.77	4.61	3.77	3.36	2.76	0	39.7	-0.4	N/A	0	50	1.3
1Yx3Y	3.64	4.53	3.64	3.41	2.81	0	59.5	-0.3	N/A	0	51	1.5
1Yx5Y	3.64	4.53	3.64	3.59	2.98	0	97.6	-0.1	N/A	0	52	1.8
1Yx10Y	3.92	4.75	3.92	3.94	3.30	0	183.5	-0.1	N/A	0	53	1.8
1Yx30Y	3.99	4.69	3.99	3.96	3.33	0	382.6	-0.4	N/A	0	56	1.2



Structure	Spot Yield			ATMF Yield	25-delta payer spread				Premium-neutral payer 1x2s			
	Spot	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	3.77	4.61	3.77	3.58	3.92	8	23.2	1.2	N/A	0	-51	8.1
3Mx3Y	3.64	4.53	3.64	3.53	3.87	19	33.7	0.2	N/A	0	-50	6.3
3Mx5Y	3.64	4.53	3.64	3.59	3.92	23	51.6	-0.6	N/A	0	-49	5.0
3Mx10Y	3.92	4.75	3.92	3.91	4.21	23	89.6	-0.9	N/A	0	-48	4.2
3Mx30Y	3.99	4.69	3.99	3.97	4.22	28	158.9	-0.6	N/A	0	-46	3.8
6Mx2Y	3.77	4.61	3.77	3.45	3.89	8	30.8	0.7	N/A	0	-51	4.7
6Mx3Y	3.64	4.53	3.64	3.45	3.89	19	44.0	0.2	N/A	0	-50	3.5
6Mx5Y	3.64	4.53	3.64	3.57	3.98	28	67.0	-0.2	N/A	0	-49	2.6
6Mx10Y	3.92	4.75	3.92	3.90	4.30	33	116.9	-0.4	N/A	0	-48	2.1
6Mx30Y	3.99	4.69	3.99	3.96	4.29	34	204.3	-0.2	N/A	0	-45	2.1
1Yx2Y	3.77	4.61	3.77	3.36	3.95	17	40.6	0.0	N/A	0	-50	1.8
1Yx3Y	3.64	4.53	3.64	3.41	3.99	25	58.1	-0.2	N/A	0	-49	1.5
1Yx5Y	3.64	4.53	3.64	3.59	4.13	41	87.1	-0.3	N/A	0	-48	1.1
1Yx10Y	3.92	4.75	3.92	3.94	4.45	61	155.0	-0.4	N/A	0	-47	1.1
1Yx30Y	3.99	4.69	3.99	3.96	4.37	47	262.9	-0.1	N/A	0	-44	1.3

European Rates Strategy

Implied and delivered directionality report - AUD

				Directionality*; %				(Imp - Deliv)							
	Implied vol; bp/day			Implied		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	Rsqr	
1s/3s	5.9	6.6		11 %	28 %	17 %	-6 %	100 %	89 %	-69	-91	22	6 %	38 %	
1s/5s	5.9	6.5		10 %	33 %	6 %	4 %	100 %	90 %	-60	-87	27	-4 %	9 %	
1s/10s	5.9	6.1		4 %	33 %	-14 %	18 %	100 %	96 %	-10	-40	30	-18 %	50 %	
1s/30s	5.9	5.4		-8 %	25 %	-41 %	33 %	100 %	108 %	46	16	30	-33 %	51 %	
2s/5s	6.5	6.5		-0 %	17 %	-14 %	14 %	100 %	100 %	2	-12	14	-14 %	76 %	
2s/7s	6.5	6.3		-3 %	18 %	-26 %	24 %	100 %	103 %	25	9	16	-24 %	79 %	
2s/10s	6.5	6.1		-6 %	17 %	-39 %	33 %	100 %	106 %	58	41	17	-33 %	77 %	
2s/20s	6.5	5.6		-16 %	10 %	-59 %	43 %	100 %	116 %	116	99	17	-43 %	67 %	
2s/30s	6.5	5.4		-20 %	7 %	-71 %	51 %	100 %	120 %	119	102	17	-51 %	62 %	
3s/5s	6.6	6.5		-1 %	7 %	-13 %	12 %	100 %	101 %	10	4	6	-12 %	83 %	
3s/7s	6.6	6.3		-4 %	8 %	-25 %	21 %	100 %	104 %	34	25	8	-21 %	81 %	
3s/10s	6.6	6.1		-7 %	7 %	-37 %	30 %	100 %	107 %	66	57	10	-30 %	77 %	
3s/20s	6.6	5.6		-17 %	0 %	-57 %	40 %	100 %	117 %	125	115	9	-40 %	65 %	
3s/30s	6.6	5.4		-21 %	-4 %	-69 %	48 %	100 %	121 %	128	119	9	-48 %	60 %	
5s/10s	6.5	6.1		-6 %	-0 %	-22 %	16 %	100 %	106 %	56	53	3	-16 %	73 %	
5s/20s	6.5	5.6		-15 %	-8 %	-39 %	24 %	100 %	115 %	114	111	3	-24 %	54 %	
5s/30s	6.5	5.4		-20 %	-12 %	-50 %	30 %	100 %	120 %	117	114	3	-30 %	50 %	
10s/30s	6.1	5.4		-13 %	-12 %	-24 %	11 %	100 %	113 %	58	58	-1	-11 %	32 %	
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr	
1s/2s/3s	5.9	6.5	6.6	5 %	4 %	10 %	-5 %	100 %	52 %	-32	-28	4	5 %	83 %	
1s/3s/5s	5.9	6.6	6.5	6 %	10 %	14 %	-8 %	100 %	53 %	-50	-42	8	9 %	81 %	
2s/5s/7s	6.5	6.5	6.3	1 %	7 %	-2 %	3 %	100 %	51 %	-17	-11	6	-4 %	53 %	
2s/5s/10s	6.5	6.5	6.1	3 %	8 %	2 %	1 %	100 %	51 %	-32	-26	6	-1 %	4 %	
2s/7s/12s	6.5	6.3	6.0	1 %	10 %	-7 %	8 %	100 %	51 %	-18	-10	8	-8 %	73 %	
2s/10s/30s	6.5	6.1	5.4	2 %	12 %	-9 %	12 %	100 %	51 %	-6	4	9	-12 %	72 %	
3s/7s/15s	6.6	6.3	5.9	2 %	6 %	-4 %	6 %	100 %	51 %	-18	-15	4	-6 %	76 %	
5s/10s/30s	6.5	6.1	5.4	3 %	4 %	-1 %	3 %	100 %	51 %	1	2	2	-3 %	47 %	
10s/20s/30s	6.1	5.6	5.4	-3 %	-2 %	-3 %	1 %	100 %	49 %	25	25	0	-1 %	6 %	

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions

Delivered directionality is defined as: Curves: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. Flies: Delivered directionality is defined as the 3M beta obtained from regressing the 50:50 fly with the body of the fly

** Curves weighted by the implied weights listed in the adjacent column. Flies weighted by the implied weights listed in the adjacent column. These weights make the fly premium-neutral at inception.

*** Carry for curve flatteners and long body in the fly

**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent

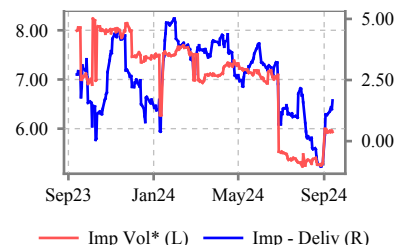
columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

European Rates Strategy

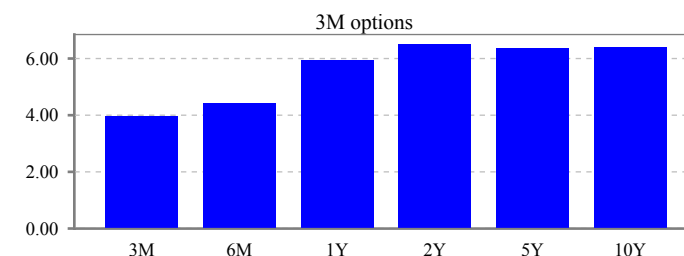
ZAR Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	4.9	0.0	-1.1	3.0	3.5	3.8	10.1	1.8	4.7	38 %
3M	5.9	0.6	-0.5	3.6	4.3	4.7	9.6	3.3	6.0	58 %
6M	6.8	0.0	-1.1	4.2	4.8	5.3	9.6	4.9	7.4	67 %
1Y	7.8	-0.4	-1.7	4.7	5.7	5.9	10.4	7.0	9.1	82 %

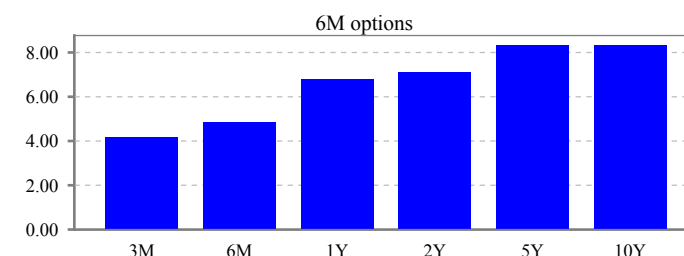
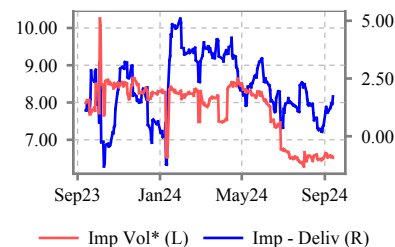


Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



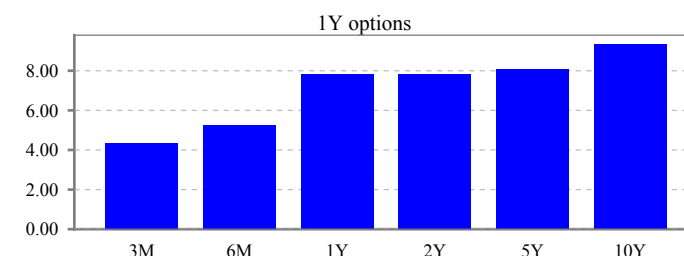
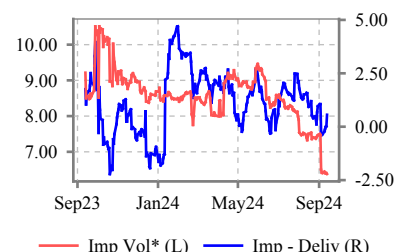
Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.1	0.0	-1.0	3.8	4.4	4.6	11.1	2.8	6.4	52 %
3M	6.5	0.0	-1.0	4.1	4.8	5.1	10.3	4.2	7.3	73 %
6M	7.1	-0.2	-1.2	4.4	5.3	5.5	10.3	5.8	8.2	80 %
1Y	7.8	-0.8	-1.9	4.7	5.8	6.0	10.8	7.6	9.5	95 %



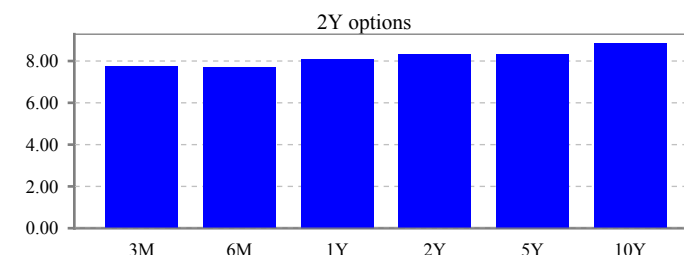
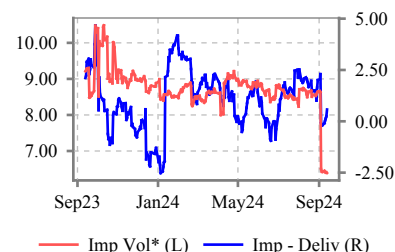
Options on 5Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.9	-0.6	-1.7	4.4	5.6	5.9	15.7	3.6	8.1	87 %
3M	6.4	-1.1	-2.5	4.7	5.8	6.2	12.1	5.6	8.7	95 %
6M	8.3	0.1	-0.9	4.8	6.2	6.5	11.6	7.1	9.4	71 %
1Y	8.1	-1.1	-2.7	4.9	6.4	6.9	11.5	8.5	10.2	100 %



Options on 10Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.9	-1.0	-1.9	4.4	5.7	6.3	16.7	4.2	8.2	87 %
3M	6.4	-2.2	-3.6	4.6	5.8	6.5	12.5	5.8	8.7	96 %
6M	8.3	-0.5	-1.6	4.7	6.0	6.7	11.4	7.1	9.2	67 %
1Y	9.3	0.0	-0.8	4.8	6.2	7.0	11.0	8.5	9.8	58 %

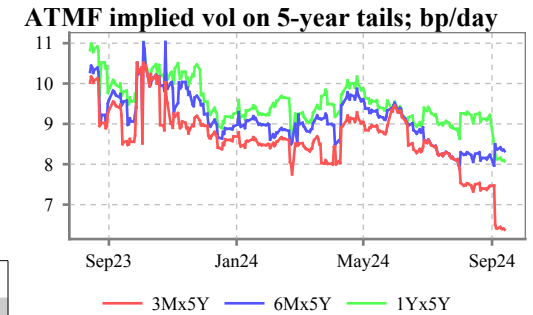
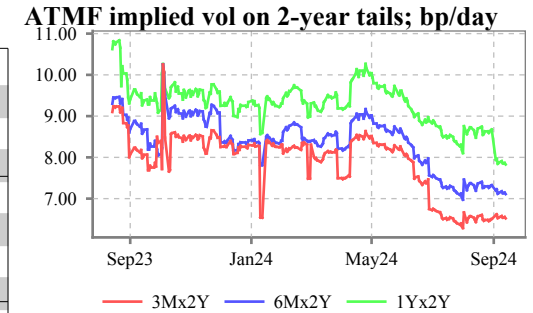


* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

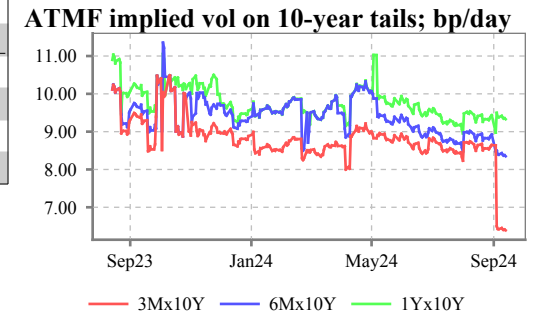
Derivatives Strategy

ZAR Swaptions – Outright ATM and OTM payers & receivers

Structure	ATMF Receiver				25-delta Receiver				10-delta Receiver			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	6.98	6.52	37.5	0.0	6.65	6.16	0.0	0.0	6.37	6.11	0.0	0.0
3Mx3Y	7.04	6.48	54.1	0.0	6.71	6.12	0.0	0.0	6.43	6.07	0.0	0.0
3Mx5Y	7.40	6.38	83.0	0.0	7.07	6.03	0.0	0.0	6.80	5.98	0.0	0.0
3Mx10Y	8.52	6.39	137.7	0.0	8.18	6.05	0.0	0.0	7.91	6.00	0.0	0.0
6Mx2Y	6.90	7.11	56.8	0.0	6.42	6.59	0.0	0.0	6.02	6.40	0.0	0.0
6Mx3Y	7.02	7.52	87.1	0.0	6.51	6.95	0.0	0.0	6.09	6.77	0.0	0.0
6Mx5Y	7.45	8.32	150.1	0.0	6.88	7.68	0.0	0.0	6.44	7.49	0.0	0.0
6Mx10Y	8.59	8.35	248.6	0.0	7.99	7.72	0.0	0.0	7.56	7.54	0.0	0.0
1Yx2Y	6.92	7.83	85.9	0.0	6.19	7.09	0.0	0.0	5.70	6.76	0.0	0.0
1Yx3Y	7.10	7.90	125.9	0.0	6.36	7.15	0.0	0.0	5.87	6.83	0.0	0.0
1Yx5Y	7.66	8.07	199.8	0.0	6.86	7.14	0.0	0.0	6.40	6.73	0.0	0.0
1Yx10Y	8.78	9.33	379.2	0.0	7.83	8.18	0.0	0.0	7.35	7.70	0.0	0.0



Structure	ATMF Payer				25-delta Payer				10-delta Payer			
	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	6.98	6.52	37.5	0.0	7.30	0.00	0.0	0.0	8.99	11.09	0.0	0.0
3Mx3Y	7.04	6.48	54.1	0.0	7.35	0.00	0.0	0.0	9.05	11.01	0.0	0.0
3Mx5Y	7.40	6.38	83.0	0.0	7.70	0.00	0.0	0.0	9.41	10.83	0.0	0.0
3Mx10Y	8.52	6.39	137.7	0.0	8.81	0.00	0.0	0.0	10.53	10.68	0.0	0.0
6Mx2Y	6.90	7.11	56.8	0.0	7.41	0.00	0.0	0.0	9.06	10.67	0.0	0.0
6Mx3Y	7.02	7.52	87.1	0.0	7.55	0.00	0.0	0.0	9.23	11.29	0.0	0.0
6Mx5Y	7.45	8.32	150.1	0.0	8.03	0.00	0.0	0.0	9.78	12.48	0.0	0.0
6Mx10Y	8.59	8.35	248.6	0.0	9.14	0.00	0.0	0.0	10.89	12.28	0.0	0.0
1Yx2Y	6.92	7.83	85.9	0.0	7.78	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx3Y	7.10	7.90	125.9	0.0	7.96	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx5Y	7.66	8.07	199.8	0.0	8.46	0.00	0.0	0.0	0.00	0.00	0.0	0.0
1Yx10Y	8.78	9.33	379.2	0.0	9.63	0.00	0.0	0.0	0.00	0.00	0.0	0.0

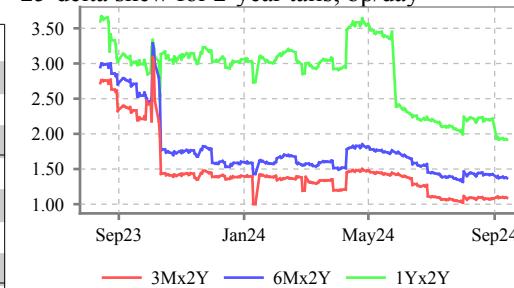


Derivatives Strategy

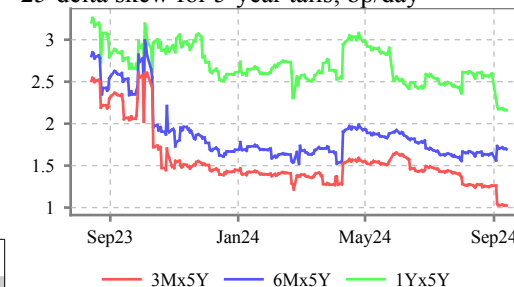
ZAR Swaps – Spreads and 1x2s

Structure	Spot Yield			ATMF Yield	25-delta receiver spread				Premium-neutral receiver 1x2s			
	Current	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	7.13	8.51	7.13	6.98	6.65	0	25.1	-3.5	N/A	0	52	1.9
3Mx3Y	7.11	8.63	7.11	7.04	6.71	0	36.3	-2.8	N/A	0	52	3.0
3Mx5Y	7.37	9.07	7.37	7.40	7.07	0	56.1	-1.4	N/A	0	52	4.8
3Mx10Y	8.45	10.26	8.45	8.52	8.18	0	94.6	-0.7	N/A	0	52	5.7
6Mx2Y	7.13	8.51	7.13	6.90	6.42	0	37.5	-1.8	N/A	0	51	2.2
6Mx3Y	7.11	8.63	7.11	7.02	6.51	0	57.8	-1.5	N/A	0	52	3.9
6Mx5Y	7.37	9.07	7.37	7.45	6.88	0	99.7	-1.2	N/A	0	52	6.6
6Mx10Y	8.45	10.26	8.45	8.59	7.99	0	168.7	-1.1	N/A	0	53	6.9
1Yx2Y	7.13	8.51	7.13	6.92	6.19	0	56.4	-0.2	N/A	0	51	3.5
1Yx3Y	7.11	8.63	7.11	7.10	6.36	0	83.1	0.3	N/A	0	51	3.9
1Yx5Y	7.37	9.07	7.37	7.66	6.86	0	139.8	0.9	N/A	0	53	4.4
1Yx10Y	8.45	10.26	8.45	8.78	7.83	0	270.5	0.3	N/A	0	55	5.5

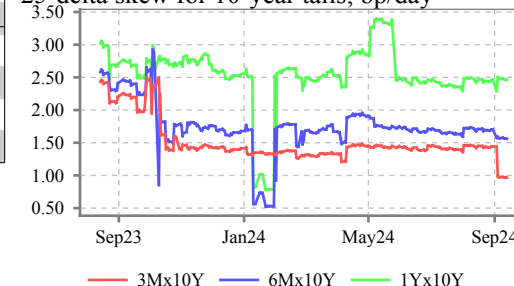
25-delta skew for 2-year tails; bp/day



25-delta skew for 5-year tails; bp/day



25-delta skew for 10-year tails; bp/day



Structure	Spot Yield			ATMF Yield	25-delta payer spread				Premium-neutral payer 1x2s			
	Spot	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	7.13	8.51	7.13	6.98	7.30	16	17.6	0.9	N/A	0	-48	7.6
3Mx3Y	7.11	8.63	7.11	7.04	7.35	23	25.3	-0.3	N/A	0	-48	5.9
3Mx5Y	7.37	9.07	7.37	7.40	7.70	24	38.6	-1.1	N/A	0	-48	4.5
3Mx10Y	8.45	10.26	8.45	8.52	8.81	26	63.0	-1.2	N/A	0	-48	4.1
6Mx2Y	7.13	8.51	7.13	6.90	7.41	24	28.0	-0.3	N/A	0	-49	4.4
6Mx3Y	7.11	8.63	7.11	7.02	7.55	28	42.5	-0.8	N/A	0	-48	4.4
6Mx5Y	7.37	9.07	7.37	7.45	8.03	38	71.1	-1.5	N/A	0	-48	4.9
6Mx10Y	8.45	10.26	8.45	8.59	9.14	41	114.0	-1.5	N/A	0	-47	4.7
1Yx2Y	7.13	8.51	7.13	6.92	7.78	40	43.4	-0.6	N/A	0	-49	2.1
1Yx3Y	7.11	8.63	7.11	7.10	7.96	51	62.8	-0.9	N/A	0	-49	1.5
1Yx5Y	7.37	9.07	7.37	7.66	8.46	58	91.7	-0.9	N/A	0	-47	0.3
1Yx10Y	8.45	10.26	8.45	8.78	9.63	59	161.9	-0.8	N/A	0	-45	1.9

European Rates Strategy

Implied and delivered directionality report - ZAR

Implied and derived directionality report - 27/11														
	Implied vol; bp/day			Directionality*; %				Implied weights; %		Weighted curve**; bp			3M regression stats****	
Trades	Short	Long		Current	3M Lagged	Deliv	(Imp - Deliv)	Short	Long	3M fwd	Spot	3M Carry***	Beta	Rsqr
1s/3s	5.9	6.5		9 %	9 %	13 %	-4 %	100 %	91 %	-70	-99	29	4 %	8 %
1s/5s	5.9	6.4		7 %	16 %	13 %	-6 %	100 %	93 %	-26	-63	38	6 %	11 %
1s/10s	5.9	6.4		7 %	17 %	6 %	1 %	100 %	93 %	77	35	42	-1 %	0 %
2s/5s	6.5	6.4		-2 %	12 %	3 %	-5 %	100 %	102 %	59	41	18	5 %	15 %
2s/7s	6.5	6.4		-2 %	12 %	-2 %	-0 %	100 %	102 %	111	89	22	0 %	0 %
2s/10s	6.5	6.4		-2 %	13 %	-6 %	4 %	100 %	102 %	171	149	22	-4 %	4 %
2s/20s	6.5	8.9		27 %	17 %	-5 %	32 %	100 %	73 %	-35	-54	19	-32 %	68 %
3s/5s	6.5	6.4		-2 %	8 %	-0 %	-2 %	100 %	102 %	48	39	10	2 %	5 %
3s/7s	6.5	6.4		-2 %	8 %	-5 %	3 %	100 %	102 %	100	86	14	-3 %	7 %
3s/10s	6.5	6.4		-1 %	10 %	-9 %	8 %	100 %	101 %	160	147	14	-8 %	18 %
3s/20s	6.5	8.9		27 %	14 %	-8 %	35 %	100 %	73 %	-45	-55	11	-35 %	79 %
5s/10s	6.4	6.4		0 %	2 %	-10 %	10 %	100 %	100 %	110	106	4	-10 %	49 %
5s/20s	6.4	8.9		29 %	7 %	-8 %	37 %	100 %	71 %	-91	-92	1	-37 %	90 %
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr
1s/2s/3s	5.9	6.5	6.5	5 %	0 %	4 %	1 %	100 %	53 %	-54	-47	7	-1 %	6 %
1s/3s/5s	5.9	6.5	6.4	5 %	0 %	7 %	-2 %	100 %	53 %	-72	-62	10	2 %	6 %
2s/5s/7s	6.5	6.4	6.4	-1 %	5 %	4 %	-5 %	100 %	49 %	-3	4	7	5 %	54 %
2s/5s/10s	6.5	6.4	6.4	-1 %	5 %	6 %	-7 %	100 %	49 %	-33	-26	7	7 %	71 %
2s/7s/12s	6.5	6.4	6.4	-1 %	6 %	3 %	-4 %	100 %	49 %	2	13	11	4 %	34 %
3s/7s/15s	6.5	6.4	7.3	-8 %	3 %	0 %	-9 %	100 %	46 %	46	53	7	8 %	79 %

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions.

Delivered directionality is defined as: Curves: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. Flies: Delivered directionality is defined as the 3M beta obtained from regressing the 50:50 fly with the body of the fly

** Curves weighted by the implied weights listed in the adjacent column. Flies weighted by the implied weights listed in the adjacent column. These weights make the fly premium-neutral at inception.

*** Carry for curve flatteners and long body in the fly

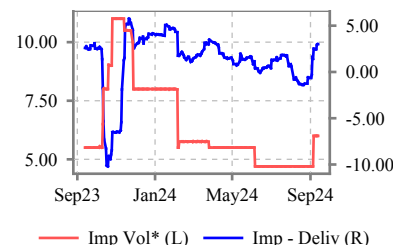
**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

European Rates Strategy

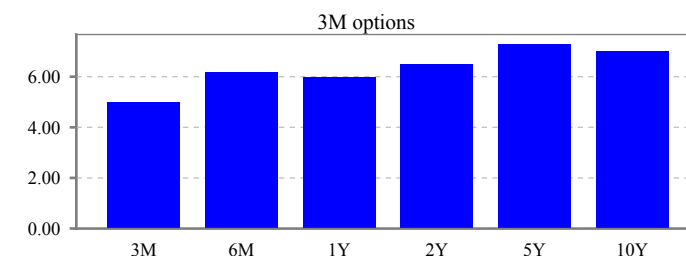
ILS Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	1.5	3.3	2.2	2.2	3.2	15.6	0.5	4.4	19 %
3M	6.0	1.3	1.9	3.2	3.0	4.2	10.9	1.8	6.0	40 %
6M	6.5	1.0	2.3	4.5	4.0	5.5	9.7	3.9	7.4	69 %
1Y	7.5	0.5	0.1	6.1	5.4	7.4	10.5	7.5	9.3	99 %

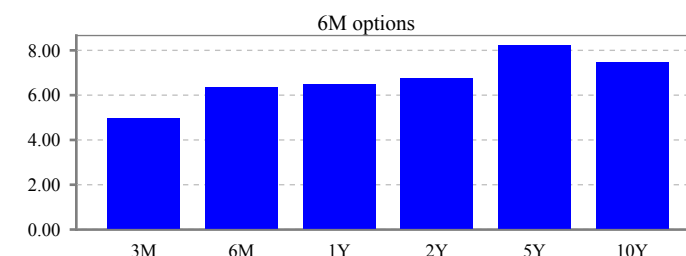
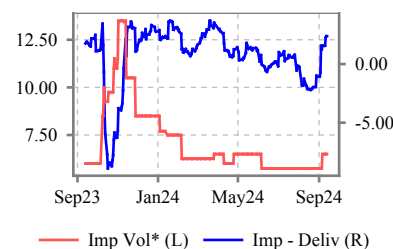


Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



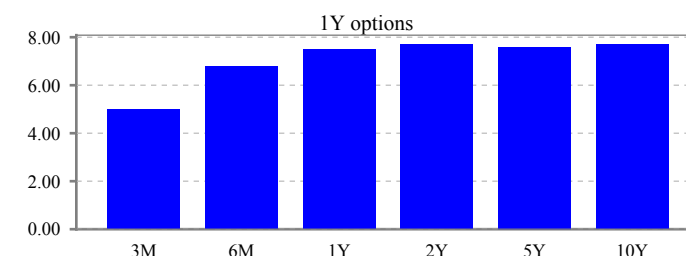
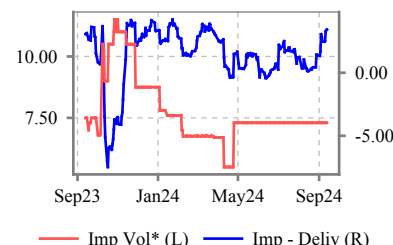
Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	0.5	4.4	4.1	3.7	5.3	16.9	1.3	5.9	37 %
3M	6.5	0.8	1.3	4.5	4.1	5.8	11.5	3.0	6.9	48 %
6M	6.8	0.3	2.4	4.9	4.5	6.3	9.8	4.3	7.6	69 %
1Y	7.7	0.5	0.1	5.2	4.8	6.8	9.4	6.7	8.3	84 %



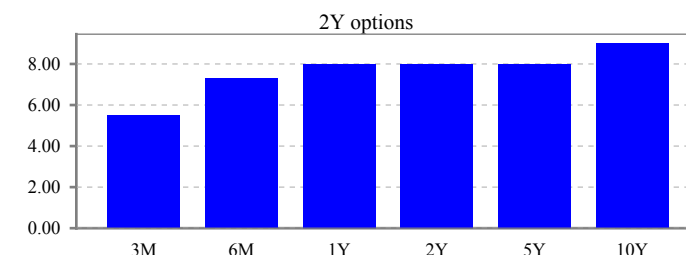
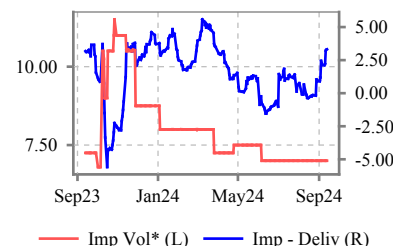
Options on 5Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.7	0.0	-0.3	3.8	3.7	5.4	16.1	2.2	6.1	34 %
3M	7.3	0.0	0.4	4.0	3.9	5.6	10.4	3.3	6.7	40 %
6M	8.2	0.7	2.0	4.1	4.0	5.8	8.7	4.2	7.2	23 %
1Y	7.6	0.4	0.4	4.2	4.1	6.0	8.7	6.2	7.7	53 %



Options on 10Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	7.0	0.0	-0.1	3.6	3.6	5.6	14.5	2.1	6.0	26 %
3M	7.0	0.0	-0.7	3.7	3.7	5.7	9.6	3.3	6.4	36 %
6M	7.5	0.0	-0.6	3.7	3.8	5.9	8.3	4.0	6.8	39 %
1Y	7.7	0.3	0.4	3.7	3.8	6.0	8.0	5.6	7.2	24 %



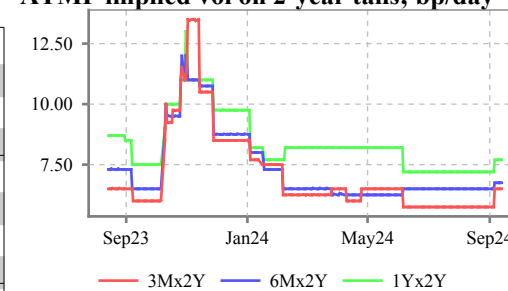
* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

Derivatives Strategy

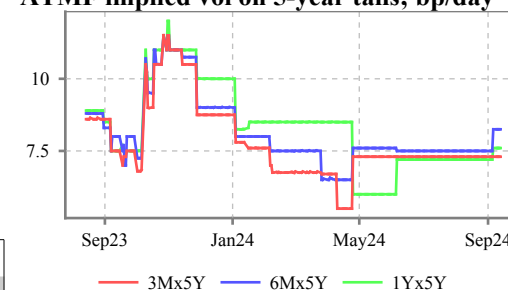
ILS Swaptions – Outright ATM and OTM payers & receivers

Structure	Strike	ATMF Receiver				25-delta Receiver				10-delta Receiver			
		Imp Vol	Premium	1M carry		Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	3.95	6.50	0.0	0.0		3.58	6.09	0.0	0.0	3.31	5.89	0.0	0.0
3Mx3Y	3.95	6.77	58.6	0.0		3.57	6.34	0.0	0.0	3.28	6.15	0.0	0.0
3Mx5Y	4.06	7.30	101.4	0.0		3.64	6.92	0.0	0.0	3.34	6.78	0.0	0.0
3Mx10Y	4.32	7.00	175.5	0.0		3.94	7.02	0.0	0.0	3.60	7.23	0.0	0.0
6Mx2Y	3.88	6.75	55.5	0.0		3.34	6.32	0.0	0.0	2.95	6.12	0.0	0.0
6Mx3Y	3.92	7.25	87.9	0.0		3.34	6.79	0.0	0.0	2.93	6.60	0.0	0.0
6Mx5Y	4.05	8.25	160.0	0.0		3.37	6.98	0.0	0.0	3.02	6.44	0.0	0.0
6Mx10Y	4.33	7.50	262.5	0.0		3.72	7.06	0.0	0.0	3.30	6.97	0.0	0.0
1Yx2Y	3.82	7.70	88.2	0.0		2.94	7.04	0.0	0.0	2.48	6.75	0.0	0.0
1Yx3Y	3.91	7.67	129.5	0.0		3.02	7.01	0.0	0.0	2.57	6.73	0.0	0.0
1Yx5Y	4.08	7.60	205.1	0.0		3.19	6.95	0.0	0.0	2.74	6.69	0.0	0.0
1Yx10Y	4.36	7.70	374.5	0.0		3.47	7.19	0.0	0.0	3.00	7.08	0.0	0.0

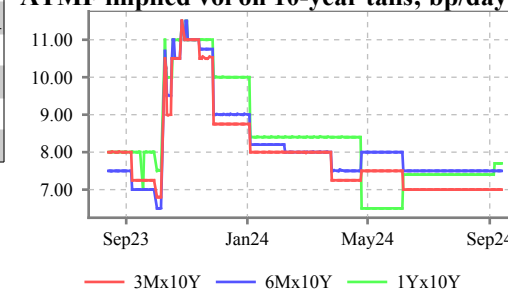
ATMF implied vol on 2-year tails; bp/day



ATMF implied vol on 5-year tails; bp/day



ATMF implied vol on 10-year tails; bp/day

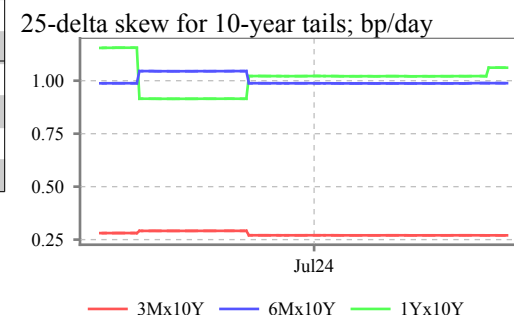
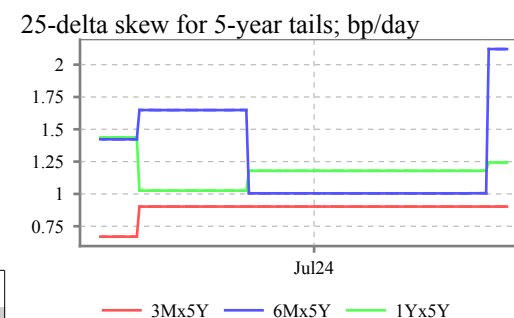
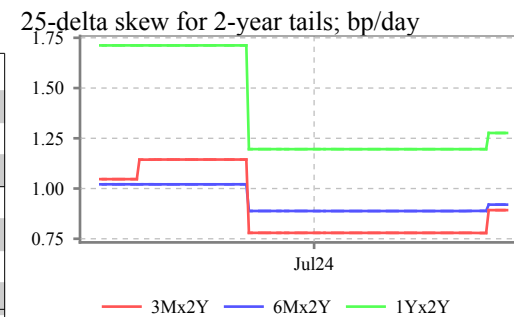


Structure	Strike	ATMF Payer				25-delta Payer				10-delta Payer			
		Imp Vol	Premium	1M carry		Strike	Imp Vol	Premium	1M carry	Strike	Imp Vol	Premium	1M carry
3Mx2Y	3.95	6.50	38.2	0.0		4.25	0.00	0.0	0.0	5.87	9.65	0.0	0.0
3Mx3Y	3.95	6.77	58.6	0.0		4.26	0.00	0.0	0.0	5.88	10.00	0.0	0.0
3Mx5Y	4.06	7.30	101.4	0.0		4.38	0.00	0.0	0.0	5.97	10.48	0.0	0.0
3Mx10Y	4.32	7.00	175.5	0.0		4.65	0.00	0.0	0.0	6.18	9.32	0.0	0.0
6Mx2Y	3.88	6.75	55.5	0.0		4.30	0.00	0.0	0.0	5.87	9.11	0.0	0.0
6Mx3Y	3.92	7.25	87.9	0.0		4.36	0.00	0.0	0.0	5.96	9.71	0.0	0.0
6Mx5Y	4.05	8.25	160.0	0.0		4.45	0.00	0.0	0.0	6.40	12.79	0.0	0.0
6Mx10Y	4.33	7.50	262.5	0.0		4.75	0.00	0.0	0.0	6.44	10.44	0.0	0.0
1Yx2Y	3.82	7.70	88.2	0.0		4.45	0.00	0.0	0.0	6.28	10.08	0.0	0.0
1Yx3Y	3.91	7.67	129.5	0.0		4.53	0.00	0.0	0.0	6.37	10.08	0.0	0.0
1Yx5Y	4.08	7.60	205.1	0.0		4.66	0.00	0.0	0.0	6.52	10.07	0.0	0.0
1Yx10Y	4.36	7.70	374.5	0.0		4.90	0.00	0.0	0.0	6.81	10.42	0.0	0.0

Derivatives Strategy

ILS Swaptions – Spreads and 1x2s

Structure	Spot Yield			ATMF Yield	25-delta receiver spread				Premium-neutral receiver 1x2s			
	Current	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	4.05	4.53	3.80	3.95	3.58	0	25.9	-2.8	N/A	0	55	3.6
3Mx3Y	4.00	4.54	3.74	3.95	3.57	0	39.8	-2.6	N/A	0	55	4.4
3Mx5Y	4.07	4.59	3.82	4.06	3.64	0	68.2	-2.4	N/A	0	55	5.2
3Mx10Y	4.32	4.81	4.08	4.32	3.94	0	108.1	-1.5	N/A	0	53	4.8
6Mx2Y	4.05	4.53	3.80	3.88	3.34	0	38.3	-1.8	N/A	0	55	2.1
6Mx3Y	4.00	4.54	3.74	3.92	3.34	0	60.8	-1.6	N/A	0	55	3.1
6Mx5Y	4.07	4.59	3.82	4.05	3.37	0	123.1	-2.7	N/A	0	60	4.4
6Mx10Y	4.32	4.81	4.08	4.33	3.72	0	181.6	-1.6	N/A	0	57	3.8
1Yx2Y	4.05	4.53	3.80	3.82	2.94	0	63.3	-1.2	N/A	0	57	2.8
1Yx3Y	4.00	4.54	3.74	3.91	3.02	0	93.2	-0.8	N/A	0	57	2.7
1Yx5Y	4.07	4.59	3.82	4.08	3.19	0	148.1	0.5	N/A	0	58	1.8
1Yx10Y	4.32	4.81	4.08	4.36	3.47	0	264.9	-0.4	N/A	0	59	2.6



Structure	Spot Yield			ATMF Yield	25-delta payer spread				Premium-neutral payer 1x2s			
	Spot	6M max	6M min		Outstrike	6M %-tile	Premium	1M carry	Outstrike	6M %-tile	Delta	1M carry
3Mx2Y	4.05	4.53	3.80	3.95	4.25	60	18.5	0.4	N/A	0	-45	6.7
3Mx3Y	4.00	4.54	3.74	3.95	4.26	66	28.1	-0.4	N/A	0	-45	5.9
3Mx5Y	4.07	4.59	3.82	4.06	4.38	77	48.7	-1.0	N/A	0	-45	5.7
3Mx10Y	4.32	4.81	4.08	4.32	4.65	84	91.5	-1.2	N/A	0	-47	4.6
6Mx2Y	4.05	4.53	3.80	3.88	4.30	68	26.7	0.1	N/A	0	-45	4.4
6Mx3Y	4.00	4.54	3.74	3.92	4.36	83	41.7	-0.4	N/A	0	-45	4.2
6Mx5Y	4.07	4.59	3.82	4.05	4.45	89	56.4	0.0	N/A	0	-40	4.6
6Mx10Y	4.32	4.81	4.08	4.33	4.75	97	113.3	-0.3	N/A	0	-43	3.6
1Yx2Y	4.05	4.53	3.80	3.82	4.45	98	39.0	-0.1	N/A	0	-43	3.0
1Yx3Y	4.00	4.54	3.74	3.91	4.53	100	56.3	-0.1	N/A	0	-43	2.3
1Yx5Y	4.07	4.59	3.82	4.08	4.66	100	86.5	-0.7	N/A	0	-42	1.2
1Yx10Y	4.32	4.81	4.08	4.36	4.90	100	144.3	-0.2	N/A	0	-41	1.9

European Rates Strategy

Implied and delivered directionality report - ILS

Implied and derived directionality report - 120														
	Implied vol; bp/day			Directionality*; %			(Imp - Deliv)	Implied weights; %		Weighted curve**; bp			3M regression stats****	
				Implied		Deliv								
Trades	Short	Long	Current	3M Lagged	Levels	Levels	Short	Long	3M fwd	Spot	3M Carry***	Beta	Rsqr	
1s/3s	6.0	6.8	11 %	25 %	49 %	-37 %	100 %	89 %	-65	-78	13	37 %	82 %	
1s/5s	6.0	7.3	18 %	36 %	48 %	-30 %	100 %	82 %	-82	-99	16	30 %	68 %	
1s/10s	6.0	7.0	14 %	33 %	46 %	-32 %	100 %	86 %	-45	-63	18	32 %	60 %	
2s/5s	6.5	7.3	11 %	21 %	7 %	4 %	100 %	89 %	-34	-43	9	-4 %	5 %	
2s/7s	6.5	7.0	7 %	18 %	5 %	2 %	100 %	93 %	-8	-17	10	-2 %	1 %	
2s/10s	6.5	7.0	7 %	18 %	2 %	5 %	100 %	93 %	6	-4	10	-5 %	3 %	
2s/20s	6.5	6.5	-0 %	12 %	0 %	-0 %	100 %	100 %	70	60	10	0 %	0 %	
3s/5s	6.8	7.3	7 %	14 %	-2 %	9 %	100 %	93 %	-19	-23	4	-9 %	32 %	
3s/7s	6.8	7.0	3 %	10 %	-4 %	7 %	100 %	97 %	8	4	5	-7 %	12 %	
3s/10s	6.8	7.0	3 %	10 %	-7 %	10 %	100 %	97 %	23	18	5	-10 %	11 %	
3s/20s	6.8	6.5	-4 %	4 %	-9 %	5 %	100 %	104 %	90	84	6	-5 %	1 %	
5s/10s	7.3	7.0	-4 %	-4 %	-6 %	1 %	100 %	104 %	45	44	2	-1 %	0 %	
5s/20s	7.3	6.5	-12 %	-12 %	-10 %	-2 %	100 %	112 %	117	115	2	2 %	0 %	
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr
1s/2s/3s	6.0	6.5	6.8	2 %	5 %	18 %	-16 %	100 %	51 %	-19	-18	1	17 %	81 %
1s/3s/5s	6.0	6.8	7.3	2 %	4 %	26 %	-25 %	100 %	51 %	-27	-23	5	25 %	87 %
2s/5s/7s	6.5	7.3	7.0	8 %	13 %	4 %	3 %	100 %	54 %	-38	-34	4	-4 %	14 %
2s/5s/10s	6.5	7.3	7.0	8 %	13 %	7 %	0 %	100 %	54 %	-46	-42	4	-0 %	0 %
2s/7s/12s	6.5	7.0	6.7	6 %	11 %	6 %	-0 %	100 %	53 %	-31	-26	5	0 %	0 %
3s/7s/15s	6.8	7.0	6.6	4 %	8 %	4 %	1 %	100 %	52 %	-28	-26	2	-1 %	1 %

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions

Delivered directionality is defined as: Curves: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. Flies: Delivered directionality is defined as the 3M beta obtained from regressing the 50:50 fly with the body of the fly

** Curves weighted by the implied weights listed in the adjacent column. Flies weighted by the implied weights listed in the adjacent column. These weights make the fly premium-neutral at inception.

*** Carry for curve flatteners and long body in the fly

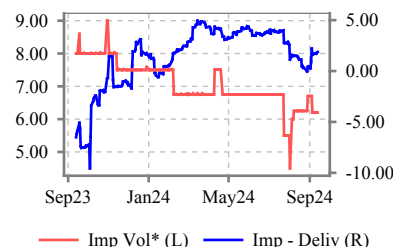
**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

European Rates Strategy

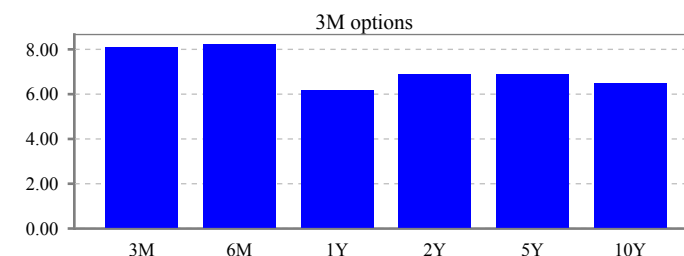
PLN Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	-1.0	-0.6	1.8	2.9	2.9	16.6	1.5	6.4	52 %
3M	6.2	0.0	-0.9	2.8	4.3	4.1	18.3	2.7	9.2	64 %
6M	7.0	0.7	-0.4	4.1	6.2	6.2	18.1	4.8	11.3	84 %
1Y	7.8	0.8	0.0	6.6	7.8	8.8	18.7	8.6	14.1	100 %

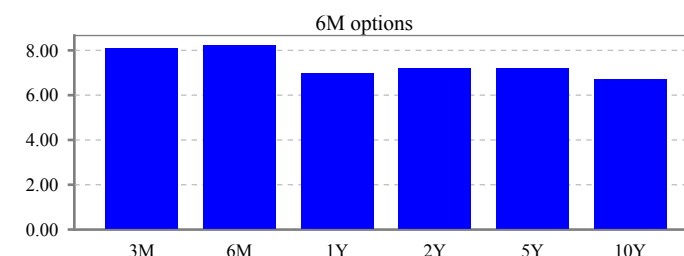
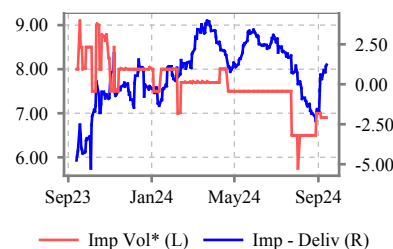


Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



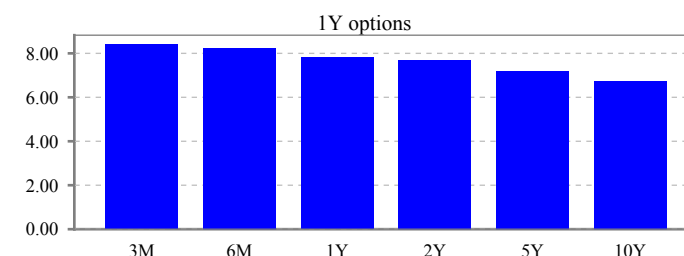
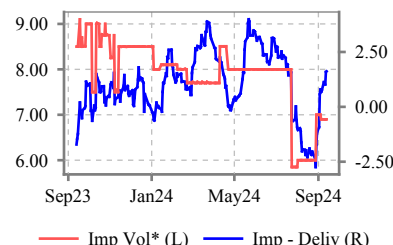
Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	-0.5	-1.5	4.2	5.1	5.7	23.4	3.6	9.4	78 %
3M	6.9	0.4	-0.8	4.6	5.7	6.3	20.3	4.8	10.9	80 %
6M	7.2	0.7	-0.7	5.2	6.4	7.3	19.1	6.2	12.0	87 %
1Y	7.7	0.7	-0.5	5.5	6.5	7.9	17.1	7.7	12.7	100 %



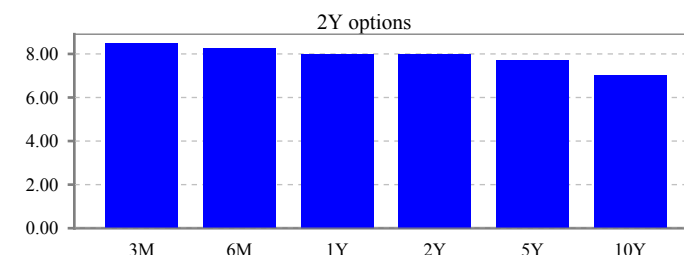
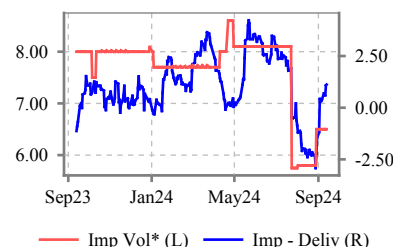
Options on 5Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	0.2	-1.3	4.1	5.1	6.3	23.9	3.7	9.6	86 %
3M	6.9	0.9	-0.7	4.3	5.3	6.6	18.5	5.3	10.5	79 %
6M	7.2	1.0	-0.6	4.5	5.5	6.9	18.2	6.2	11.2	85 %
1Y	7.2	0.7	-0.8	4.6	5.6	7.2	16.4	7.3	12.1	100 %



Options on 10Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	0.5	-1.1	4.5	5.3	6.3	22.7	3.8	9.4	82 %
3M	6.5	0.7	-1.0	4.5	5.4	6.5	17.2	5.2	10.0	83 %
6M	6.7	0.7	-1.0	4.7	5.5	6.7	17.2	6.0	10.6	88 %
1Y	6.8	1.0	-0.9	4.7	5.6	6.8	15.4	6.9	11.3	100 %



* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

European Rates Strategy

Implied and delivered directionality report - PLN

			Directionality*; %							Weighted curve**; bp			3M regression stats****	
	Implied vol; bp/day			Implied		Deliv	(Imp - Deliv)	Implied weights; %						
Trades	Short	Long	Current	3M Lagged	Levels	Levels	Short	Long	3M fwd	Spot	3M Carry***	Beta	Rsqr	
1s/3s	6.2	6.9	10 %	12 %	57 %	-47 %	100 %	90 %	-140	-160	20	47 %	93 %	
1s/5s	6.2	6.9	10 %	16 %	59 %	-49 %	100 %	90 %	-147	-175	28	49 %	92 %	
1s/10s	6.2	6.5	5 %	17 %	60 %	-56 %	100 %	95 %	-109	-141	32	56 %	92 %	
2s/5s	6.9	6.9	0 %	6 %	17 %	-17 %	100 %	100 %	-34	-54	19	17 %	74 %	
2s/7s	6.9	6.7	-3 %	6 %	17 %	-20 %	100 %	103 %	-17	-39	22	20 %	75 %	
2s/10s	6.9	6.5	-6 %	7 %	18 %	-24 %	100 %	106 %	9	-16	24	24 %	75 %	
2s/20s	6.9	6.0	-15 %	0 %	19 %	-34 %	100 %	115 %	78	51	26	34 %	85 %	
3s/5s	6.9	6.9	0 %	4 %	3 %	-3 %	100 %	100 %	-8	-17	9	3 %	23 %	
3s/7s	6.9	6.7	-3 %	4 %	3 %	-6 %	100 %	103 %	9	-3	12	6 %	40 %	
3s/10s	6.9	6.5	-6 %	5 %	4 %	-11 %	100 %	106 %	35	21	14	11 %	51 %	
3s/20s	6.9	6.0	-15 %	-2 %	6 %	-21 %	100 %	115 %	104	88	16	21 %	78 %	
5s/10s	6.9	6.5	-6 %	1 %	1 %	-8 %	100 %	106 %	43	38	5	8 %	58 %	
5s/20s	6.9	6.0	-15 %	-7 %	2 %	-17 %	100 %	115 %	112	105	7	17 %	86 %	
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr
1s/2s/3s	6.2	6.9	6.9	5 %	4 %	17 %	-12 %	100 %	53 %	-48	-48	0	12 %	87 %
1s/3s/5s	6.2	6.9	6.9	5 %	4 %	27 %	-22 %	100 %	53 %	-75	-69	6	23 %	96 %
2s/5s/7s	6.9	6.9	6.7	1 %	3 %	8 %	-7 %	100 %	51 %	-34	-26	8	7 %	76 %
2s/5s/10s	6.9	6.9	6.5	3 %	3 %	8 %	-5 %	100 %	51 %	-46	-38	7	5 %	67 %
2s/7s/12s	6.9	6.7	5.3	9 %	3 %	8 %	1 %	100 %	55 %	-81	-70	11	-2 %	8 %
3s/7s/15s	6.9	6.7	5.5	7 %	3 %	1 %	6 %	100 %	54 %	-54	-49	5	-7 %	82 %

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions.

Delivered directionality is defined as: Curves: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. Flies: Delivered directionality is defined as the 3M beta obtained from regressing the 50:50 fly with the body of the fly

** Curves weighted by the implied weights listed in the adjacent column. Flies weighted by the implied weights listed in the adjacent column. These weights make the fly premium-neutral at inception.

*** Carry for curve flatteners and long body in the fly

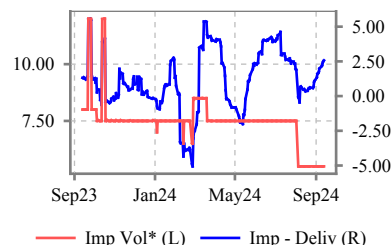
**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

European Rates Strategy

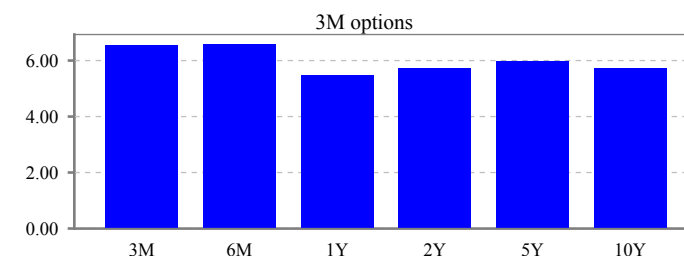
CZK Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.0	0.0	-1.8	1.8	1.9	3.4	11.9	1.9	5.6	59 %
3M	5.5	0.0	-1.8	2.9	2.9	4.3	14.1	4.3	8.1	93 %
6M	6.3	0.0	-1.8	3.9	4.1	5.6	14.5	6.7	10.1	100 %
1Y	7.0	0.0	-1.8	6.4	6.0	7.4	17.4	8.7	13.5	100 %

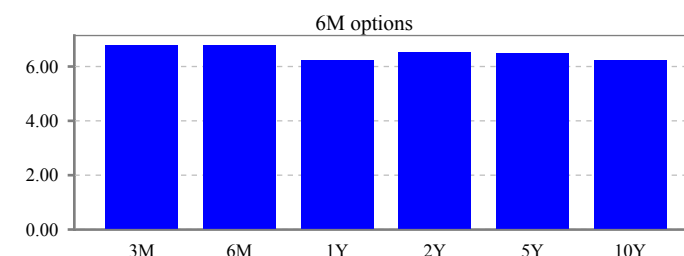
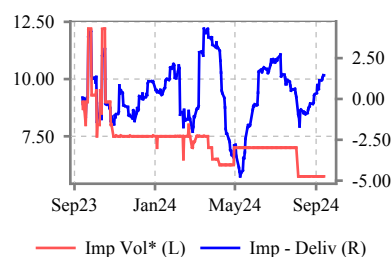


Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



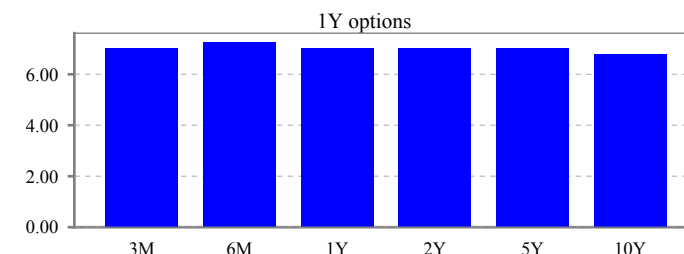
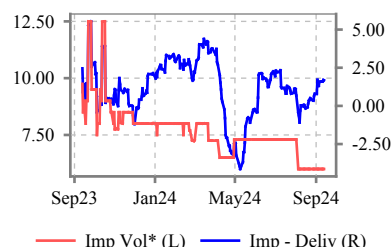
Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.3	0.0	-1.3	4.0	3.8	5.0	18.4	2.7	8.6	89 %
3M	5.8	0.0	-1.6	4.4	4.3	5.6	16.7	5.5	10.1	98 %
6M	6.6	0.0	-1.0	4.8	4.8	6.1	16.6	7.1	11.1	100 %
1Y	7.0	0.0	-1.7	5.1	5.1	6.4	15.3	7.5	11.7	100 %



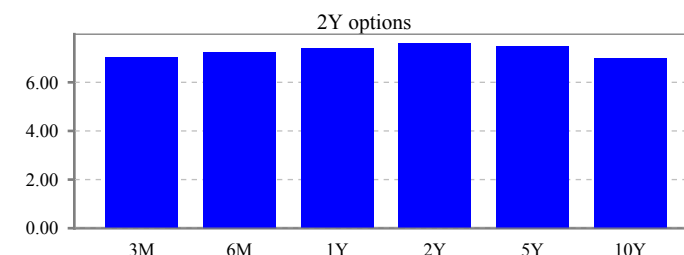
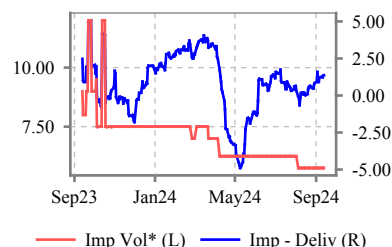
Options on 5Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	6.0	0.0	-1.6	3.9	4.1	5.3	19.2	3.3	8.5	77 %
3M	6.0	0.0	-1.6	4.0	4.3	5.5	15.1	4.7	9.2	90 %
6M	6.5	0.0	-1.6	4.1	4.5	5.8	15.1	6.2	9.7	98 %
1Y	7.0	0.0	-1.7	4.3	4.7	5.9	13.3	6.9	10.2	96 %



Options on 10Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	% Hist > Imp
1M	5.5	0.0	-1.0	4.0	4.3	5.1	17.7	3.3	7.9	79 %
3M	5.8	0.0	-1.2	4.1	4.4	5.2	14.2	4.2	8.4	87 %
6M	6.3	0.0	-1.0	4.3	4.5	5.3	13.6	6.0	8.8	96 %
1Y	6.8	0.0	-1.6	4.4	4.6	5.4	12.0	6.4	9.3	78 %



* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

European Rates Strategy

Implied and delivered directionality report - CZK

Implied and derived directionality report - 2024														
				Directionality*, %										
				Implied vol; bp/day		Implied								
Trades	Short		Long	Current	3M Lagged	Levels	Levels	Short	Long	3M fwd	Spot	3M Carry***	Beta	Rsqr
1s/3s	5.5		5.8	6 %	-6 %	2 %	3 %	100 %	94 %	-46	-72	26	-3 %	3 %
1s/5s	5.5		6.0	8 %	-3 %	-3 %	11 %	100 %	92 %	-53	-84	31	-11 %	12 %
1s/10s	5.5		5.8	4 %	-20 %	-17 %	21 %	100 %	96 %	-22	-57	34	-21 %	21 %
2s/5s	5.8		6.0	4 %	4 %	-10 %	14 %	100 %	96 %	-16	-29	13	-14 %	43 %
2s/7s	5.8		5.8	0 %	7 %	-16 %	16 %	100 %	100 %	5	-11	15	-16 %	41 %
2s/10s	5.8		5.8	0 %	-12 %	-26 %	26 %	100 %	100 %	16	0	16	-26 %	50 %
2s/20s	5.8		5.8	0 %	-22 %	-24 %	24 %	100 %	100 %	23	6	17	-24 %	48 %
3s/5s	5.8		6.0	3 %	3 %	-7 %	9 %	100 %	97 %	-8	-13	5	-9 %	53 %
3s/7s	5.8		5.8	-1 %	5 %	-13 %	12 %	100 %	101 %	13	5	8	-12 %	48 %
3s/10s	5.8		5.8	-1 %	-14 %	-23 %	21 %	100 %	101 %	25	16	9	-21 %	57 %
3s/20s	5.8		5.8	-1 %	-23 %	-21 %	19 %	100 %	101 %	32	22	10	-19 %	55 %
5s/10s	6.0		5.8	-4 %	-17 %	-16 %	11 %	100 %	104 %	34	30	4	-11 %	62 %
5s/20s	6.0		5.8	-4 %	-27 %	-14 %	9 %	100 %	104 %	41	36	5	-9 %	56 %
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr
1s/2s/3s	5.5	5.8	5.8	1 %	-4 %	4 %	-2 %	100 %	51 %	-21	-15	6	3 %	15 %
1s/3s/5s	5.5	5.8	6.0	1 %	-4 %	4 %	-3 %	100 %	51 %	-30	-19	10	3 %	15 %
2s/5s/7s	5.8	6.0	5.8	4 %	1 %	-2 %	6 %	100 %	52 %	-24	-19	5	-6 %	47 %
2s/5s/10s	5.8	6.0	5.8	4 %	9 %	2 %	2 %	100 %	52 %	-30	-25	5	-2 %	12 %
2s/7s/12s	5.8	5.8	7.2	-13 %	5 %	-3 %	-10 %	100 %	44 %	25	30	6	9 %	65 %
3s/7s/15s	5.8	5.8	6.7	-9 %	8 %	-1 %	-8 %	100 %	46 %	18	21	3	7 %	79 %

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions.

Delivered directionality is defined as: Curves: $(1 - 3M \text{ beta obtained from regressing short maturity yields to long maturity yields})$. Flies: Delivered directionality is defined as the 3M beta obtained from regressing the 50:50 fly with the body of the fly

** Curves weighted by the implied weights listed in the adjacent column. Flies weighted by the implied weights listed in the adjacent column. These weights make the fly premium-neutral at inception.

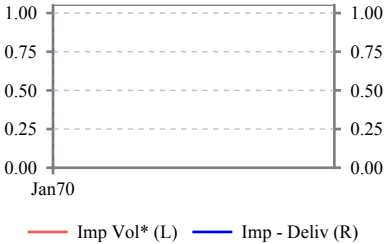
*** Carry for curve flatteners and long body in the fly

**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

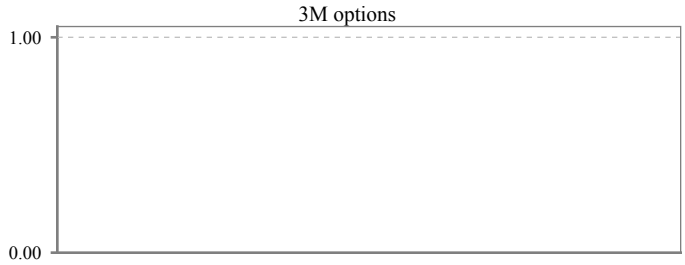
TRY Short-Dated Swaption Volatility Report

Options on 1Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			% Hist > Imp
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	
1M										0 %
3M										0 %
6M										0 %
1Y										0 %

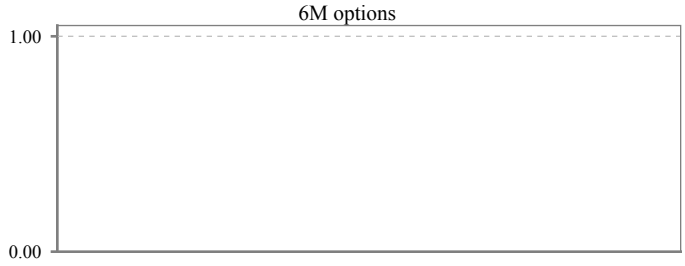
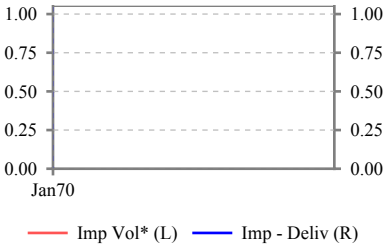


Maturity term structure for 3M, 6M, 1Y and 2Y options; bp/day



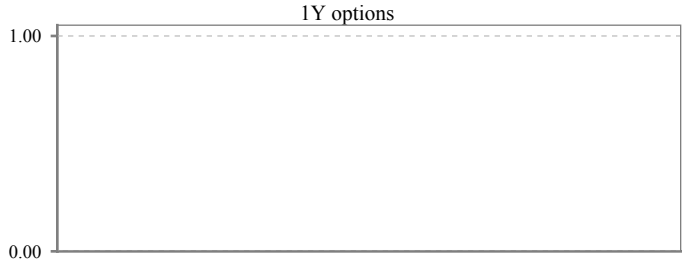
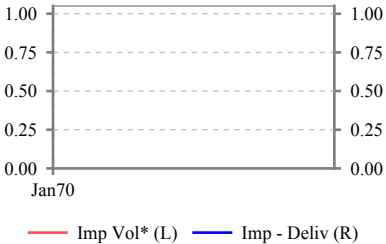
Options on 2Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			% Hist > Imp
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	
1M										0 %
3M										0 %
6M										0 %
1Y										0 %



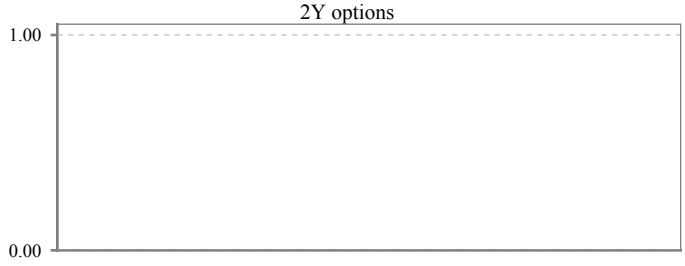
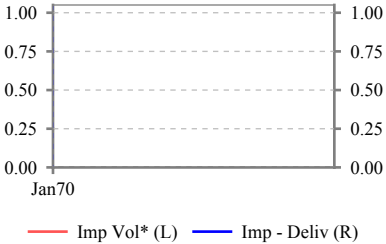
Options on 5Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			% Hist > Imp
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	
1M										0 %
3M										0 %
6M										0 %
1Y										0 %



Options on 10Y swaps

Exp	Imp Vol (bp/day)			Deliv Vol (bp/day)			Deliv vol 3Y Cone; bp/day			% Hist > Imp
	Curr	1M Chg	6M Zscore	10D	1M	3M	Max	Min	Avg	
1M										0 %
3M										0 %
6M										0 %
1Y										0 %



* For Swaptions:
Imp Vol: implied vol of 3M options
Deliv Vol: 1M deliv vol on 3M fwd swap rate

European Rates Strategy

Implied and delivered directionality report - TRY

Implied and derived directionality report

				Directionality*; %									3M regression stats****	
	Implied vol; bp/day			Implied		Deliv	(Imp - Deliv)	Implied weights; %		Weighted curve**; bp				
Trades	Short	Long		Current	3M Lagged	Levels	Levels	Short	Long	3M fwd	Spot	3M Carry***	Beta	Rsqr
1s/3s						-13 %		100 %						
1s/5s						-8 %		100 %						
1s/10s						26 %		100 %						
2s/5s						-20 %		100 %						
2s/7s						-9 %		100 %						
2s/10s						7 %		100 %						
2s/20s						27 %		100 %						
3s/5s						-14 %		100 %						
3s/7s						-8 %		100 %						
3s/10s						5 %		100 %						
3s/20s						22 %		100 %						
5s/10s						10 %		100 %						
5s/20s						24 %		100 %						
Structure	Left wing	Body	Right wing	Current	3M Lagged	Levels	Levels	Body	Wings	Spot	Fwd	3M carry***	Beta	Rsqr
1s/2s/3s						6 %		100 %						
1s/3s/5s						5 %		100 %						
2s/5s/7s						-7 %		100 %						
2s/5s/10s						-9 %		100 %						
2s/7s/12s						-6 %		100 %						
3s/7s/15s						-11 %		100 %						

* Implied directionality is defined as: Curves: $(1 - (\text{Implied vol on short maturity} / \text{Implied vol on long maturity}))$. Flies: $(1 - (0.5 * (\text{implied vol of the left wing} + \text{implied vol of the right wing}) / (\text{implied vol of the body})))$. We use 3M expiry swaptions.

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**** Curves: 3M regression stats obtained from regressing the weighted curve (using the weights in the adjacent columns on the left) with long maturity yields; Flies: Regression stats obtained from regressing the weighted fly (see above for definition) with the body of the fly.

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