

## INFLATION VOLATILITY DIGEST

Recently, we reversed our position on near-term US CPI floors. We now like selling near-term OTM floors as we see upside risks to near-term inflation versus market expectations. In this context, we discuss selling April17s versus Jan17s.

### This week's inflation volatility market views

#### US

- Sell April17s versus Jan17s to benefit from declining floor value
- Sell OTM 1% 2y CPI floors versus buy matched maturity OTM 40% Crude Puts

#### Europe

- Inflation vol market activity very low during summer period
- Upside in ZC floors as euro HICPx swaps vulnerable to further correction
- Y/y cap vols remains cheap versus floor vols

#### UK

- Recovery in RPI swap rates has partially reversed, leaving 30y RPI within 10bp of local trough; 10y RPI has proved more resilient
- LPI swaps have pared back relative cheapening versus RPI
- Market will increasingly focus on September 13 CPAC meeting given potential for methodological changes to RPI

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Source for all charts and tables in this document: Barclays Research, indicative mid levels as of August 27, 2012.

## US INFLATION VOLATILITY

## Long Jan17s versus April17s

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**Recently, we reversed our position on near-term US CPI floors. We now like selling near-term OTM floors as we see upside risks to near-term inflation versus market expectations. In this context, we discuss selling April17s versus Jan17s.**

### The case is building against April17 floors...

With front-end breakevens cheap and commodity futures (food and gasoline) rising, we have felt uncomfortable owning April17 floors. We think now is a good time to sell April17 floors outright or as a spread trade, long Jan17s versus April17s. The latter trade setup is more favourable because we think near-term inflation dynamics look more positive than the longer term, which should help steepen the short-end real curve. Being Long Jan17s versus April17s combines the floor as well as the curve view. For reference, as shown in the first table of the vol digest, April17 floors are now valued at 5.8bp in running terms (or about 0.27% of notional) versus 7.6bp (or about 0.38% of notional) about a month ago, indicating a slight change in sentiment with regards to the near-term floor.

We anticipate this declining trend in 5y floor will continue as the accrued inflation index ratio on the bond (currently at 1.01053 versus strike of 1) will likely climb and become further out of the money in the coming months because of higher food and energy prices. In addition, the Fed has been espousing a more dovish policy reaction function to boost growth. The latest FOMC meeting minutes noted that the US drought would likely result in a temporary run up in consumer food prices later this year. The statement indicates that the food price inflation is unlikely to change the Fed's cautious view on the economic outlook given its view that the food price run up would be temporary in nature. Our food futures based food inflation model indicates 1y and 2y food inflation of about 3.7-4%. The trade also makes sense for selling OTM floors under 5y. Figure 1 shows mid-indicative levels for various deflation floors out to the 10y and sector and respective deflation probabilities. We would recommend energy hedging some of the downside risks on 5y and under floors via crude puts.

Trade Recommendations: Long Jan17s versus April17s or Sell 2y OTM CPI floors hedged with crude puts

- Long Jan17s versus April17s:** Currently, the Jan17 versus April17s real yield spread is about 0bp. We anticipate the floor value on the issue to come down to 1 or 2bp from the current 6bp in the coming year, again of about 4bp. Also, positive near-term inflation dynamic are likely to steepen the Jan17-Apr17s real curve.
- Sell OTM 2y CPI floors hedged with OTM crude puts:** Selling \$100mn 1% CPI floors at (\$550K) and buying 50 \$80/crude puts has a net premium intake of about \$300k.

Figure 1: Deflation premiums and probabilities

Tenor	Option Value, % of Notional	CPI Swap Rate, % (mean, mu) *	Implied Probability of Deflation through the option expiry					
			8/24/2012	1w ago	1m ago	3m ago	6m ago	12m ago
1	0.13%	1.65%	16%	16%	26%	25%	23%	28%
2	0.25%	1.75%	15%	16%	20%	20%	20%	25%
3	0.29%	1.88%	13%	13%	16%	15%	16%	19%
4	0.30%	2.02%	11%	11%	13%	11%	15%	16%
5	0.34%	2.16%	10%	10%	12%	10%	14%	14%
7	0.41%	2.35%	9%	9%	11%	10%	14%	13%
10	0.42%	2.52%	7%	8%	9%	8%	14%	12%

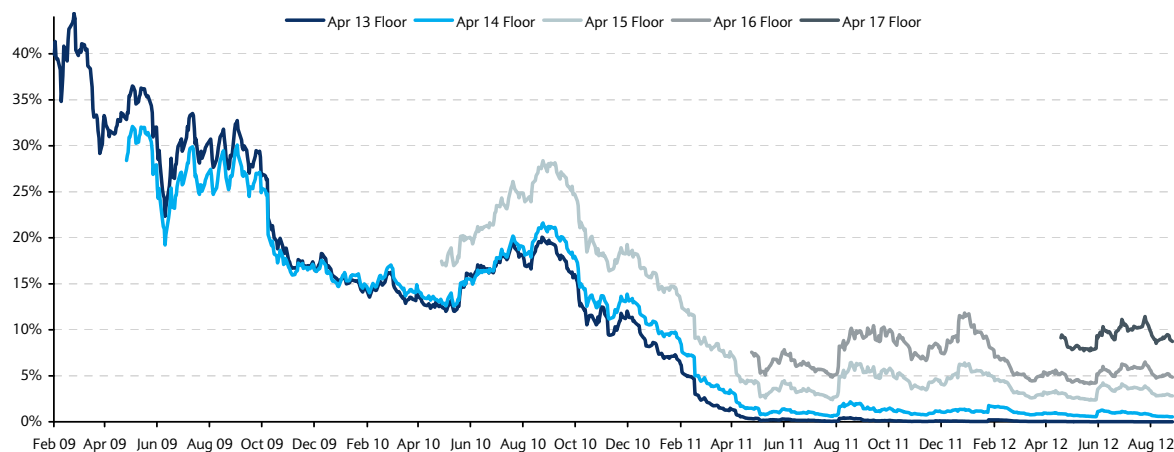
Source: Barclays Research

## US Inflation Volatility Packet

## Embedded TIPS Floor Premium implied by CPI Options Market

Bond	Real Yield, %	BEI, %	Index Ratio	Annualized Deflation needed for the floor to be ATM	"Max" BEI decline before reaching the floor	Minimum nominal Yield to Maturity *	TIPS Floor Premium, bps				
							8/27/2012	1w Ago	1m Ago	3m Ago	6m Ago
TII Apr 13 0.625%	-0.80	0.981	1.086	12.3%	13.2%	-13.1%	0.0	0.0	0.0	0.0	0.0
TII Jul 13 1.875%	-1.53	1.732	1.250	22.4%	24.1%	-23.9%	0.0	0.0	0.0	0.0	0.0
TII Jan 14 2%	-1.21	1.453	1.242	14.5%	16.0%	-15.7%	0.0	0.0	0.0	0.0	0.0
TII Apr 14 1.25%	-1.16	1.430	1.085	4.9%	6.3%	-6.0%	0.4	0.4	0.6	0.4	0.7
TII Jul 14 2%	-1.52	1.796	1.218	9.9%	11.7%	-11.5%	0.0	0.0	0.0	0.0	0.0
TII Jan 15 1.625%	-1.35	1.646	1.202	7.4%	9.1%	-8.8%	0.1	0.1	0.1	0.1	0.1
TII Apr 15 0.5%	-1.33	1.651	1.059	2.2%	3.8%	-3.5%	2.0	2.1	2.6	1.6	2.1
TII Jul 15 1.875%	-1.49	1.847	1.180	5.6%	7.4%	-7.1%	0.2	0.2	0.2	0.1	0.2
TII Jan 16 2%	-1.37	1.784	1.156	4.2%	6.0%	-5.6%	0.3	0.3	0.4	0.3	0.4
TII Apr 16 0.125%	-1.33	1.785	1.040	1.1%	2.9%	-2.4%	3.2	3.4	4.1	2.7	3.4
TII Jul 16 2.5%	-1.43	1.928	1.137	3.2%	5.2%	-4.7%	0.5	0.5	0.6	0.4	0.6
TII Jan 17 2.375%	-1.31	1.912	1.138	2.9%	4.8%	-4.2%	0.6	0.6	0.8	0.6	0.7
TII Apr 17 0.125%	-1.31	1.960	1.011	0.2%	2.2%	-1.5%	5.6	6.2	7.1	5.0	
TII Jul 17 2.625%	-1.34	2.033	1.107	2.1%	4.1%	-3.4%	1.0	1.1	1.3	1.0	1.4
TII Jan 18 1.625%	-1.24	2.015	1.096	1.7%	3.7%	-2.9%	1.4	1.6	1.9	1.6	2.0
TII Jul 18 1.375%	-1.24	2.127	1.064	1.1%	3.2%	-2.3%	2.2	2.4	2.9	2.5	2.9
TII Jan 19 2.125%	-1.09	2.084	1.069	1.0%	3.1%	-2.1%	2.2	2.4	2.8	2.5	2.8
TII Jul 19 1.875%	-1.09	2.151	1.075	1.0%	3.2%	-2.1%	2.1	2.2	2.6	2.2	2.5
TII Jan 20 1.375%	-0.96	2.124	1.061	0.8%	2.9%	-1.8%	2.4	2.5	3.0	2.6	2.9
TII Jul 20 1.25%	-0.92	2.200	1.052	0.6%	2.8%	-1.6%	2.4	2.6	3.1	2.7	3.0
TII Jan 21 1.125%	-0.80	2.150	1.049	0.6%	2.7%	-1.4%	2.5	2.7	3.2	2.8	3.2
TII Jul 21 0.625%	-0.78	2.253	1.018	0.2%	2.5%	-1.0%	3.4	3.6	4.3	3.7	4.2
TII Jan 22 0.125%	-0.68	2.245	1.014	0.1%	2.4%	-0.8%	3.6	3.8	4.6	4.0	4.5
TII Jul 22 0.125%	-0.66	2.275	0.998	0.0%	2.3%	-0.6%	4.0	4.2	5.1		
TII Jan 25 2.375%	-0.32	2.184	1.218	1.6%	3.8%	-1.9%	0.5	0.5	0.6	0.5	0.5
TII Jan 26 2%	-0.21	2.220	1.156	1.1%	3.3%	-1.3%	0.7	0.8	0.9	0.8	0.8
TII Jan 27 2.375%	-0.15	2.233	1.138	0.9%	3.1%	-1.0%	0.8	0.8	0.9	0.8	0.8
TII Jan 28 1.75%	-0.07	2.223	1.096	0.6%	2.8%	-0.7%	1.0	1.1	1.3	1.1	1.2
TII Apr 28 3.625%	-0.05	2.257	1.419	2.2%	4.5%	-2.3%	0.1	0.1	0.1	0.1	0.1
TII Jan 29 2.5%	-0.04	2.288	1.069	0.4%	2.7%	-0.4%	1.2	1.2	1.4	1.3	1.3
TII Apr 29 3.875%	-0.02	2.262	1.396	2.0%	4.2%	-2.0%	0.1	0.1	0.1	0.1	0.1
TII Apr 32 3.375%	0.05	2.262	1.293	1.3%	3.6%	-1.2%	0.3	0.3	0.4	0.3	0.4
TII Feb 40 2.125%	0.35	2.270	1.062	0.2%	2.5%	0.1%	1.1	1.2	1.4	1.4	1.3
TII Feb 41 2.125%	0.37	2.274	1.048	0.2%	2.4%	0.2%	1.3	1.3	1.5	1.5	1.4
TII Feb 42 0.75%	0.42	2.307	1.016	0.1%	2.4%	0.4%	1.7	1.8	2.1	2.1	2.0

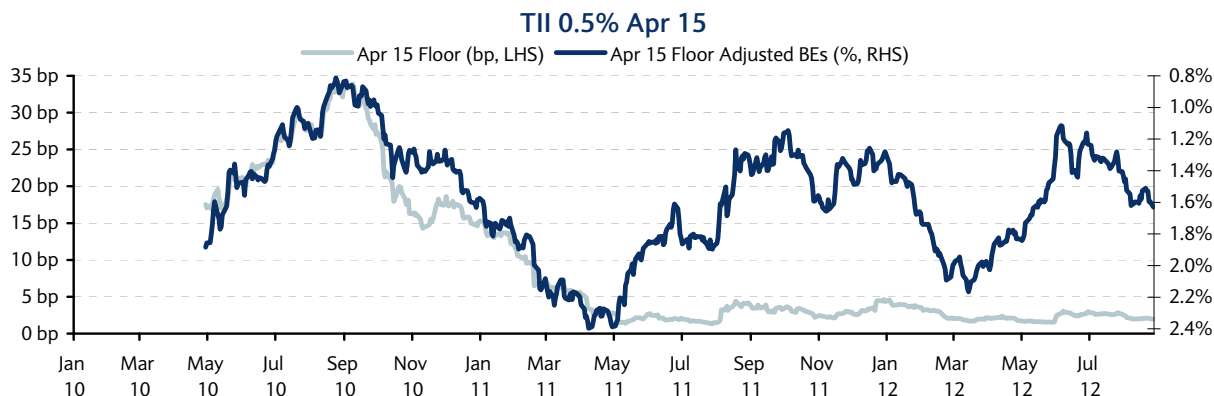
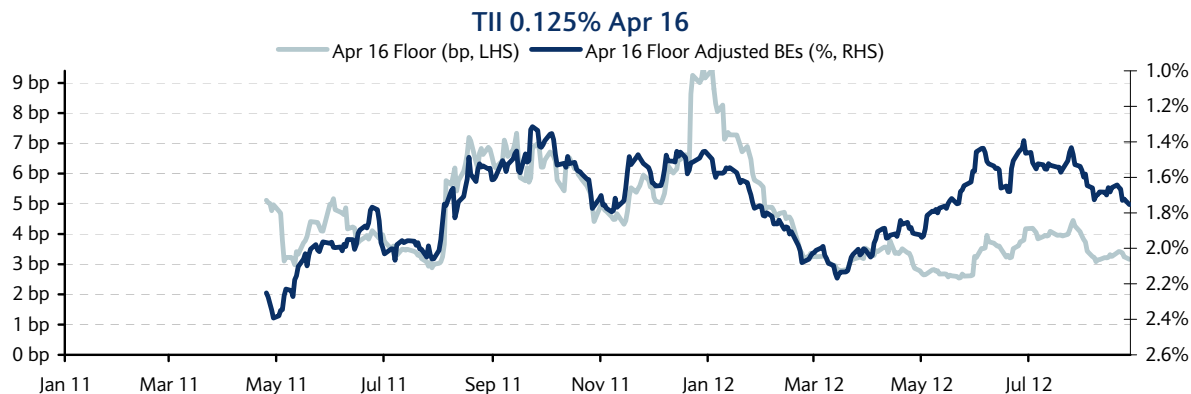
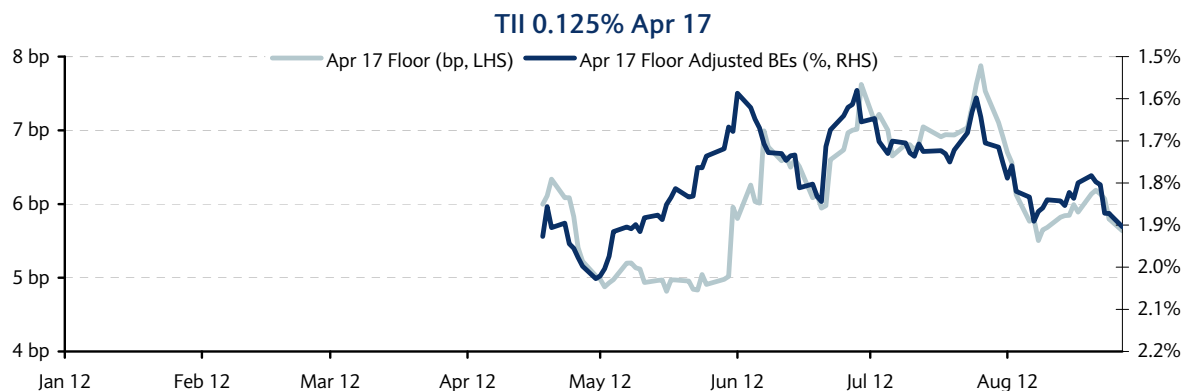
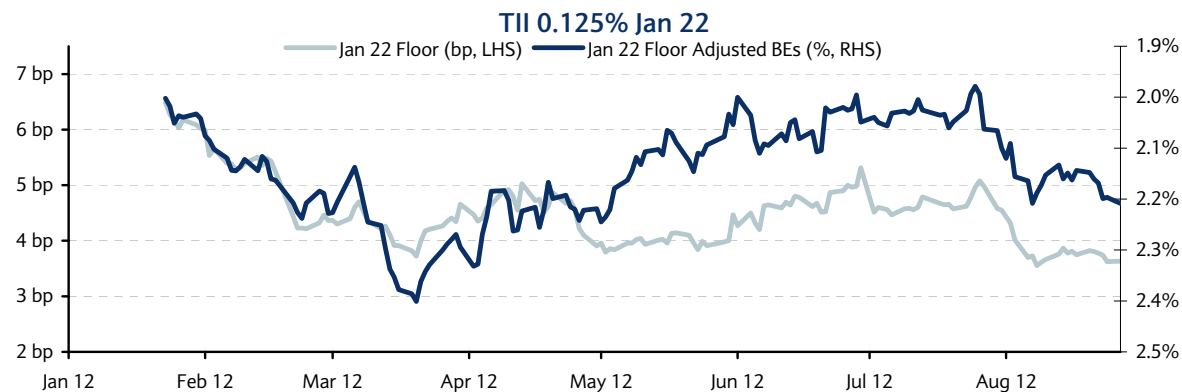
## Implied Probability of Floor being Exercised using CPI Options Market



Note: Black-Scholes options framework is used to back out these probabilities.

Source: Barclays Research

## Historical 3y-10y Floor Premiums implied by CPI Options Market



Source: Barclays Research

## TIPStions Report (1m Receivers and Payers)

Bond	Real Yield, %	1m TIPS Real Yield Payer, bps *			1m TIPS Real Yield Receiver, bps *		
		ATM+20	ATM+10	ATM	ATM	ATM-10	ATM-20
TII Apr 13 0.625%	-0.80	0.2	0.4	0.7	46.0	36.7	27.7
TII Jul 13 1.875%	-1.53	0.2	0.5	0.9	39.6	30.3	21.7
TII Jan 14 2%	-1.21	0.2	0.7	1.6	23.6	15.3	8.6
TII Apr 14 1.25%	-1.16	0.4	1.0	2.2	20.4	12.6	6.6
TII Jul 14 2%	-1.52	0.2	0.8	1.9	19.3	11.5	5.6
TII Jan 15 1.625%	-1.35	0.4	1.2	2.8	15.7	8.7	3.8
TII Apr 15 0.5%	-1.33	0.4	1.3	3.1	14.5	7.8	3.3
TII Jul 15 1.875%	-1.49	0.4	1.3	3.1	14.2	7.5	3.1
TII Jan 16 2%	-1.37	0.5	1.6	3.6	12.7	6.5	2.5
TII Apr 16 0.125%	-1.33	0.6	1.8	4.0	12.2	6.1	2.3
TII Jul 16 2.5%	-1.43	0.6	1.7	3.9	12.0	6.0	2.2
TII Jan 17 2.375%	-1.31	0.7	1.9	4.2	11.2	5.4	1.9
TII Apr 17 0.125%	-1.31	0.9	2.3	4.8	11.1	5.5	2.0
TII Jul 17 2.625%	-1.34	0.7	2.0	4.4	10.8	5.1	1.8
TII Jan 18 1.625%	-1.24	0.7	2.1	4.7	10.2	4.7	1.6
TII Jul 18 1.375%	-1.24	0.8	2.3	5.0	10.0	4.7	1.6
TII Jan 19 2.125%	-1.09	0.9	2.5	5.3	9.8	4.6	1.6
TII Jul 19 1.875%	-1.09	1.0	2.6	5.5	9.6	4.5	1.5
TII Jan 20 1.375%	-0.96	1.1	2.8	5.7	9.4	4.3	1.4
TII Jul 20 1.25%	-0.92	1.1	2.9	5.8	9.3	4.3	1.4
TII Jan 21 1.125%	-0.80	1.2	3.0	6.0	9.1	4.2	1.4
TII Jul 21 0.625%	-0.78	1.2	3.1	6.2	9.1	4.2	1.4
TII Jan 22 0.125%	-0.68	1.7	3.8	7.1	9.6	4.7	1.8
TII Jul 22 0.125%	-0.66	1.8	4.1	7.4	9.2	4.5	1.6
TII Jan 25 2.375%	-0.32	1.8	4.0	7.3	9.2	4.4	1.6
TII Jan 26 2%	-0.21	2.0	4.2	7.7	9.3	4.5	1.7
TII Jan 27 2.375%	-0.15	2.0	4.4	7.8	9.4	4.6	1.8
TII Jan 28 1.75%	-0.07	2.1	4.5	8.0	9.3	4.6	1.7
TII Apr 28 3.625%	-0.05	2.1	4.5	7.9	9.4	4.6	1.8
TII Jan 29 2.5%	-0.04	2.1	4.5	8.0	9.3	4.6	1.7
TII Apr 29 3.875%	-0.02	2.1	4.5	7.9	9.3	4.6	1.7
TII Apr 32 3.375%	0.05	2.1	4.6	8.1	9.2	4.5	1.7
TII Feb 40 2.125%	0.35	2.3	4.8	8.4	9.0	4.4	1.7
TII Feb 41 2.125%	0.37	2.3	4.8	8.4	9.1	4.5	1.7
TII Feb 42 0.75%	0.42	2.7	5.3	8.9	9.5	4.8	1.9

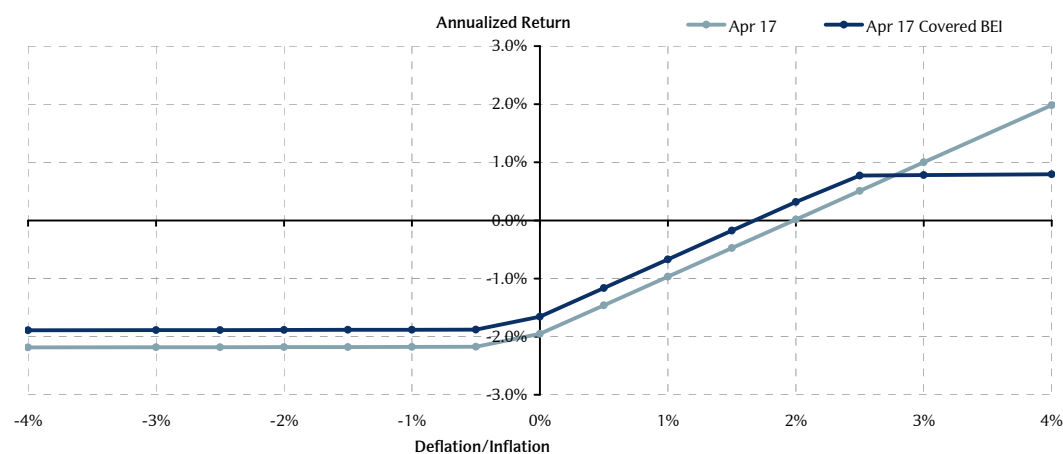
\* ATM yield is defined as the current spot real yields for the respective issue

Source: Barclays Research

## Covered Breakevens implied by CPI Options Market

Bond	BEI, %	CPI Caps					
		BEI + 50bps		BEI + 100bps		BEI + 150bps	
		Premium, bps	Effective BEI, %	Premium, bps	Effective BEI, %	Premium, bps	Effective BEI, %
TII Apr 13 0.625%	0.981	44	0.54	28	0.70	18	0.80
TII Jul 13 1.875%	1.732	38	1.36	24	1.50	14	1.59
TII Jan 14 2%	1.453	41	1.05	25	1.20	15	1.30
TII Apr 14 1.25%	1.430	37	1.06	23	1.20	14	1.29
TII Jul 14 2%	1.796	36	1.44	22	1.57	13	1.66
TII Jan 15 1.625%	1.646	39	1.26	24	1.40	15	1.50
TII Apr 15 0.5%	1.651	37	1.28	23	1.42	14	1.51
TII Jul 15 1.875%	1.847	37	1.48	23	1.62	14	1.71
TII Jan 16 2%	1.784	39	1.39	24	1.54	15	1.63
TII Apr 16 0.125%	1.785	39	1.40	24	1.54	15	1.64
TII Jul 16 2.5%	1.928	37	1.55	23	1.69	15	1.78
TII Jan 17 2.375%	1.912	39	1.52	25	1.66	16	1.76
TII Apr 17 0.125%	1.960	39	1.57	25	1.72	16	1.80
TII Jul 17 2.625%	2.033	39	1.65	25	1.78	16	1.87
TII Jan 18 1.625%	2.015	42	1.59	28	1.74	18	1.83
TII Jul 18 1.375%	2.127	43	1.70	28	1.84	19	1.94
TII Jan 19 2.125%	2.084	44	1.64	30	1.79	20	1.89
TII Jul 19 1.875%	2.151	45	1.71	30	1.85	20	1.95
TII Jan 20 1.375%	2.124	47	1.66	31	1.81	21	1.91
TII Jul 20 1.25%	2.200	46	1.74	31	1.89	21	1.99
TII Jan 21 1.125%	2.150	49	1.66	33	1.82	22	1.93
TII Jul 21 0.625%	2.253	48	1.77	33	1.92	22	2.03
TII Jan 22 0.125%	2.245	50	1.75	34	1.90	23	2.01
TII Jul 22 0.125%	2.275	51	1.77	35	1.93	24	2.04
TII Jan 25 2.375%	2.184	52	1.66	37	1.82	25	1.93
TII Jan 26 2%	2.220	53	1.69	37	1.85	26	1.96
TII Jan 27 2.375%	2.233	51	1.72	36	1.87	25	1.98
TII Jan 28 1.75%	2.223	54	1.68	38	1.84	26	1.96
TII Apr 28 3.625%	2.257	46	1.79	33	1.93	23	2.03
TII Jan 29 2.5%	2.288	49	1.80	35	1.94	24	2.05
TII Apr 29 3.875%	2.262	45	1.81	32	1.94	22	2.04
TII Apr 32 3.375%	2.262	47	1.80	33	1.93	23	2.03
TII Feb 40 2.125%	2.270	50	1.77	36	1.91	26	2.01
TII Feb 41 2.125%	2.274	50	1.77	36	1.91	26	2.01
TII Feb 42 0.75%	2.307	59	1.71	43	1.88	31	2.00

## Annualized Returns on a long ATM BEI+50bp Covered Breakeven Positions

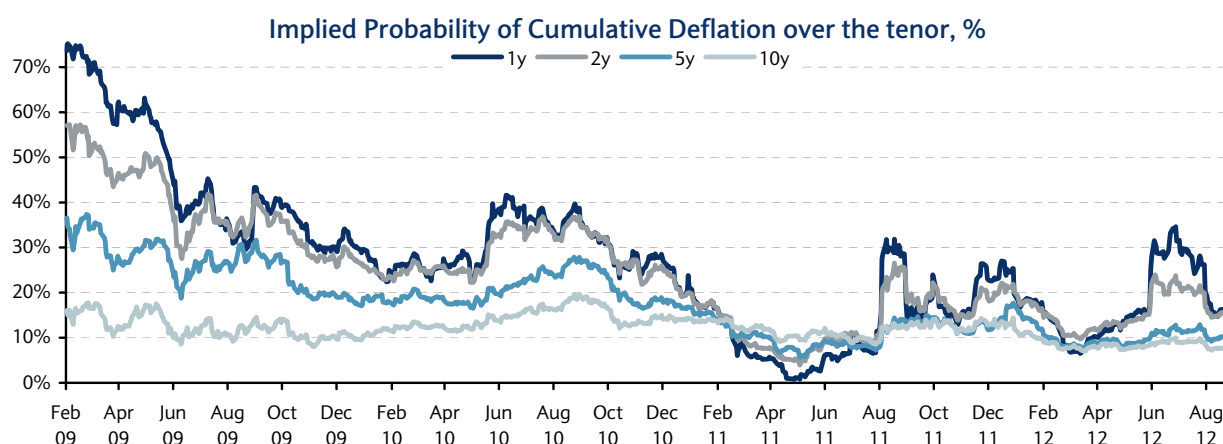
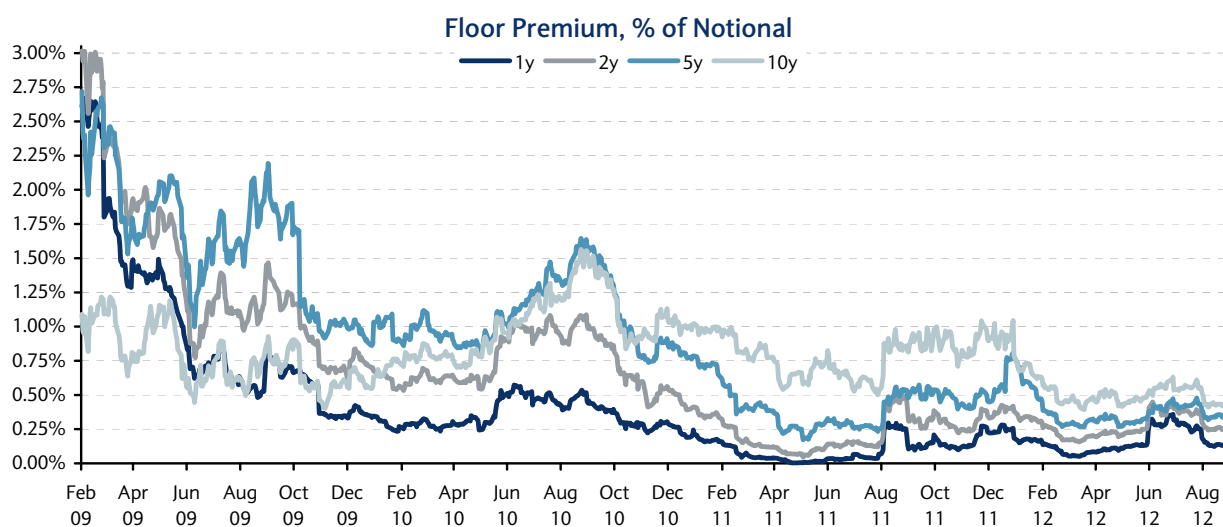


Source: Barclays Research

## Historical Cumulative Deflation Probabilities implied by CPI Options Market

Tenor	Option Value, % of Notional	CPI Swap Rate, % (mean, $\mu$ ) *	Implied Probability of Deflation through the option expiry					
			8/27/2012	1w ago	1m ago	3m ago	6m ago	12m ago
1	0.13%	1.67%	16%	16%	26%	28%	23%	29%
2	0.25%	1.77%	15%	15%	20%	22%	19%	26%
3	0.28%	1.91%	12%	13%	16%	17%	16%	20%
4	0.29%	2.06%	10%	11%	13%	12%	14%	16%
5	0.33%	2.19%	9%	10%	12%	11%	13%	14%
7	0.41%	2.37%	9%	9%	11%	10%	14%	14%
10	0.42%	2.52%	7%	8%	9%	9%	13%	13%
15	0.40%	2.63%	6%	6%	7%	7%	11%	10%
20	0.47%	2.68%	6%	7%	8%	7%	12%	9%
25	0.48%	2.69%	6%	7%	7%	7%	12%	9%
30	0.55%	2.70%	7%	7%	8%	8%	13%	10%

\* Zero Coupon CPI Swap Rates are calculated using stepwise interpolation, option prices are based on the stepwise interpolated rate

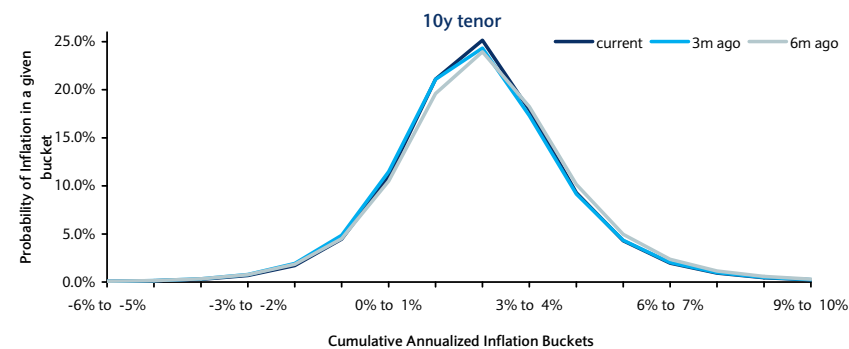
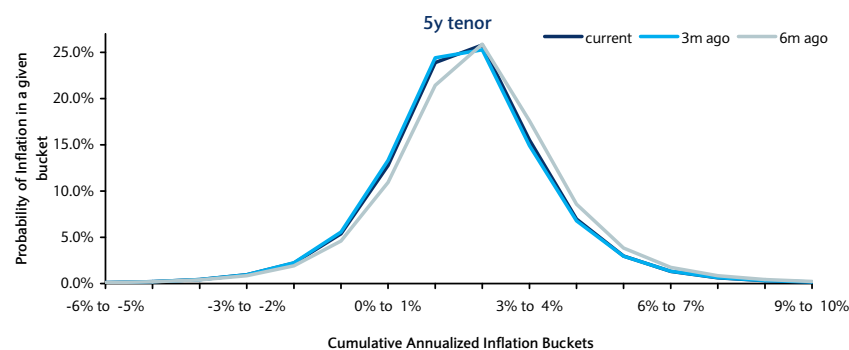
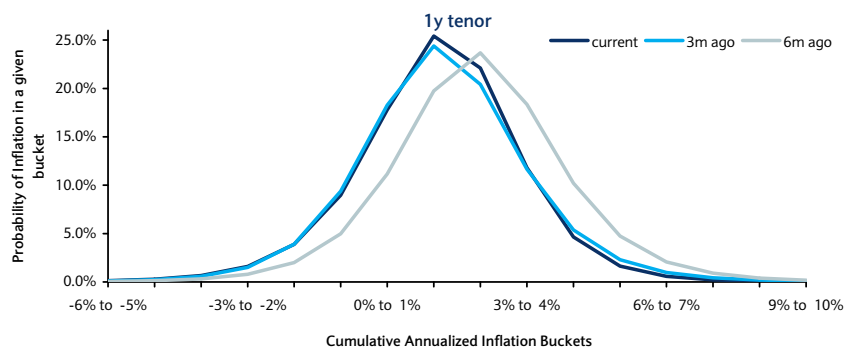


Source: Barclays Research

## Probability of Cumulative Inflation within Inflation bucket implied by CPI Options Market

Inflation Bucket	Implied Probability of Inflation through the option expiry								
	8/27/2012			3m ago			6m ago		
	1y	5y	10y	1y	5y	10y	1y	5y	10y
-6% to -5%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
-5% to -4%	0.3%	0.2%	0.1%	0.2%	0.2%	0.2%	0.1%	0.2%	0.2%
-4% to -3%	0.7%	0.4%	0.3%	0.6%	0.4%	0.3%	0.3%	0.4%	0.3%
-3% to -2%	1.6%	1.0%	0.7%	1.5%	1.0%	0.8%	0.8%	0.8%	0.8%
-2% to -1%	3.9%	2.2%	1.7%	3.9%	2.2%	1.9%	2.0%	1.9%	1.8%
-1% to 0%	9.0%	5.4%	4.5%	9.4%	5.6%	4.9%	5.0%	4.6%	4.5%
0% to 1%	17.8%	12.8%	11.0%	18.3%	13.3%	11.5%	11.2%	10.9%	10.5%
1% to 2%	25.4%	23.9%	21.1%	24.4%	24.4%	21.1%	19.8%	21.4%	19.6%
2% to 3%	22.1%	25.8%	25.2%	20.4%	25.3%	24.3%	23.7%	25.9%	23.9%
3% to 4%	11.8%	15.5%	17.9%	11.7%	14.9%	17.3%	18.4%	17.6%	18.2%
4% to 5%	4.7%	7.0%	9.3%	5.4%	6.8%	9.2%	10.2%	8.6%	10.2%
5% to 6%	1.6%	3.0%	4.3%	2.3%	3.0%	4.3%	4.7%	3.8%	5.0%
6% to 7%	0.6%	1.3%	2.0%	1.0%	1.3%	2.0%	2.1%	1.8%	2.4%
7% to 8%	0.2%	0.6%	0.9%	0.4%	0.6%	1.0%	0.9%	0.8%	1.2%
8% to 9%	0.1%	0.3%	0.5%	0.2%	0.3%	0.5%	0.4%	0.4%	0.6%
9% to 10%	0.0%	0.2%	0.2%	0.1%	0.2%	0.3%	0.2%	0.2%	0.3%

### Current Probability of Cumulative Inflation occurring by Inflation buckets



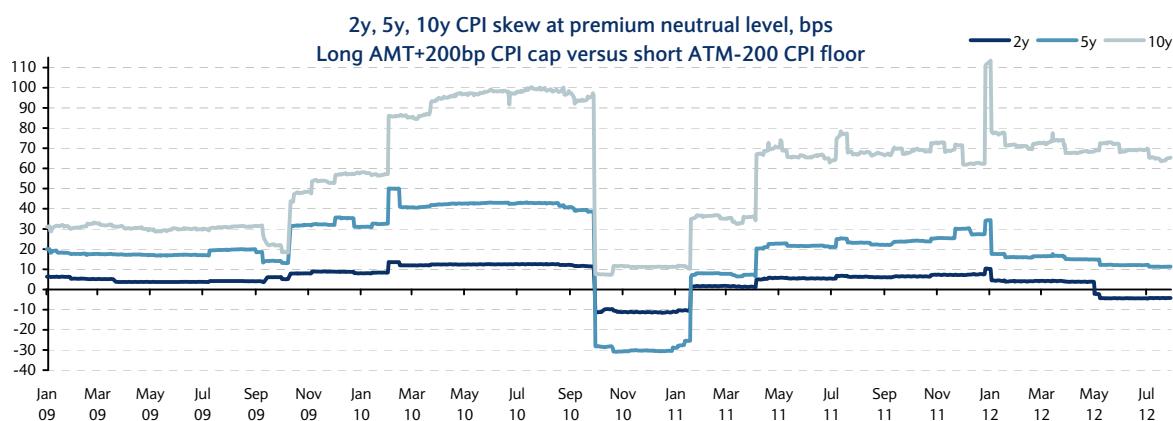
Source: Barclays Research



## Current Levels: CPI Swaps, Cumulative Caps, Floors, Straddles implied by CPI Options Market

Tenor	CPI Swap Rate, % *	Caps, % of Notional				Floors, % of Notional			
		ATM	ATM +50bps	ATM +100bps	ATM +150bps	ATM	ATM-50bps	ATM-100bps	ATM-150bps
1y	1.67%	0.6%	0.4%	0.2%	0.1%	0.6%	0.4%	0.3%	0.2%
2y	1.77%	1.2%	0.8%	0.5%	0.3%	1.2%	0.8%	0.5%	0.3%
3y	1.91%	1.7%	1.1%	0.7%	0.4%	1.8%	1.1%	0.7%	0.4%
4y	2.06%	2.3%	1.5%	0.9%	0.6%	2.3%	1.4%	0.9%	0.5%
5y	2.19%	3.0%	1.9%	1.2%	0.8%	3.0%	1.8%	1.1%	0.7%
7y	2.37%	4.5%	3.0%	2.0%	1.4%	4.5%	2.8%	1.7%	1.0%
10y	2.52%	6.5%	4.5%	3.1%	2.1%	6.5%	4.0%	2.4%	1.4%
15y	2.63%	9.9%	7.0%	4.9%	3.3%	9.9%	6.2%	3.6%	1.9%
20y	2.68%	13.3%	9.5%	6.7%	4.6%	13.3%	8.2%	4.8%	2.6%
25y	2.69%	15.9%	11.5%	8.1%	5.6%	15.9%	9.6%	5.4%	2.8%
30y	2.70%	18.8%	13.8%	9.9%	7.0%	18.8%	11.1%	6.2%	3.2%

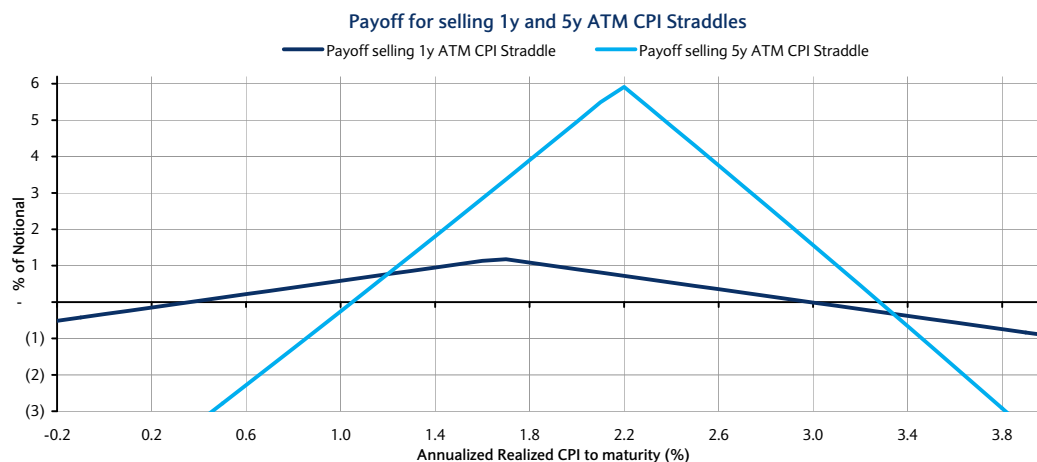
\* Zero Coupon CPI Swap Rates are calculated using stepwise interpolation, option prices are based on the stepwise interpolated rate



## Breakeven points for selling ATM CPI straddles

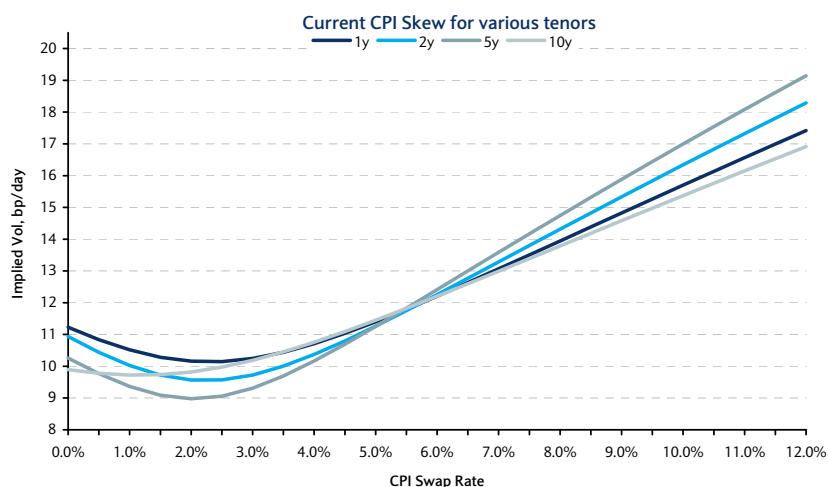
Tenor	CPI Swap Rate, % *	Expiry	ATM Strike, %	Cap, % of Notional	Floor, % of Notional	Straddle, % of Notional	Lower CPI breakeven point	Higher CPI breakeven point
1y	1.67%	8/29/2013	1.67%	0.6%	0.6%	1.2%	0.36%	2.99%
2y	1.77%	8/29/2014	1.77%	1.2%	1.2%	2.4%	0.53%	2.99%
3y	1.91%	8/31/2015	1.91%	1.7%	1.8%	3.5%	0.75%	3.06%
4y	2.06%	8/29/2016	2.06%	2.3%	2.3%	4.6%	0.92%	3.16%
5y	2.19%	8/29/2017	2.19%	3.0%	3.0%	6.0%	1.05%	3.28%
7y	2.37%	8/29/2019	2.37%	4.5%	4.5%	8.9%	1.21%	3.46%
10y	2.52%	8/29/2022	2.52%	6.5%	6.5%	13.0%	1.43%	3.53%
15y	2.63%	8/30/2027	2.63%	9.9%	9.9%	19.8%	1.64%	3.51%
20y	2.68%	8/30/2032	2.68%	13.3%	13.3%	26.5%	1.80%	3.43%
25y	2.69%	8/31/2037	2.69%	15.9%	15.9%	31.7%	1.96%	3.32%
30y	2.70%	8/29/2042	2.70%	18.8%	18.8%	37.5%	2.07%	3.24%

\* Zero Coupon CPI Swap Rates are calculated using stepwise interpolation, option prices are based on the stepwise interpolated rate

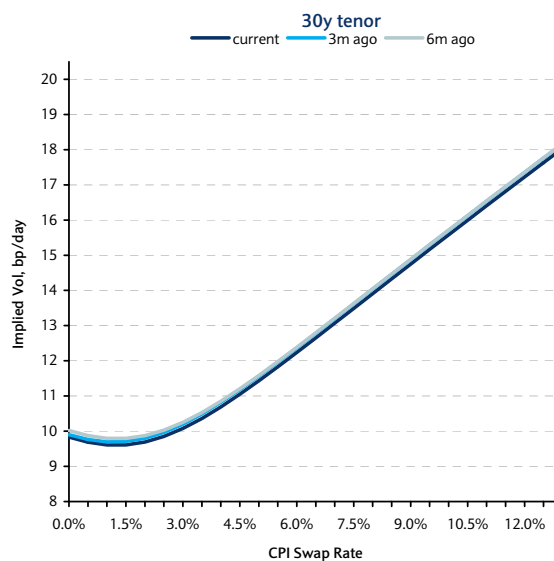
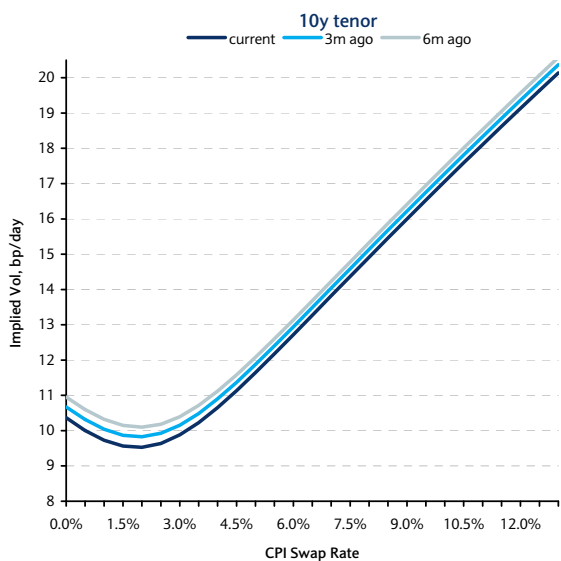
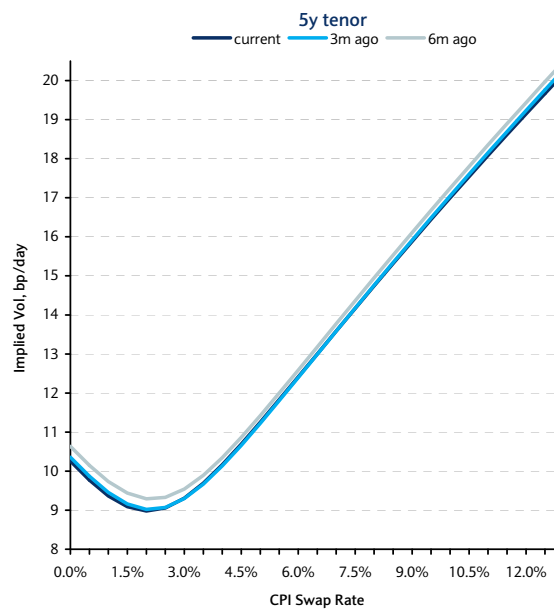
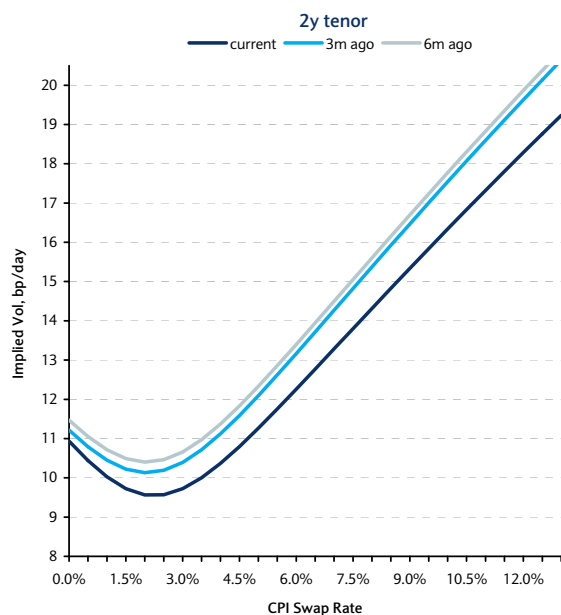


Source: Barclays Research

## CPI Skew for various tenors



## CPI Skew by tenor: current, 3m ago and 6m ago

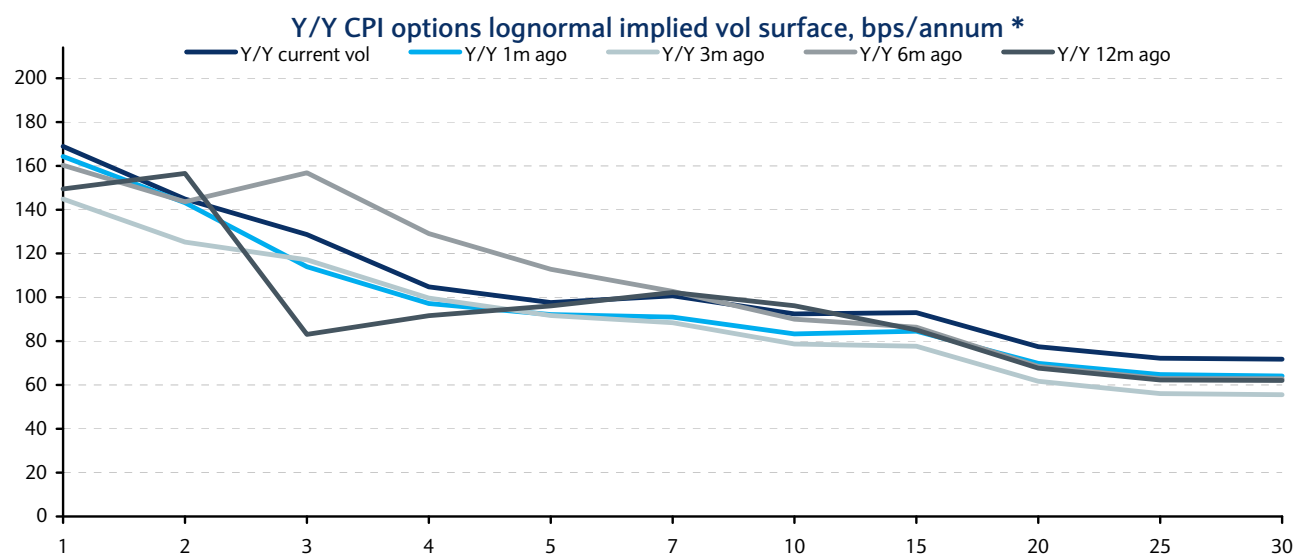


Source: Barclays Research

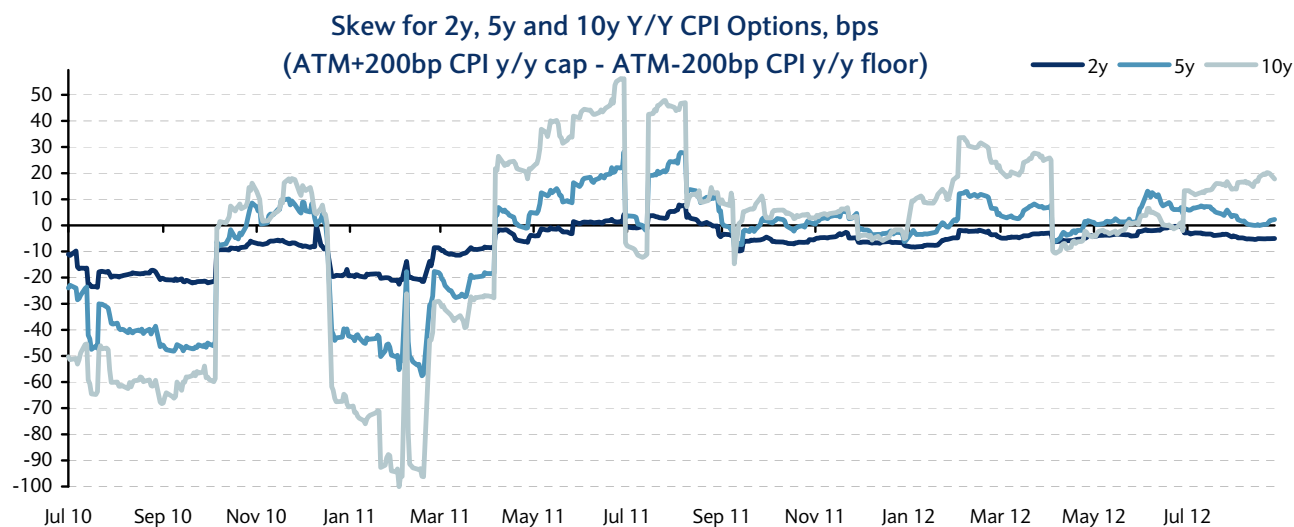
## Y/Y CPI Caps/Floors implied by CPI Options Market

Tenor	Y/Y CPI Swap Rate *	Y/Y CPI Caps, % of Notional				Y/Y CPI Floors, % of Notional			
		ATM	ATM+50bp	ATM+100bp	ATM+150bp	ATM	ATM-50bp	ATM-100bp	ATM-150bp
1	1.67%	0.6%	0.4%	0.2%	0.1%	0.6%	0.4%	0.3%	0.2%
2	1.77%	1.4%	1.0%	0.6%	0.4%	1.4%	1.0%	0.7%	0.5%
3	1.91%	2.4%	1.7%	1.3%	0.9%	2.4%	1.8%	1.3%	1.0%
4	2.06%	3.4%	2.5%	1.9%	1.4%	3.4%	2.5%	1.9%	1.5%
5	2.19%	4.4%	3.4%	2.6%	2.0%	4.5%	3.4%	2.6%	2.0%
7	2.37%	6.7%	5.2%	4.1%	3.3%	6.8%	5.2%	4.1%	3.2%
10	2.53%	10.2%	8.1%	6.6%	5.4%	10.3%	8.2%	6.5%	5.3%
15	2.64%	15.6%	12.7%	10.5%	8.7%	15.9%	12.9%	10.5%	8.6%
20	2.68%	20.5%	16.9%	14.1%	11.9%	21.0%	17.2%	14.1%	11.8%
25	2.69%	24.5%	20.3%	17.0%	14.4%	25.1%	20.7%	17.1%	14.3%
30	2.70%	28.2%	23.4%	19.7%	16.7%	28.8%	23.8%	19.8%	16.6%

\* Y/Y CPI Swap Rates are calculated using stepwise interpolation, and option prices are based on the stepwise interpolated rate

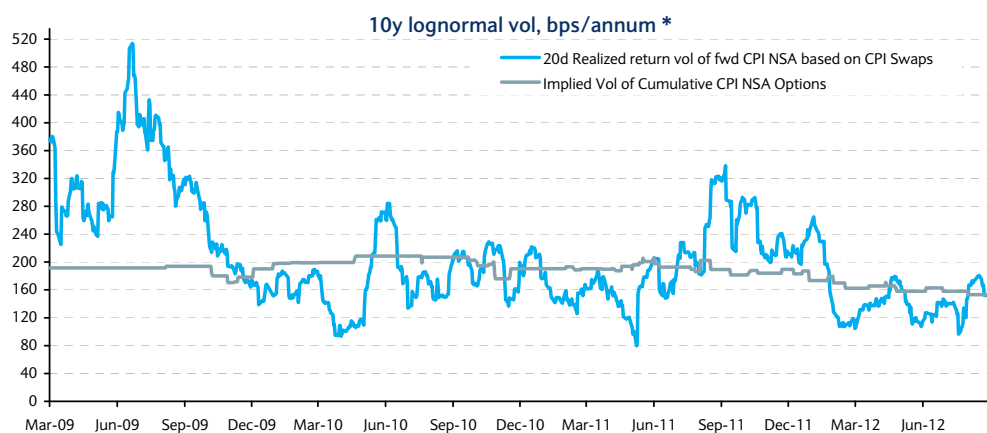
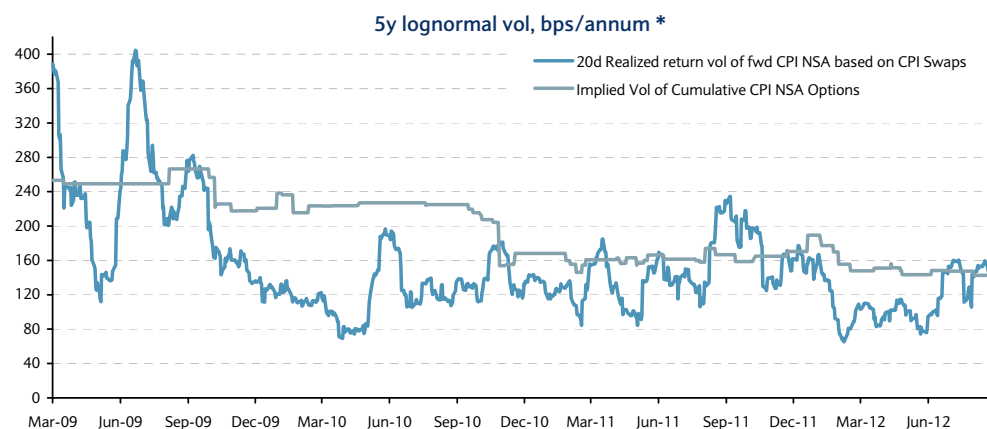
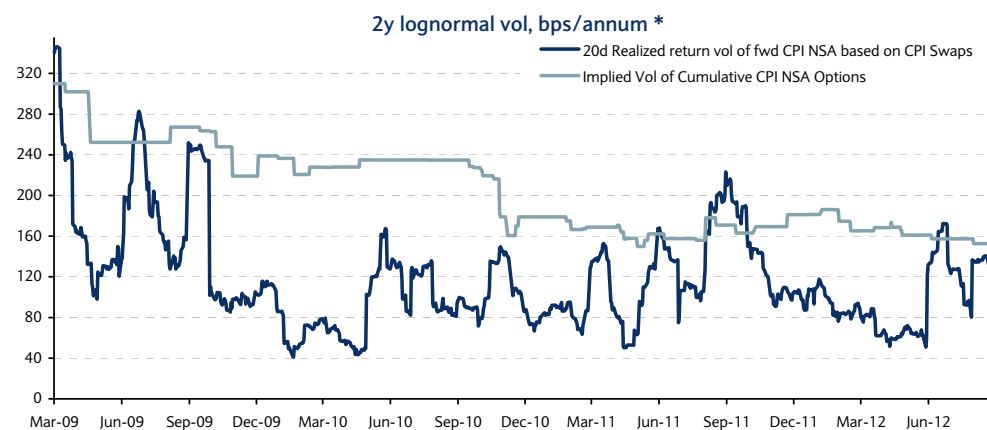
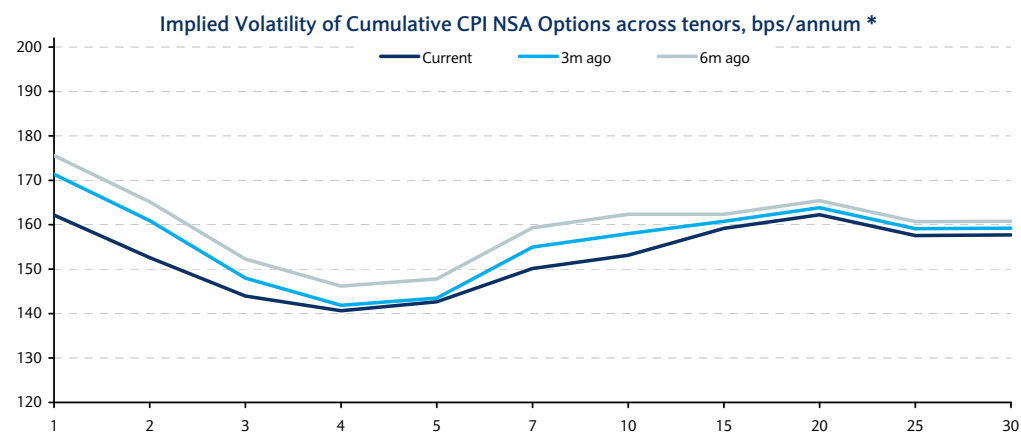


\* Note: This is lognormal volatility of Y/Y CPI ATM Options extracted from Inflation SSABR Volatility Surface



Source: Barclays Research

## Implied Volatility of Cumulative Inflation Options vs Realized Volatility for CPI Swaps

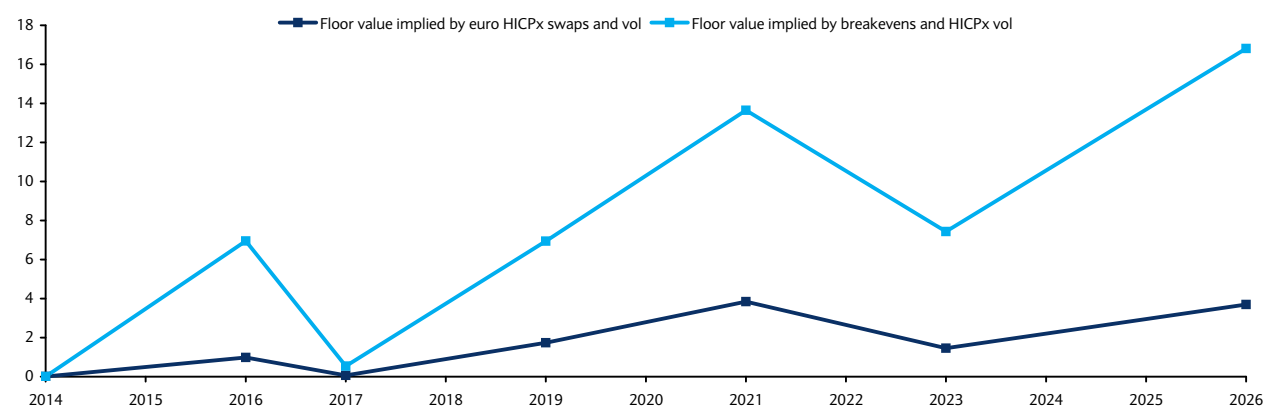


Source: Barclays Research

## Embedded European Linker Floor Premium implied by inflation swaps levels and implied vol

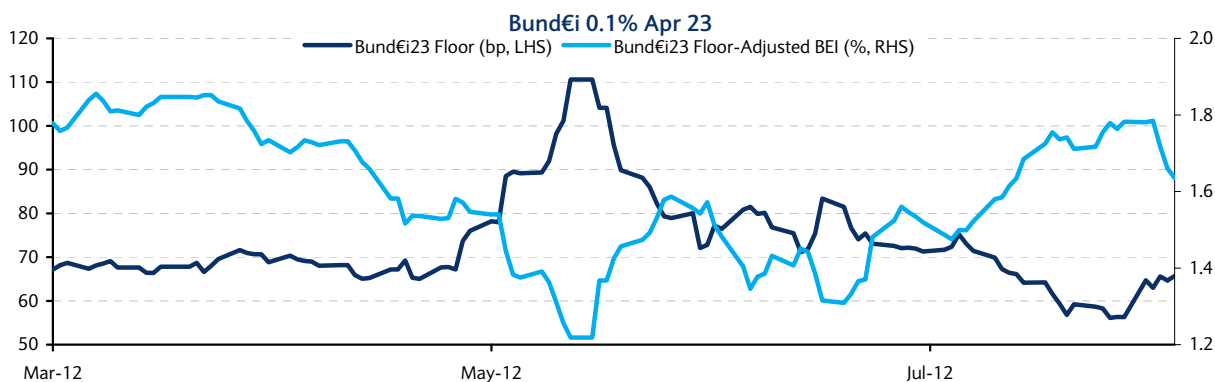
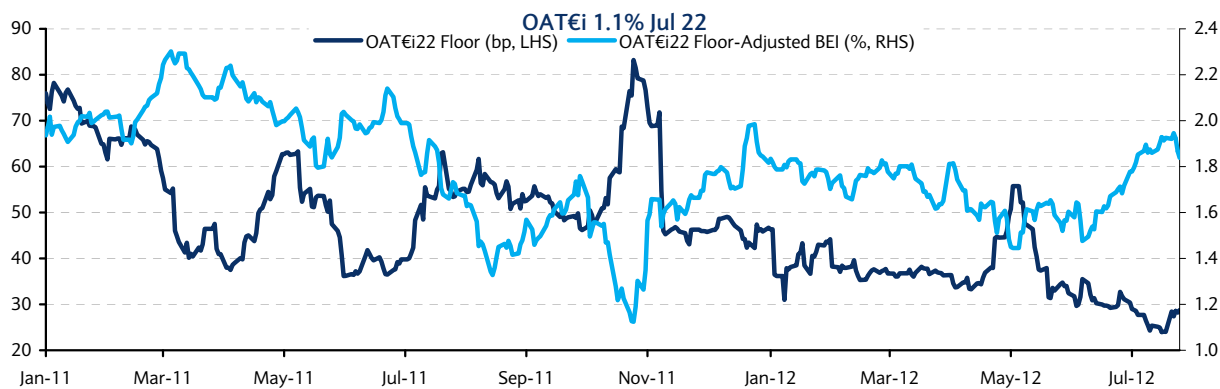
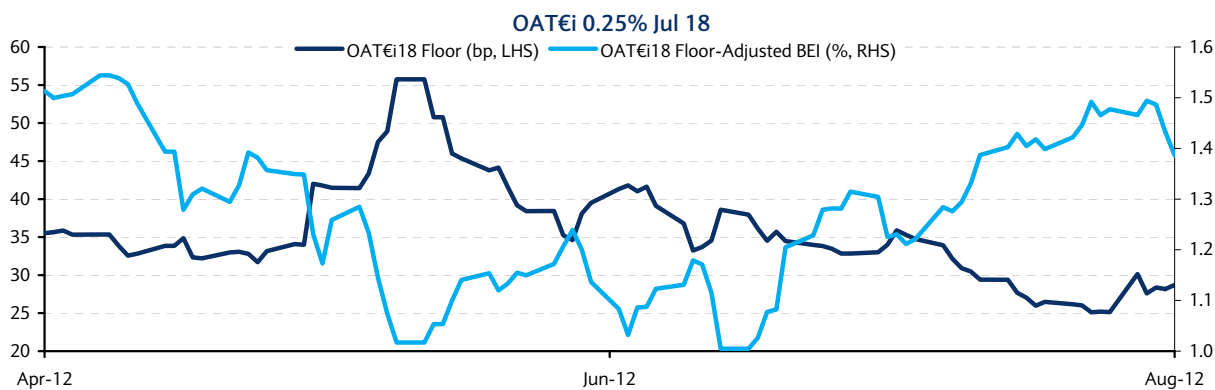
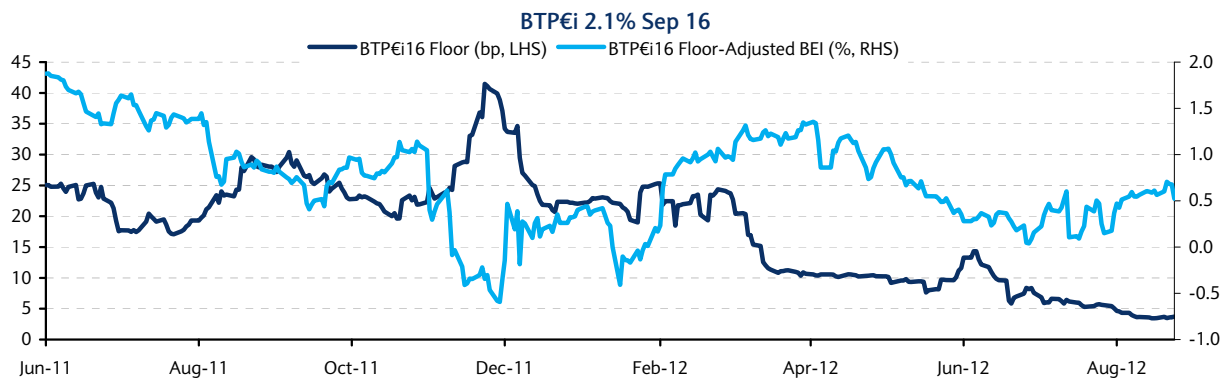
Bond	Real Yield, %	BEI, %	Index Ratio	Annualized Deflation needed for the floor to be ATM	"Max" BEI decline before reaching the floor	Minimum nominal Yield to Maturity *	European linker Floor Premium, cents				
							24-Aug-2012	1w Ago	1m Ago	3m Ago	6m Ago
OBL 2.250% Apr 13	-0.05	-0.01	1.12454	17.1%	17.1%	-17.1%	0.0	0.0	0.0	0.0	0.1
BTPS 2.150% Sep 14	2.32	1.01	1.20013	8.5%	9.5%	-6.2%	0.0	0.0	0.0	0.1	0.6
FRTR 1.600% Jul 15	-1.07	1.30	1.17584	5.4%	6.7%	-6.5%	0.0	0.0	0.0	0.4	2.2
DBRI 1.500% Apr 16	-0.97	1.04	1.14289	3.6%	4.6%	-4.6%	0.1	0.1	0.1	1.1	6.1
BTPS 2.100% Sep 16	3.76	0.53	1.05274	1.3%	1.8%	2.5%	3.7	3.5	5.7	9.7	24.4
BTPS 2.100% Sep 17	4.09	0.65	1.14289	2.6%	3.3%	1.5%	0.3	0.2	0.3	1.1	9.1
OBLI 0.750% Apr 18	-0.76	1.22	1.04509	0.8%	2.0%	-1.5%	19.6	17.0	23.8	31.2	45.5
FRTR 0.250% Jul 18	-0.35	1.43	1.02268	0.4%	1.8%	-0.7%	28.7	25.1	34.0	41.8	
BTPS 2.350% Sep 19	4.35	0.88	1.08858	1.2%	2.1%	3.1%	11.0	9.2	11.5	16.3	30.4
DBRI 1.750% Apr 20	-0.64	1.51	1.07730	1.0%	2.5%	-1.6%	20.4	17.3	21.6	28.3	41.1
FRTR 2.250% Jul 20	-0.04	1.68	1.19996	2.3%	4.0%	-2.3%	1.9	1.5	1.6	3.7	14.3
BTPS 2.100% Sep 21	4.66	0.94	1.06539	0.7%	1.6%	4.0%	30.6	25.5	31.1	41.6	45.9
FRTR 1.100% Jul 22	0.19	1.87	1.06673	0.7%	2.5%	-0.5%	28.7	24.0	29.8	44.7	43.0
DBRI 0.100% Apr 23	-0.45	1.69	1.01822	0.2%	1.9%	-0.6%	65.7	56.3	72.4	89.5	
BTPS 2.600% Sep 23	4.76	0.99	1.12270	1.0%	2.0%	3.7%	13.5	11.1	13.7	26.1	29.0
BTPS 3.100% Sep 26	4.85	1.04	1.04286	0.3%	1.3%	4.6%	40.4	34.6	46.1	63.6	59.5
FRTR 1.850% Jul 27	0.46	2.02	1.05122	0.3%	2.4%	0.1%	36.5	31.2	41.1	57.7	54.7
FRTR 3.150% Jul 32	0.60	2.15	1.21580	1.0%	3.1%	-0.4%	9.6	7.8	10.1	18.0	23.5
BTPS 2.350% Sep 35	4.59	1.62	1.17556	0.7%	2.3%	3.9%	14.7	11.8	16.6	26.8	32.6
FRTR 1.800% Jul 40	0.65	2.26	1.12622	0.4%	2.7%	0.2%	20.8	16.7	24.2	42.8	46.8
BTPS 2.550% Sep 41	4.46	1.77	1.06842	0.2%	2.0%	4.2%	30.2	24.5	35.8	61.2	62.8
FRTR 2.500% Jul 13	-1.55	1.55	1.18209	16.9%	18.5%	-18.5%	0.0	0.0	0.0	0.0	0.1
BTNS 0.450% Jul 16	-0.89	1.38	1.03972	1.0%	2.4%	-1.9%	2.1	1.9	3.0	6.0	17.3
FRTR 1.000% Jul 17	-0.71	1.48	1.12231	2.3%	3.8%	-3.0%	0.1	0.1	0.1	0.3	6.0
FRTR 1.300% Jul 19	-0.33	1.71	1.05617	0.8%	2.5%	-1.1%	7.7	6.2	8.1	10.0	25.9
FRTR 2.100% Jul 23	0.17	2.06	1.08799	0.8%	2.8%	-0.6%	9.0	6.8	8.7	17.7	24.3
FRTR 3.400% Jul 29	0.50	2.14	1.24031	1.3%	3.4%	-0.8%	2.2	1.6	1.9	6.6	11.4

## BTP€i Floor value implied by bond breakevens and euro HICPx swaps



Source: Barclays Research

## Historical euro HICPx linker floor premiums implied by euro HICPx options market



Source: Barclays Research

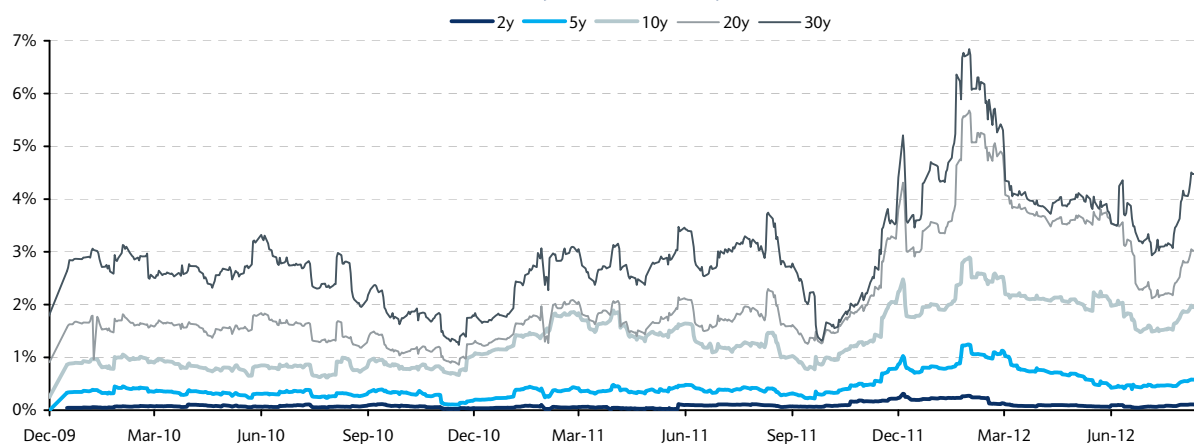
## Euro HICPx Zero-Coupon Floor and Cap Prices

Tenor	HICPx Swap Rate, %	ATM Cap/Floor price	Floors, % of Notional				Caps, % of Notional			
			-1%	-0.5%	0%	0.5%	2.5%	3%	3.5%	4%
2y	1.67%	0.9%	0.03%	0.05%	0.09%	0.18%	0.36%	0.22%	0.14%	0.09%
5y	1.71%	3.2%	0.09%	0.16%	0.38%	0.81%	1.80%	1.23%	0.83%	0.57%
7y	1.81%	4.8%	0.12%	0.27%	0.59%	1.19%	3.06%	2.18%	1.55%	1.11%
10y	2.02%	7.2%	0.14%	0.34%	0.73%	1.47%	5.35%	3.87%	2.78%	2.00%
15y	2.22%	10.3%	0.09%	0.25%	0.62%	1.37%	8.60%	6.18%	4.38%	3.08%
20y	2.26%	10.3%	0.07%	0.21%	0.56%	1.31%	10.56%	7.23%	4.80%	3.12%
30y	2.40%	10.3%	0.04%	0.15%	0.44%	1.18%	16.93%	11.44%	7.38%	4.57%

0% strike Zero-Coupon Euro HICPx Floor Premium, % of Notional

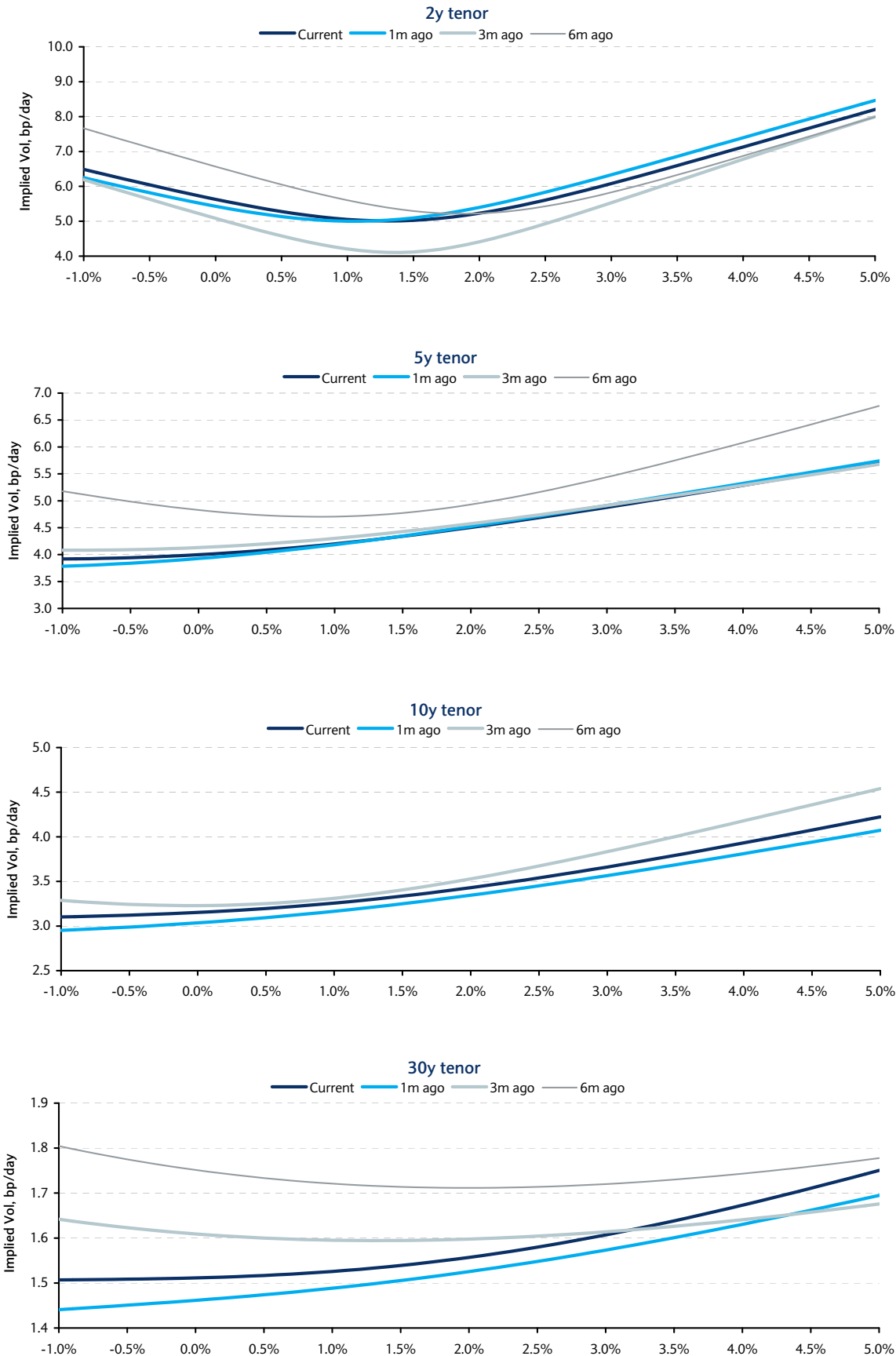


4% strike Zero-Coupon Euro HICPx Cap Premium, % of Notional



Source: Barclays Research

## Euro HICPx Zero Coupon Vol Smile for various tenors



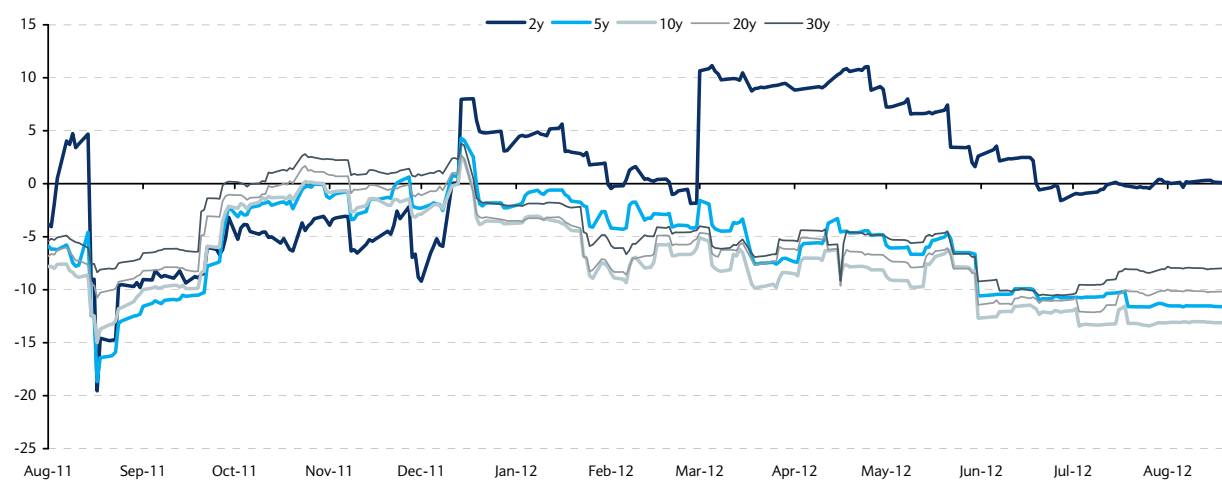
Source: Barclays Research



## Euro Y/Y HICPx Cap/Floor running premium

Tenor	Y/Y Euro HICPx swap rate	ATM Cap/Floor running premium	Y/Y euro HICPx Floor running premium, bps							Y/Y euro HICPx Cap, running premium, bps						
			-1.0%	-0.5%	0.0%	0.5%	1.0%	1.5%	2.0%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%
2y	1.67%	58	8	11	15	22	33	51	76	43	27	18	12	9	7	6
5y	1.70%	97	31	38	46	56	70	88	112	82	63	48	38	31	26	22
7y	1.80%	111	40	47	56	67	80	98	121	101	80	63	51	43	36	31
10y	2.00%	119	41	48	57	67	81	97	119	118	95	76	62	51	43	37
15y	2.19%	119	38	45	53	63	75	91	110	129	103	83	67	55	46	39
20y	2.23%	117	37	44	52	61	73	88	107	130	104	83	67	55	46	40
30y	2.34%	116	37	43	50	59	70	83	101	135	108	86	70	58	49	43

## Euro HICPx Y/Y Vol skew: ATM+200bp minus ATM-200bp strike, bp/yr

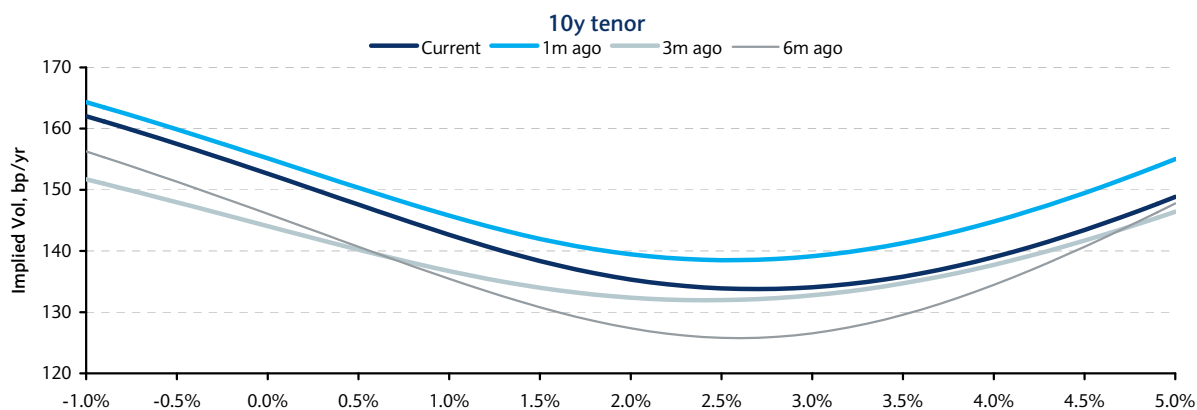
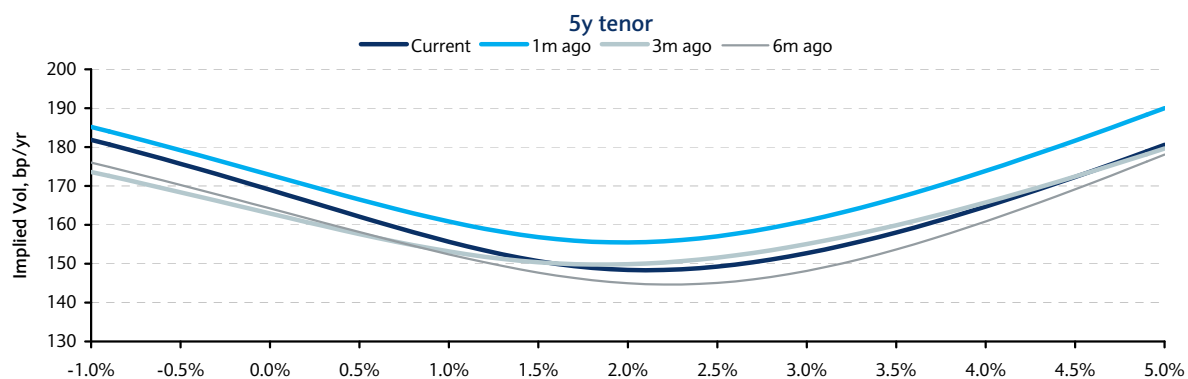
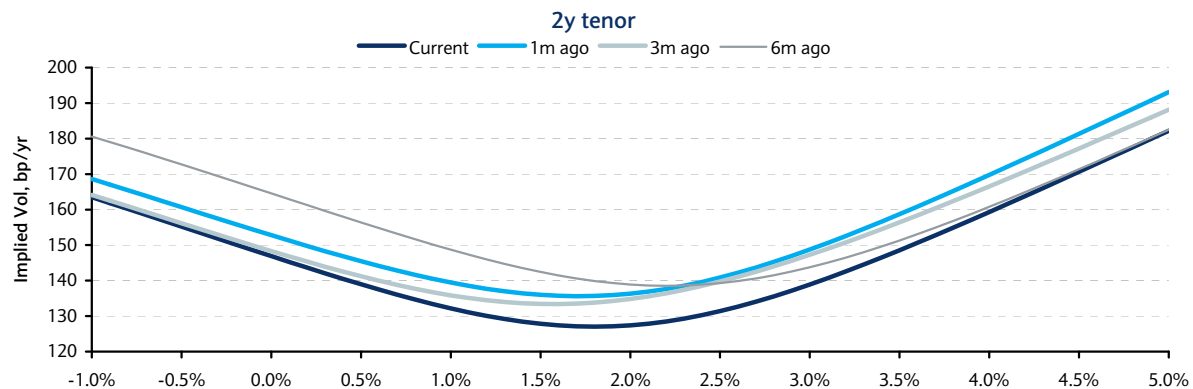


## Euro HICPx Y/Y Vol skew: 4% minus 0% strike, bp/yr



Source: Barclays Research

## Euro HICPx Y/Y Vol Smile for various tenors

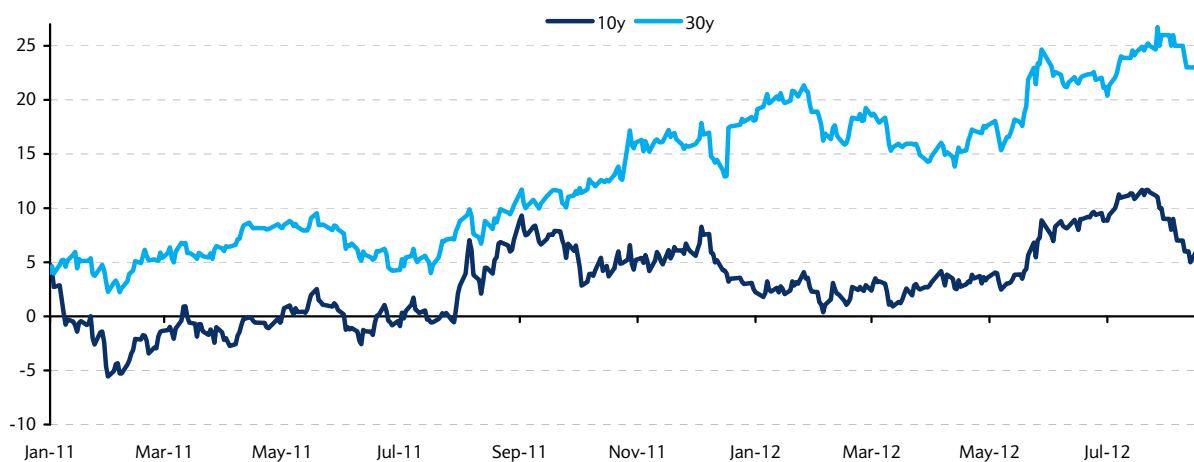


Source: Barclays Research

## UK Inflation Volatility Market Summary

LPI [0.5] y/y						LPI premium versus zero-cpn RPI swap (bp)				
	24-Aug-12	-1m	-3m	-6m	-12m	24-Aug-12	-1m	-3m	-6m	-12m
10y	3.02%	2.90%	3.15%	3.18%	3.23%	8	9	9	13	34
15y	3.21%	3.12%	3.33%	3.37%	3.46%	13	13	12	14	23
20y	3.35%	3.29%	3.50%	3.52%	3.62%	18	17	14	16	19
30y	3.54%	3.51%	3.66%	3.69%	3.73%	25	24	21	22	18
LPI [0.3] y/y						LPI premium versus zero-cpn RPI swap (bp)				
	24-Aug-12	-1m	-3m	-6m	-12m	24-Aug-12	-1m	-3m	-6m	-12m
10y	2.40%	2.34%	2.46%	2.46%	2.48%	-55	-48	-61	-59	-41
15y	2.47%	2.43%	2.53%	2.54%	2.58%	-60	-55	-69	-70	-65
20y	2.53%	2.50%	2.58%	2.59%	2.64%	-65	-62	-78	-77	-79
30y	2.60%	2.59%	2.64%	2.65%	2.71%	-69	-68	-81	-82	-84
LPI [3.5] y/y						LPI premium versus zero-cpn RPI swap (bp)				
	24-Aug-12	-1m	-3m	-6m	-12m	24-Aug-12	-1m	-3m	-6m	-12m
10y	3.62%	3.57%	3.70%	3.72%	3.75%	68	75	63	67	86
15y	3.73%	3.69%	3.81%	3.84%	3.89%	66	70	59	60	66
20y	3.83%	3.79%	3.92%	3.93%	3.98%	65	67	56	58	54
30y	3.94%	3.92%	4.02%	4.04%	4.02%	66	65	57	57	47
LPI [0,inf] y/y						LPI premium versus zero-cpn RPI swap (bp)				
	24-Aug-12	-1m	-3m	-6m	-12m	24-Aug-12	-1m	-3m	-6m	-12m
10y	3.45%	3.30%	3.59%	3.63%	3.57%	51	48	52	58	68
15y	3.66%	3.54%	3.80%	3.85%	3.86%	58	56	58	62	63
20y	3.81%	3.73%	3.98%	4.01%	4.04%	64	61	62	65	61
30y	3.99%	3.96%	4.14%	4.18%	4.19%	70	68	69	71	64

## LPI[0,5] spread to zero-coupon RPI swap rate (bp)



Note: LPI levels are indicative, reflecting Research calculations and no convexity adjustment

Source: Barclays Research

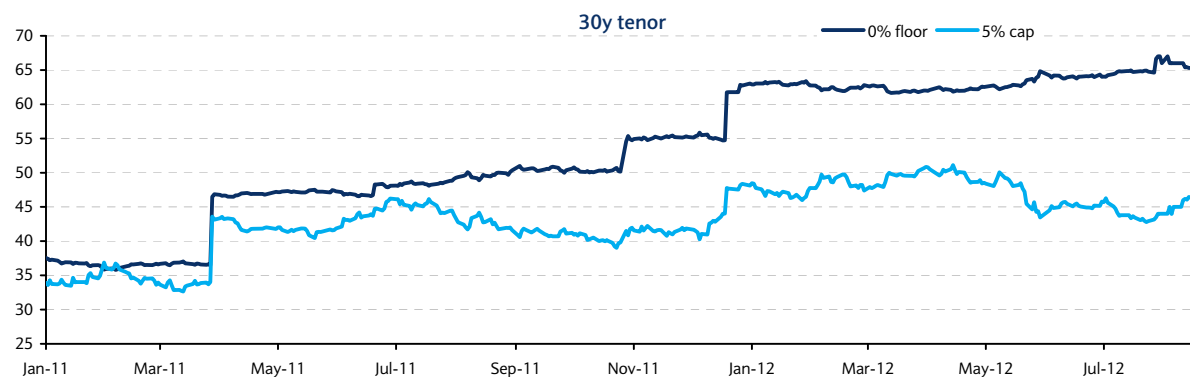
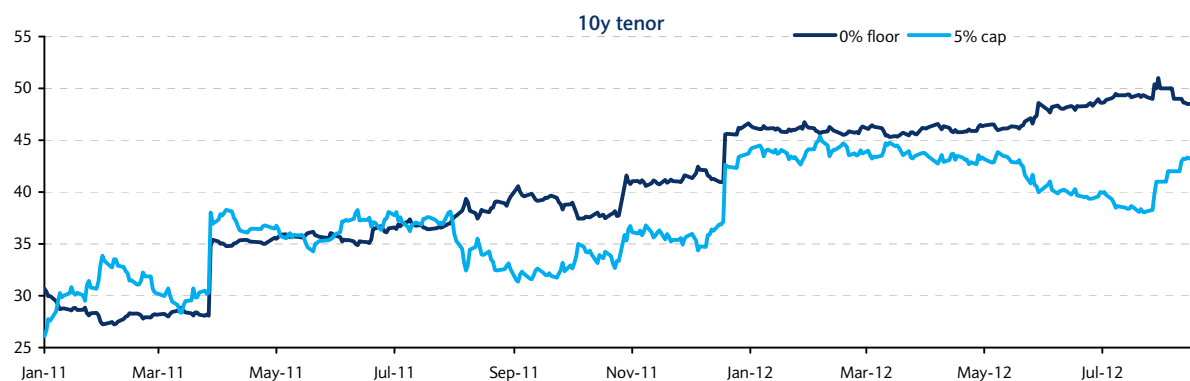
### RPI y/y floor and cap running premia (bp per annum)

	RPI y/y	Floors				Caps			
		ATM	0.0%	2.5%	3.0%	ATM	2.5%	3.0%	5.0%
5y	2.79%	91	33	80	103	91	105	78	29
10y	3.24%	106	49	91	110	106	134	103	42
15y	3.40%	110	56	94	111	110	148	115	45
20y	3.42%	112	61	95	110	112	158	124	45
25y	3.45%	114	64	97	111	114	163	127	45
30y	3.65%	114	66	97	111	114	168	132	45

### Implied Black Normal y/y RPI vol skew, tenor versus strikes (5y ATM vol = 100)

	y/y RPI	ATM	0%	2.50%	3%	5%
5y	2.79%	100	134	101	99	113
10y	3.24%	88	124	92	88	94
15y	3.40%	78	114	84	79	80
20y	3.42%	71	107	78	73	70
25y	3.45%	66	102	73	68	64
30y	3.65%	62	97	70	65	59

### RPI y/y running premium (bp per annum)



Source: Barclays Research

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