

Market update: Forward vol and midcurve calendar spreads in USD and EUR

Recent levels and carry and trades of note

We present a view on forward volatility, and recommend a number of midcurve calendar spreads as both good carry opportunities and a means of getting possible upside to recent economic and policy surprises. With rising implied vols and spiking realised, FVAs have risen but forward curves have further inverted, increasing the carry. In this report, we highlight a few trades that we think warrant consideration based on a number of metrics: USD 2y2y10y, USD 2y5y20y, USD 6m6m10y and EUR 5y5y3y. We only consider trades struck at spot to heighten the carry.

We first present USD and EUR FVA levels (with historical comparison) and 1y carry (please see notes at end for definition). We then highlight a number of midcurve calendar spread trades in USD and EUR which stand out on a number of metrics including their carry, the absolute level of forward vol and their breakeven widths.

USD FVA

Market Commentary: USD short gamma strategies have underperformed over the past month for all tenors with significantly worse performance in the long end.

Accommodating for the spike in realised, implieds have risen with the 1m expiries leading the charge at both ends of the curve. FVAs have risen over this same timeframe, but not at the same pace, since for the most part, the carry has also risen (i.e., the forward curves have further inverted). Noted exceptions are at 2y expiries at the upper right corner and other expiries close to the upper left corner where FVA vols decreased.

In spite of the increases, FVAs still have decent entry points especially on shorter expiry USD FVAs for all except the 30y tails and upper left corner. Relatively few of these same shorter expiry trades have decent vol rolls. Some of the 2y expiries get a balance between entry levels and vol carry. By contrast, many midcurve calendar spreads (which we recommend below) have decent carry, which would partly be from their theta exposure (or negative gamma).

Global Markets Research

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Fig. 1: USD FVA in levels

Levels (bp) and recent performance

6m Exp.	Current Level							1-month Change							1-year Percentile						
	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
3m	51.0	60.7						4.3	0.8						37%	13%					
6m	53.4	62.1		75.4	79.1		75.7	4.1	1.1		2.2	2.5		2.5	25%	3%		6%	10%		18%
1y	66.7	70.5	75.2	78.9	80.6		75.9	2.3	0.1	0.3	1.8	1.3		1.9	7%	2%	3%	8%	9%		21%
2y	79.8	80.2	81.0	82.7	82.5		74.9	-0.2	-1.0	-0.7	0.9	0.6		0.8	0%	0%	0%	8%	8%		26%
3y	86.8	86.0		85.0	83.3		73.4	-0.4	-0.1		0.4	0.4		0.1	1%	3%		4%	8%		22%
1y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y	71.7	71.5	75.1	79.0	80.1		74.1	2.2	-1.3	-0.9	2.1	0.8		1.5	10%	2%	3%	13%	9%		41%
2y	84.4	83.9	82.1	82.0	81.4		72.3	-0.2	-0.6	-1.1	0.0	-0.1		-0.2	4%	4%	3%	1%	1%		20%
3y	88.3	86.1		84.6	82.4		71.2	-0.3	0.0		0.4	0.4		-0.2	4%	4%		5%	10%		22%
5y		89.0		86.3	81.7	71.2	68.6		0.1		0.7	0.7	0.0	0.0		24%		25%	21%	24%	28%
10y				77.0	72.8	63.0					0.4	0.6	0.3					31%	56%	52%	
2y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y	89.3	85.2	81.2	77.9	78.7		68.0	5.2	2.1	-0.3	-1.3	-0.4		-1.4	48%	44%	5%	0%	2%		19%
2y	88.4	85.4	83.4	81.8	80.2		67.6	0.4	-0.4	-1.9	0.0	0.5		-0.7	6%	5%	0%	1%	9%		20%
3y	89.2	86.4		84.7	81.4		67.0	-0.5	-0.7		1.1	1.2		-0.3	2%	4%		32%	26%		24%
5y		86.5		83.2	78.8	67.0	64.4		0.2		1.3	1.0	0.2	0.2		69%		47%	28%	31%	43%
10y				74.2	70.0	59.6					0.7	0.8	0.5					28%	62%	56%	
5y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y	82.1	78.9	76.9	74.1	71.5		57.8	1.0	-0.2	0.3	2.7	2.2		2.0	23%	66%	84%	88%	69%		94%
2y	81.3	78.2	75.1	73.6	71.2		56.8	2.2	-0.3	-1.3	2.6	2.1		1.9	68%	92%	71%	89%	72%		94%
3y	77.9	75.1		72.6	71.2		56.3	1.9	0.2		2.5	2.5		2.1	73%	81%		87%	76%		96%
5y		72.0		69.9	70.7	57.4	54.5		0.7		1.4	2.5	2.2	2.1		72%		73%	78%	89%	96%
10y				66.1	63.1	50.7					2.2	2.5	1.8					71%	95%	79%	

Source: Nomura Research

Fig. 2: USD FVA 1 year / term vol carry

Carry over 1 year horizon or to term whichever is shorter (in bp)

6m Exp.	Current Level							1-month Change							1-year Percentile						
	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
3m	-8.5	-2.5						-0.5	2.5						52%	78%					
6m	-3.4	1.4		3.4	1.4		3.3	-1.4	-0.5		0.2	1.8		2.7	42%	86%		69%	58%		53%
1y	-4.9	-0.4	0.2	1.4	0.8		2.2	-0.9	-0.1	0.2	0.0	1.7		1.6	71%	84%	73%	39%	43%		27%
2y	-2.0	-0.9	0.3	1.1	0.9		2.5	0.1	0.0	0.5	0.9	1.1		1.5	34%	14%	35%	43%	42%		37%
3y	0.0	0.7		0.5	0.8		2.3	0.3	0.1		0.4	0.5		0.9	25%	23%		17%	25%		31%
1y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y	-9.8	-1.4	0.3	1.3	1.3		4.0	-0.8	1.3	1.3	-0.3	2.2		2.0	61%	83%	77%	29%	37%		22%
2y	-6.6	-4.7	-0.8	1.9	1.9		4.7	0.1	-0.4	0.8	1.8	1.9		2.5	18%	4%	19%	41%	32%		31%
3y	-1.5	0.5		0.9	1.8		4.5	0.2	0.0		0.3	0.5		1.2	13%	6%		9%	12%		26%
5y		1.8		2.2	2.9	4.2	4.3		0.5		0.5	0.5	0.5	0.6		8%		15%	26%	15%	12%
10y				3.1	3.0	3.5					0.1	0.1	0.3					50%	18%	29%	
2y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y	-17.7	-13.7	-6.1	1.1	1.4		6.0	-3.0	-3.4	-0.6	3.3	1.2		2.9	1%	2%	4%	70%	54%		70%
2y	-3.9	-1.5	-1.3	0.2	1.2		4.7	-0.6	-0.3	0.8	0.0	-0.6		0.5	5%	11%	26%	16%	12%		56%
3y	-0.9	-0.3		-0.1	0.9		4.2	0.2	0.7		-0.7	-0.8		0.1	19%	26%		1%	8%		43%
5y		2.6		3.2	3.0	4.2	4.2		-0.1		-0.6	-0.3	-0.2	-0.2		3%		8%	39%	21%	10%
10y				2.8	2.8	3.4					-0.2	-0.2	-0.2					53%	24%	30%	
5y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y	8.6	8.8	9.9	10.3	8.3		4.7	1.3	2.9	2.9	1.2	1.4		-0.6	55%	54%	65%	79%	75%		16%
2y	7.0	7.5	8.2	7.5	6.0		4.3	0.3	2.2	2.4	1.1	0.9		-0.2	34%	56%	67%	72%	72%		20%
3y	7.9	8.3		6.3	4.3		3.5	0.9	1.1		0.6	0.0		-0.5	84%	85%		66%	30%		6%
5y		5.5		4.6	2.9	3.1	3.2		0.2		0.2	-0.3	-0.5	-0.4		70%		22%	7%	3%	4%
10y				3.0	2.3	2.9					-0.4	-0.5	-0.3					7%		15%	

Source: Nomura Research

EUR FVA

Market Commentary: Most European vols have risen over the past month's equity market, BOJ and China-based developments, with 3m expiries and in particular 3m30y rising the most (10.24bp). Short gamma strategies suffered in Europe as well, except for the 20y and 30y tails, where 1m and 3m expiry short gamma strategies have actually performed well.

After the BOJ action last Friday, most parts of the forward vol surface have picked up compared with the level one month ago. We can find only a couple of decent entry points in 5-year expiries (5y3y1y to 5y5y5y).

Much as this is true of USD FVAs, the rise in implied vols has lifted FVAs with it, but has also increased the inversion with FVA carry increasing. When looking into the 1-year or

term vol carry, some of the longer expiry trades stand out. Among them, carry in the 5y3y1y to 5y10y20y region has picked up to almost a one-year high. Some of the short-tail trades can achieve a good balance between carry and entry point.

Fig. 3: EUR FVA in levels

Levels (bp) and recent performance¹

6m Exp.	Current Level							1-month Change							1-year Percentile						
	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y																					
2y		47.7	51.3	57.0			72.2		1.4	1.5	1.4			2.6		50%	56%	84%			90%
3y	55.8	57.8						1.5	2.4						55%	60%					
5y			68.1	70.2	75.2					1.9	1.7	2.5					93%	100%	100%		
1y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y																					
2y		54.3	57.0	60.1			70.7		2.7	2.1	1.9			3.6		56%	69%	92%			97%
3y	60.6	61.4						2.3	2.6						60%	74%					
5y			67.2	68.5	73.7					2.1	1.9	2.8					98%	100%	100%		
10y				71.6	71.8	63.6					1.3	1.2	1.4					90%	98%	99%	
2y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y		57.7							4.8							88%					
2y	62.6	61.8	63.4	62.3			65.2	5.0	4.7	3.8	2.5			2.4	88%	82%	83%	98%			100%
3y	64.9	63.5						2.9	3.2						63%	63%					
5y			65.2	65.5	71.9					1.6	1.4	2.8					87%	97%	100%		
10y				71.0	70.7	61.0					1.4	1.4	1.3					88%	97%	98%	
5y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y	63.0	55.4						-0.6	2.2						87%	78%					
2y	57.9	55.5	58.8	53.5			56.1	3.0	3.1	2.4	1.3			2.0	74%	45%	38%	44%			95%
3y	54.1	54.0						2.7	3.0						24%	20%					
5y			57.2	56.2	68.5					0.6	-0.8	0.3					22%	24%	48%		
10y				71.2	68.7	55.8					1.6	1.1	1.5					77%	75%	67%	

Source: Nomura Research

Fig. 4: EUR FVA 1 year / term vol carry

Carry over 1 year horizon or to term whichever is shorter (in bp)

6m Exp.	Current Level							1-month Change							1-year Percentile						
	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y																					
2y		-3.5	-3.2	-1.3			2.4		0.5	0.5	0.7			0.8		84%	80%	63%			28%
3y	-2.5	-2.1						0.8	0.4						85%	79%					
5y			0.9	1.7	1.6					0.6	0.7	0.4					52%	50%	42%		
1y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y																					
2y		-10.1	-9.0	-4.4			3.9		-0.8	-0.1	0.1			-0.2		65%	57%	36%			16%
3y	-7.3	-5.7						0.0	0.2						78%	66%					
5y			1.8	3.4	3.0					0.5	0.4	0.1					55%	51%	42%		
10y				2.3	2.4	3.1					0.2	0.1	0.1					56%	55%	50%	
2y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y		-26.7							-14.4							0%					
2y	-29.9	-7.5	-6.4	-2.3			5.6	-22.8	-2.1	-1.7	-0.6			1.2	0%	12%	21%	35%			65%
3y	-4.3	-2.1						-0.6	-0.5						53%	74%					
5y			2.0	3.0	1.8					0.5	0.5	0.0					80%	80%	64%		
10y				0.7	1.2	2.6					-0.2	-0.1	0.1					45%	61%	79%	
5y Exp.	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y	1y	2y	3y	5y	10y	20y	30y
1y	1.3	2.7						1.1	1.6						5%	29%					
2y	1.3	1.1	1.7	3.8			3.2	0.2	1.1	1.3	1.0			2.2	57%	58%	63%	75%			80%
3y	6.7	6.2						0.4	0.3						91%	93%					
5y			2.5	2.2	0.6					0.3	0.8	1.6					95%	92%	100%		
10y				-0.2	0.8	1.8					0.5	0.7	0.2					87%	100%	100%	

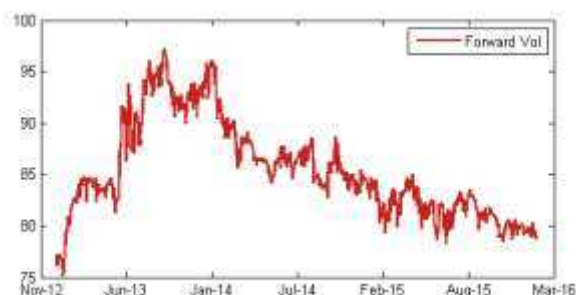
Source: Nomura Research

¹ 1y forwards are not included from many of the EUR tables due to data issues when rates are negative.

USD 2y1y10y Midcurve Calendar Spread Trade

Fig. 5: Forward Volatility

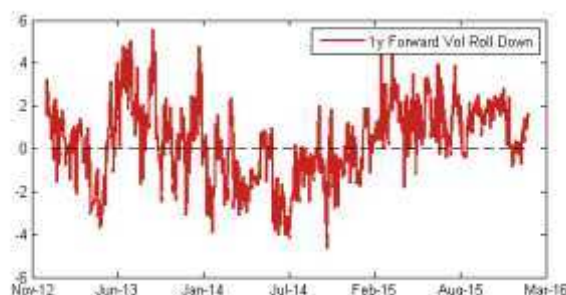
Forward vol has reached very low level



Source: Nomura Research

Fig. 6: 1-Year Forward Volatility Roll-down

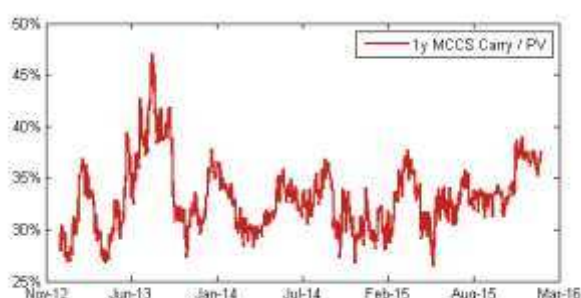
1-year forward volatility roll-down is relatively high



Source: Nomura Research

Fig. 7: 1-Year MCCC Carry / PV

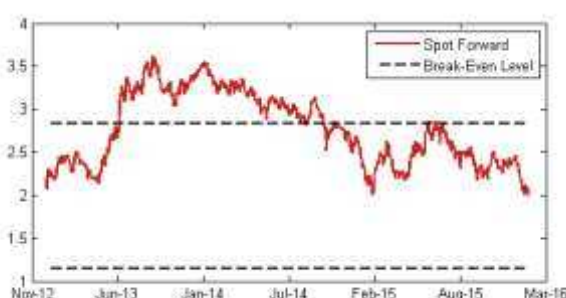
1-year MCCC carry / PV is nearly three-year high



Source: Nomura Research

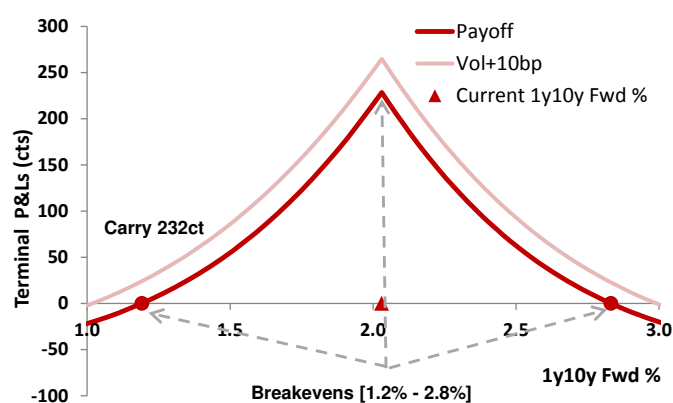
Fig. 8: Spot Forward and Breakeven Levels

Breakeven range is wide



Source: Nomura Research

Fig. 9: Payoff of USD 2y1y10y MCCC trade struck at 1y10y forward



Source: Nomura Research

FVA:

- Level: 78.7bp, 2nd percentile (1year)
- 1y Carry: 1.3bp, 37th percentile (1year)

Midcurve Calendar Spread:

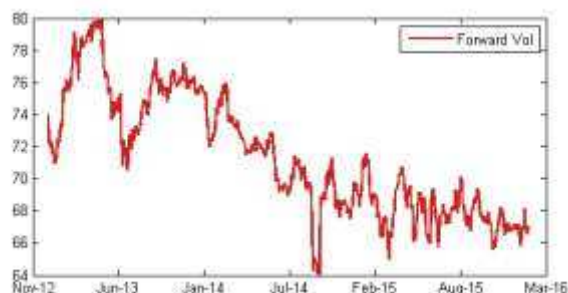
- 1 year Carry/PV 60%, at 5th Percentile (1year)
- 2 year carry/PV 329% at 48th Percentile (1 year)
- Term B/E range/Vol 1.16 at 94th Percentile

Trade idea: Buy \$100mn USD 3y10y vanilla payers and sell \$100mn USD 2y1y10y midcurve payers, both struck at 1y10y spot rates for a package mid-price of 70.5cts. The expected carry is 232cts in two years (forward ref: 1y10y 2.03%, 3y10y 2.33%).

USD 2y5y20y Midcurve Calendar Spread Trade

Fig. 10: Forward Volatility

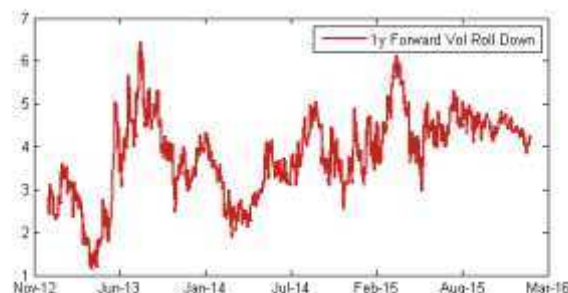
Forward vol has reached a very low level



Source: Nomura Research

Fig. 11: 1-Year Forward Volatility Roll-down

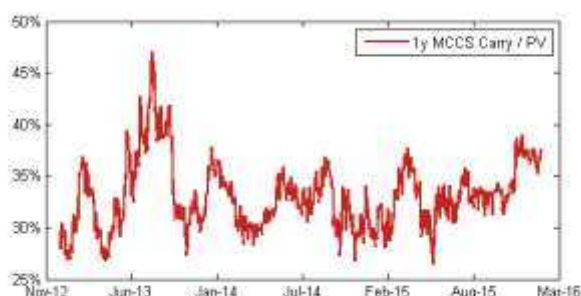
1-year forward volatility roll-down is relatively high



Source: Nomura Research

Fig. 12: 1-Year MCCC Carry / PV

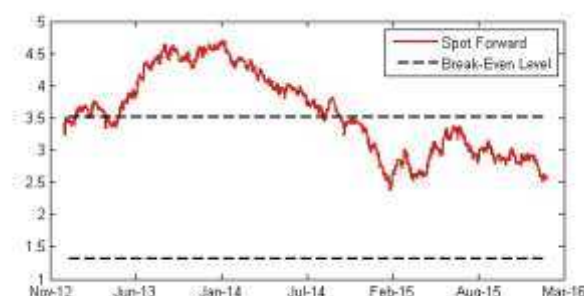
1-year MCCC carry / PV is nearly three-year high



Source: Nomura Research

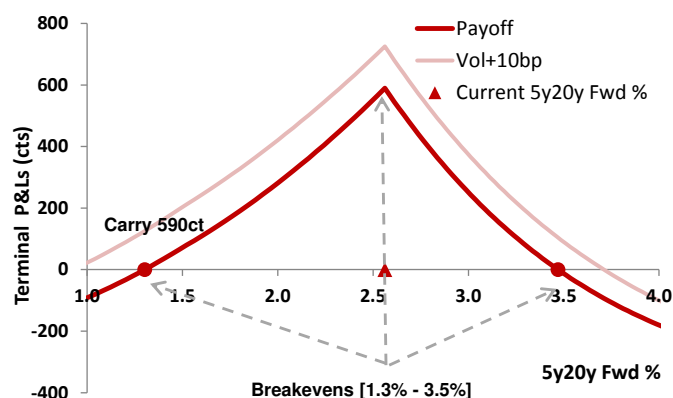
Fig. 13: Spot Forward and Breakeven Levels

Breakeven range is wide and positioned for new levels



Source: Nomura Research

Fig. 14: Payoff of USD 2y5y20y MCCC trade struck at 5y20y forward



Source: Nomura Research

FVA:

- Level: 67bp, 31st percentile (1year)
- 1y Carry: 4.2bp, 21st percentile (1year)

Midcurve Calendar Spread:

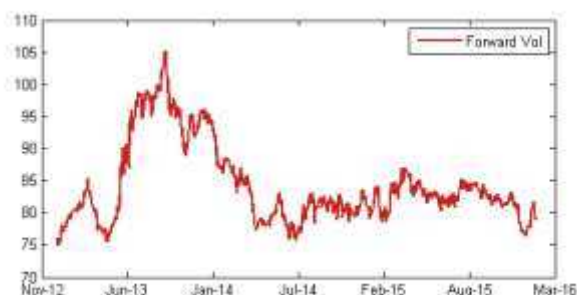
- 1 year Carry/PV 37%, at 94th Percentile (1year)
- 2 year carry/PV 133% at 73rd Percentile (1 year)
- Term B/E range/Vol 1.57 at 92nd Percentile

Trade idea: Buy \$100mn USD 7y20y vanilla payers and sell \$100mn USD 2y5y20y midcurve payers, both struck at 5y20y spot rates for a package mid-price of 443.9cts. The expected carry is 590cts in two years (forward ref: 5y20y 2.56%, 7y20y 2.61%).

USD 6m6m10y Midcurve Calendar Spread Trade

Fig. 15: Forward Volatility

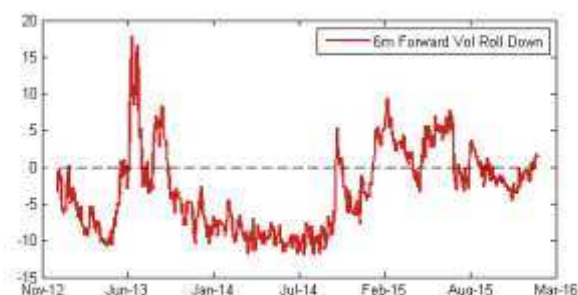
Forward vol has reached a relatively low level



Source: Nomura Research

Fig. 16: 6-month Forward Volatility Roll-down

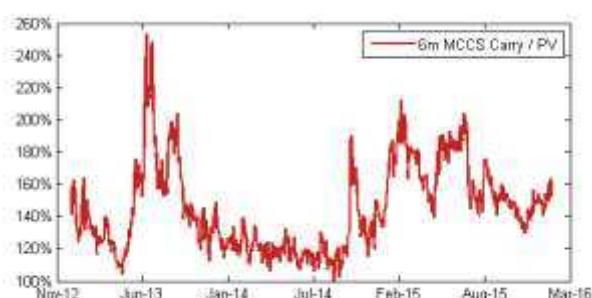
6-month forward volatility roll-down is relatively high



Source: Nomura Research

Fig. 17: 6-month MCCC Carry / PV

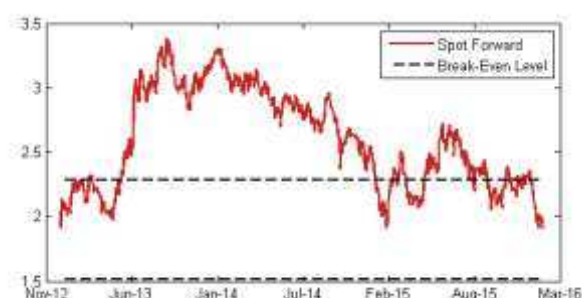
6-month MCCC carry / PV is nearly at a three-year high



Source: Nomura Research

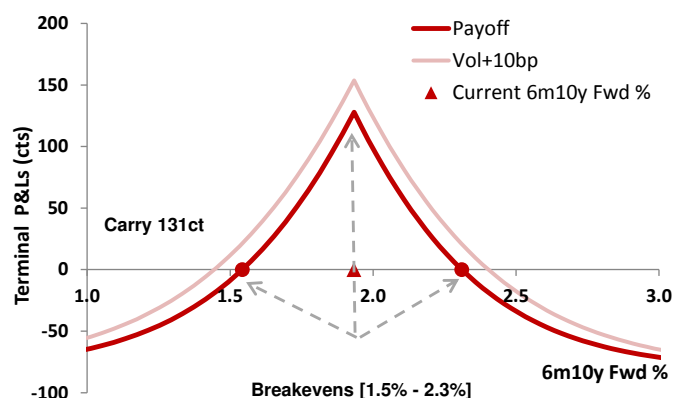
Fig. 18: Spot Forward and Breakeven Levels

Breakeven range is reasonably wide for the trade horizon



Source: Nomura Research

Fig. 19: Payoff of USD 6m6m10y MCCC trade struck at 6m10y forward



Source: Nomura Research

FVA:

- Level: 79.1bp, 10th percentile (1year)
- Term Carry: 1.4bp, 58th percentile (1year)

Midcurve Calendar Spread:

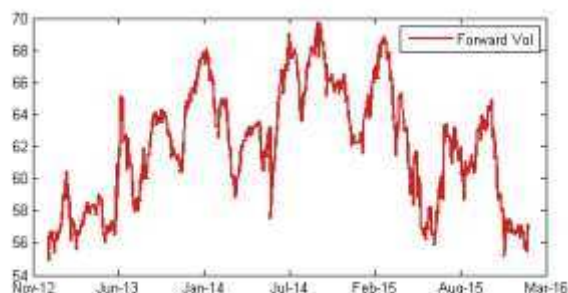
- Term Carry/PV 160%, at 54th Percentile (1year)
- Term B/E range/Vol 0.28 at 96th Percentile

Trade idea: Buy \$100mn USD 1y10y vanilla payers and sell \$100mn USD 6m6m10y midcurve payers, both struck at 6m10y spot rates for a package mid-price of 81.9cts. The expected carry is 131cts in six months (forward ref: 6m10y 1.93%, 1y10y 2.03%).

EUR 5y5y3y Midcurve Calendar Spread Trade

Fig. 20: Forward Volatility

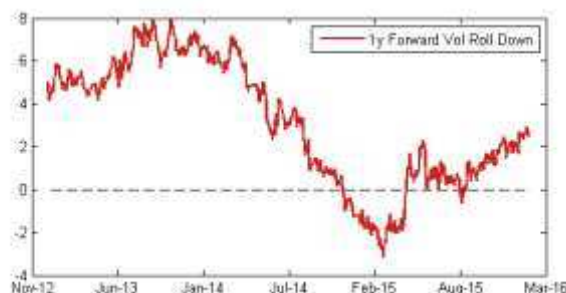
Forward vol has reached an exceptionally low level



Source: Nomura Research

Fig. 21: 1-Year Forward Volatility Roll-down

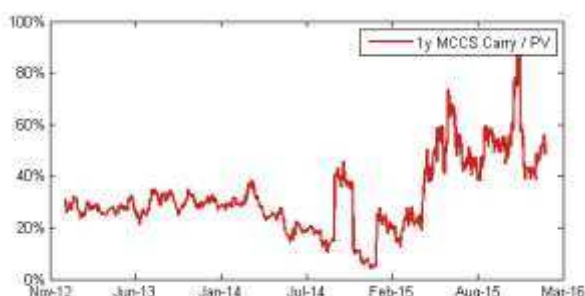
1-year forward volatility roll-down is relatively high



Source: Nomura Research

Fig. 22: 1-Year MCCC Carry / PV

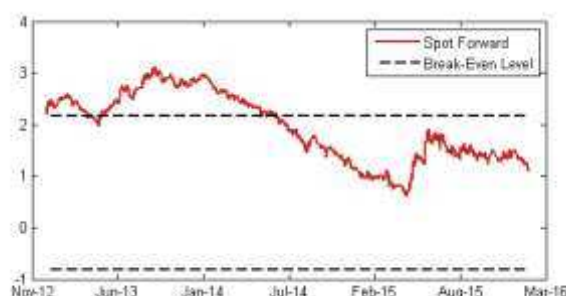
1-year MCCC carry / PV is just off its three-year high



Source: Nomura Research

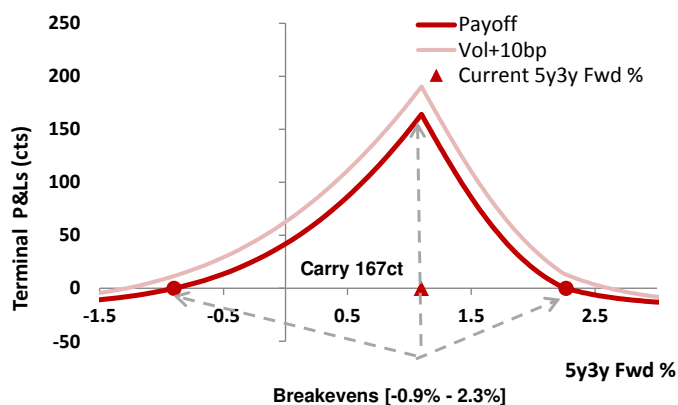
Fig. 23: Spot Forward and Breakeven Levels

Breakeven range is wide and levels in line with accommodation



Source: Nomura Research

Fig. 24: Payoff of EUR 5y5y3y MCCC trade struck at 5y3y forward



Source: Nomura Research

FVA:

- Level: 57.2bp, 22nd percentile (1year)
- 1y Carry: 2.5bp, 95th percentile (1year)

Midcurve Calendar Spread:

- 1Y Carry/PV 48% at 56th percentile (1 year)
- Term Carry/PV 860%, at 76th Percentile (1year)
- Term B/E range/Vol 4.46 at 96th Percentile (1 year)

Trade idea: Buy €100mn EUR 10y3y vanilla payers and sell €100mn EUR 5y5y3y midcurve payers, both struck at 5y3y spot rates for a package mid-price of 19cts. The expected carry is 167cts in five years (forward ref: 5y3y 1.10%, 10y3y 1.84%).

Notes:

- 1) Forward vol is implied from FVA trades (i.e., the strike-less constant vega forward vol trade) and measured in bp;
- 2) FVA Term Carry = Spot Vol - Fwd Vol; FVA 1y Carry = Aged 1y Fwd Vol - Fwd Vol (e.g., for a 5y2y10y trade we report the spread 4y2y10y FVA – 5y2y10y FVA);
- 3) MCCS Carry is measured in cts and normalised by entry PV;
- 4) MCCS Term Breakeven Range / Realised Vol = (High B/E - Low B/E) / 6m Realised Vol of Spot Forward.

We judge trades on a number of these metrics, noting that carry for midcurves may also be driven by the negative gamma of the trades, and breakeven ranges (which we only measure at trade expiry) may be narrow when volatilities are low, so scaling seems appropriate.

Appendix A-1

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- Quantitative analysis of price variations.
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