

## FX options trading screeners

Weekly RV signals - 31 May

A few relevant trading signals for FX vols this week:

- CAD, AUD, NZD, MXN, PLN vs. USD vols are a buy from a beta-to-vol angle; TRY, RUB, CNH, KRW, INR are a sell (Exhibit 2).
- ZAR, MXN, XAU are the three flattest USD-vol curves (1y-6m) from a 2-yr z-score (Exhibit 5) perspective; HUF, INR, CLP are the steepest. The RV analysis between autoregressive behavior and shape of vol curves (Exhibit 4, RHS) currently pinpoints EUR, XAU, CNH, GBP, CHF, BRL, NZD as best short-vol opportunities via DNTs. The analysis linking shape of FX vol curves to the spot vs. rates differential correlation dynamics (Exhibit 6) now finds that G10 and EM vol curves are excessively flat, especially in the far end segment. This should leave the door open for long FVA trades, with a focus on the 1y1y segment.
- Within USD/G10, based on the underlying rates vols/correlations (Exhibit 7), NOK, SEK vols are rich by 2.6, 1.6 vols and JPY, NZD vols are cheap by 1.0, 1.3 vols. 1y G10 FX USD vols screen as cheap by 2.4 vols (1.6 sigma, Exhibit 9) relative to rates drivers. Average USD/G10 rates correlation (58% on average) jumped on the US regional banks crisis and has remained elevated ever since (Exhibit 8, RHS); all else being equal, higher rates correlation supports lower FX vol fair-values.
- CAD/NZD, CAD/JPY, NZD/NOK, now offer the best opportunity to sell USD-correlation (with corr premium up to 20 corr pts., as on average the premium ranges from 0 to -15 corr pts. on elevated realized correlations), whereas AUD/NOK, EUR/NOK, NOK/CHF, GBP/CAD, GBP/NOK amongst others offer room to buy (Exhibit 11). Proxy of average USD realized correlation rose over the second half of May, lifting implied correlations too.
- FX Vol remain ~0.2 vols above the latest mid-May low, ahead of the vote on Wednesday on the US debt ceiling – on the Gamma segment (Exhibit 13) G10 vols look modestly underpriced relative to realized vols, while some EM vols show some premium. The realization of 3M skew (from a spot/vol correlation standpoint, not accounting for vol-of-vol and vol corrections) is now more evident for USD/G10 than USD/EM vols (Exhibit 14) at the moment. USD/RUB, USD/TRY (both illiquid), USD/BRL, USD/TWD and USD/IDR are currently displaying a wide skew premium based on the above. G10/EM implied vol of vol have dropped so far in 2023, after rebounding on the latest wave of risk-aversion at the end of 2022 (Exhibit 15). Implied – realized premia remain wide on even lower realized vol of vols, putting aside TRY

### Global Quantitative and Derivatives Strategy

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(illiquid).

- The sentiment models for Gamma trading keeps an aggressive allocation to short-Gamma, with latest (as of 29th of May at day close) average signal at 97/96% of the max Vega budget for USD-vols and EUR-vols (Exhibit 17, 20, LHS). 50% is the threshold at which the long/short version of the model would start taking long-Gamma trades. As the latest wave of risk-aversion got entirely de-priced, none of the global variables monitored is now pointing to scale down risk (Exhibit 17, RHS). Vol surface indicators are now little activated: main deviations from full short-Gamma allocation are now USD/ZAR, EUR/BRL, EUR/ZAR, EUR/PLN, EUR/HUF (86%), EUR/JPY, USD/CHF, EUR/NZD, USD/BRL, USD/MXN, USD/TRY, USD/HUF, EUR/SGD (93%) where some risk reduction is applied (Exhibit 16, 19). PnL time series and portfolios statistics show the recent (at the end of last year and throughout 2022) and long-term effectiveness of the filtering approach as applied to USD and EUR vol portfolios (Exhibit 18, 21) – the total return version of the model, allowing long-Gamma trade, has recently reached new all-time highs.
- Rich JPY, NOK, TRY vols, cheap GBP, CAD, AUD, NZD, BRL vols are the current dislocations (i.e., |z-scores| above 1.5; Exhibit 22) for 1y ATM vols. BRL vs. MXN, G4 vs. CAD, JPY vs. CHF vol spreads have short half-lives ( $\leq 3$  months, Exhibit 23). The Vol compression indicator (Exhibit 24), which measures an average level of dislocation within the FX vol space, still marks the end of the dislocated vol regime, started with the war between Ukraine and Russia, although the average dislocation has started to rise from the lows. Additional filters (Exhibit 25, 26) support selling JPY vs. EUR, GBP, SEK, AUD, NZD vols; buying EUR vs. NOK vols; buying AUD, NZD vols vs. NOK vol; buying BRL vol vs. MXN, ZAR, SGD, KRW, CNH vols; selling TRY vol vs. BRL, MXN, PLN, HUF, SGD, KRW vols.
- Page 12 focuses on RV opportunities in the FX vol convexity space (as expressed by 1y fly/ATM vol ratios). Tactically, vol convexity is cheapest on KRW, NOK, SGD, CNH, JPY and richest on TRY, RUB, PLN, CHF, BRL (Exhibit 27, 28). Long-term historical distributions (Exhibit 29) are now finding G10, EM vol convexity below historical averages, as the modest re-pricing as occurred in March was faded by markets. There are now no compelling opportunities to sell convexity relative to historical averages; vol convexity remains outright cheap in select EM pairs (especially so for ZAR, HUF, BRL, KRW, CNH) and on NZD, AUD, NOK, JPY.

## FX betas vs. vol, carry and skew

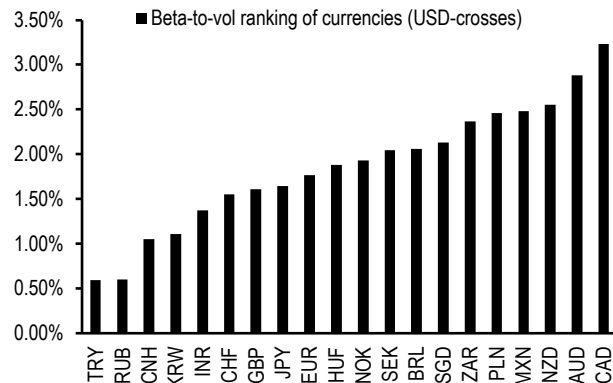
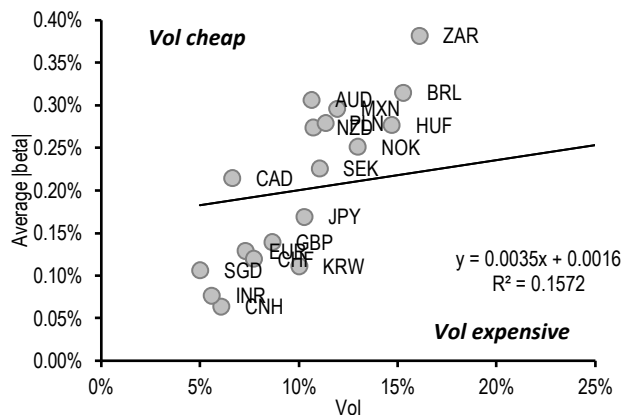
Exhibit 1. Screening for opportunities in the beta over vol space across G10 and EM currencies

	Betas						
G10	SPX	USD TWI	VIX	VXYG7	Mean  Beta	1y Vol	Beta/Vol
EUR	0.05%	0.37%	0.03%	0.07%	0.13%	7.3%	1.77%
JPY	0.18%	0.18%	0.16%	0.16%	0.17%	10.3%	1.64%
GBP	0.09%	0.30%	0.06%	0.10%	0.14%	8.7%	1.61%
AUD	0.32%	0.43%	0.24%	0.23%	0.31%	10.6%	2.88%
NZD	0.28%	0.41%	0.21%	0.19%	0.27%	10.7%	2.55%
CAD	0.23%	0.30%	0.19%	0.14%	0.21%	6.6%	3.24%
CHF	0.06%	0.33%	0.06%	0.03%	0.12%	7.7%	1.55%
NOK	0.20%	0.47%	0.16%	0.18%	0.25%	13.0%	1.93%
SEK	0.19%	0.44%	0.13%	0.15%	0.23%	11.1%	2.04%

	Betas						
EM	SPX	USD TWI	VIX	VXYG7	Mean  Beta	1y Vol	Beta/Vol
BRL	0.37%	0.35%	0.31%	0.23%	0.31%	15.3%	2.06%
MXN	0.35%	0.30%	0.30%	0.24%	0.30%	11.9%	2.48%
TRY	0.26%	0.35%	0.23%	0.24%	0.27%	45.9%	0.59%
ZAR	0.39%	0.49%	0.34%	0.30%	0.38%	16.1%	2.37%
HUF	0.22%	0.51%	0.18%	0.20%	0.28%	14.7%	1.88%
PLN	0.25%	0.48%	0.19%	0.21%	0.28%	11.4%	2.46%
RUB	0.21%	0.27%	0.22%	0.18%	0.22%	36.7%	0.60%
KRW	0.07%	0.23%	0.06%	0.09%	0.11%	10.0%	1.11%
SGD	0.09%	0.20%	0.07%	0.07%	0.11%	5.0%	2.13%
CNH	0.05%	0.12%	0.04%	0.04%	0.06%	6.1%	1.06%
INR	0.06%	0.13%	0.05%	0.07%	0.08%	5.6%	1.37%

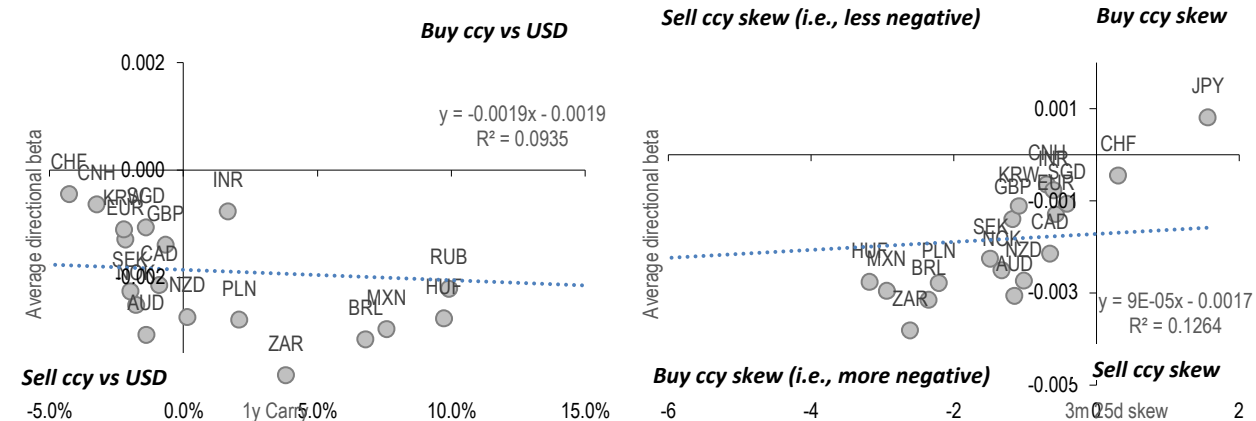
Source: J.P.Morgan

Exhibit 2. A linear regression finds a decent relationship between vol levels (1y ATM) and average |betas| across a set of USD-crosses



Source: J.P.Morgan

Exhibit 3. Market betas can be compared to implied carry (from 3m FWD) and skew (3m 25delta risk-reversal)

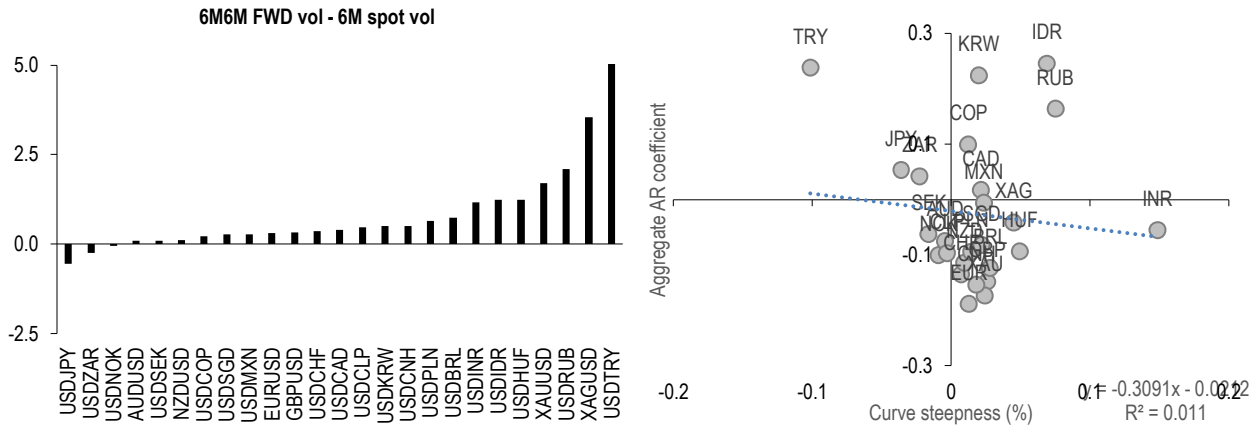


Source: J.P.Morgan

Find more details [here](#) and [here](#)

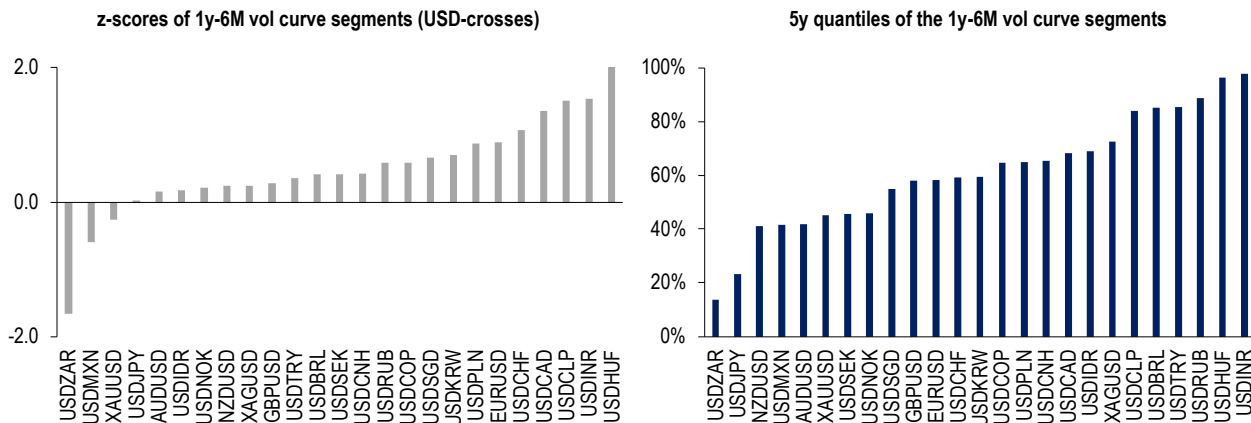
## Dislocations on vol-curves

Exhibit 4. 6m6m fwd vol – 6m spot vol (LHS). Interplay between steepness of 3M-1M vol segment and aggregated AR behavior (RHS)



Source: J.P.Morgan

Exhibit 5. 2yr z-scores of 1y-6M segment of vol curves (LHS) and 5y quantiles of the 1y-6M segment of vol curves (RHS)



Source: J.P.Morgan

Exhibit 6. Interplay between shape of vol curves and spot vs. rates differential correlation dynamics

ccy	RD (6M)	Spot Vol	RD vol (6M)	RD spot correl (6M)	RD spot correl (6M) - LT	1y-6m z score	2y-1y z-score	TRY	RD (6M)	Spot Vol	RD vol (6M)	RD spot correl (6M)	RD spot correl (6M) - LT	1y-6m z score	2y-1y z-score
EUR	-2.0%	8.3%	0.8%	48.6%	25.3%	0.7	-0.5	TRY	61.1%	4.4%	38.0%	-7.8%	-12.7%	0.2	-8.7
GBP	-0.4%	8.7%	1.1%	22.8%	24.0%	-0.9	-2.9	HUF	8.3%	15.8%	5.8%	21.5%	6.1%	-0.8	-5.3
JPY	-5.8%	10.5%	1.0%	61.1%	13.9%	-2.2	-7.7	PLN	2.0%	10.5%	2.9%	8.2%	10.5%	1.5	0.6
CHF	-4.0%	9.2%	1.1%	44.5%	13.8%	1.0	-0.5	ZAR	3.8%	14.5%	1.2%	-12.4%	-8.1%	-0.4	-0.1
CAD	-0.8%	6.6%	0.6%	23.2%	26.1%	2.0	1.7	RUB	10.8%	14.0%	33.5%	15.0%	-8.4%	-0.3	-4.4
AUD	-1.3%	10.8%	1.0%	37.6%	25.5%	-0.2	-2.6	CNH	-3.2%	5.4%	1.4%	20.4%	-8.7%	3.1	1.5
NZD	0.2%	12.5%	1.0%	50.1%	16.8%	1.0	1.6	KRW	-2.2%	10.0%	1.8%	-0.6%	19.1%	1.2	0.2
NOK	-1.5%	13.8%	1.0%	2.6%	22.4%	-1.6	-2.2	BRL	6.2%	11.8%	1.8%	-14.8%	12.3%	0.4	-3.4
SEK	-1.8%	11.8%	0.9%	19.1%	19.0%	-0.6	-3.4	MXN	7.1%	11.8%	5.0%	-4.5%	-12.2%	-0.3	-1.6

Source: J.P.Morgan

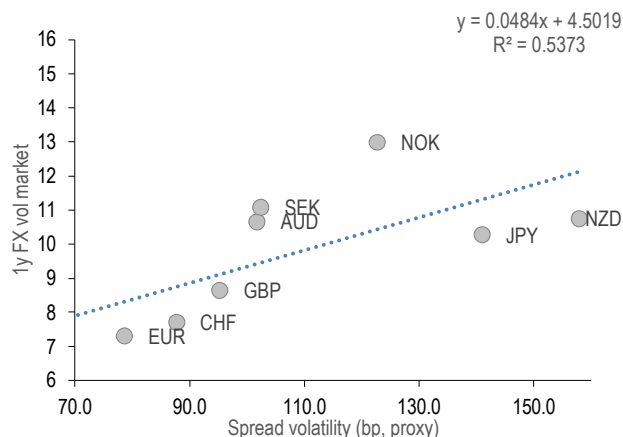
Find more details: 1) [vol curves](#), 2) [AR behavior](#), 3) [rates dynamics vs. vol curves](#)

## FX vols vs rates vols/correls

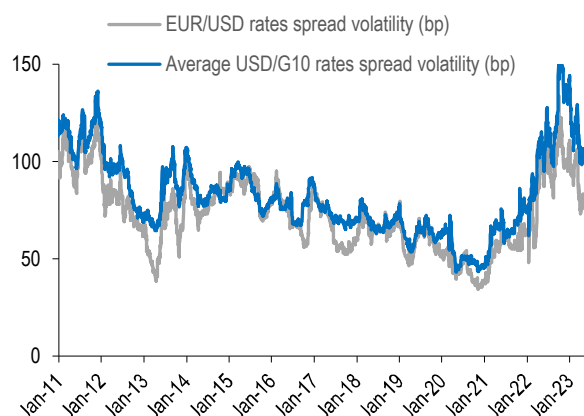
**Exhibit 7. Summary of FX vs rates regression per currency, in the G10 space (left hand side chart). Scatter plot between G10 1y FX vols and swaptions (right hand side chart)**

ccy	Rates vol	Correl	Spread vol	1y FX vol (market)	1y FX vol (model)
USD	131.6				
EUR	113.1	80.4%	78.7	7.3	8.3
JPY	48.6	-1.6%	141.0	10.3	11.3
GBP	126.0	72.7%	95.3	8.7	9.1
CHF	111.6	75.2%	87.7	7.7	8.7
CAD	128.6	91.2%	54.6	6.6	7.1
AUD	131.8	70.2%	101.8	10.7	9.4
NZD	117.2	19.9%	157.9	10.8	12.1
NOK	124.1	54.1%	122.7	13.0	10.4
SEK	91.8	63.2%	102.4	11.1	9.5

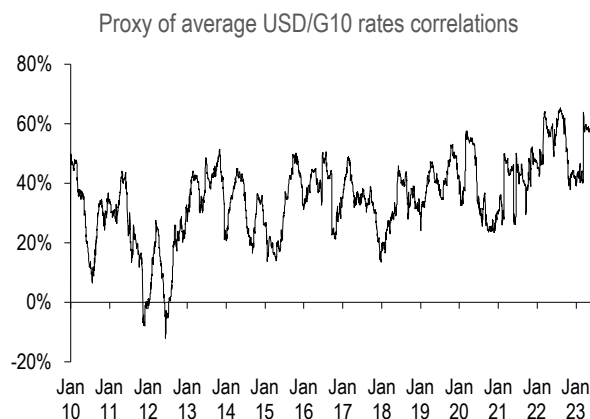
Source: J.P.Morgan



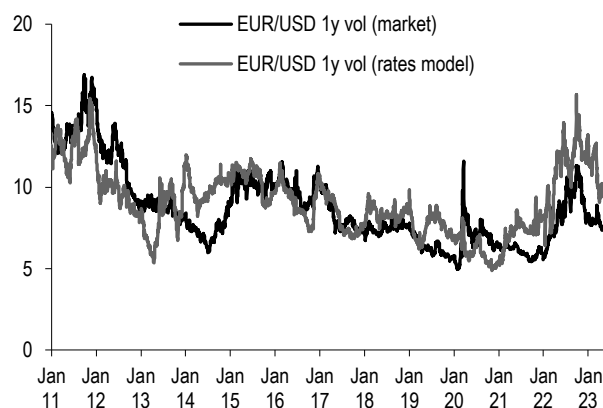
**Exhibit 8. Time series of EUR/USD and average USD/G10 proxies of rates spreads volatility (in bp) and of average USD/G10 rates correlation**



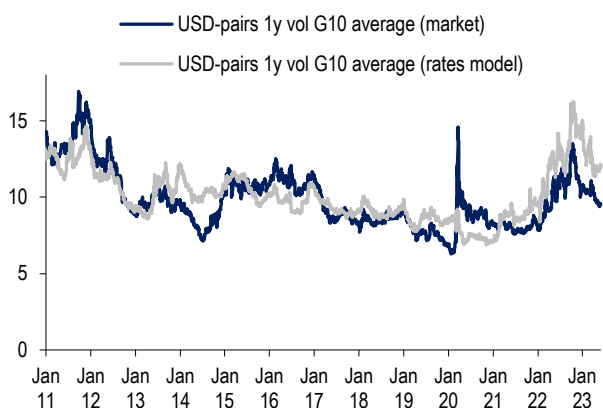
Source: J.P.Morgan



**Exhibit 9. Market vs rates time series models for EUR/USD and average G10 FX vol (USD-pairs)**



Source: J.P.Morgan

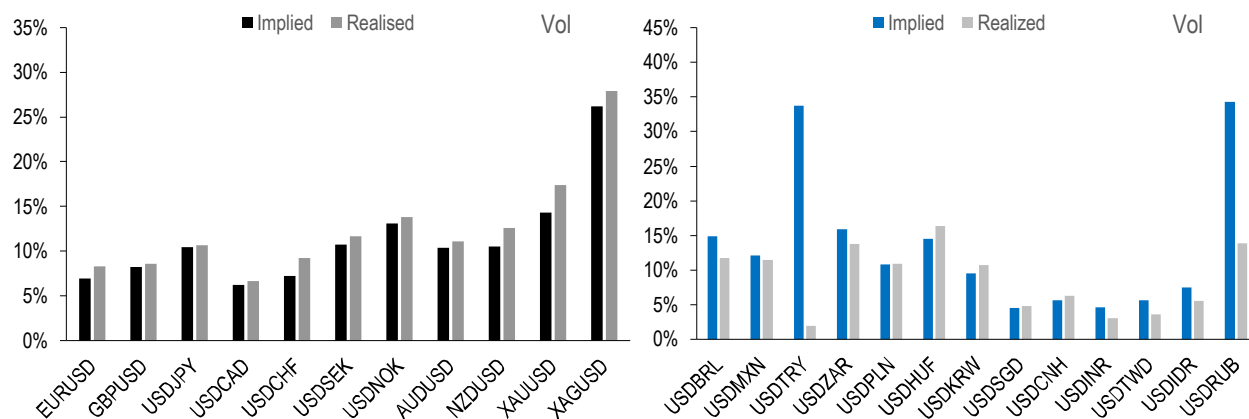


Find more details [here](#) and [here](#)



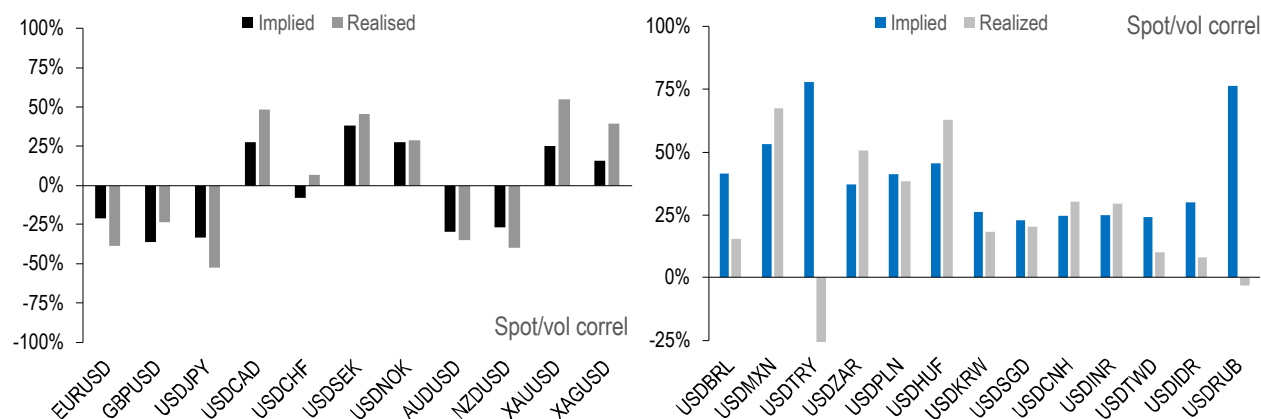
## Implied vs. realized smile parameters (3M, G10 currencies vs USD)

Exhibit 13. Implied vs realized vol (G10/EM USD-crosses)



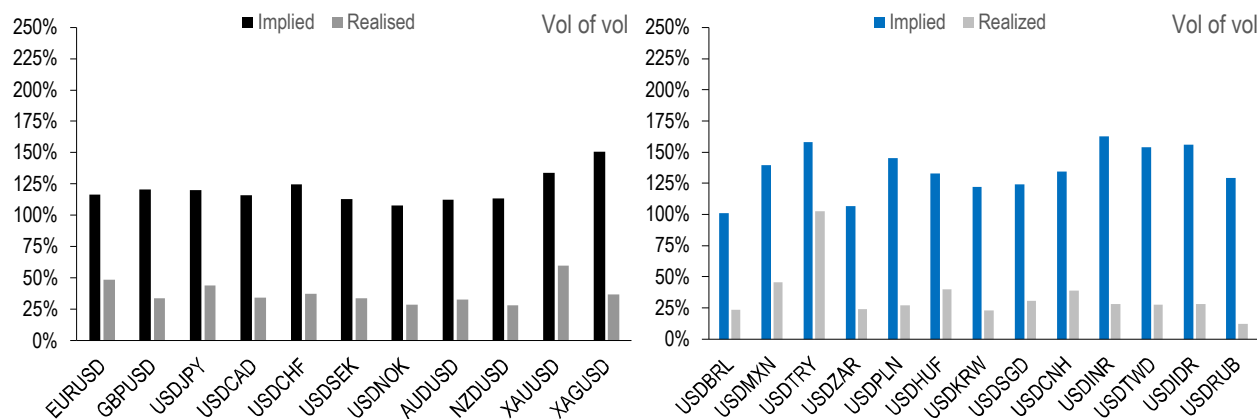
Source: J.P.Morgan

Exhibit 14. Implied vs realized spot/vol correlation (G10/EM USD-crosses)



Source: J.P.Morgan

Exhibit 15. Implied vs realized vol of vol (G10/EM USD-crosses)

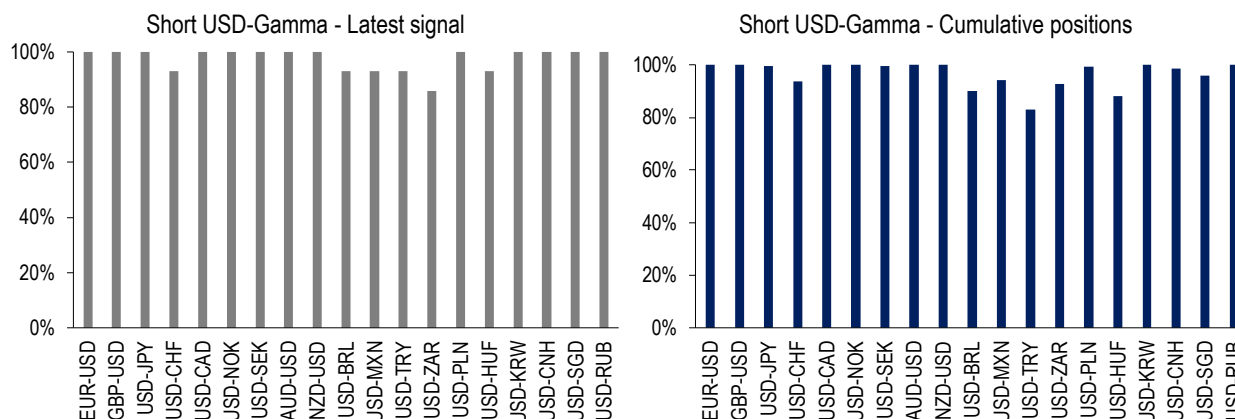


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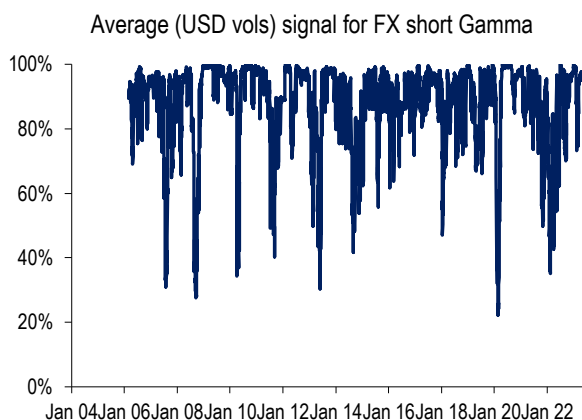
## Timing indicators for Gamma trades (1M, 25delta strangles) – USD vols

Exhibit 16. Latest signals (left) and cumulated positions (right) for short USD-Gamma - fraction of the max allocation to short-vol



Source: J.P.Morgan

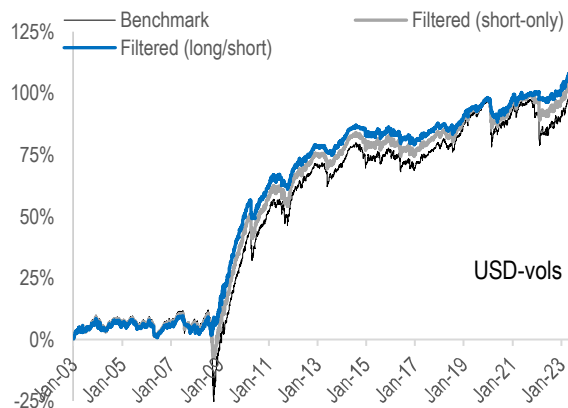
Exhibit 17. Average signal across currencies of the latest signals – time series. Global risk-factors: current activation.



Source: J.P.Morgan

	Gold To Silver	US swaptions	FX Vol	VIX	TED
z-score	-0.84	0.78	-2.10	-1.82	-0.40
Filter activated	NO	NO	NO	NO	NO

Exhibit 18. Benchmark and filtered USD-Gamma systematic portfolios – PnL time series (left) and statistics (right)



Source: J.P.Morgan

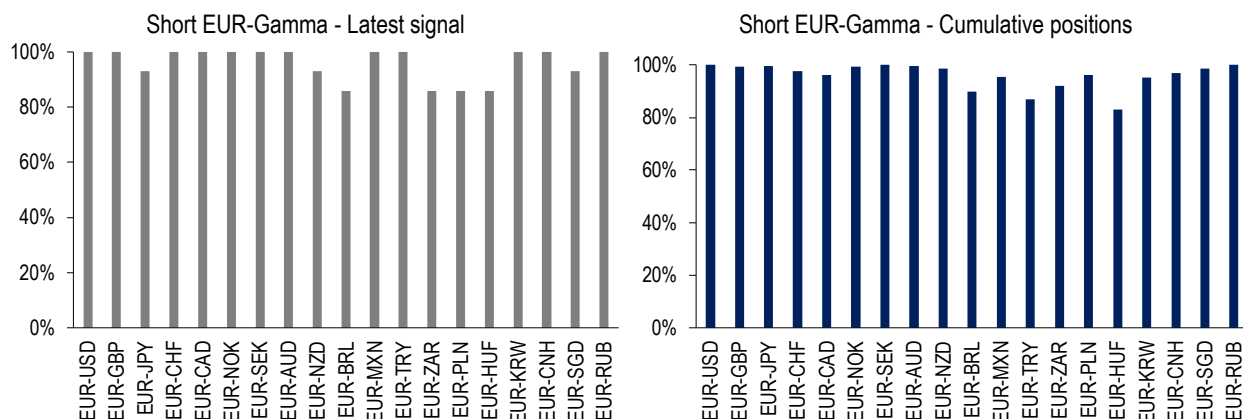
Strategy	Return	Vol	Sharpe	Max DD
Benchmark	4.7%	7.7%	0.61	-37.1%
Short-only	5.0%	5.9%	0.85	-18.4%
Long/short	5.1%	5.0%	1.03	-9.8%

Find more details in this [note](#) and related [follow-up](#)



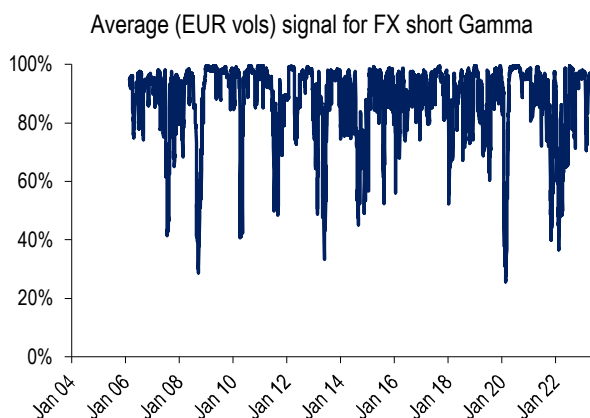
## Timing indicators for Gamma trades (1M, 25delta strangles) – EUR vols

Exhibit 19. Latest signals (left) and cumulated positions (right) for short EUR-Gamma - fraction of the max allocation to short-vol



Source: J.P.Morgan

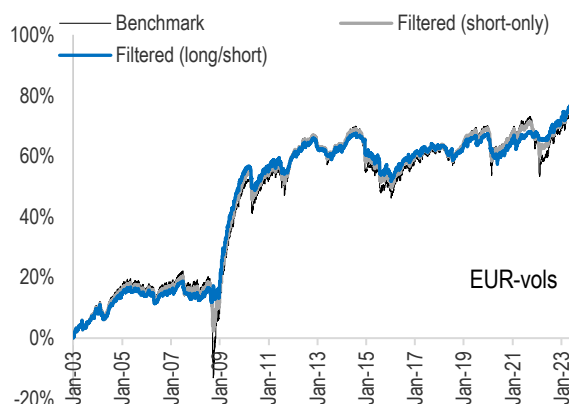
Exhibit 20. Average signal across currencies of the latest signals – time series. Global risk-factors: current activation.



Source: J.P.Morgan

	Gold To Silver	US swaptions	FX Vol	VIX	TED
z-score	-0.84	0.78	-2.10	-1.82	-0.40
Filter activated	NO	NO	NO	NO	NO

Exhibit 21. Benchmark and filtered EUR-Gamma systematic portfolios – PnL time series (left) and statistics (right)



Source: J.P.Morgan

Strategy	Return	Vol	Sharpe	Max DD
Benchmark	3.6%	6.8%	0.52	-35.2%
Short-only	3.6%	5.1%	0.72	-19.7%
Long/short	3.6%	4.2%	0.87	-15.8%

Find more details in this [note](#) and related [follow-up](#)

## FX Vol Mean reversion (I) – Current dislocations and half-lives for vol spreads

Exhibit 22. 1y ATM vols 2yr z-scores (off-diagonal spreads are long the row vol / short the column vol, diagonal elements long the row vol)

z-scores	EUR-USD	GBP-USD	USD-JPY	USD-CHF	USD-CAD	USD-NOK	USD-SEK	AUD-USD	NZD-USD	z-scores	USD-BRL	USD-MXN	USD-TRY	USD-ZAR	USD-PLN	USD-HUF	USD-RUB	USD-SGD	USD-KRW	USD-CNH
EUR-USD	-0.22	0.31	-1.61	-0.59	0.57	-1.97	-0.11	0.46	0.40	USD-BRL	-2.39	-2.89	-2.19	-2.91	-1.30	-0.91	-0.70	-2.75	-2.35	-2.65
GBP-USD	-0.31	-0.31	-1.64	-0.58	0.27	-1.43	-0.36	0.02	0.01	USD-MXN	2.89	-0.11	-1.86	-0.64	0.26	-0.07	-0.47	0.00	-0.61	-0.33
USD-JPY	1.61	1.64	0.61	1.27	1.33	0.87	1.86	2.09	1.92	USD-TRY	2.19	1.86	1.72	1.73	2.18	2.16	0.70	1.81	1.83	1.74
USD-CHF	0.59	0.58	-1.27	-0.04	1.23	-1.19	0.22	1.17	1.20	USD-ZAR	2.91	0.64	-1.73	0.70	0.36	0.02	-0.43	0.64	-0.24	0.07
USD-CAD	-0.57	-0.27	-1.33	-1.23	-1.13	-1.46	-0.44	-0.37	-0.42	USD-PLN	1.30	-0.26	-2.18	-0.36	-0.23	-0.37	-0.57	-0.25	-0.77	-0.39
USD-NOK	1.97	1.43	-0.87	1.19	1.46	0.31	0.97	2.73	2.51	USD-HUF	0.91	0.07	-2.16	-0.02	0.37	0.04	-0.53	0.07	-0.15	-0.01
USD-SEK	0.11	0.36	-1.86	-0.22	0.44	-0.97	-0.13	0.43	0.38	USD-RUB	0.70	0.47	-0.70	0.43	0.57	0.53	0.44	0.46	0.43	0.44
AUD-USD	-0.46	-0.02	-2.09	-1.17	0.37	-2.73	-0.43	-0.40	-0.05	USD-SGD	2.75	0.00	-1.81	-0.64	0.25	-0.07	-0.46	-0.12	-0.74	-0.59
NZD-USD	-0.40	-0.01	-1.92	-1.20	0.42	-2.51	-0.38	0.05	-0.42	USD-KRW	2.35	0.61	-1.83	0.24	0.77	0.15	-0.43	0.74	0.39	0.49
										USD-CNH	2.65	0.33	-1.74	-0.07	0.39	0.01	-0.44	0.59	-0.49	0.21

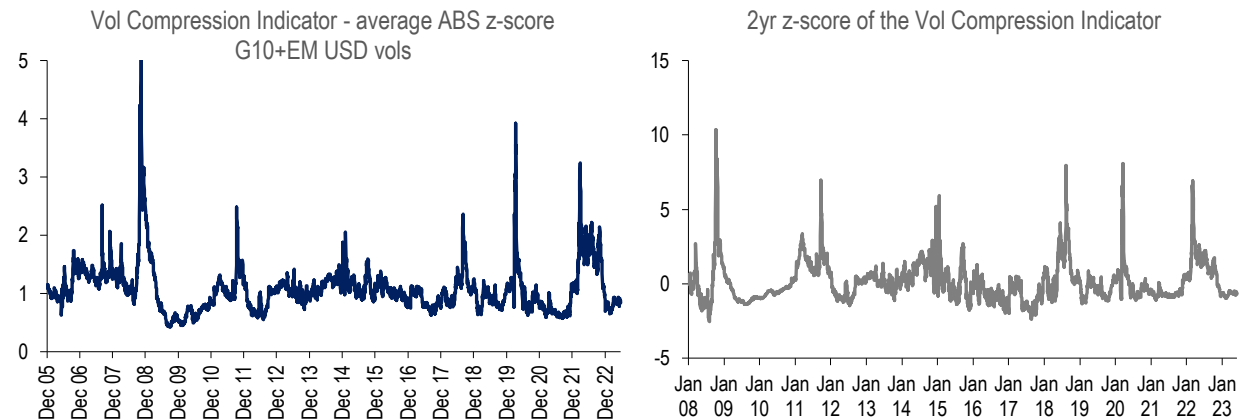
Source: J.P.Morgan

Exhibit 23. Half-lives for the vols / vol spreads - 1y ATM vols

Half-lives	EUR-USD	GBP-USD	USD-JPY	USD-CHF	USD-CAD	USD-NOK	USD-SEK	AUD-USD	NZD-USD	Half-lives	USD-BRL	USD-MXN	USD-TRY	USD-ZAR	USD-PLN	USD-HUF	USD-RUB	USD-SGD	USD-KRW	USD-CNH
EUR-USD	280.5	174.7	79.8	142.7	84.6	210.3	287.0	57.0	46.9	USD-BRL	97.0	73.9	326.2	54.4	144.6	143.8	232.0	59.0	69.3	81.9
GBP-USD	174.7	208.7	82.1	178.4	85.3	97.1	144.2	67.6	77.5	USD-MXN	73.9	97.6	353.1	56.6	87.6	105.6	236.2	52.0	29.2	83.1
USD-JPY	79.8	82.1	158.1	80.2	79.8	87.5	81.5	87.4	69.6	USD-TRY	326.2	353.1	569.4	719.1	848.6	622.7	158.4	635.4	381.7	548.5
USD-CHF	142.7	178.4	80.2	200.1	103.5	211.1	270.4	85.7	62.1	USD-ZAR	54.4	56.6	719.1	127.1	187.8	186.5	430.9	59.5	67.3	87.8
USD-CAD	84.6	85.3	79.8	103.5	305.8	83.2	82.3	48.5	27.9	USD-PLN	144.6	87.6	848.6	187.8	437.0	44.6	459.0	218.7	41.3	709.1
USD-NOK	210.3	97.1	87.5	211.1	83.2	211.1	109.7	29.0	45.4	USD-HUF	143.8	105.6	622.7	186.5	44.6	393.4	350.2	198.5	53.5	724.6
USD-SEK	287.0	144.2	81.5	270.4	82.3	109.7	288.1	32.5	37.0	USD-RUB	232.0	236.2	158.4	430.9	459.0	350.2	399.2	384.8	260.5	320.5
AUD-USD	57.0	67.6	87.4	85.7	48.5	29.0	32.5	202.7	75.9	USD-SGD	59.0	52.0	635.4	59.5	218.7	198.5	384.8	228.2	73.1	336.0
NZD-USD	46.9	77.5	69.6	62.1	27.9	45.4	37.0	75.9	193.2	USD-KRW	69.3	29.2	381.7	67.3	41.3	53.5	260.5	73.1	137.9	256.4
										USD-CNH	81.9	83.1	548.5	87.8	709.1	724.6	320.5	336.0	256.4	156.3

Source: J.P.Morgan

Exhibit 24. Vol Compression Indicator (average abs of z-score of diagonal + off-diagonal G10+EM USD vol spreads) and its 2yr z-score.



Source: J.P.Morgan

Find more details in this [piece](#) and its [follow-up](#)

## FX Vol Mean reversion (II) – Additional filters

Exhibit 25. Number of filters activated for a spread (long row vol / short column vol) supported by the mean-reversion signal

# active filters	EUR-USD	GBP-USD	USD-JPY	USD-CHF	USD-CAD	USD-NOK	USD-SEK	AUD-USD	NZD-USD	USD-BRL	USD-MXN	USD-TRY	USD-ZAR	USD-PLN	USD-HUF	USD-RUB	USD-SGD	USD-KRW	USD-CNH
EUR-USD	0	0	3	0	0	2	0	0	0	0	0	3	0	0	0	0	0	0	0
GBP-USD	0	0	2	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-JPY	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-CHF	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-CAD	0	0	0	0	0	0	0	0	0	0	4	3	2	0	0	0	4	0	3
USD-NOK	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-SEK	0	0	2	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
AUD-USD	0	0	1	0	0	2	0	0	0	0	0	3	0	0	0	0	0	3	0
NZD-USD	0	0	2	0	0	3	0	0	0	0	0	3	0	0	0	0	0	4	0
USD-BRL	2	1	1	2	1	1	2	2	2	1	2	3	1	0	0	0	1	2	1
USD-MXN	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-TRY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USD-ZAR	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-PLN	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-HUF	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-RUB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
USD-SGD	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-KRW	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
USD-CNH	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0

Source: J.P.Morgan

Exhibit 26. Filters activated for a given spread: A) mean-reversion; B) short-term dislocation; C) Vol Carry; D) Term structure

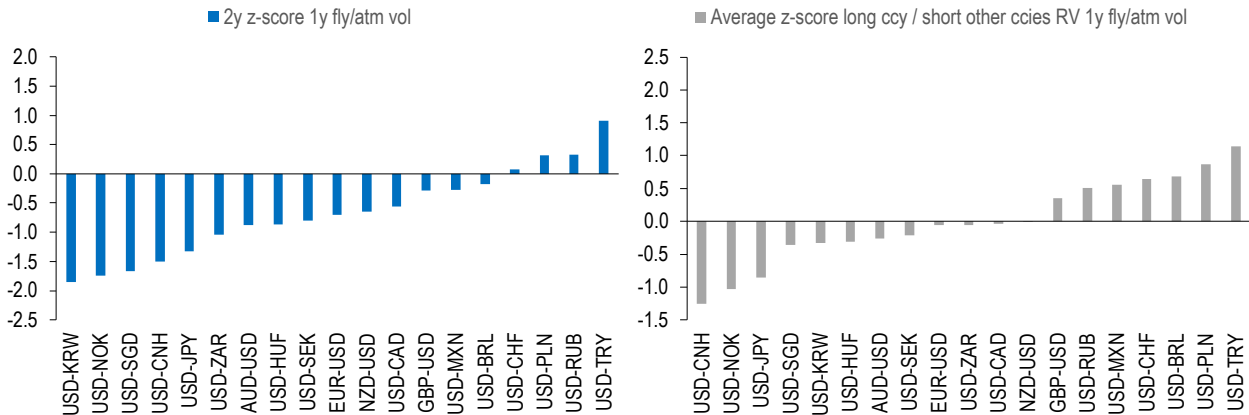
active filters	EUR-USD	GBP-USD	USD-JPY	USD-CHF	USD-CAD	USD-NOK	USD-SEK	AUD-USD	NZD-USD	USD-BRL	USD-MXN	USD-TRY	USD-ZAR	USD-PLN	USD-HUF	USD-RUB	USD-SGD	USD-KRW	USD-CNH
EUR-USD	C	BCD	ABC	BCD	BC	AC	BC	BC	BC	BCD	BCD	ACD	C	BCD	BD	BCD	BCD	BCD	BCD
GBP-USD	B	B	AB	B	B	B	B	B	B	BCD	B	ACD	C	B	BD	BCD	BC	B	C
USD-JPY	BD	BCD	BCD	BD	BCD	BD	BD	BCD	BD	BCD	BCD	ACD	BCD	BCD	BD	BCD	BCD	BD	BCD
USD-CHF	B	BCD	BC	C	BC	C	BC	BC	BC	BCD	BCD	ACD	C	BCD	BD	BCD	BC	BCD	BCD
USD-CAD	BD	BCD	B	BD	B	0	BD	BC	B	BCD	ABCD	ACD	AC	BCD	BD	BCD	ABCD	BD	ACD
USD-NOK	BD	BCD	BC	BD	BCD	BC	BCD	BC	B	BCD	BCD	ACD	BC	BCD	BD	BCD	BCD	BCD	BCD
USD-SEK	BD	CD	AC	BD	C	0	C	BC	B	BCD	CD	ACD	C	BCD	BD	BCD	CD	BCD	CD
AUD-USD	D	BCD	A	BD	D	AD	BD	0	B	BCD	D	ACD	CD	BD	BD	BCD	CD	ABD	CD
NZD-USD	D	BCD	AC	BD	CD	ACD	BCD	BCD	C	BCD	CD	ACD	CD	BCD	BD	BCD	CD	ABCD	CD
USD-BRL	AB	A	A	AB	A	A	AB	AB	AB	A	AB	ACD	A	0	BD	BC	A	AB	A
USD-MXN	B	BCD	B	B	B	B	B	BC	B	BCD	B	ACD	BC	BC	BD	BCD	BC	BD	BC
USD-TRY	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
USD-ZAR	BD	BD	B	BD	BD	BD	BD	B	B	BCD	BD	ACD	B	BD	BD	BCD	BD	BD	BD
USD-PLN	B	BCD	B	B	B	B	B	BC	B	BCD	BD	ACD	C	B	BD	BCD	BC	BD	C
USD-HUF	C	C	C	C	C	C	C	C	C	BC	C	ACD	C	C	C	C	C	C	C
USD-RUB	B	B	B	B	B	B	B	B	B	BD	B	CD	B	B	BD	B	B	B	B
USD-SGD	B	BD	B	BD	B	0	B	B	B	BCD	BD	ACD	C	BD	BD	BCD	0	BD	BCD
USD-KRW	B	BCD	BC	B	BC	0	B	BC	B	BCD	BC	ACD	BC	BC	BD	BCD	BC	BC	BC
USD-CNH	B	BD	B	B	B	B	B	B	B	BCD	BD	ACD	BC	BD	BD	BCD	B	BD	B

Source: J.P.Morgan

Find more details in this [piece](#) and its [follow-up](#)

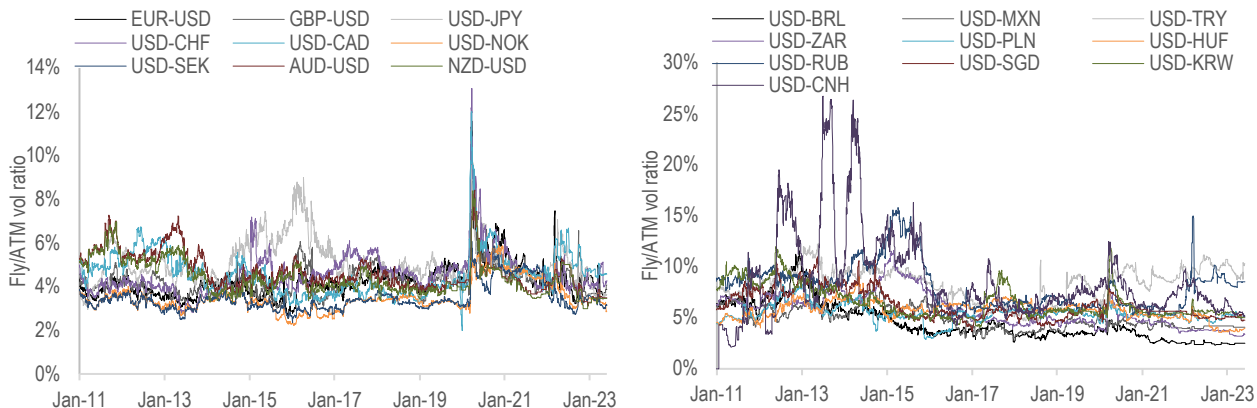
## RV in the vol convexity space

Exhibit 27. 2yr z-score of diagonal and average of off-diagonal 1y fly/atm vol ratios



Source: J.P.Morgan

Exhibit 28. Time series of USD/G10 and USD/EM 1y fly / ATM vol ratios



Source: J.P.Morgan

Exhibit 29. Historical distributions of 1y fly / atm vol ratios for G10 and EM pairs

	1y 25D fly / ATM ratio																			
	EUR-USD	GBP-USD	USD-JPY	USD-CHF	USD-CAD	USD-NOK	USD-SEK	AUD-USD	NZD-USD	USD-BRL	USD-MXN	USD-TRY	USD-ZAR	USD-PLN	USD-HUF	USD-RUB	USD-SGD	USD-KRW	USD-CNH	
Current	3.9%	4.1%	3.6%	4.3%	4.6%	2.9%	3.1%	3.5%	3.4%	2.5%	4.1%	10.3%	3.4%	5.2%	3.9%	8.5%	4.7%	5.0%	5.1%	
%ile rank	26.1%	36.7%	10.6%	42.2%	60.1%	10.3%	28.5%	4.3%	3.5%	6.1%	19.3%	94.3%	2.7%	41.6%	4.5%	51.8%	11.3%	7.4%	8.9%	
Min	2.6%	3.0%	2.1%	2.7%	2.0%	2.2%	2.4%	3.0%	3.0%	2.3%	2.1%	4.3%	2.8%	2.4%	3.5%	4.7%	3.1%	4.0%	2.1%	
Bottom 25%	3.8%	3.9%	4.3%	4.0%	3.7%	3.1%	3.1%	4.0%	3.8%	3.4%	4.2%	6.8%	4.5%	4.9%	5.1%	6.3%	5.1%	5.4%	6.0%	
Average	4.3%	4.3%	4.9%	4.6%	4.5%	3.5%	3.5%	4.6%	4.4%	4.7%	5.0%	8.0%	5.7%	5.3%	5.7%	8.2%	6.1%	6.9%	8.6%	
Median	4.2%	4.2%	4.7%	4.5%	4.4%	3.4%	3.4%	4.4%	4.1%	4.3%	4.8%	8.4%	5.5%	5.3%	5.7%	8.4%	5.7%	6.4%	7.2%	
Top 75%	4.6%	4.7%	5.5%	5.0%	4.9%	3.7%	3.7%	5.0%	4.8%	5.8%	5.9%	9.2%	6.8%	5.7%	6.2%	9.3%	7.0%	8.2%	10.1%	
Max	11.6%	10.2%	9.8%	13.1%	12.0%	5.9%	6.0%	8.4%	8.4%	11.5%	8.2%	12.3%	11.5%	8.5%	9.0%	15.8%	10.9%	12.9%	26.7%	

Source: J.P.Morgan

Find more details on vol convexity trades in [this piece](#)

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