JPM FX - Derivatives Chartpack Notes

Assessing the impact of rates correlations on FX vols

- With the Fed and the ECB entering a new phase of rate cuts, the possible convergence or divergence in terms of Central Bank activity is a key driver for the FX market as a whole, at least if we believe that, despite the recent disconnect, rates remain a lead indicator for FX. We follow-up on a previous note and assess the link between FX and rates vols, by taking into account a proxy of the future correlation between the two underlying rates, which allows a substantial increase of the explanatory power of the analysis.
- By running both cross-sectional and time series analyses, FX vols currently look underpriced on EUR/USD, USD/CHF and USD/JPY. For USD/NOK, the elevated FX vol is to some extent explained by the negative correlation between USD and NOK rates, after the recent Norges Bank rates hike.
- We consider dual digitals and long/short conditional (non-delta-hedged) implementations of the RV theme of favouring JPY, CHF vols against SEK and commodity currencies highlighted by the rates-based analysis.

Assessing the impact of rates correlations on FX vols. Over the past few months, major Central Banks, most notably Fed and ECB, have entered more dovish territories, paving the way for rates cuts later this year (see for instance *Global Fixed Income Markets Weekly, 2H19 Outlook: the music will play loud at the "easing" party*, Bassi). A previous publication (*What is the impact of rates vols on FX vols?*, Ravagli, Jankovic, 1 May) had addressed a tentative link between rates and FX vols. The whole idea was based on the empirical finding that, in the long run, changes in rates differentials tend to anticipate changes in the FX spot market, at least in the G10 space: we refer to the earlier note for more details. The earlier analysis was relying on several approximations, amongst which the assumption that the correlation between rates was zero. In this follow up note, we try to expand the latter aspect and introduce a measure of correlation between the two underlying interest rates.

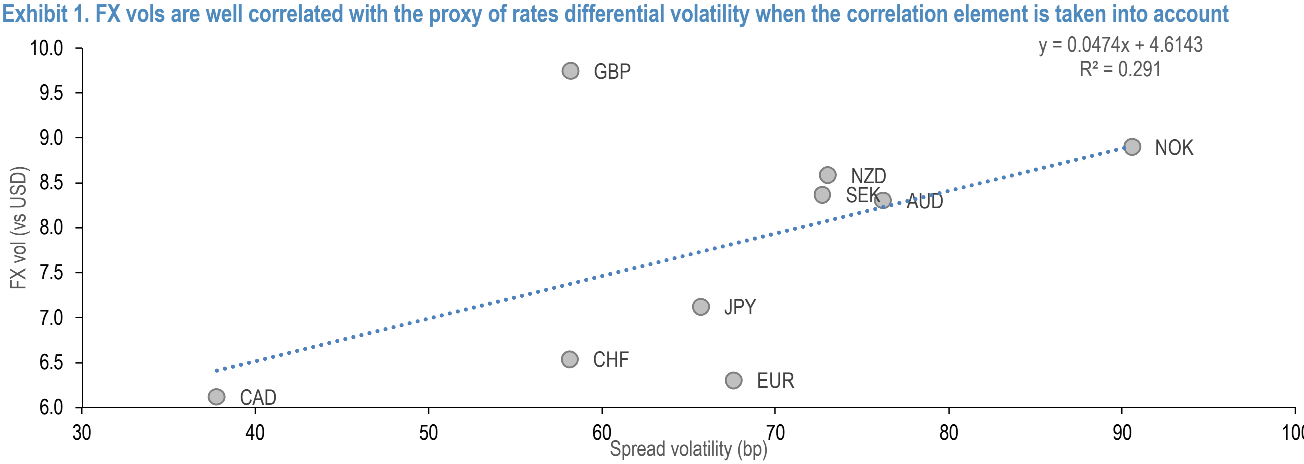
We adjust our estimate of the (implied) volatility of the rates spread by introducing a correlation term ρ

$$\sigma(r_1 - r_2) = \sqrt{\sigma(r_1)^2 + \sigma(r_2)^2} \rightarrow \sqrt{\sigma(r_1)^2 + \sigma(r_2)^2 - 2\rho * \sigma(r_1) * \sigma(r_2)}$$

We now want to regress FX vols based on this assessment of the volatility of the rates differentials

$$\sigma(FX) \approx \alpha + \beta\sqrt{\sigma(r_1)^2 + \sigma(r_2)^2 - 2\rho * \sigma(r_1) * \sigma(r_2)} + \epsilon$$

Exhibit 1. FX vols are well correlated with the proxy of rates differential volatility when the correlation element is taken into account



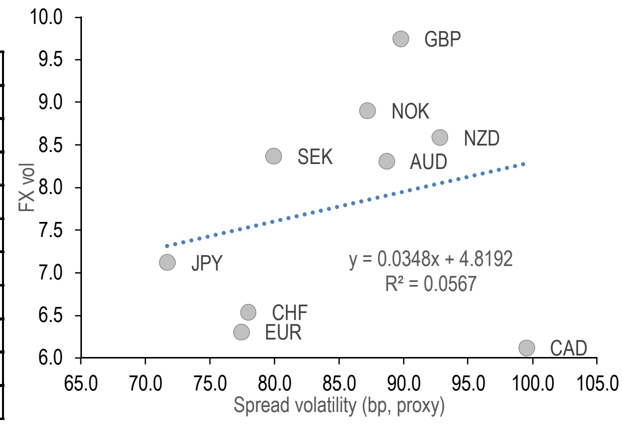
Source: J.P.Morgan

Exhibit 1 shows the results of the cross-sectional analysis, using current values of 1y5y swaptions and 1y ATM vols (vs USD) for G10 currencies. The correlation-adjusted regression well reproduces market values of FX vols, with a reasonable R2 of around 30%: the only well identified outlier is GBP/USD, where it is clear that the current risk premium cannot be attributed to rates risk in the first place. EUR/USD, USD/JPY and USD/CHF appear all undervalued based on the estimate of rates differentials volatility.

For the calculation, rather than inferring a measure of rates correlation from market prices, we rely on a (reactive) estimate based on the 3M realized correlation of 2yr swap rates. Exhibit 2 (left-hand side) further breaks down the cross-sectional analysis by highlighting the current estimates of rates correlations. For the G10 vs. USD pairs, it is in all cases positive with the exception of NOK, where the Norges Bank has hiked rates last week, in a market where generally global rates are falling. Given the formulas above, a negative correlation between the two rates can justify the elevated FX vol (highest amongst the USD crosses).

Exhibit 2. Correlation of 2yr rates (vs USD) are all in positive territory with the exception of NOK. The inclusion of the correlation term allows increasing the R2 from 6% to 29%.

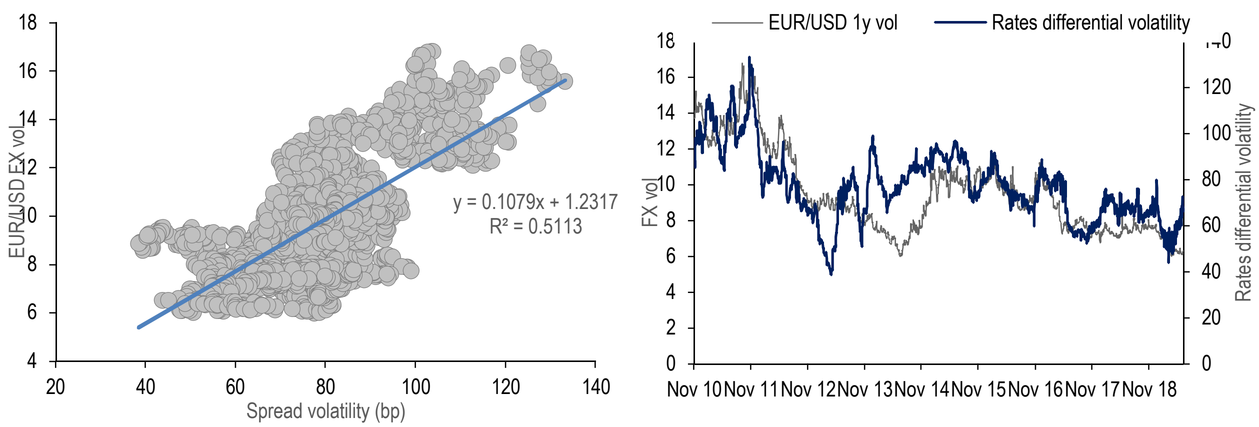
ccy	Rates vol	Correl	Spread vol	FX vol (market)	FX vol (model)
USD	70.0				
EUR	33.1	30.8%	67.580	6.3	7.8
JPY	15.4	38.1%	65.684	7.1	7.7
GBP	56.2	59.4%	58.161	9.7	7.4
CHF	34.3	56.2%	58.123	6.5	7.4
CAD	70.7	85.6%	37.751	6.1	6.4
AUD	54.4	27.0%	76.195	8.3	8.2
NZD	61.0	38.5%	72.993	8.6	8.1
NOK	52.0	-8.2%	90.552	8.9	8.9
SEK	38.6	20.4%	72.689	8.4	8.1



Source: J.P.Morgan

The right-hand side shows how the relationship between FX and rates vols appear much more blurred if the correlation element is not taken into account. For instance, USD/CAD vol would appear undervalued by neglecting the correlation-induced correction term. In fact, given the 86% current correlation between USD and CAD rates, the estimate of Exhibit 1would find USD/CAD undervalued by just 0.3 vol points.

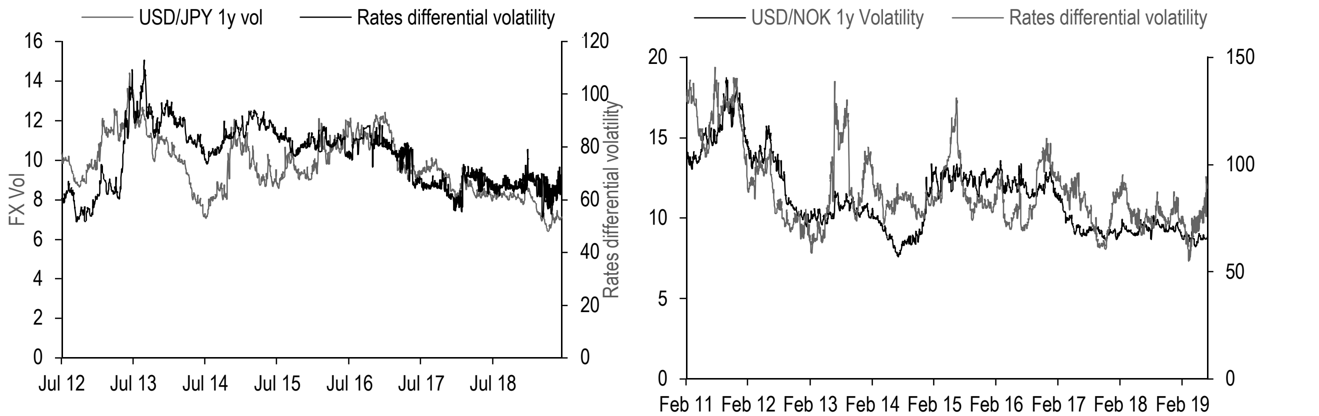
Exhibit 3. Scatter plot and time series analysis for EUR/USD



Source: J.P.Morgan

Rather than relying solely on a cross-sectional study with today's data, we can apply the same screening to the time varying estimates of rates differentials volatilities and FX vol values, for different currencies. In Exhibit 4, we investigate more in detail the EUR/USD case (with data since November 2010). The two quantities are well correlated in the long run (R2 of 51%): this indirectly confirms the tight link between FX and rates markets, although we acknowledge that, as of late, changes in rates differential have failed to anticipate FX moves (see for instance *FX Alpha Chartpack*, Chandan, 25 June). At present, the regression based on the longer time series of data for EUR/USD, would find a fair value for the 1y FX vol at 8.3%, well above the market value of 6.3%. This can be understood by looking at the actual time series of both variables in the right-hand side chart: EUR/USD has pretty much continued trending lower, and this despite some signs of life from the underlying rates drivers. In fact, more than a substantial spike in the USD and EUR basis-points volatility, the rise in the estimate of the volatility of the spread is justified by a drop in the correlation between the two rates. We can see from the chart that, possibly with the exception of the period 2012-2014, the two time series follow each other quite closely.

Exhibit 4. Time series analyses for USD/JPY and USD/NOK



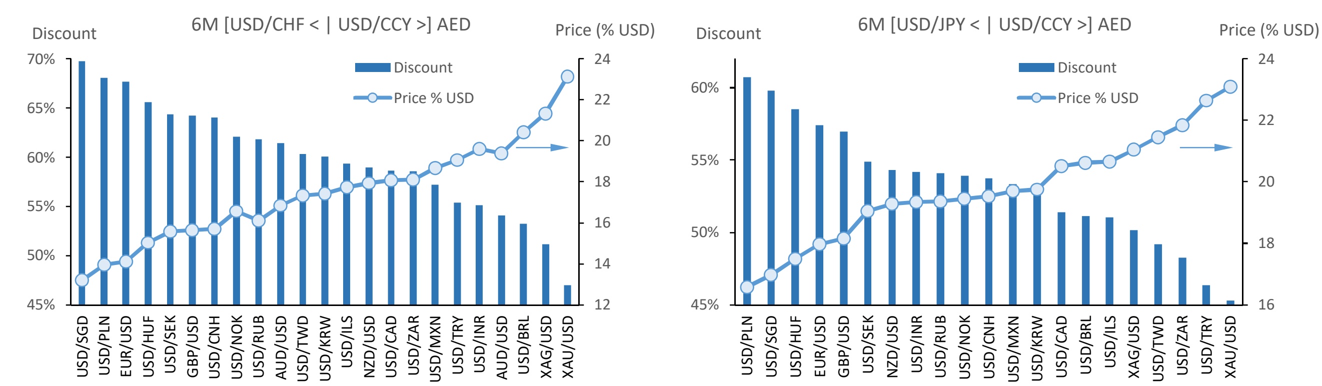
Source: J.P.Morgan

A similar picture is at play when overviewing USD/JPY and USD/NOK (Exhibit 4). In both cases, the estimate of spread volatility has risen as of late, and especially so for NOK (currently at 88 bps per year vs 55 bps on mid March), since the rates correlation estimate flipped sign last week. For USD/CHF (not displayed in the chart), USD/JPY and USD/NOK, the time series analyses ran on each pair find that FX vols are currently undervalued.

The analysis of Exhibit 1 suggests there is value in pairing undervalued vols like EUR/USD, USD/JPY or USD/CHF with overvalued ones like NZD/USD, AUD/USD or USD/SEK, putting aside the case of GBP/USD. A few extra considerations can guide us towards the choice of a suitable RV trade. The ownership of JPY vols (and more specifically JPY calls) was supported as a theme which could hold up well in 2H19 (*FX Derivatives: Currency differentiation to drive cross-volatility in H2*, Sandilya, 21 June). A recent note by the rates strategy team finds value in entering short gamma trades on AUD swaptions post-RBA rate cuts last month (*Antipodean Vol Monthly – A review of AUD short gamma performance during easing regimes*, St John, Auld, 24 June). Owning USD/CHF and USD/JPY vols looks favourably in terms of vol carry (USD/CHF 1M implied trails realized by more than 1 vols), whereas for instance the premium on AUD/USD is above 1 vol points.

Exhibit 5. 6M at-expiry short USD correl type of dual digitals.

ATMF strikes. 3% b/o accounted for.



Source: J.P.Morgan

Exhibit 5 displays a set of possible choices for owning 6M at-expiry-dual-digitals in the format USD/CHF and USD/JPY puts and USD/CCY calls (both legs ATMF). Pairing the long USD/safe havens puts with USD/SEK calls allows obtaining significant correlation-induced discounts. While ATMF strikes would be a perfectly legitimate choice for a short-vol play on USD/SEK (6M USD/SEK forward at 9.16 gives a decent cushion vs. current spot at 9.27), choosing OTMF strikes on the put legs would allow cheapening the cost of the structures and expressing the directional nature in terms of vol/spot view as embodied by the trade.

Consider:

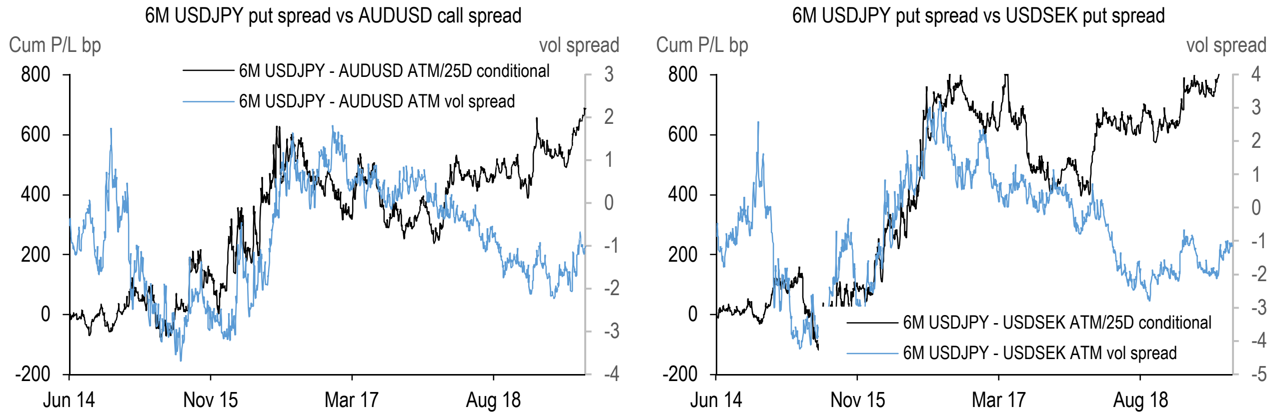
- A 6M at-expiry dual-digital [USD/CHF put 1% OTMF, USD/SEK call ATMF] costs 9/11% USD

Conditionals as an expression of long yen vol – short G10 commodity view and short USD correlations

One way to express long JPY and CHF vol vs short G10 commodity stance from Exhibit 1 is to consider zero-cost conditional structures. As seen in Exhibit 6, such structures have shown solid returns over the last 5 years, especially during the periods of yen vol rallies. Vol setup is off the lows but at still attractive levels for USDJPY-AUDUSD and USDJPY-USDSEK. We recently argued that longer expiries (6M+) topside yen option structures are worth owning amid increasing market attention towards the late cycle hedging topic.

Exhibit 6. Zero-cost yen outperformance financed by selling AUD and SEK topside in 6M to 12M tenors

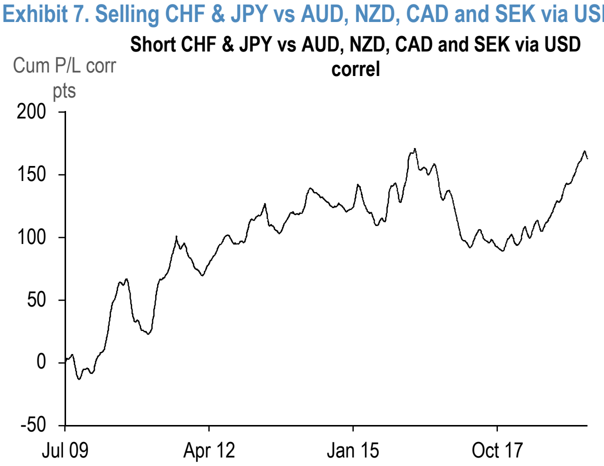
6M option structures, long ATM/25D yen call spreads with the other leg strikes set such that the overall structure is zero cost. No delta hedging. No transaction costs. Structures held for 3 month.



Source: J.P.Morgan

Moreover, we expect USD correlations to soften as divergence between safe haven CHF and JPY on one side and high beta G10 (AUD, NZD and CAD) on the other side takes hold over coming months. We prefer yen topside as P/L from CHF topside options has been somewhat suboptimal in options space amid the hangover from the de-peg. We have relied on AUD and NZD downside structures in various forms in recent months, and still see that as a good source of funding for yen topside options on this occasion as well. After all, long JPY – short AUD via USD, i.e. effectively selling JPY-AUD USD correlation is well supported by the notion of the systematic profitability of selling CHF & JPY - G10 Cmdty (via USD) correlations (Exhibit 7).

Exhibit 7. Selling CHF & JPY vs AUD, NZD, CAD and SEK via USD correlations has been systematically profitable.



Source: J.P.Morgan

We recommend:

- Near zero-cost long 6M USD/JPY ATM/25 delta put spread vs short AUD/USD ATM/30 delta call spread, get paid @2 bp USD (not delta-hedged)

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