01 May 2019

JPM FX - Derivatives Chartpack Notes

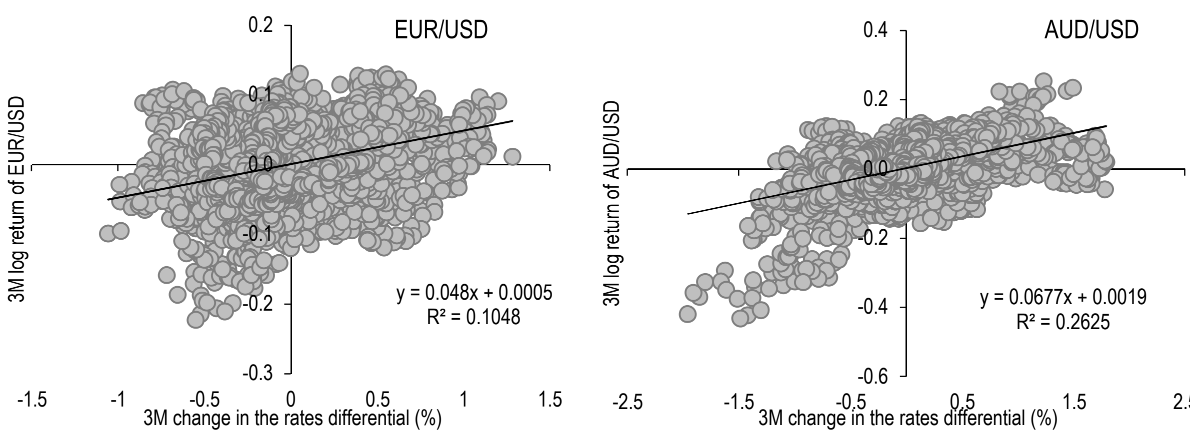
What is the impact of rates vols on FX vols?

- We look for possible cross-asset catalysts that could drive FX volatilities higher from the current ultra-depressed levels.
- We infer a possible relationship between FX and rates volatilities, which relies on the well-known empirical observation that, within DM, rising rates tend to support the strengthening of the currency in the cash market. In the derivatives space, we find that higher rates volatilities should trigger higher FX vols.
- We consider two RV long USD/CAD vs USD/NOK vol constructs, one pure vol and one directional, to play a correction of the CAD-NOK vol spread, which appears too tight based on the FX vs. rates vols screener.

Assessing the link between FX and rates volatilities. Despite the rebound that occurred during the last week of April, FX vols, especially in the G3 segment (*FX derivatives: What will and will not change in FX vol in Q2*, Sandilya, 5 April), remain near historical lows. In this market, characterized by ultra-depressed volatility levels, the strategic appeal of holding long-optionality positions clashes with the multi-month/year trend dragging implied/realised vols even lower, thus impacting positions via time decay. At present, while trend-following approaches (*Timing FX short-vol strategies: a systematic approach*, Ravagli and Duran-Vara, 5 March) would still favour keeping a short-vol bias, ML models and seasonal factors would suggest tactically increasing long-vol positioning (*FX derivatives – Stars lining up for a tactical defensive FX vol stint*, Jankovic, 26 April).

In this context, it appears natural to look for possible catalyst towards higher FX vol levels by investigating relationships involving other asset classes, as done for instance in *The J.P. Morgan View – The rolling bear market in volatility*, Normand, 15 March. A few weeks back, we had assessed the valuation of FX vols from the perspective of sensitivity to global market factors (*Beta-over-vol ratios: a bottom-up approach for spotting RV trades*, Ravagli et al, 27 March). Here, we try to highlight a different driver behind FX vol levels by investigating in more detail the relationship between FX and the underlying rates variables.

Exhibit 1. Scatter plots, for EUR/USD and AUD/USD, of FX spot log return vs change in rates differentials confirm that, in the G7 space, higher rates support the appreciation of the underlying currencies.



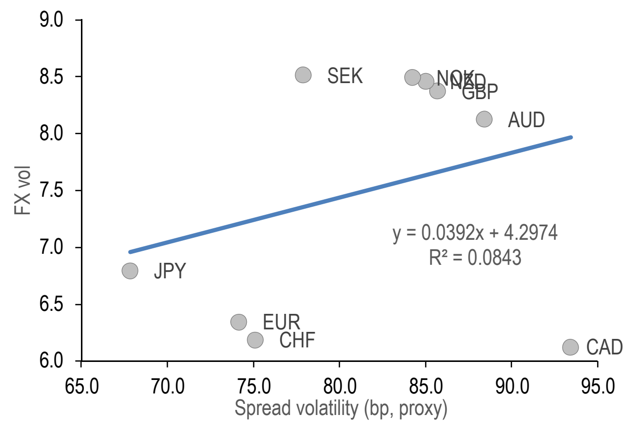
Source: J.P.Morgan

We start by carrying out an analysis on delta-one variables (Exhibit 1), involving 3M FX log-returns (y-axis) and 3M change in the 2yr swap rates differential (x-axis). For the two currencies displayed in the chart

(EUR/USD and AUD/USD), the linear analysis supports the appreciation of the currency where the interest rates are rising. These empirical results, along with the well-known positive performance (in the long run) of FX carry trade strategies, question the possibility of relying on FX forwards as reliable predictors of future FX spot rates. The analysis is expanded to the whole G10 space, by keeping the USD as a common leg for all pairs (Exhibit 2). Encouragingly, results across different currencies are surprisingly stable, in that regression coefficients between rates and FX are always positive (i.e. higher rates support higher FX) and also comparable in values (around 5%). There is more variability on the values of the R2 coefficients, ranging from a meagre 6% for SEK to a more solid 26% for AUD (as seen above). As the correlation analysis, as presented earlier, does not take into account the notion of causality, it would be important to test whether changes in FX and rates differentials occur simultaneously or whether it's normally one variable driving the other: Granger causality tests are normally employed for the purpose. Also, we have not overviewed EM currencies in the table below: the reason is that, contrary to DM, rising interest rates are often associated with a weaker currency, given the higher Credit risk.

Exhibit 2. Summary of FX vs rates regressions per currency, in the G10 space (left-hand side). Scatter plot between G7 FX vols and swaptions (right-hand side).

FX pair	Beta	Constant	R2
EUR/USD	0.048	0.0005	10.5%
GBP/USD	0.057	-0.0018	18.0%
AUD/USD	0.068	0.0019	26.3%
NZD/USD	0.058	0.0038	17.7%
USD/JPY	0.035	0.0001	8.1%
USD/CHF	0.041	-0.0042	8.3%
USD/CAD	0.052	-0.0018	15.5%
USD/NOK	0.051	0.0006	15.3%
USD/SEK	0.0428	0.0017	6.4%



Source: J.P.Morgan/Bloomberg

We simply rely on these empirical results between delta-one FX and rates to infer a similar linear relationship in the vol space. By skipping the math steps, one is tempted to look for a relationship like:

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

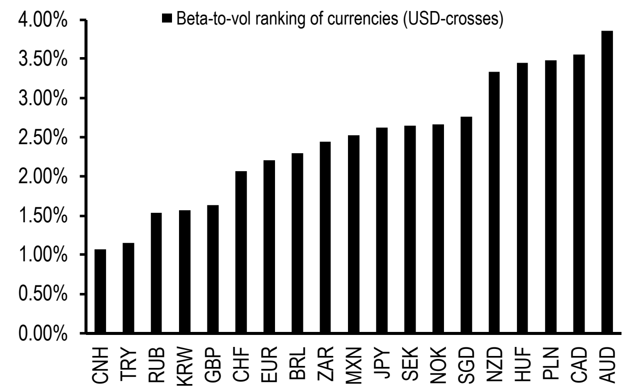
where $\sigma(FX)$ is the log-normal FX vol for the pair, $\sigma(r_1), \sigma(r_2)$ the normal (BP) vols for rates and β the delta-one regression coefficient. In principle, one would need to take into account a correlation term between the two rates implied vols, which we don't consider here. However, given the multitude of aspects that would deserve additional clarifications, we plan to expand these results in a more detailed note over the course of the next few months. To test the relationship above (Exhibit 2, right-hand side), we use 1yr FX vols (ATM) and (relatively liquid) 1y5y swaptions data (from Bloomberg), being aware that the liquidity of the latter might not be homogeneous across different currencies.

The results of the linear analysis for the vols are quite encouraging, in that the inferred regression coefficients, at +4%, are very close to the +5% average value as obtained earlier when looking at delta-one variables. It is confirmed that higher rates vols would imply higher FX vols. We acknowledge that the value of the R2 (8.4%) is quite low: this is not surprising, as we are only considering one single factor (i.e., rates) to explain FX moves, which is a brutal oversimplification. Yet, the consistency of the results when moving from delta one to vols suggest that there is valuable information to be extracted here: having highlighted the limitations of the approach, the tool can be relied upon for identifying opportunities in the FX vol space, especially when expectations of future activity from a Central Bank were not fully reflected by the corresponding FX vol variable. As commented earlier, modest expectations of a dramatic shift in monetary policy as operated by G3 Central Banks should dampen the potential of a major repricing higher of G3 FX vol levels.

Exhibit 3 (left-hand side) further expands on the results of the chart, by showing that CAD, CHF, EUR and JPY are the FX vols that screen cheap based on the proxy of rates differential volatility as obtained from swaptions data. SEK, NOK and GBP screen as the three most overvalued FX vols. CAD swaptions values have modestly risen over the past year, whereas most of other variables, for instance NOK ones, did fall over the same period. Ownership of CAD vol is also supported, based on the beta-to-vol ratio screening (Exhibit 3 right-hand side chart), which favours owning the vols that offer the highest sensitivity to a set of global market risk factors.

Exhibit 3. Summary of the FX vol vs swaptions regression (left-hand side). Beta-to-vol ratios support being long optionality on CAD.

ccy	Rates vol	Spread vol	FX vol (market)	FX vol (model)
USD	66.8			
EUR	32.2	74.1	6.3	7.2
JPY	11.8	67.8	6.8	7.0
GBP	53.7	85.7	8.4	7.7
CHF	34.3	75.1	6.2	7.3
CAD	65.3	93.4	6.1	8.0
AUD	57.9	88.4	8.1	7.8
NZD	52.6	85.0	8.5	7.7
NOK	51.3	84.2	8.5	7.6
SEK	40.0	77.9	8.5	7.4

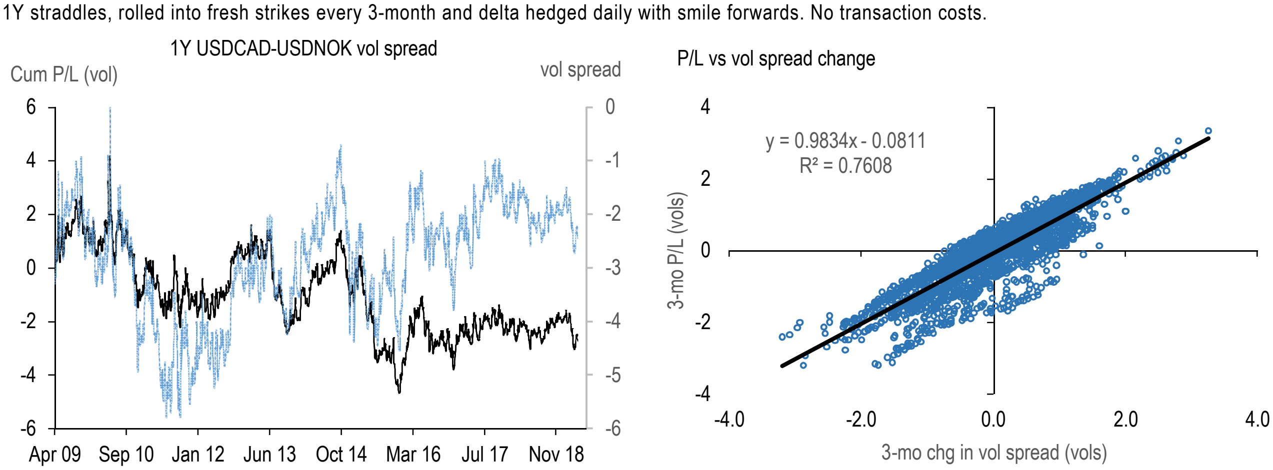


Source: J.P.Morgan/Bloomberg

The FX strategy team suggests keeping long positions on USD/CAD, both cash and via options (*FX Markets Weekly: Ripples on Lake Placid*, Meggyesi, 26 April): while they see little room for BoC to act soon, given the recent shift in policy stance, which eliminated the rate hiking bias that was left over from its latest meeting, they still see USMCA ratification as a possible source of risk (and a possible catalyst for higher FX vol). Conversely, they maintain a more supportive view on NOK, although they argue that the ongoing dovishness by global central banks could cause the Norges Bank to turn more neutral as well. Given the 60% chance of a rate hike in June, as pencilled in by the Bank, a more dovish stance at the next May 9 meeting would likely drag NOK swaptions values lower, weighing on USD/NOK vol as well. The appeal of a long USD/CAD / short USD/NOK vol spread had already been highlighted at the end of March when introducing the beta-to-vol ratios. In the following, we will consider two possible implementations of the RV signal discussed above, one as a pure vol RV trade and one as a directional construct.

Exhibit 4. P/L highly correlated (1pnt for 1pnt) with the vega tenors USD/CAD and USD/NOK vol spread.

1Y straddles, rolled into fresh strikes every 3-month and delta hedged daily with smile forwards. No transaction costs.



Source: J.P.Morgan

<u>CAD-NOK vol spread:</u> The vol spread touched a multi-year low in April as CAD vols sank to their lowest since 2014 at a more rapid pace than NOK vols. The spread started to rebound, but based on the swaptions-FX vol framework, still leaves ~3pts of misalignment between the two. While realized vol spread has started to perform (only just), we prefer to focus on the lingering longer-term risks that have been largely ignored by the markets and should play right into our hands. Historical P/L time series (Exhibit 4) show tight correlation between the vol spread and its returns that translates each vol pt of change in vol spread into 1 vol pt of returns.

We recommend:

Buy 1Y USD/CAD straddle @6.0/6.2 vs sell USD/NOK straddle @8.45/8.9

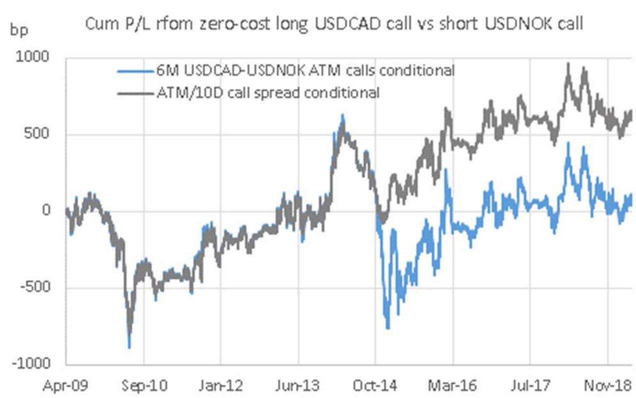
CAD-NOK conditional: The lingering BoC and USMCA risks give a clear directional bias for CAD. Meanwhile, our medium-term view on NOK is modestly bullish on gradual rate hikes (*Key Currency Views: Spring is coming?*, Chandan et al, April 12). The setup is favourable for financing CAD downside by selling NOK downside, especially considering that our swaptions-FX vol framework sees value in CAD options ownership and instructs us to sell NOK options. One additional twist is in utilizing call spreads instead of unlimited downside call conditionals. Even though still at very modest levels, the ratio of OTM USD/CAD calls to ATM calls is at the highest in almost 2 years, suggesting value in selling OTM strikes in the form of call spreads. The construct outperformed the standard USD/CAD ATM call vs. USD/NOK ATM call, as the loss-capping mechanism intervened on the short USD/NOK leg during the massive USD rally in 2014 (Exhibit 5). Other than loss capping, the structure shows nearly 100% exposure to the historically observed upside, with USD/CAD skew historically underperforming.

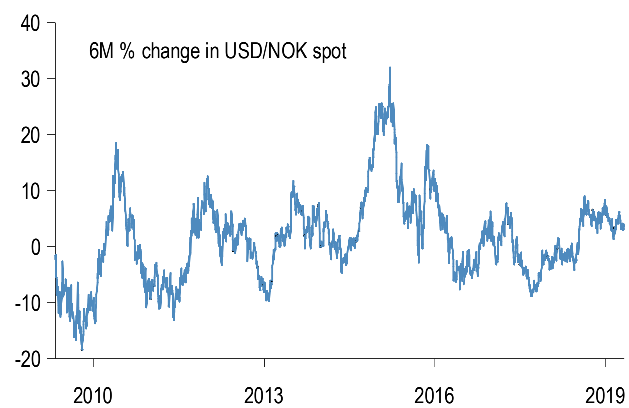
Consider:

Buy 6M ATM/10D USD/CAD call spread, financed by selling ~40D/7D USD/NOK call spread, in a zero cost structure, not delta hedged.

Exhibit 5. USDCAD ATM/10D call spread vs. USDNOK ATM/10D call spread is an efficient way of expressing the CAD-NOK conditional structure.

6M options, held to expiry. Structured as zero cost instruments by setting USD/NOK leg strikes in such way that the overall structure is net zero premium. No transaction costs.





Source: J.P.Morgan

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