J.P.Morgan

Global Quantitative & Derivatives Strategy
14 March 2022

Cross Asset Strategy

Mind the Gap in Vol

- **In an earlier report, we focused on the implications of policy normalization for multi-asset investors and proposed a trend-following systems played at the front-end of the USD yield curve. This momentum strategy has not disappointed, and we keep it on top of our strategic UW in Bonds.**

- **Over the past few weeks, geopolitics has dominated the price action. We have approached this period by sticking to our strategic OW in Commodities and our preference for Energy and petro markets and in this short note, we look for other opportunities in the Vol space.**

- **At a high level, geopolitical stress has usually meant more short-term volatility than long-term trend reversal, but occasionally the consequences were more severe. After all, three of the past seven US recessions came through a geopolitical event triggering an oil shock. For now, our forecast sees the expansion dented but not derailed but the risks of large energy supply disruptions are rising. We see substantial alternatives and arguably more structural resiliency but risks and uncertainty remain high.**

- **Being OW FX volatility, at least from an RV perspective, has a lot of merits in this backdrop. Valuations, both standalone and relative to other asset classes, are the most obvious but FX vol positive correlation to UST yields and its anti-cyclical properties matter. Hence, we believe owning FX vol relative to other asset classes is attractive and we think it's best to own it vs Equity around 1Y expiries.**

- **In the report, we offer one possible expression of this view and we also go through some of the best tactical opportunities within the FX vol space. The front-end segment of FX vol curves is the one most impacted by geo-political risk, with SEK vol associated with the widest Gamma premium across G10. As such, long-dated vols do offer better value for hedging policy normalization risk and or playing EMFX carry trades. Distressed pricing of smile parameters and of implied correlations on EUR-crosses offer several opportunities for playing a drop or a rise in the EUR.**

Global Cross Asset Strategy

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See page 12 for analyst certification and important disclosures, including non-US analyst disclosures.

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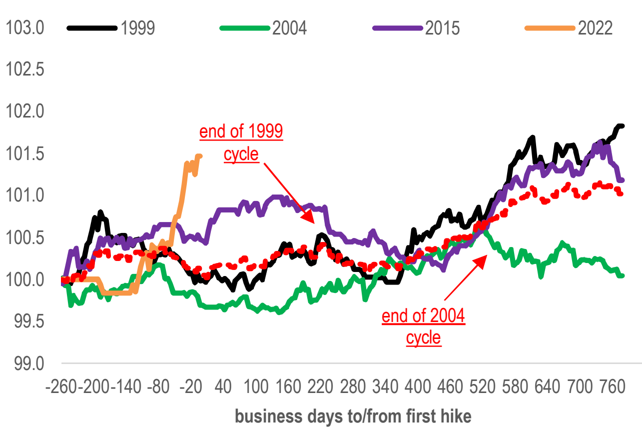
Introduction

In our previous report we focused on the theme of policy normalization (*Cross Asset Strategy: Rising rates and the 60/40* , Jan 19th**).** On that occasion, we analyzed the impact of higher rates on the Fixed Income and Equity allocations of a standard 60/40 portfolio and we looked to earlier period of normalization to search for patterns and draw some insights on how to position. Further, we also proposed trend-following systems played at the front-end of the USD yield curve as portfolio hedge to the upcoming monetary normalization. This strategy has usually done well around normalization episodes and, since our recommendation in mid-January, it has not disappointed (Chart 1). This hedge should be additional to our strategic UW in Bonds (Chart 2) and preference for Value/Cyclical/reflation theme vs high-duration segments (see our latest *Global Asset Allocation* for more).

Over the past few weeks, geopolitics has dominated the price action. The deflagration of the Russia/Ukraine conflict has captured markets attention since the end of February. Despite the shock, central banks lean toward returning to neutral. The projected 25bp hikes by the Fed and BoE this week will not be difficult decisions. Fed and BoE actions will follow on the heels of a surprisingly hawkish ECB, which last week announced a faster taper and changed its guidance to say rates will rise only "sometime after" QE ends. We have approached this period by sticking to our strategic OW in Commodities and our preference for Energy and petro markets as a way to hedge our portfolio from geopolitics and inflation. In this short note, we look for other opportunities in the Vol space.

Chart 1: The momentum system has also done well during previous normalization episodes and it has not disappointed so far
Cumulative return of a momentum strategy system played across 2nd-9th ED contracts.



Source: J.P. Morga

Chart 2: We keep large UW in Bonds and large OW in Commodities
Long only asset class recommendations

Asset Classes	Active Weights	UW | OW
Equities	12%	
Govt. Bonds	-12%	
Corp. Bonds	-9%	
Commodities	7%	
Cash	2%	

Source: J.P. Morgan

Tensions around Russia/Ukraine continued to dominate the price action for a third week now, keeping uncertainty and volatility high. Risk markets have remained under pressure and volatile last week. Equities overall (MSCI ACWI) are about 1.0% above their lows on Feb 24th but fell 0.5% this week. The Eurozone outperformed in DM even if it remains the DM region that has suffered more from the geopolitical flare-up. In EM, Latam has been the bright spot given its exposure to the broad Commodities complex. Sectorally, Energy was the best performing sector while Tech remained at the bottom of the league table. Spreads seems to have found

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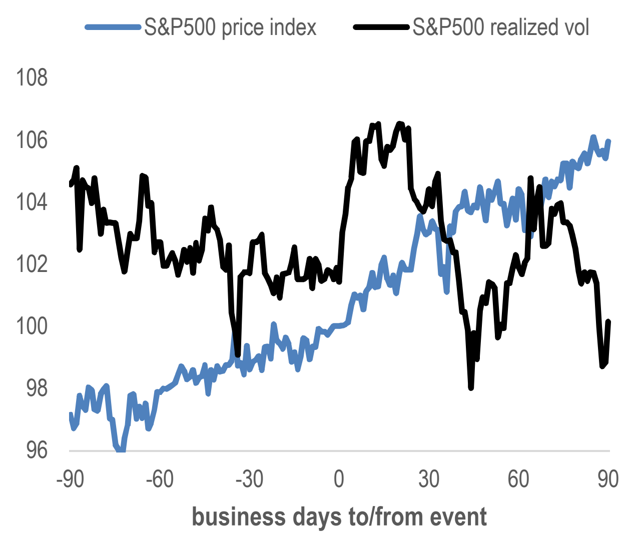
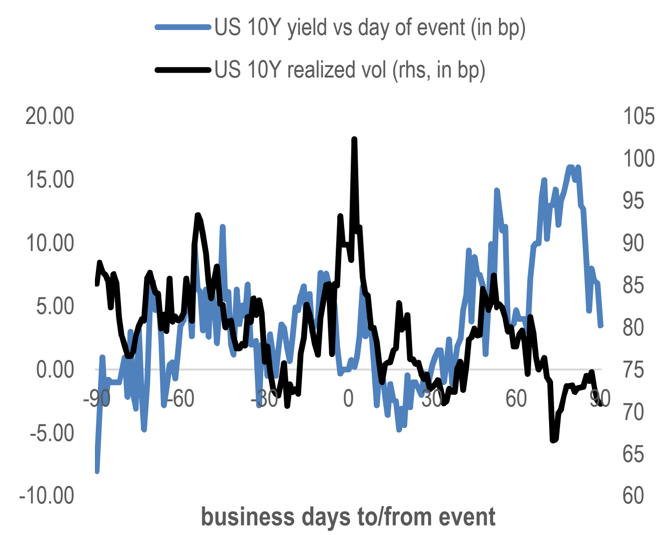
some stability this week and after earlier widening they now generally sit close to their 10Y averages. Bond yields were higher this week and retraced most of the previous down moves. As a result, 10Y UST have climbed back to mid-February although thanks to 10Y breakeven rising as real yields are about 40bp below their year-to-date highs. The dollar was generally higher but not vs all pairs. The European bloc (EUR, GBP and Scandies) was lower while high beta FX like AUD, NZD and CAD were all higher. Commodity sectors generally hit new multi-year highs last early last week but have retraced some of this up-move. Volatility remained extremely elevated with VIX above 30 and MOVE above 100.

Chart 3:Often geopolitics is more about short-term volatility…
S&P500 price and vol around the start of 27 geopolitical events



Source: J.P. Morga

Chart 4: than long-term trend reversal
UST 10Y yield and vol around the start of 27 geopolitical events



Source: J.P. Morgan

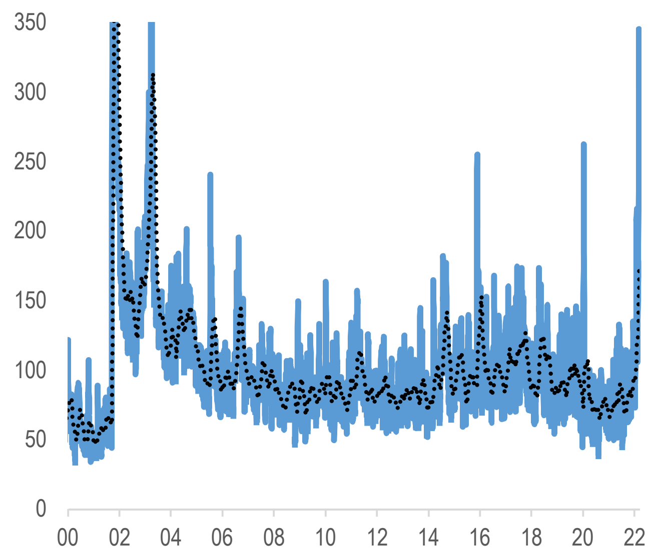
Geopolitics is often more about short-term volatility than long-term trend reversal

At a high level, geopolitical stress has usually meant more short-term volatility than long-term trend reversal, but occasionally the consequences were more severe. In these respects, we ran an event study focused on ~27 of the most significant geopolitical events since WWII. While some are one-day and some protracted, our criteria is to include all major US military conflicts and all conflicts involving major oil producers. The bottom line is that the majority of episodes end up being more emotive than material for broad risk markets. Indeed, looking at median across episodes we can conclude that these events have usually tended to trigger more short-term volatility than long-term trend reversal for both Stocks and Bonds (Chart 1 and Chart 2). The reason is probably that usually, episodes don't involve two large countries in direct conflict (due to mutual fear/respect) but often larger countries routinely quarreling with a smaller one. That said, sometimes the consequences have been more severe for the global economy. After all, three of the past seven US recessions came through a geopolitical even triggering an oil shock (1973, 1980 and 1990) and currently, geopolitical risk, at least measure by a geopolitical risk index, is extremely elevated.

Our forecast sees the expansion dented but not derailed. Over the past month, our economists have revised down their 1H22 global GDP growth forecast by 1.5%-pts at an annual rate, a drag that leaves global growth still running at potential. Our view of resilient growth in the face of this large shock rests on three important judgments: a) robust underlying growth. Before the recent sweeping downgrades to global growth, we were projecting global GDP growth to accelerate to a boomy 5.5%ar in 2Q21 as Omicron drags faded, boosting service-sector activity, and as global goods demand rotated toward business. b) Excess saving cushioning a US income shock. We anticipate that wealth gains and excess savings built up during the pandemic will keep DM consumers resilient in the face of large income shocks; and c) EU/EM fiscal policy ramps up to offset income loss.

Chart 5: Global Geopolitical risk is at 20-year highs

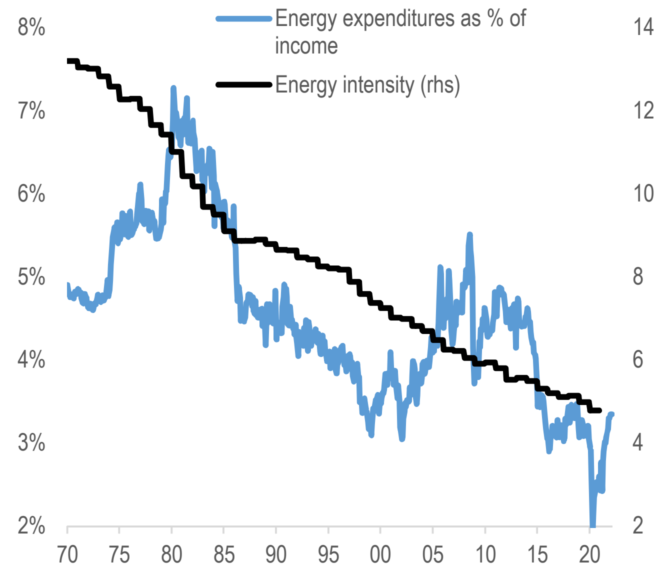
Global Geopolitical Risk Index



Source: J.P. Morgan

Chart 6: Structural resiliency to higher energy prices

Energy intensity and share of energy expenses as % of income



Source: J.P. Morgan

The risks of large energy supply disruptions are rising. We still view commodities as the primary channel of transmission to inflation and growth. Last week's news that the US closed off energy imports from Russia and the European Commission proposed a sharp cutback of natural gas imports from Russia increases the risk of a larger shock. While commodities are fully carved out from the sanctions package, it is clear that Russian oil is being ostracized as 66% of Russian oil is struggling to find buyers even at a discount. In addition, there is growing risk that the flow of natural gas through Ukrainian pipelines gets disrupted. The extreme downside is to assume that all Russian exports of oil to Europe and the US are curtailed for an entire year. This amounts to a negative supply shock of 4.3mbd. In this case, Brent would soar to $185/bbl. The hit to economic activity would be large, lowering global GDP by 3% and pushing the global economy into recession.

However, there are substantial alternatives and arguably more structural resiliency. The release of Iranian barrels could add on average 0.8mbd while an aggressive release of Strategic Petroleum Reserves (SPR) could add +1.9mbd. Further, OPEC would likely raise production in the face of an inevitable deep

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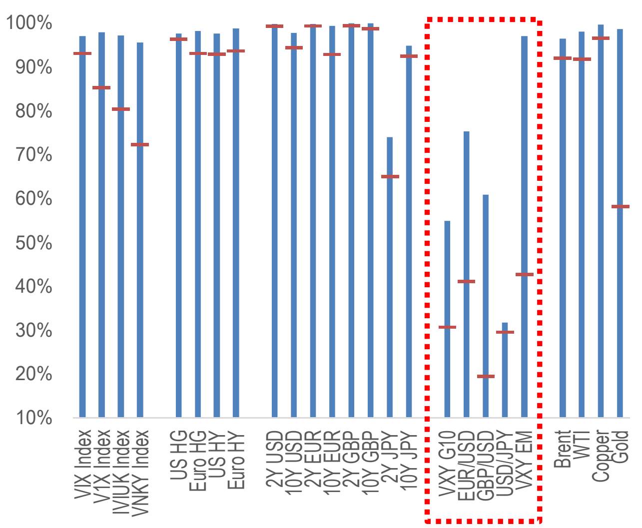
recession. OPEC spare capacity could ramp up to add another 1.6mbd. Added to this list is the likely rise in US shale production which could be incentivized to grow more than the current 2-3% guidance from the largest E&P operators. Also, there are some structural reasons to expect some economy-wide resiliency relative to past oil shocks. First, the share of oil in the economy has declined since the 1970s. Energy intensity, defined as consumption of primary energy per unit of GDP, is at record-low levels in major economies due to policies to promote energy efficiency. In addition, at least in the US, household expenditures on energy (as % of income) are record low and a substantial excess-savings buffer has been accumulated during the COVID-19 crisis (**Error! Reference source not found.** 6). Second, the way monetary policy is conducted has changed. The Fed responded to the 70's/early 80's oil shocks by tightening policy to control inflation, thereby contributing to the subsequent recessions but, this time, the central bank might display more tolerance to supply side inflation if the economy starts to weaken. In the US, Powell confirmed that the Fed remains on track to start normalization with a 25bp hike this week and to begin balance sheet reduction later this year. That said, he nodded to the greater geopolitical uncertainty by assuring that the Fed would continue hiking "carefully".

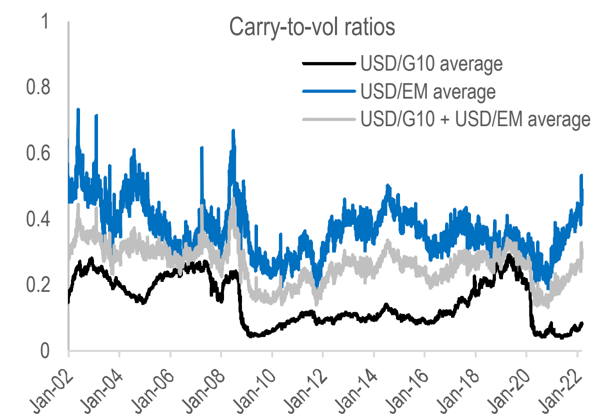
Chart 7: In contrast with implied volatility for other asset classes, FX vol is close to average levels

3M implied volatility. Blue bar shows current percentile vs Feb 17th percentile



Source: J.P. Morgan

Chart 8: 1y carry to vols still rising despite extreme geopolitical conditions



Source: J.P. Morgan

The attractiveness of FX vol for multi-asset portfolios

Despite the worsening of the conflict in Ukraine, pricing of FX vols remain generally benign. In contrast with implied volatility for other asset classes, FX vols are generally around their long-term averages (Chart 7), despite geopolitical tensions that are particularly distorting the front-end of volatility curves. Another observation regards the rising carry-to-vol ratios (Chart 8), especially for EM FX, despite the escalation of geo-political risk premia across markets. Carry-to-vol ratios are indicative of the appeal of owning vol relative to a natural driver of delta-one moves (i.e., rates differentials). On the 1y tenor, basically the widening rates differentials more than compensate for the relative increase in vol levels: in other words, there are still opportunities on the vols provided one can avoid the very front end of vol curves.

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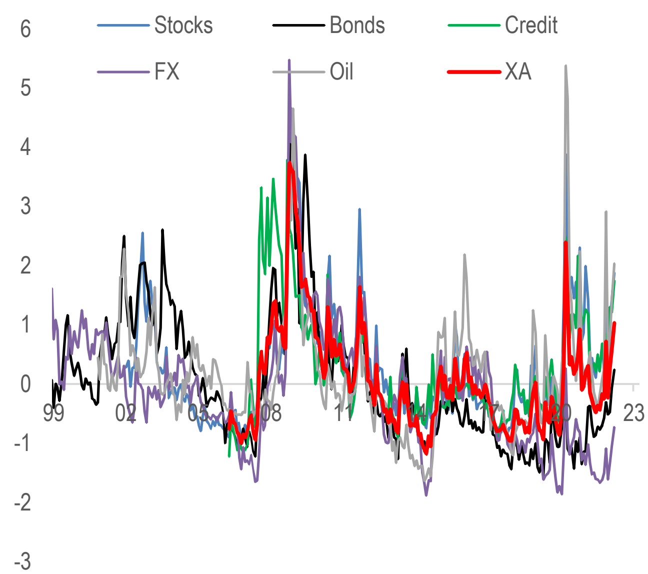
A second related set of observation concerns the "cheapness" of FX vols to all other asset classes. While implied volatility has spiked and has remained elevated since late February, FX vol seems to have remained more immune to this. Usually, implied volatility levels for different asset classes are highly correlated and tend to spike at the same time because vol-related risk premia reprice simultaneously. This time, FX has clearly lagged (Chart 9). The same conclusion can be reached by looking at other metrics (Chart 10) introduced in to previous research on the topic (on FX vs. rates and FX vs. Equities vols). The tight dynamics (at least over the most recent history) especially between rates and FX vols has witnessed a number of corrections, from cheap to rich and vice-versa, of the corresponding residual. Most notably, FX vols caught up on higher rates vol proxy between 2013 and 2015, and again on early 2020, before the early March spike.

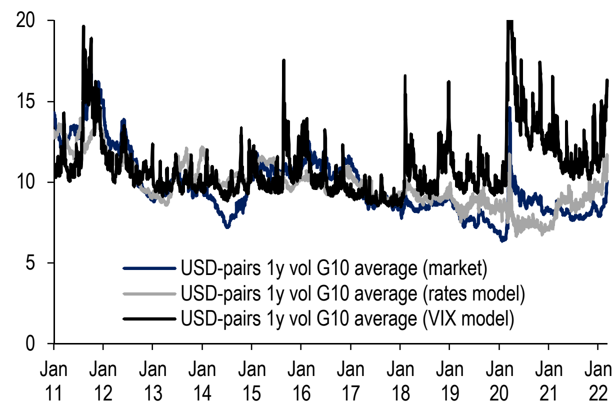
Chart 9: FX volatility has lagged other asset classes

All expressed in sigma from the mean



Source: J.P. Morgan

Chart 10: FX vols screen as cheap relative to Rates and Equities markets



Source: J.P. Morgan

The cross-market dislocations tend to correct (Chart 11 and Chart 12) and would currently suggest holding on to strategic long FX vol trades, although part of the correction (especially relative to rates) has already taken place.

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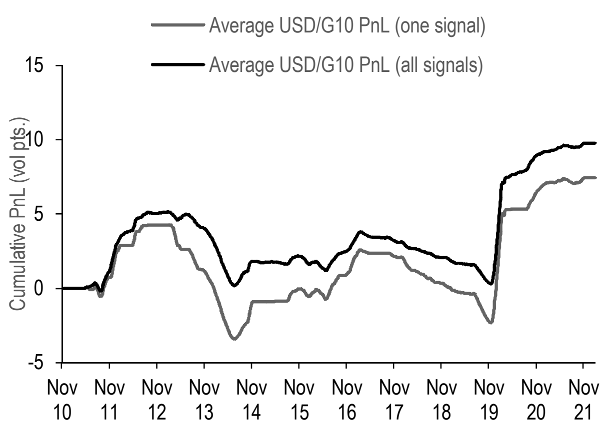
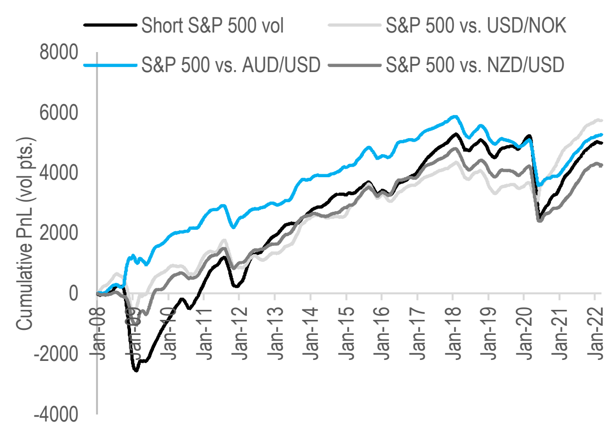
Chart 11: Cross-asset mean reversion trades can lead to positive PnL in the long-run



Source: J.P. Morgan

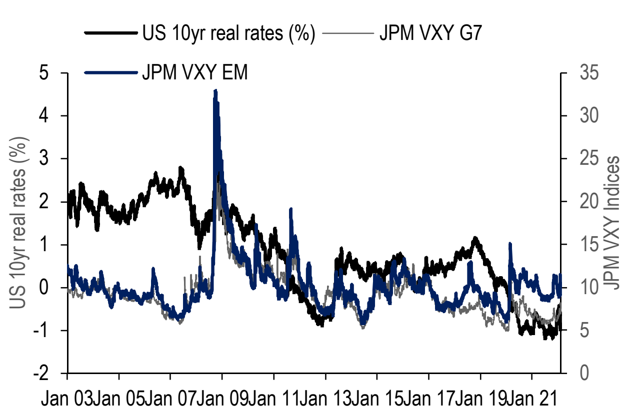
Chart 12: Cross-asset mean reversion trades can lead to positive PnL in the long-run



Source: J.P. Morgan

On top of valuations, being long FX vol is also desirable for other reasons. The first is its positive correlation to UST yields. FX vols have spiked during the previous tightening cycle of the Fed, see the jump of yields and vols in 2013 and 2015 (Chart 13). Compared to other asset classes, like Equities, the beta to higher yields is also substantially higher (Chart 14). Hence, in relative terms, FX vol should do better in a scenario in which yields continue their move higher and approach our year-end target of 2.5%.

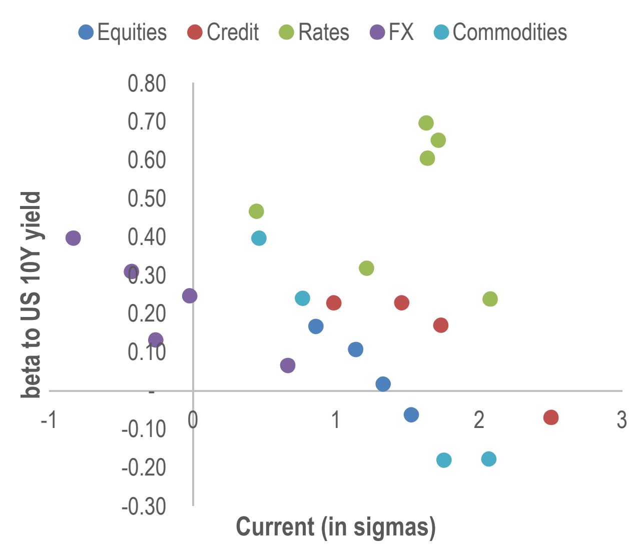
Chart 13: Moves higher in US yields / real rates tend to be accompanied by higher FX vols



Source: J.P. Morgan

Chart 14: Compared to other asset classes, like Equities, the beta to higher yields is also substantially higher

Valuation vs beta to UST 10Y yield



Source: J.P. Morgan

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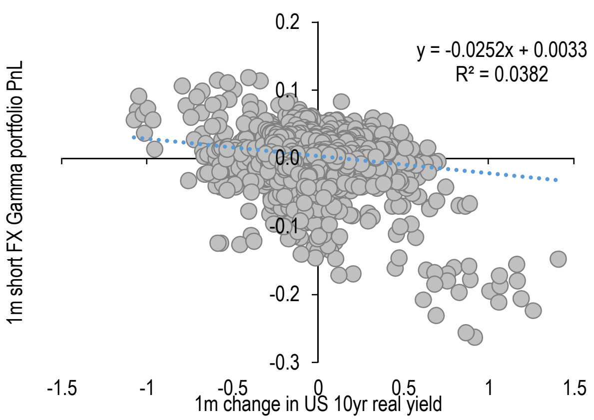
While during normal markets, correlation between FX vols and rates tends to be modest, FX vols have historically performed during tightening cycles (Chart 15). We proxy a typical Theta-collecting strategy in FX vols via a systematic Gamma strategy selling delta-hedged strangles. The sharp repricing higher of US real rates on the occasion led to an underperformance of the short FX Gamma strategy, as the strategy is negatively correlated with a rise in real rates. Most of the bottom-right large move in real yields episodes corresponded to September / October 2008, Taper Tantrum in summer 2013, then March 2020, by March 2021, January 2022.

Finally, FX vols have also desirable anti-cyclical properties. Similarly to implied volatility for other asset classes, the beta to global PMIs is negative (Chart 16). But quite desirably, in magnitude, the coefficient is slightly lower than that of Equities. Hence, relative to Equity vol, FX vol should do relatively well in a scenario of higher growth or stability but it could do even well in a scenario where growth slows-down from here. FX vol is consistent with current PMI levels while implied volatility on other asset classes seems to already discount substantially more negative on the growth front.

Hence, we believe owning FX vol relative to other asset classes is attractive and we think it's best to own it vs Equity. A cross-asset FX/Equity RV vol trade such as the below could be supported:

- Buy 1y vol swap on AUD/USD @11, sell 1y vol swap on S&P 500 @26.2, in 1:0.4 Vegas

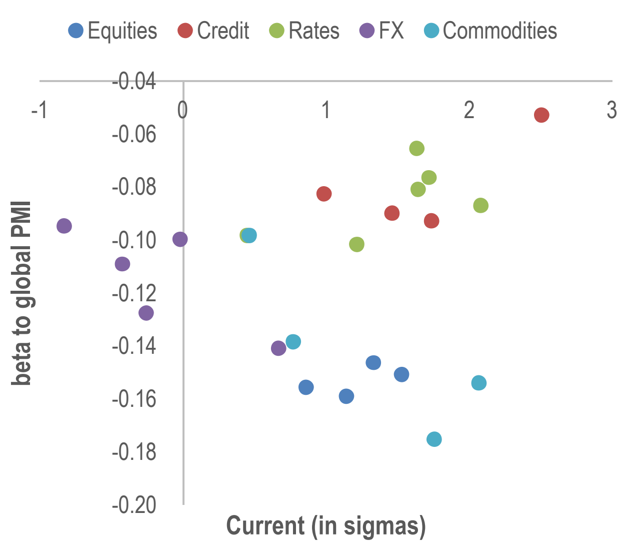
Chart 15: Short Gamma can suffer on such occasions



Source: J.P. Morgan

Chart 16: FX vols have also desirable anti-cyclical properties.

Valuations vs beta to global PMI



Source: J.P. Morgan

More opportunities within the FX vol space

Given the context above, what other opportunities can be found at present in the FX vol market? Most vol curves are sharply inverted as a result of the geo-

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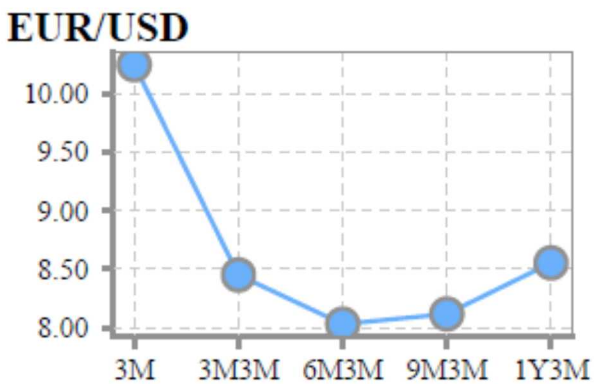
political risk premium (see for instance EUR/USD, Chart 17); as a result, the longer-end of the curves (i.e., Vega segment) offer better value for owning volatility. Accordingly, long-dated optionality is mechanically supported via the inverted vol curve, reducing the natural time-decay long vol trades are exposed to. For instance**, a 3M in 6M FVA on EUR/USD at 7.4 offers a 1.6 vol discounts relative to the outright 3m spot ATM vol which is currently at 9.0**. FVAs offer an attractive entry point for owning forward volatility that could be triggered as major central banks tighten, without paying for the current war-related risk premium. All else being equal (i.e., vol curves not moving) FVAs benefit from inverted vol curves and enjoy a positive time-decay.

Chart 17: FX vol curves inverted on souring market sentiment



Source: J.P. Morgan

Chart 18: . Several long-dated EMFX carry plays via options still look attractive.

Pair	Type	3m	6m	1y	2y	3y	5y	1y-5y % diff
EUR-RUB	Put	10.4	8.3	2.8	1.0	0.1	0.1	-95%
EUR-TRY	Put	4.8	3.5	2.1	0.9	0.6	0.3	-85%
USD-TRY	Put	4.2	3.1	2.0	1.1	0.8	0.5	-78%
USD-RUB	Put	9.0	7.1	2.9	2.3	1.7	0.9	-68%
TRY-JPY	Call	3.6	2.7	1.6	0.7	0.5	0.5	-67%
JPY-INR	Put	0.3	0.6	0.7	0.6	0.5	0.4	-48%
BRL-JPY	Call	0.4	0.7	1.1	1.3	1.2	0.9	-18%
EUR-BRL	Put	0.7	1.0	1.3	1.4	1.4	1.1	-12%
USD-INR	Put	0.3	0.4	0.5	0.6	0.5	0.4	-11%
EUR-INR	Put	0.4	0.6	0.7	0.8	0.8	0.8	10%
EUR-COP	Put	0.7	1.0	1.2	1.4	1.5	1.3	15%

Source: J.P. Morgan

A related feature concerns the time-decay property of long option trades – for a fixed strike for high-yielders calls, long carry trade position can make money even if spot and/or vol do not move thanks to the flat vol curve, the elevated carry-to-vol and the skew component, and one can buy optionality without suffering too much negative time decay (these features were described in an earlier note). While most CEEMEA currencies were impacted by the conflict in Ukraine, as a whole the EM complex has held up well recently (in particular, Latam and Asia-ex-Japan), with higher EM rates providing a cushion against the higher US yields as the Fed tightens. Beyond RUB and TRY, at present BRL, INR and COP vs. EUR, JPY or USD look attractive for EMFX carry trades via long-dated options (Chart 18). **Consider a low-premium EMFX carry trade such as:**

- Buy 3y JPY/INR put, strike 0.6369, spot ref. 0.6584 at 0.5% mid

Distressed pricing due to geopolitical premium led to vol surfaces becoming heavily distorted especially at the end of week ending on 4th March, with extreme moves on riskies, flies and vol curves (see for instance Chart 19). On EUR/USD, the current setup allows buying USD topside by capitalizing on rich skew (i.e., too negative) via EUR/USD put via digital options – the trade banks on positive delta-one carry in favor of USD and on skew-driven discount. Opportunistic long dated EUR call can similarly benefit from overstretched skews by adding a KO lower barrier. EUR/JPY KO call do benefit from the same features plus a more supportive carry / outlook on rates differentials. Consider:

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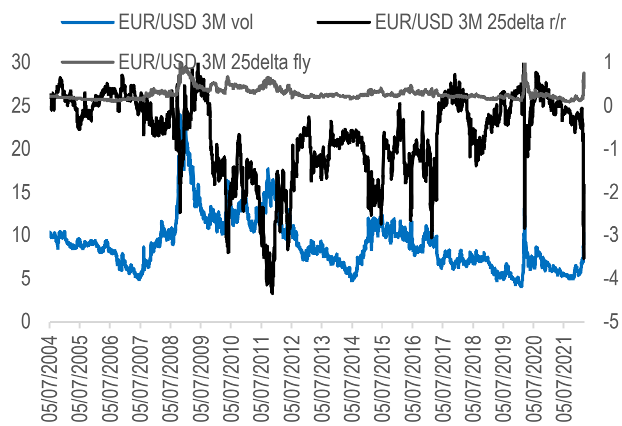
- Buy a 1y 5% OTMS EUR/USD digital put, strike at 1.047, spot ref. 1.1019 @ 14.6% mid

- Buy a 1y KO EUR/JPY call strike at 130, KO barrier at 125, spot ref. 127.79, @ 1.4% mid (3.0% for the outright long call)

Vol traders can bank on rich butterflies / vol-of-vol by buying ATM / selling OTM options and /or buying Vol vs. selling Vol swaps.

Despite the substantial re-pricing already gone through, several vols are still lagging and remain near all-time lows (Chart 20). EUR/GBP, GBP/NZD, AUD/NZD USD/JPY and GBP/AUD 1y vols still trade at the 15% lowest percentile (based on historical distributions since 2006) or lower, which offers an attractive entry point to own vol for playing a renewed focus on Central Banks monetary policy, such as for instance by **buying a 1y vol swap on EUR/GBP at 7.05**.

Chart 19: Violent repricing of smile parameters occurred on early March (here for EUR/USD)



Source: J.P. Morgan

Chart 20: Several FX vols still trade near record lows.

1y vol	Top 5 buy vol				
15y	EUR/GBP	GBP/NZD	AUD/NZD	USD/JPY	GBP/AUD
Current	6.7	8.5	5.5	7.2	8.5
Average	9.0	11.3	7.4	10.2	10.9
Median	8.6	10.7	7.4	10.0	10.5
Min	5.1	7.3	4.7	6.0	6.4
25%	7.3	9.3	6.2	8.2	9.0
75%	10.6	13.1	8.6	12.0	12.5
Max	19.4	20.9	13.9	19.1	22.1
%ile	9.9%	11.5%	14.3%	15.4%	17.5%
3M real	5.5	6.7	5.1	5.1	7.3

Source: J.P. Morgan

A sentiment-based model for FX Gamma trading points to the direst conditions for markets since the start of the pandemic. The model has consistently helped mitigating drawdowns as experienced by short Gamma strategies over multiple risk-aversion episodes, most recently last December on TRY and since January on RUB. The approach suggests not to enter in short Gamma trades until market conditions improve from current distressed levels, despite the optically wide premia on the Gamma-end of vol curves. A RV analysis highlights several possible FX vol dislocations, with EUR, SEK, RUB, PLN, HUF vols screening as rich and GBP, JPY, CHF, MXN, SGD, KRW, CNH vols screening as cheap. **Beyond EM currencies, the SEK vol premium appears as significantly wide,** given its direct geographical exposure to the conflict. **Double-no-touches allow fading the rich vol while limiting the maximum loss to the premium paid:**

- Buy a 6M DNT on USD/SEK, barriers at 9/10.25, spot ref. 9.65 @14.5% USD

EUR was under heavy selling pressure as of late on the basis of: a) geographical proximity to the conflict and b) heavy reliance on energy supplied from the region, coupled with everlasting inflation theme. **Such a dynamics led to a re-pricing higher of EUR-correlation.** Elevated EUR-corrs can open the way for gradually

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fading the geo-political risk premium via diverging sensitivities of EUR/ccy on rates/energy drivers. As such, there are several short EUR-correlation opportunities, which allow elevated leverage and are consistent with the medium-term targets by the FX strategy team: USD/NOK lower with USD/JPY higher, EUR/NOK or EUR/CAD lower with EUR/JPY higher (on higher energy and rates). **A leveraged trade for playing EUR/USD higher** (on ECB faster than expected tapering and eventual de-pricing of geo-political risk premium) **and USD/JPY higher** (on wider rates differentials via the Fed tightening) **is:**

- Buy a 9M dual-digi EUR/USD>3% OTMS, USD/JPY >2% OTMS @ USD 9% (the cheapest of the two digitals costs 32%).

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