GLOBAL VOLATILITY & POSITIONING TRENDS

August 13th, 2018

LEGAL

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FUTURES & OPTIONS POSITIONING

INVESTORS ARE PILING INTO SHORT BOND POSITIONS (RATES-RISING)

CFTC NET NON-COMMERCIAL FUTURES & OPTIONS POSITIONING

EQUITIES	Current Contract Length	WW Chg.	MM Chg.	3M Chg.	6M Chg.	TTM Z-Score	3Yr Z-Score
S&P 500 (Index + E-Mini)	153,884	(4,923)	(1,557)	16,807	(95,754)	0.1	0.7
Dow Jones (Mini)	29,282	4,406	13,738	26,679	(14,354)	-0.6	-1.0
Nasdaq 100 (Mini)	36,988	(7,019)	15,224	43,188	21,606	1.1	-0.4
Russell 2000 (Mini + E-Mini)	14,795	(19,728)	(30,938)	(26,297)	1,480	0.1	0.2
Nikkei Index	(2,658)	2,428	3,855	(13,809)	(6,247)	-1.2	-1.8
CBOE Volatility Index (VIX)	(113,789)	(10,283)	(60,960)	(131,378)	(199,607)	-0.7	-0.5
INTEREST RATES	**Current Contract Length**	**W/W Chg.**	**M/M Chg.**	**3M Chg.**	**6M Chg.**	**TTM Z-Score**	**3Yr Z-Score**
30D Fed Funds	81,243	(77,824)	(47,204)	34,810	199,878	0.6	1.1
2YR Note	(93,237)	7,073	(98,501)	(41,043)	105,483	0.4	-0.1
5Yr Note	(843,041)	(33,109)	(254,510)	(212,842)	(381,708)	-2.3	-2.9
10Yr Note	(562,527)	10,459	(216,236)	(190,560)	(278,062)	-1.7	-2.0
30Yr Bond	(38,020)	(13,877)	(35,923)	(43,936)	(76,394)	-1.9	-1.5
CURRENCIES	**Current Contract Length**	**W/W Chg.**	**M/M Chg.**	**3M Chg.**	**6M Chg.**	**TTM Z-Score**	**3Yr Z-Score**
USD	30,193	1,654	11,419	30,628	33,696	3.0	0.6
JPY	(67,755)	4,286	(25,827)	(58,371)	45,354	0.1	-0.3
EUR	9,124	(13,032)	(18,069)	(103,356)	(134,478)	-2.2	-0.2
GBP	(58,733)	(10,656)	(20,879)	(71,313)	(89,883)	-2.1	-0.6
AUD	(53,700)	(1,820)	(13,066)	(38,360)	(69,501)	-1.7	-2.4
CAD	(26,195)	8,776	27,518	(4,271)	(67,918)	-1.0	-0.6
MXN	33,411	6,705	5,213	(42,837)	(59,488)	-0.8	0.1
NZD	(24,527)	(847)	2,047	(37,073)	(27,859)	-1.6	-1.7
CHF	(46,722)	(1,878)	(6,296)	(13,779)	(26,651)	-1.8	-2.4
RUB	7,661	(78)	1,295	(1,717)	(13,340)	-0.8	-0.7
ZAR	2,322	(77)	(5,463)	(5,332)	(6,573)	-2.3	-0.5
BRL	(17,205)	4,171	10,115	8,537	(30,222)	-0.7	-1.3
COMMODITIES	**Current Contract Length**	**W/W Chg.**	**M/M Chg.**	**3M Chg.**	**6M Chg.**	**TTM Z-Score**	**3Yr Z-Score**
Crude Oil	639,606	(10,092)	(53,573)	(83,583)	(137,847)	0.0	0.7
Gold	(6,995)	(23,928)	(76,051)	(110,535)	(215,166)	-2.4	-2.5
Copper	2,124	(5,781)	(11,876)	(30,047)	(49,916)	-2.5	-1.3
Natural Gas	(109,165)	19,414	(8,505)	15,259	(52,322)	-0.5	-1.0
RBOB Gasoline	110,810	(1,381)	8,344	24,177	21,019	2.2	2.1
ULSD Heating Oil	38,190	(3,241)	(12,295)	5,558	(11,402)	-0.3	0.2
Silver	4,327	(1,640)	(19,072)	5,512	(11,391)	-0.8	-1.3
Platinum	(7,387)	(241)	(1,073)	(17,517)	(51,167)	-1.7	-2.1
Aluminum	163,475	(2,043)	(1,765)	6,145	(3,122)	0.4	0.7
Nickel	42,230	(365)	(1,818)	(1,834)	65	1.4	0.2
Corn	52,204	21,424	59,852	(298,798)	53,555	0.0	0.1
Soybeans	(41,461)	(2,538)	(10,063)	(205,370)	(38,211)	-1.1	-1.2
Wheat	63,219	11,580	55,653	46,840	124,318	2.2	2.4
Live Cattle	76,139	8,138	23,360	50,899	(41,103)	-0.3	-0.5
Lean Hogs	(7,456)	(676)	(3,925)	(1,846)	(53,147)	-1.3	-1.8
Sugar	(75,089)	2,797	(60,927)	16,271	28,186	-0.5	-0.9
Cotton	106,561	(2,290)	11,210	(11,721)	12,820	0.6	0.5
Coffee	(88,251)	(6,852)	(16,659)	(55,456)	(42,662)	-2.5	-2.0
Cocoa	7,231	(13,355)	(34,124)	(50,865)	(10,863)	-0.3	0.1
Orange Juice	5,279	(129)	539	2,937	7,403	1.5	0.8

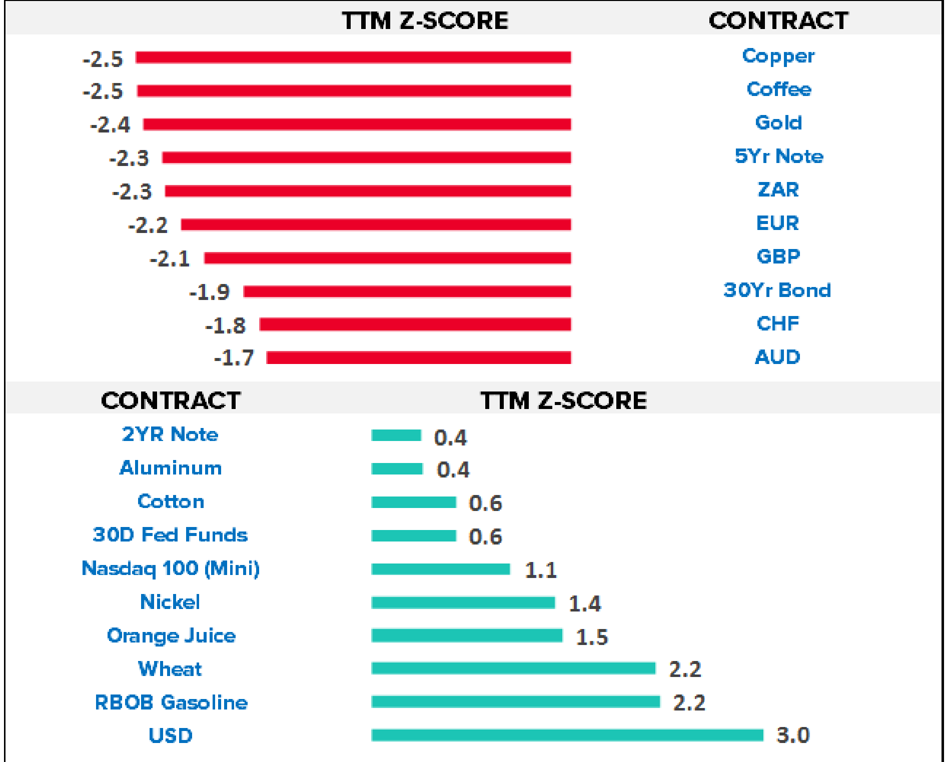
Data Source: CFTC, LME, CME, Bloomberg

Takeaway: We're more than happy to be on the other side of a growing consensus macro position with our call that the peak for inflation and long-term interest rates is in.

MARGINAL SHIFT TO THE SHORT-SIDE IN METALS

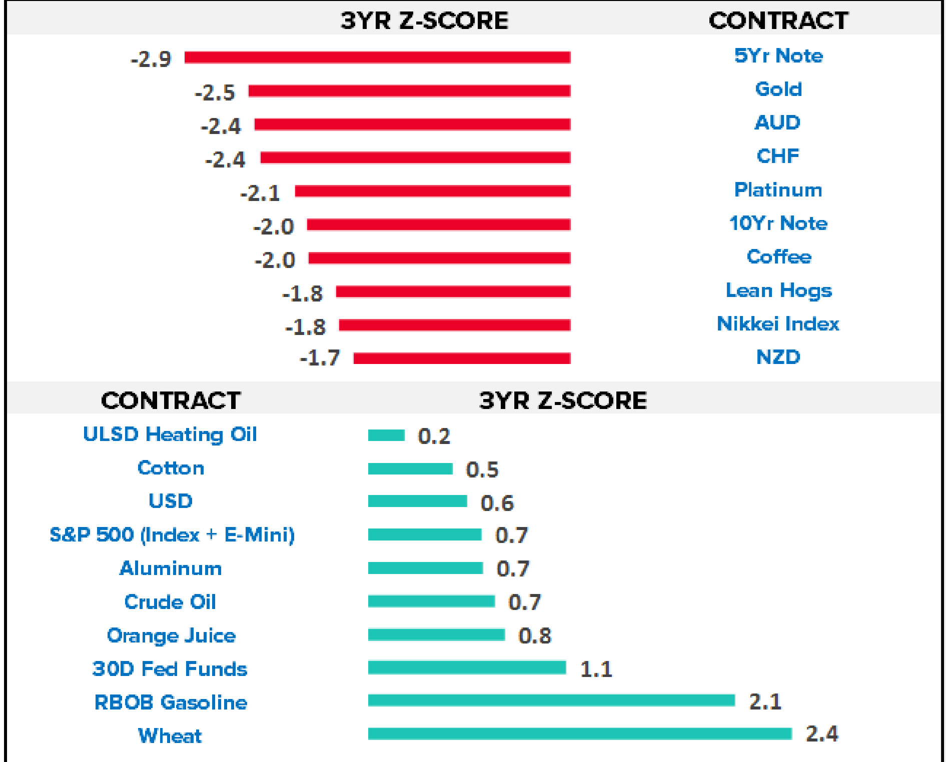
TAKEAWAY: #STRONG DOLLAR IS ALSO FUELING BEARISH BETS IN THE METALS SPACE (GOLD, COPPER, PLATINUM)

CFTC NET FUTURES & OPTIONS POSITIONING (TTM Z-SCORE)



Data Source: CFTC, LME, Bloomberg

CFTC NET FUTURES & OPTIONS POSITIONING (3YR Z-SCORE)



Data Source: CFTC, LME, Bloomberg

#STRONGDOLLAR UPDATE

STRONG USD CONTINUES TO PUMMEL EVERY CURRENCY...

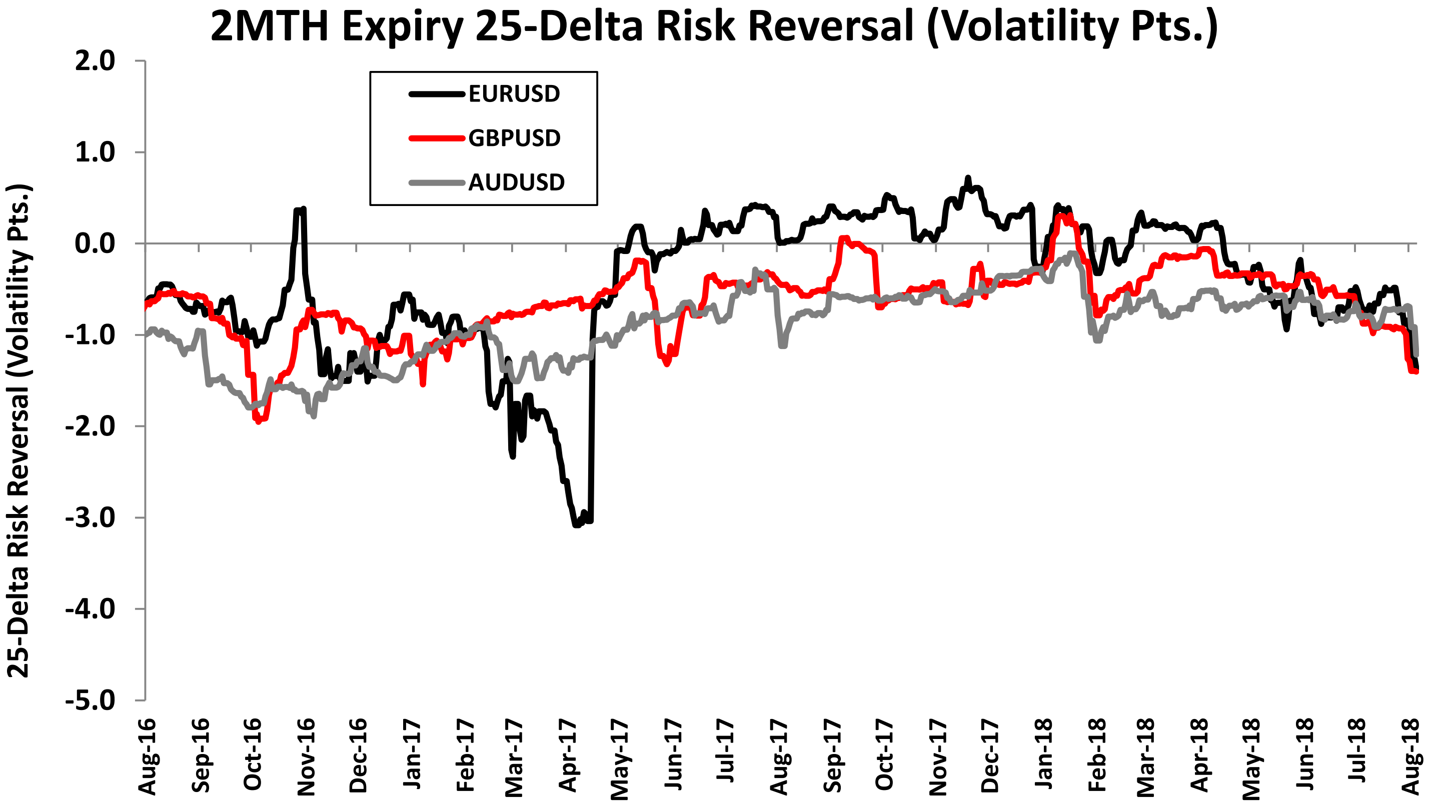
G-20 Currency Dashboard (Multi-Duration Performance)

CURRENCY PAIR	TICKER	W/W%	1M %	3M %	6M %	Y/Y%	WTD%	MTD%	YTD%
U.S. Dollar Index	DXY	1.06%	1.84%	3.03%	6.95%	3.75%	0.03%	1.93%	4.62%
FX BASE	**TICKER**	**W/W%**	**1M %**	**3M %**	**6M %**	**Y/Y%**	**WTD%**	**MTD%**	**YTD%**
EURO / USD	EURUSD	-1.36%	-2.52%	-3.16%	-7.20%	-4.19%	-0.15%	-2.52%	-5.07%
POUND / USD	GBPUSD	-1.41%	-2.59%	-4.80%	-9.44%	-5.31%	-0.02%	-2.80%	-5.60%
AUSSIE DOLLAR / USD	AUDUSD	-1.65%	-1.57%	-4.42%	-5.45%	-4.57%	-0.52%	-2.16%	-6.98%
USD BASE	**TICKER**	**W/W%**	**1M %**	**3M %**	**6M %**	**Y/Y%**	**WTD%**	**MTD%**	**YTD%**
USD / YEN	USDJPY	-0.57%	-0.53%	1.10%	3.58%	-1.26%	0.12%	1.05%	1.80%
USD / CANADIAN DOLLAR	USDCAD	1.03%	-0.26%	1.62%	2.79%	3.57%	-0.03%	-1.05%	-4.36%
USD / REAL	USDBRL	4.72%	3.40%	5.50%	16.11%	20.09%	-1.29%	-4.02%	-15.38%
USD / MEXICAN PESO	USDMXN	3.48%	1.53%	-5.52%	4.81%	2.88%	-1.67%	-3.04%	2.22%
USD / RUPEE	USDINR	1.51%	1.55%	3.58%	7.62%	8.48%	-1.56%	-1.98%	-8.66%
USD / RUBLE	USDRUB	6.58%	7.71%	9.03%	16.95%	15.38%	-0.60%	-8.24%	-15.34%
USD / LIRA	USDTRY	31.06%	47.34%	56.18%	72.69%	78.49%	-8.19%	-29.86%	-45.78%
USD / ARGENTINE PESO	USDARS	9.50%	8.40%	18.12%	48.29%	73.77%	-2.40%	-8.38%	-37.80%
USD / WON	USDKRW	0.90%	0.25%	5.40%	6.02%	4.38%	-0.44%	-1.35%	-5.87%
USD / RIYAL	USDSAR	0.00%	0.01%	0.01%	0.01%	0.01%	0.00%	-0.01%	0.00%
USD / RUPIAH	USDIDR	0.90%	0.87%	4.85%	6.02%	8.02%	-0.89%	-1.33%	-7.21%
USD / RAND	USDZAR	7.41%	7.26%	10.49%	19.99%	5.10%	-2.29%	-7.97%	-14.15%

Data Source: Bloomberg

...SPARKING MARGINALLY BULLISH USD DIRECTIONAL HEDGING...

RISK REVERSAL PRICING REVEALS THE MOST BULLISH USD POSITIONING OF 2018 IN 3 MAJOR CURRENCY PAIRS.

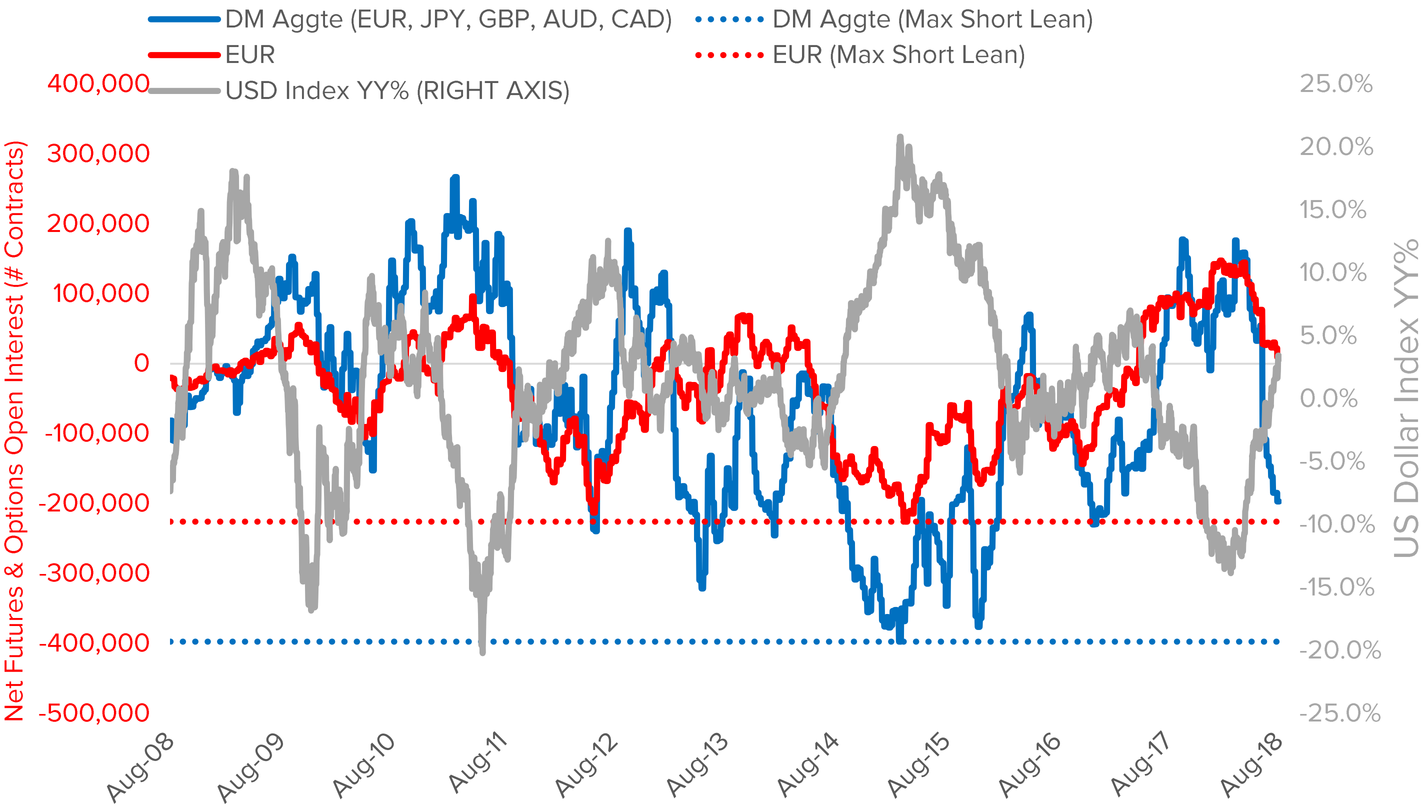


We look to “volatility skew” or “risk-reversal pricing” for the directional consensus lean.

This chart is one of many that shows marginally BULLISH USD positioning in FX. In this particular chart, a line moving lower and right means that downside puts are increasingly expensive relative to upside calls in a given currency pair.

...BUT THERE IS PLENTY OF ROOM FOR MORE DOWNSIDE

BELOW WE EXEMPLIFY THAT THE OBSERVED PRESSURE ON CROWDED US DOLLAR SHORT BETS HAS A LOT OF RUNWAY TO UNWIND FURTHER

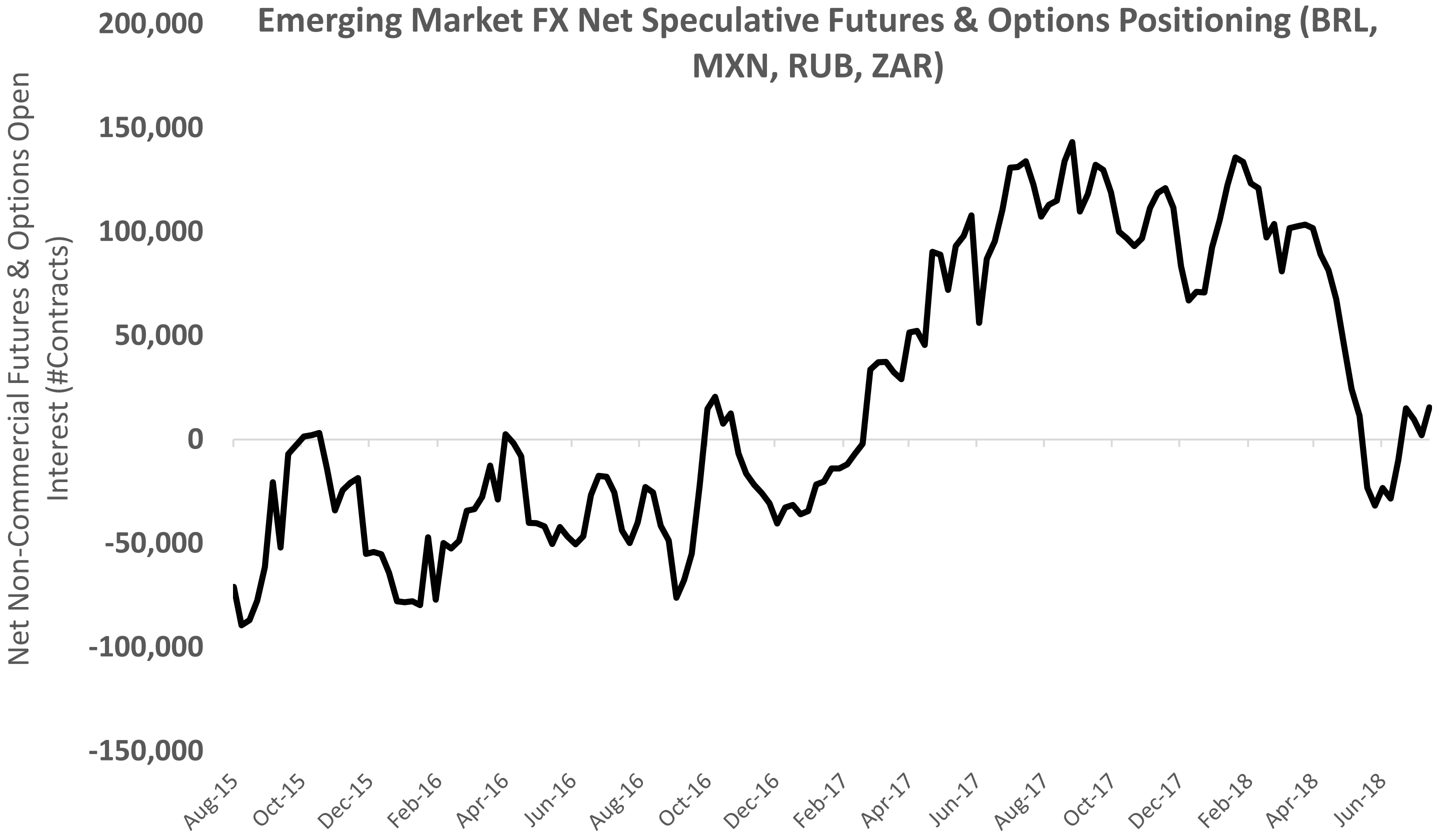


We've been asked the question whether or not consensus positioning has now swung the other way in Q2 & Q3 in favor of US Dollar strength....

Pulling back the clock on speculative positioning in Developed Market currency futures and options markets suggests the recent puking of short USD positions has room to run.

CONSENSUS MACRO ON EM CURRENCIES? A "PARTIAL" PUKE

BELOW WE SHOW NET NON-COMMERCIAL FUTURES & OPTIONS POSITIONING OF THE FOUR EMERGING MARKET CURRENCY MARKETS IN THE G-20 WHERE POSITIONING IS REPORTED



Data Source: CFTC, Bloomberg

Takeaway: Consensus was long and wrong of emerging market currencies at exactly the wrong time. Prospectively, the puke could get worse. In just the last three years, there have been periods where consensus was leaning much shorter of emerging market currencies than it is currently.

GLOBAL MACRO CONSENSUS ON RATES

GLOBAL VOLATILITY TRENDS: RATE-SENSITIVE VOLATILITY SMASH

THE COST OF HEDGING RATE SENSITIVE EXPOSURES LIKE TREASURY-LINKED VEHICLES AND THE RUSSELL 2000 ARE RIGHT OFF 10YR LOWS (SEE RED COLOR CODING FAR RIGHT COLUMN).

TIME WINDOW SETTING: VOLATILITY_30D PUT_IMP_VOL_30D	TICKER	TOTAL RETURN PERFORMANCE YTD %	IVOL PREMIUM/DISCOUNT IVOL PREM % IVOL / RVOL	TTM Z-Score	3Yr Z-Score	REALIZED VOLATILITY TRENDS RVOL CURRENT	MM %	PERCENTILE 10YR	IMPLIED VOLATILITY TRENDS IVOL CURRENT	MM %	PERCENTILE 10YR
US EQUITIES											
Power Shares QQQ Trust ETF	QQQ US EQUITY	16.55%	-5%	-0.4	-0.5	14.1	-2%	42%	13.5	-10%	25%
I-Shares Russell 2000 ETF	IWM US EQUITY	9.80%	6%	-0.2	0.0	10.9	-3%	6%	11.6	-10%	1%
SPDR S&P 500 ETF Trust	SPY US EQUITY	6.79%	14%	0.2	0.1	8.0	-11%	14%	9.1	3%	10%
Consumer Discretionary Sector SPDR ETF	XLY US EQUITY	14.59%	56%	1.2	1.4	8.3	-29%	7%	13.0	2%	25%
Financials Sector SPDR ETF	XLF US EQUITY	0.36%	9%	-0.1	0.1	13.6	11%	23%	14.8	-5%	23%
Health Care Sector SPDR ETF	XLV US EQUITY	9.35%	17%	0.5	0.3	9.6	-2%	17%	11.2	-3%	13%
Technology Sector SPDR ETF	XLK US EQUITY	15.17%	-8%	-0.5	-0.6	14.2	2%	45%	13.1	-10%	25%
Consumer Staples Sector SPDR ETF	XLP US EQUITY	-5.24%	8%	0.1	0.0	10.3	3%	41%	11.1	6%	39%
Industrials Sector SPDR ETF	XLI US EQUITY	-0.27%	-8%	-0.5	-0.6	14.3	7%	44%	13.2	-8%	24%
Materials Sector SPDR ETF	XLB US EQUITY	-3.25%	10%	0.1	0.1	13.3	-8%	25%	14.6	-3%	26%
Energy Sector SPDR ETF	XLE US EQUITY	4.42%	8%	0.0	0.2	13.9	-27%	19%	15.1	-14%	14%
Utilities Sector SPDR ETF	XLU US EQUITY	2.38%	-5%	-0.6	-0.5	13.6	-15%	48%	12.8	-7%	34%
Vanguard Real Estate REIT ETF	VNQ US EQUITY	0.10%	-5%	-0.3	-0.3	11.5	4%	21%	11.0	-5%	11%
INTERNATIONAL EQUITIES											
Euro Stoxx 50 Index	SX5E INDEX	0.14%	14%	0.0	0.0	11.3	-17%	12%	12.9	19%	11%
I-Shares MSCI Emerging Markets ETF	EEM US EQUITY	-9.12%	-3%	-0.2	-0.3	17.7	-2%	35%	17.2	10%	25%
I-Shares MSCI Japan ETF	EWJ US EQUITY	-3.89%	-1%	-0.4	-0.4	11.0	-9%	15%	10.9	4%	9%
I-Shares China Large-Cap ETF	FXI US EQUITY	-7.33%	-15%	-0.8	-1.0	23.1	3%	51%	19.5	-1%	20%
CURRENCIES											
PowerShares US Dollar Index ETF	UUP US EQUITY	6.14%	20%	0.5	0.5	5.9	-8%	19%	7.1	8%	24%
Currency Shares Euro Trust ETF	FXE US EQUITY	-5.46%	22%	1.7	0.8	6.8	-17%	17%	8.2	24%	31%
Currency Shares Japanese Yen ETF	FXY US EQUITY	1.51%	25%	0.8	0.8	5.6	15%	7%	7.1	5%	8%
Currency Shares British Pound ETF	FXB US EQUITY	-5.67%	24%	1.1	0.6	6.8	6%	20%	8.4	6%	44%
COMMODITIES											
United States Oil Fund ETF	USO US EQUITY	14.86%	-11%	-0.8	-0.8	26.5	-15%	41%	23.6	-7%	21%
United States Natural Gas Fund ETF	UNG US EQUITY	3.04%	22%	0.5	0.6	17.2	-15%	0%	21.0	3%	1%
SPDR Gold Shares ETF	GLD US EQUITY	-8.68%	11%	0.2	0.1	9.2	8%	6%	10.2	5%	7%
PowerShares DB Base Metals Fund ETF	DBB US EQUITY	-16.18%	7%	-0.5	-0.3	18.9	4%	49%	20.3	0%	35%
PowerShares DB Agriculture Fund ETF	DBA US EQUITY	-9.01%	13%	-0.6	-0.6	12.4	-25%	47%	14.0	-12%	36%
FIXED INCOME											
I-Shares 20+ Year Treasury Bond ETF	TLT US EQUITY	-3.65%	-5%	-0.3	-0.5	8.9	14%	3%	8.4	3%	1%
I-Shares 7-10 Year Treasury Bond ETF	IEF US EQUITY	-1.83%	20%	0.2	0.3	3.5	-1%	4%	4.3	-8%	2%
I-Shares IBOXX IG Corporate Bond ETF	LQD US EQUITY	-3.21%	10%	-0.3	-0.5	3.9	0%	9%	4.2	3%	4%
I-Shares IBOXX HY Corporate Bond ETF	HYG US EQUITY	1.31%	29%	0.5	0.3	2.5	-20%	1%	3.2	-2%	2%
I-Shares J.P. Morgan USD EM Bond ETF	EMB US EQUITY	-6.41%	13%	-0.8	-0.7	7.0	21%	66%	7.9	12%	59%

Data Source: CBOE, CME, Bloomberg

RUSSELL 2000: NO VOLATILITY POP PRICED INTO LONG-TERM HEDGING COSTS

Global Macro Divergences: 12Mth Implied Volatility Percentile Reading

*"12Mth" represents 12Mth Expiry Implied Volatility Historical Percentile Readings (13yr Lookback or Max Lookback)

HIGH VOLATILITY DIVERGENCES (HIGHEST PERCENTILE READINGS)

SECURITY	TICKER	12Mth Expiry IVOL Percentile Reading
I-Path Bloomberg Sugar Subindex Total I	SGGFF US Equity	100%
I-Shares MSCI Turkey ETF	TUR US Equity	99%
Teucrium Soybean Fund ETF	SOYB US Equity	82%
Currency Shares British Pound Sterling T	FXB US Equity	66%
I-Shares MSCI Brazil Capped ETF	EWZ US Equity	59%
I-Shares IBOXX Investment Grade Corpc	LQD US Equity	59%
I-Path Bloomberg Cocoa Total Return ET	NIB US Equity	50%
I-Shares MSCI South Africa ETF	EZA US Equity	50%
I-Shares Russell 1000 Growth ETF	IWF US Equity	46%
Google	GOOG US Equity	46%

LOW VOLATILITY DIVERGENCES (LOWEST PERCENTILE READINGS)

SECURITY	TICKER	12Mth IVOL Percentile Reading
SPDR S&P Regional Banking ETF	KRE US Equity	2%
Apple	AAPL US Equity	1%
I-Shares National Muni Bond ETF	MUB US Equity	1%
I-Shares Russell 2000 Value ETF	IWN US Equity	1%
SPDR Dow Jones REIT ETF	RWR US Equity	1%
I-Shares Russell 2000 ETF	IWM US Equity	1%
I-Shares Pharmaceuticals ETF	IHE US Equity	1%
I-Shares Silver Trust ETF	SLV US Equity	1%
Russell 2000 Index	RTY Index	1%
VanEck Vectors Gold Miners ETF	GDX US Equity	0%

Data Source: Bloomberg

**NOTE* Any divergence visual we show is output from a universe of well over 100 tickers across global equities & FICC. Tables are populated for the most divergent data readings for any given volatility factor.*

Takeaway: Long-term volatility expectations (cost of hedging) in the Russell 2000 index and factor ETFs are priced at all-time lows. The low realized volatility environment has been extrapolated far into the future.

MULTI-FACTOR, MULTI-DURATION COMPARISON: R2K VS. SPX

IT'S NEVER BEEN CHEAPER TO HEDGE THE RUSSELL 2000 INDEX FOR 6 MONTHS. IF YOU'RE WORRIED ABOUT PENDING #QUAD4, USING THE INDEX JUST TO HEDGE OUT SOME SMALL-CAP GROWTH EXPOSURE LOOKS ATTRACTIVE.

VOLATILITY FACTOR TREND COMPARISON

TICKER: RTY Index

VOLATILITY FACTOR	1Mth	2Mth	3Mth	6Mth	12Mth
Realized Vol %	11.0	11.3	11.0	14.8	13.4
Realized Vol Percentile*	26%	26%	24%	38%	29%
Implied Vol %	11.5	12.7	13.4	14.7	16.2
Implied Vol Percentile**	1%	1%	1%	0%	1%
Implied Vol Premium %	5%	12%	22%	-1%	21%
IVOL Prem. TTM Z-Score:	-0.3	-0.1	0.2	-1.6	-0.5
IVOL Prem. 3YR Z-Score:	0.0	0.2	0.6	-1.0	0.3

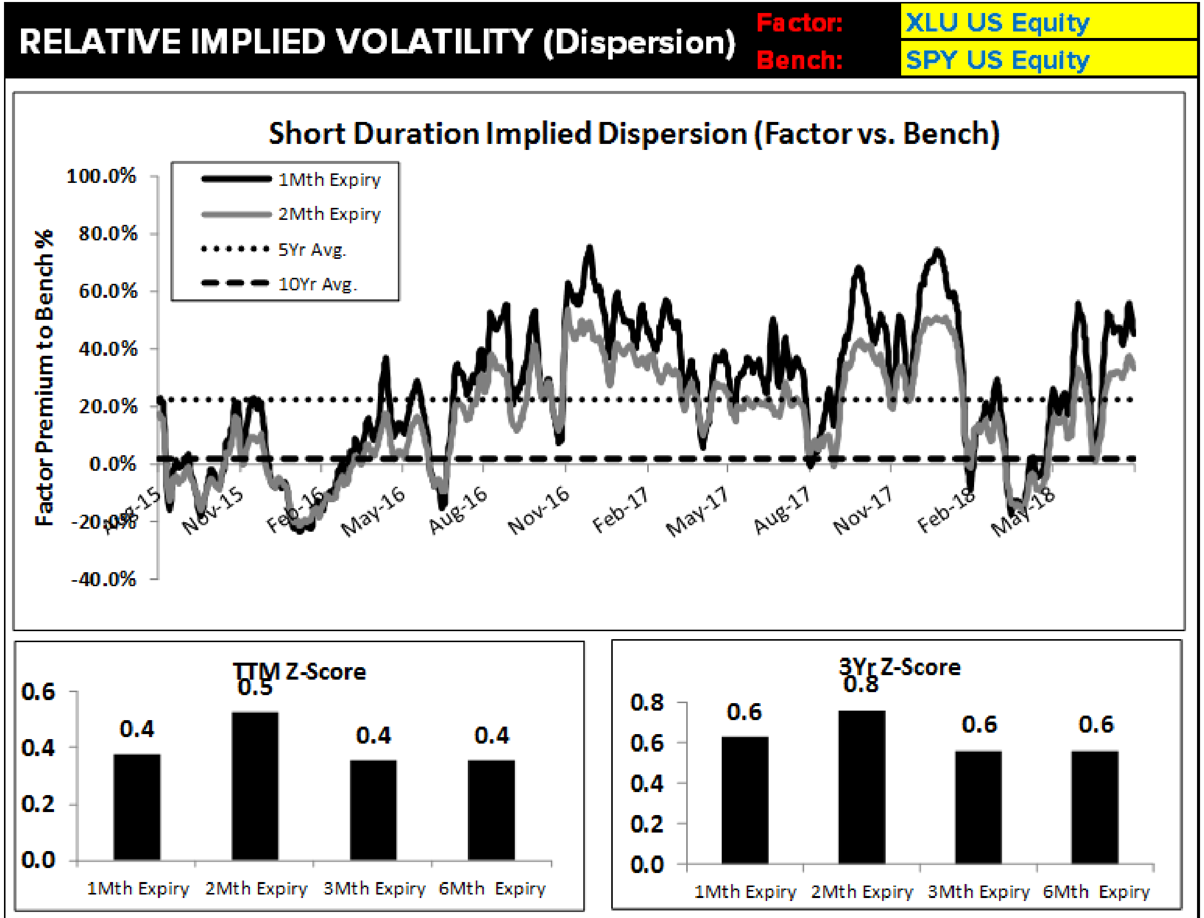
TICKER: SPX Index

VOLATILITY FACTOR	1Mth	2Mth	3Mth	6Mth	12Mth
Realized Vol %	8.2	9.0	9.9	14.6	11.4
Realized Vol Percentile*	12%	13%	16%	54%	28%
Implied Vol %	9.0	10.2	11.3	12.7	14.3
Implied Vol Percentile**	8%	9%	11%	11%	14%
Implied Vol Premium %	10%	13%	15%	-13%	26%
IVOL Prem. TTM Z-Score:	0.1	0.0	0.0	-1.5	-1.4
IVOL Prem. 3YR Z-Score:	0.0	0.0	0.0	-1.3	-0.1

*30yr historical percentile reading or max available **13Yr historical percentile reading or max available (data shortage)

Data Source: Bloomberg, CBOE

UTILITIES: YIELD-SENSITIVE UPSIDE DISPERSION

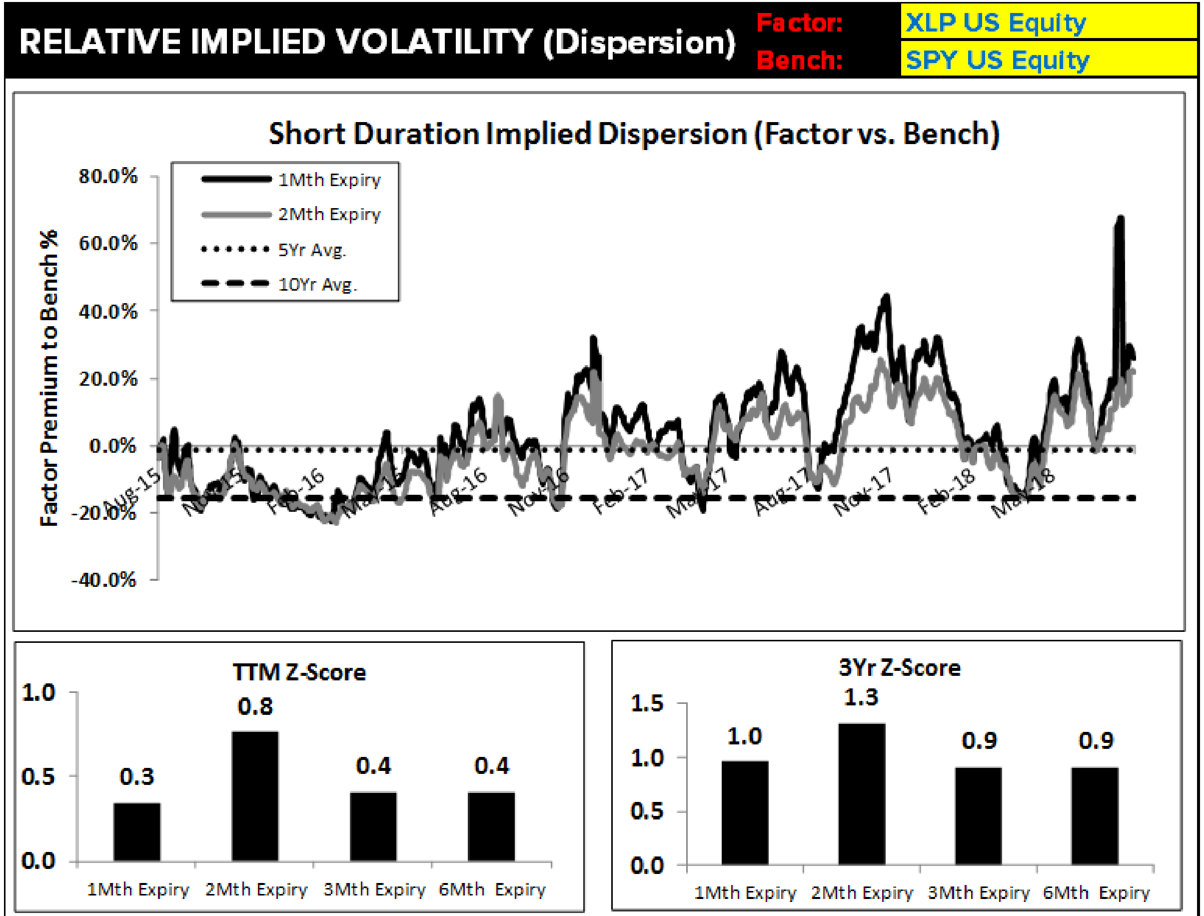


Data Source: CBOE, CME, Bloomberg

****Note*** "Implied Dispersion" reveals where implied volatility trades at the sector level relative to a benchmark.*

The slow-growth, yield-sensitive sectors are where we see the most notable upside dispersion (relatively expensive hedging costs). If the U.S. equity market was starting to discount #QUAD4, this would not be the case.

CONSUMER STAPLES: YIELD-SENSITIVE UPSIDE DISPERSION



Data Source: CBOE, CME, Bloomberg

***Note** "Implied Dispersion" reveals where implied volatility trades at the sector level relative to a benchmark.*

The slow-growth, yield-sensitive sectors are where we see the most notable upside dispersion (relatively expensive hedging costs). If the U.S. equity market was starting to discount #QUAD4, this would not be the case.

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