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Global Quantitative & Derivatives Strategy

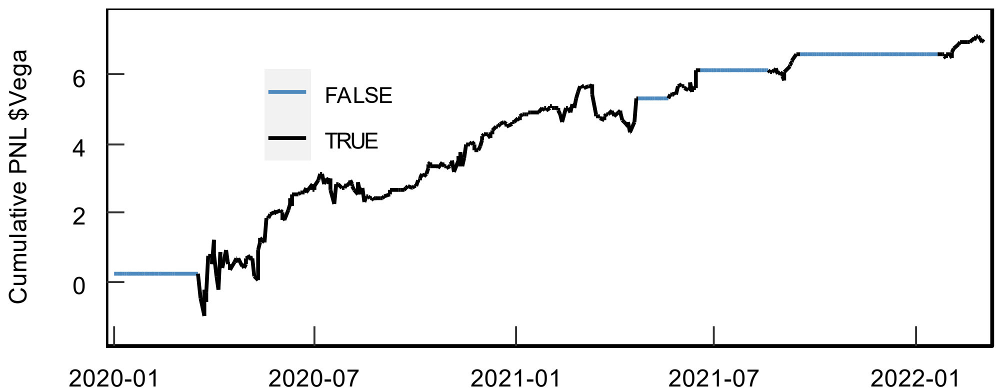
17 March 2022

VIX Technical Update

VIX vs. SPX Option Relative Value/ VXX option flow analysis

- VIX remained in the high vol regime since our last technical update in March. The Mar/Apr put calendar, which we recommended in the same note, produced a roughly flat mark-to-market P&L over this period (Figure 1). In this note, we re-assess VIX market opportunities post FOMC.

Figure 1: VIX put calendar back test PNL (before transaction cost), conditional on VIX >= 20



Source: J.P. Morgan

VIX/SPX option relative value

- Comparing the April VIX and SPX implied and realized distribution, we find the put wing of VIX to be rich and call wing of SPX to be cheap (Figure 2 and Figure 3).

Figure 2: VIX April Implied vs. Realized distribution

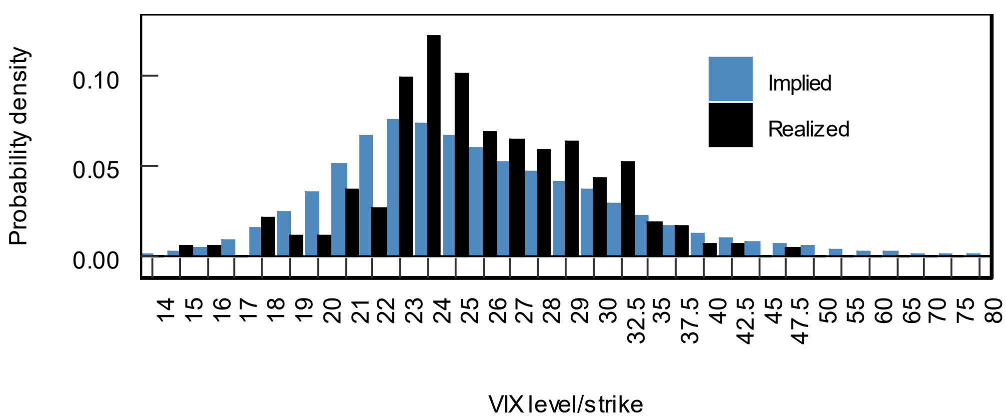


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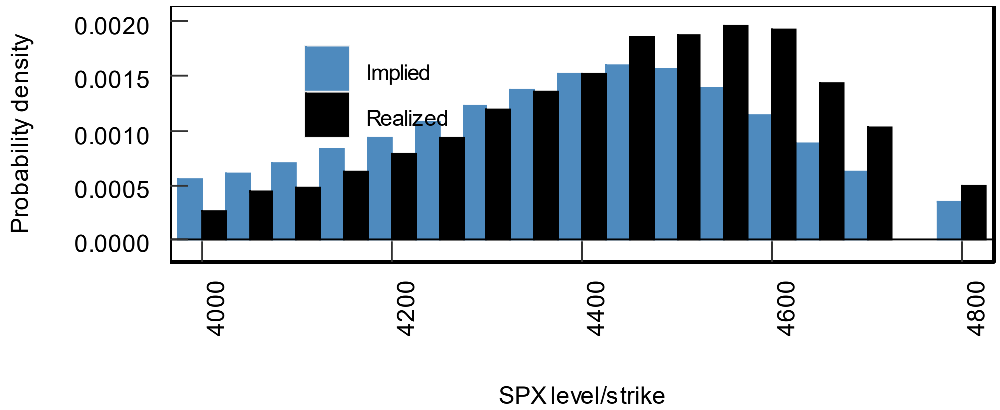
Figure 3: S&P 500 April Implied vs. Realized distribution



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- **Suggested implementation to take advantage of the relative value: sell VIX Apr 23 puts to buy SPX Apr 4550 calls, premium neutral.** The options are chosen as they both correspond to an approximately same maturity and delta (22%). The indicative sizing for 1MM VIX position is shown in **Error! Reference source not found.**.

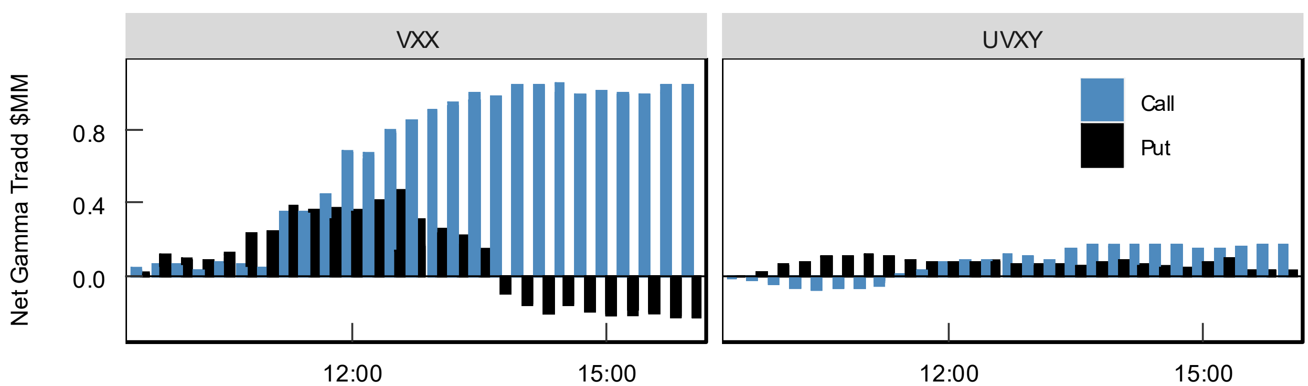
Table 1: Suggested implementation for VIX vs. SPX option switch

Direction	Index	Put/Call	Maturity	Strike	Ref	Indic. Premium $	Sizing
Sell	VIX	Put	20-Apr-22	23	27.25	1.0	1MM Vega
Buy	SPX	Call	14-Apr-21	4550	4370	28.4	$155MM Notional

VXX option flow

- On Mar 14, Barclays announced that they will temporarily suspend the sales and issuances of VXX. The price of the VXX richened relative to its NAV, and at the time of writing, trades at around 9.6% premium. Examining order flows in the cash and equity market, we believe much of the buying pressure came from short dated options. As can be seen in Figure 4, the demand for VXX call gamma picked up significantly around 11:30, the time of announcement. Mar-18 and Mar-25 expiries accounted for around 76% and 21% of the call gamma demand on that day, respectively. The two expiries also accounted for around 70% and 28% of the call delta demand. The attention on short dated options indicates that market participants believe the surge in NAV premium will be short-lived. In comparison, we do not observe abnormal option activity on the UVXY, which shares the same benchmark as the VXX, and is similar in liquidity.

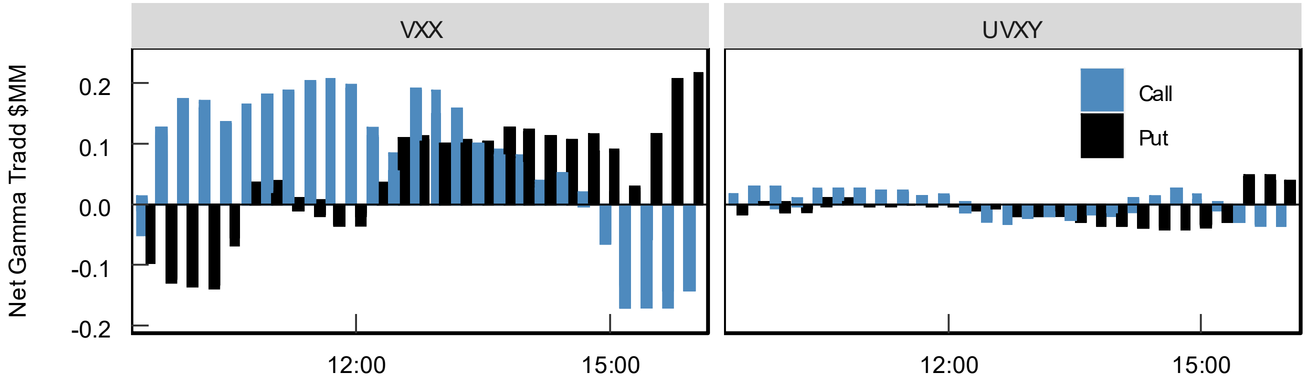
Figure 4: Gamma order flow on 2022-03-14



Source: J.P. Morgan

- Subsequently, the option activity largely returned to normal. In fact we estimate VXX call options to be net sold (with much of the Mar-18 expiry calls unwound), and put options net bought as of EOD Mar-15, as seen in Figure 5.

Figure 5: Gamma order flow on 2022-03-15



Source: J.P. Morgan

Big Data, AI and High Frequency Strategies

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Put Sale: Investors who sell put options will own the underlying asset if the asset's price falls below the strike price of the put option. Investors, therefore, will be exposed to any decline in the underlying asset's price below the strike potentially to zero, and they will not participate in any price appreciation in the underlying asset if the option expires unexercised.

Call Sale: Investors who sell uncovered call options have exposure on the upside that is theoretically unlimited.

Call Overwrite or Buywrite: Investors who sell call options against a long position in the underlying asset give up any appreciation in the underlying asset's price above the strike price of the call option, and they remain exposed to the downside of the underlying asset in the return for the receipt of the option premium.

Booster : In a sell-off, the maximum realized downside potential of a double-up booster is the net premium paid. In a rally, option losses are potentially unlimited as the investor is net short a call. When overlaid onto a long position in the underlying asset, upside losses are capped (as for a covered call), but downside losses are not.

Collar: Locks in the amount that can be realized at maturity to a range defined by the put and call strike. If the collar is not costless, investors risk losing 100% of the premium paid. Since investors are selling a call option, they give up any price appreciation in the underlying asset above the strike price of the call option.

Call Purchase: Options are a decaying asset, and investors risk losing 100% of the premium paid if the underlying asset's price is below the strike price of the call option.

Put Purchase: Options are a decaying asset, and investors risk losing 100% of the premium paid if the underlying asset's price is above the strike price of the put option.

Straddle or Strangle: The seller of a straddle or strangle is exposed to increases in the underlying asset's price above the call strike and declines in the underlying asset's price below the put strike. Since exposure on the upside is theoretically unlimited, investors who also own the underlying asset would have limited losses should the underlying asset rally. Covered writers are exposed to declines in the underlying asset position as well as any additional exposure should the underlying asset decline below the strike price of the put option. Having sold a covered call option, the investor gives up all appreciation in the underlying asset above the strike price of the call option.

Put Spread: The buyer of a put spread risks losing 100% of the premium paid. The buyer of higher-ratio put spread has unlimited downside below the lower strike (down to zero), dependent on the number of lower-struck puts sold. The maximum gain is limited to the spread between the two put strikes, when the underlying is at the lower strike. Investors who own the underlying asset will have downside protection between the higher-strike put and the lower-strike put. However, should the underlying asset's price fall below the strike price of the lower-strike put, investors regain exposure to the underlying asset, and this exposure is multiplied by the number of puts sold.

Call Spread: The buyer risks losing 100% of the premium paid. The gain is limited to the spread between the two strike prices. The seller of a call spread risks losing an amount equal to the spread between the two call strikes less the net premium received. By selling a covered call spread, the investor remains exposed to the downside of the underlying asset and gives up the spread between the two call strikes should the underlying asset rally.

Butterfly Spread: A butterfly spread consists of two spreads established simultaneously – one a bull spread and the other a bear spread. The resulting position is neutral, that is, the investor will profit if the underlying is stable. Butterfly spreads are established at a net debit. The maximum profit will occur at the middle strike price; the maximum loss is the net debit.

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