Opinion **FT Alphaville**

Vix settlement weirdness

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News comes our way of there being some concern in the market about the Vix settlement process.

In one phrase: It's off.

That is to say, it is not settling as it ought to.

According to the CBOE, the settlement process is as follows:

> "The Final Settlement Price for VIX Futures is determined from a Special Opening Quotation (SOQ) of VIX. The SOQ is calculated from the sequence of opening prices of the SPX options used to calculate the VIX index on the settlement date (the "Constituent Options"). The opening prices for SPX options used in calculating the SOQ are determined through an automated auction mechanism ("Hybrid Opening System" or "HOSS") that matches buy and sell orders residing on the Electronic Order Book prior to the opening of trading. If there is no opening price for a Constituent Option, the average of that option's bid price and ask price as determined at the opening of trading is used instead. The settlement date for VIX futures is the Wednesday that is thirty days prior to the third Friday of the calendar month immediately following the month in which the contract expires ("Final Settlement Date"). The VIX White Paper provides specific information on the VIX calculation."

Which sounds pretty simple.

On the day of expiry the future is priced for settlement at whatever the opening price is for the set of SPX options currently determining the Vix. In the event there is no opening price, the average of that option's bid and ask is used instead. It's called the Special Opening Quotation (SOQ) process.

Logically speaking, that suggests wherever the futures may have been trading prior to the settlement, they must and should converge to that opening price on settlement.

Yet this is not what's happening.

At this Wednesday's settlement, for example, the Vix opened at 17.56, traded *no higher* than 17.68, yet the Vix futures contract settled at 18.02. Which, of course, is above the day's trading range.

According to Vix futures traders, this is not the only time the settlement has been out of the range of where the VIX has traded during the open, and/or for that matter the entire day.

The problem is, we are told, that while the Vix is calculated from a range of opening prices, the fact that so many are out-of-the-money options means the SOQ can be driven by pure supply and demand of bid/ask spreads of SPX options at the pre-open.

This means, theoretically, that a flood of bid or asks — that are never executed — might be able to sway the SOQ one way or the other. So a little bit like banging the open.

Up to one out of every five settlements has on average disconnected from actual Vix pricing in this way through the life of the Vix futures, we are told. The effects of this are far ranging, because the settlement price doesn't only determine where the Vix future expires but also where options are priced.

Of course, it's not necessarily down to anything sinister. It could be something as simple as a design flaw in the settlement process. But one thing we *do know* is that Vix traders are becoming increasingly unimpressed and frustrated by the flaw.

As Chris McKhann over at Optionsmonster noted this week:

> The VIX futures settled today at 18.02, which is the level that the options will be priced on. **This is a clear demonstration of what I said yesterday on InsideOptions about the settlement getting gamed,** as the highest level for the spot VIX this morning was 17.68. The difference is the result of the VIX being calculated from the midpoint of the bid/ask for S&P 500 options while settlement comes from the actual traded prices. On most instruments that wouldn't be that big a difference, but the bid/ask spread in the SPX can be quite wide.

Interestingly, it's not a dissimilar similar criticism to that of some of the settlement practices used in the energy commodities business, an area the G20′s global securities watchdog the International Organisation of Securities Commissions (IOSCO) is currently investigating.

Either way, we'll be interested to hear what the CBOE makes of the critique.

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