What Is VIX

Everestia LLC, September 2022

Disclaimer

This short note is for informational and educational purposes only. It should not be considered as investment advice.

It Is in The News

If you read watch market TV, like CNBC, Bloomberg, you have seen and heard of VIX. It is displayed by all financial news network along with DJ, SP500, Nasdaq constantly and discussed continuously throughout the day, especially during market stress. This note outlines some basic information on VIX, as an indicator of market direction and how VIX would be traded.

VIX is defined by CBOE as follows [1]:

The VIX Index is a financial benchmark designed to be an up-to-the-minute market estimate of expected volatility of the S&P 500 Index, and is calculated by using the midpoint of real-time S&P 500® Index (SPX) option bid/ask quotes. More specifically, the VIX Index is intended to provide an instantaneous measure of how much the market thinks the S&P 500 Index will fluctuate in the 30 days from the time of each tick of the VIX Index.

(I must confess that it is my goal to process all those information on the CBOE website on Volatility, products, strategies, research papers, data.)

A “scientific way”

VIX is a measure of “aggregate” implied volatility of SP500. It is often referred as Fear Gauge of the market. During market stress, people buy more options to hedge the downside risk, which drives up the options price and the implied volatility.

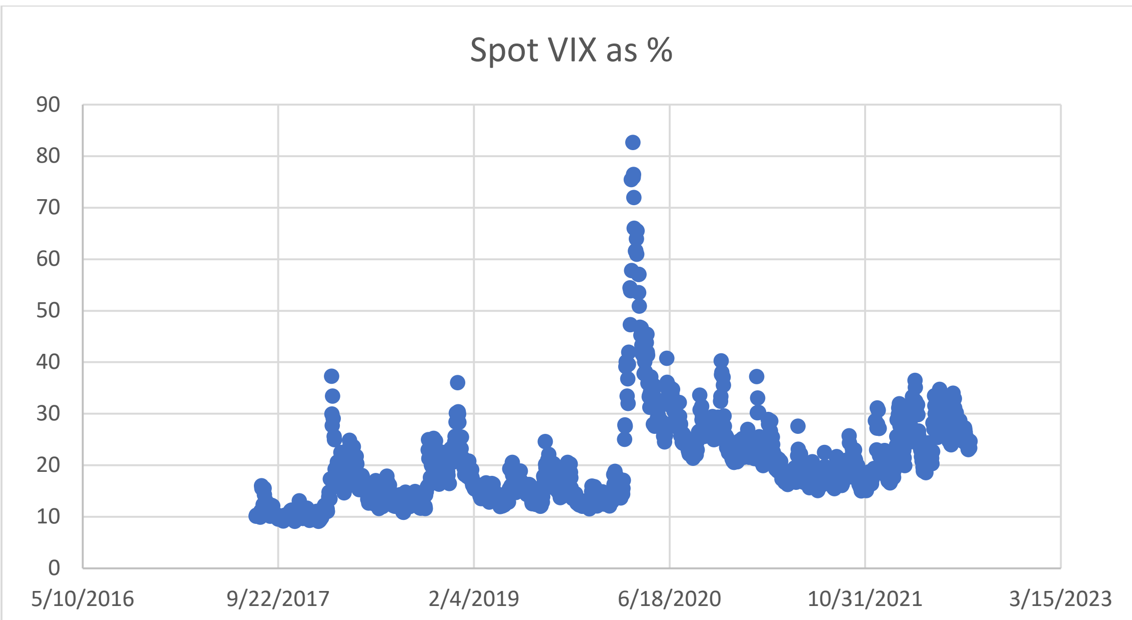
Over the years, VIX ranges from 12% (or lower) in a clam market to upwards of 40% (or higher) in a stress market. The implied volatility is commonly modeled as a surface with two dimensions, maturity and moneyness. VIX aggregates the information in the near end of the surface in a scientific way to a single scalar.

VIX is calculated as weighted price of the out of money call and puts, across the moneyness at the maturity of a month. The mathematical background of the definition is shown by Carr and Wu Paper [2]. (I must confess that it is my goal to understand all those mathematics someday.)

VIX as an indicator

Below (Figure 1) is the historical spot VIX of past 5 years. It is evident that VIX captures the market sentiment. The peak at 80 happened during COVID-19. Compare to SP500, VIX is more volatile (Volatility of Volatility). It tends to move back to the average levels (Mean Reversion), and it tends to be range bound.

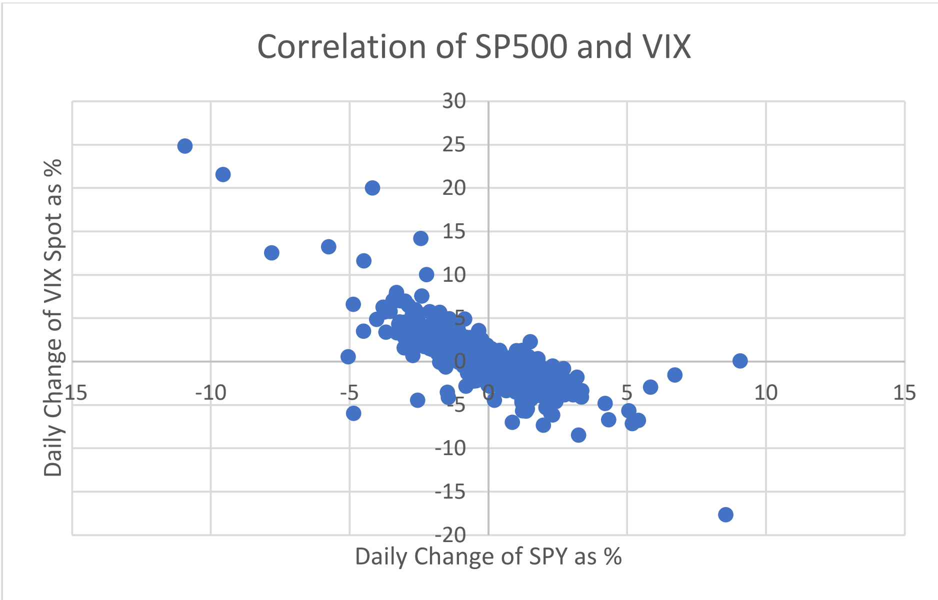
Figure 1: Spot VIX of Past 5 Years



Source: Everestia

VIX moves inversely with SP500, with negative correlation of roughly -80%.

Figure 2: Daily % Change of SP500 vs Daily change of Spot VIX



Source: Everestia

Everestia believes VIX is generally a leading indicator of the market direction. It moves before the market moves as the professional options traders digest the news and events. The correlation is the strongest in the early of the stress cycle and the correlation decreased as the cycle matures.

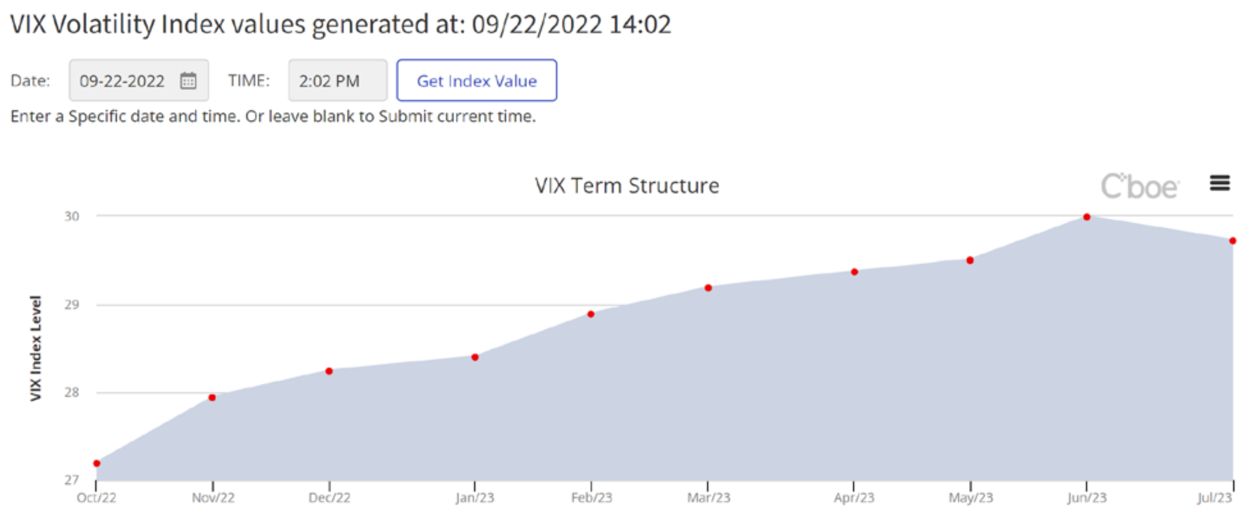
Please look for the upcoming Everestia's white paper on time series analysis and unsupervised machine learning / cluster analysis of the VIX and SP500 relationship.

VIX and Everestia's Strategy

Moves of SP500 and moves of VIX are highly correlated as shown above. There are 1 out of 5 days that SP500 and VIX moves in differently. Understanding the indication of these "out of order" days is one of the core competencies of Everestia.

The spot VIX cannot be traded. However, there is a very active futures market with 10 tenures, the VIX future curve.

Figure 3 VIX Term Structure Example



Source: CBOE

Movements in different sections of the VIX future curve is also very indicative of the market direction in next a few days, and maturity of the stress cycle.

Theta effect and mean reservation effect of VIX futures is the underlying foundation of Everestia's strategy.

Reference

[1] Peter Carr Liuren Wu, A tale of two indices, [vix04.dvi (nyu.edu)]

[2] CBOE, https://www.cboe.com/tradable_products/vix/faqs/