SFI Volatility Exchange Traded Products OHLC Backtest data Readme Notes

Notes	
1	Email support is available at vh2solutions@gmail.com and phone support at 970-430-6092.
2	**The Data** The open/high/low/close (OHLC) indicative values (IV) data from 29-March-2004 through 25-Oct-2013 for the various Exchange Traded Products (ETPs) (VXX, VIXY, UVYX, TVIX, XIV, SXVY) are provided in different sheets. The "OHL indexes" sheet provides the master data & indexes used to generate the open/high/low values. Simulated open / high / low values are based on the closing indicative value for the ETP for the previous trading day plus adjusting factors from the underlying short term VIX futures.
3	**Accuracy of Opening IV values** Using the VIX futures opening values for computing the ETP opening IV values has a known source of potential errors since 10-Dec-2010. Starting then the opening times for the underlying VIX futures have been different than the opening times for the volatility ETPs. History: 1. 26-Mar-2004 through 9-Dec-2010 VIX futures opened at 9:30AM ET (coincident with NYSE) 2. 10-Dec-2010 through 22-Sep-2011 VIX futures opened at 8:20AM ET 3. 23-Sep-2011 through 25-Oct-2013 VIX futures opened at 8:00AM ET 4. 28-Oct-2013 through 21-June-2014 VIX futures opened at 8:00AM ET Monday and 3:30PM for Tuesday through Friday trading days. Tuesday open for example would be at 4:30PM Monday ET. This change was a preliminary move to support nearly 24 hour VIX futures trading. The VIX futures closed again at 5:15PM ET on Monday through Thursday. 5. 22-June-2014 through present VIX futures trading opens at 6PM Sunday ET (Monday's "opening" time and 4:30PM Monday through Thursday. I verified with the CBOE that the available historical opening values for VIX futures followed these changes. From 10-Dec-2010 until 28-Oct-2013 the opening was 70 minutes to 90 minutes before NYSE trading started and after 28-Oct-2013 many hours before the NYSE open. The errors introduced in the Dec 2010 to Oct 2013 timeframe apear to be in the +-3% range. See http://sixfigureinvesting.com/2014/09/simulating-open-high-low-vxx-vixy-tvix-uvxy-xiv-svxy/ for more details.
4	**Accuracy of High / Low IV values** Using the VIX futures high / low values for computing ETP high / low values has several potential error sources. One source of errors is the inherent (and required) assumption made in my calculations that the M1 and M2 VIX futures reach their daily highs and lows at the same time. The other known source of errors were the shifts in trading hours for VIX futures detailed in the "Accuracy of Opening IV Values" section above. VIX futures have been trading 70 to 90 minutes outside the standard NYSE hours since 2010 and in June 2014 went to nearly 24 hour trading. Comparison to a small set of actual high / low IV values suggests the magnitude of these errors is in the +-3% range. See http://sixfigureinvesting.com/2014/09/simulating-open-high-low-vxx-vixy-tvix-uvxy-xiv-svxy/ for more details. One additional source of errors is the fact that closing futures quotes can be different from settlement quotes. The tracking indexes for ETPs use settlement values, but if the low or high for the day is at or near to the close, it's possible for the computed ETP close to be higher than the daily high, or lower than the daily low. To prevent this anomaly inappropriate highs or lows are mapped to the ETP close values.

5	**Comparison to Actual Trading Open / High / Low values to IV values** There are quite a few reasons why IV values might not align exactly to traded open/high/low/ close values. Specifically: 1. The ETP may not have traded at the official open / close or the high / low points 2. ETPs have bid / ask spreads--which often, but not always straddle the IV value. If the ETP has tracking issues (e.g., TVIX) then the IV may be signicantly different than the bid / ask prices. Some volatility ETP have spreads that are quite wide. 3. EPT closing IV values are based on a 4:15PM ET closing time coincident with the close of VIX futures trading. Reported trading close values usually reflect a 4:00PM ET closing time. See this post for more details.
6	**OHL Indexes sheet column descriptions** * Trade Date: Days when funds were trading. * M1-M2 M: Standard short term total returns index (very close to SPVXTR) * M1-M2 O: M1-M2 M index adjusted by weighted changes in M1 & M2 futures from settlement values to open value. Weighting is adjusted at close, so weighting between the futures is the same for open, high, and low as it was at close the previous day. * M1-M2 H: M1-M2 M index adjusted by weighted changes in M1 & M2 futures from settlement values to high values. M1-M2 L: M1-M2 M index adjusted by weighted changes in M1 & M2 futures from settlement values to low values.
7	* The algorithms used to generate the M1-M2 M backtest values from 20-December-2005 are published in the prospectuses of the ETN/ETFs that use them. Barlcay's VXX fund prospectus is a good example: (http://www.ipathetn.com/static/pdf/vix-prospectus.pdf)
8	* In the period from 26-Mar-2004 to 19-Dec-2005 there were some periods where there is no front month (M1) VIX futures data. I adapted the extrapolation approach specified in the prospectuses to generate the missing M1 data.
9	The futures data used to generate these values was downloaded from the CBOE website (http://www.cboe.com/). I created a master spreadsheet that integrated their 100+ spreadsheets into a single integrated sheet that made the creation of these a reasonable exercise. See http://sixfigureinvesting.com/2010/12/volatility-futures-worksheet/ for more information.
10	The M1-M2 M rolling index used to generate the backtest values doesn't exactly match the official index (SPVXSTR) that begin December 20th, 2005, but when I compare my results to samples freely available on Bloomberg my results track within: +-0.01% from Feb 07 on, +-.2% before that.
11	Revision History * Rev D: Fixed some VIX Future interpolation errors in early 2004 changed the mid term index values by around 2% * Rev E: Added open / high / low data * Rev E1: Added ZIV and VXZ and fixed errors where reported high or low futures values looked inappropriate. Interpolated futures values were used instead in those cases. * Rev E2: Indexes adjusted so that daily highs are >= close and daily lows <= close values * Rev E3: Fixed SVXY close calculation to use the correct annual fee
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