Defined Risk Volatility Income Index Methodology

Jan 2023

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Introduction

Index Objective

The Defined Risk Volatility Income Index seeks to allocate a notional portfolio between a risk premium component and an income component. It tracks the performance of a multi-asset investment in a bear call VIX spread covered by a cash allocation and Treasury notes.

Highlights

The Defined Risk Volatility Income Index allocates a fixed 100 million notional portfolio across a risk premium component and an income component. The risk premium component consists of a VIX bear call spread (paired VIX short and long call options) against 20% of the portfolio notional value covered by a matching 20 % cash allocation. The income component consists of a portfolio of 10-year US Treasuries Notes against the sum of 80% of the portfolio notional value and the option spread premium. The treasuries have maturities between 5 to 10 years.

The short call option is expected to be at the money at the time of expiration as its strike is based on the VIX futures curve with the same expiry date.

The index portfolio and its allocations are reset to the original allocations when the options expire. To support the new allocations and to create a laddered treasury portfolio, new on the run treasuries are purchased and treasuries with the lowest maturities are sold as needed. Additionally, treasuries with maturities less than 5 years are sold.

Supporting Documents

This methodology is meant to be read in conjunction with supporting documents providing greater detail with respect to the policies, procedures and calculations described herein.

The list of the main supplemental documents for this methodology can be found in the Methodologies and Governance tabs on the Index Resources page as follows:

Supporting Documents
Index Maintenance Policy
Index Governance
Index Policies
Methodology Policies
Glossary
Index Change and Consultation Policy

Index Construction

Constituents

The Defined Risk Volatility Income Index is comprised of three components:

1. Bear call spread represented by the pair of short and long call options on VIX.
2. Fixed Income, represented by a ladder structure of 10-year US Treasury notes
3. Cash

Allocations

Step 1: Select Call options on VIX

On a selection day, s, based on a VIX futures curve, identify a futures contract that expires around 45 calendar days after s, denoted by e. with volatility, denoted by v. Select a monthly short call option that expires on e with a strike, ss, closest to v. Next, select a monthly long call option that expires on e with a strike equal to 3 volatility points higher than ss., denoted by els. If the call with strike els is not available, select the call with strike closest to els, denoted by ls. The price of short call is denoted by scp and the price of a long call is denoted by lcp.

Step 2: Determine the Number of Option Contracts

On a weight day, determine the number of option contracts as follows.

- Assume a notional portfolio (NP) of USD 100 million after the close of weight date.
- Assume an option exposure percentage, OPP = 0.2
- OPP of the notional portfolio is exposed to the option spread. (OPS). (USD 20 million)
- Determine the number of option contracts, NC as follows.
  Option exposure per contract (OE) = (ls-ss) *100
  NC = OPS/OE
- The strategy holds NC pairs of short and long VIX call option contracts.
- Net Premium per contract (NP) = (scp-lcp) *100
- Option Proceeds (OP) = NP * NC

Step 3: Cash settle the options from the previous settlement date

- On a settlement day, w, use the AM settled level of VRO index, vros, as a basis to determine the option settlement amount, arising from the previous option positions.
  - Short Option Loss = NC*100*min(ss-vros,0)
  - Long Option Gain = NC*100*max(vros-ls,0)
- Option Settlement (OS)= Short Option Loss + Long Option Gain

Step 4 Invest the notional bond amount and premium into a bond portfolio

On a weight day, w, calculate the bond market cap as follows.

- The notional portfolio size is reset to USD 100 million.
- (1-OPP) of the notional portfolio is allocated to the bond portfolio (BP). (USD 80 million)
- Add the Option Proceeds (OP) to the bond portfolio.
- Total amount for bond allocation (TBA)= BP + OP
- The maturities of the notes will vary from 5-10 years. If maturity of a note falls below 5 years the note will be sold.[1]
- Compare TBA with the current bond portfolio size, CBS
- If TBA> CBS
    - Invest TBA into on-the-run 10-year US treasury notes. [2]
- If TBA < CBS
    - Sell treasury notes with the shortest maturity till the new bond portfolio size equals TBA.
- The amount exposed to the option spread, OPS, is left in cash. (USD 20 million)
- Calculate the new divisor, d, to reflect the change in market cap.

Total Return (TR) Calculations

On a daily basis, the index reflects the net combined effect of the following:

- Appreciation or depreciation arising from the price changes and coupon payments of the bond portfolio.
- Unrealized returns arising from the changes in the market prices of call options. (OPL)
- Cash

On any business day, t, other than the settlement day, market cap is calculated as follows.

Current Bond Portfolio Size: $(CBS)_t = \sum_{i=1}^{n} bu_{i,t} * \ dp_{i,t}$ (1)

Where:

$bu_{i,t}$= number of units of bonds i on day t
$dp_{i,t}$= dirty price of bond i on day t

n = total number of bonds in a portfolios

Hypothetical cost of liquidating the options:$(CLO)_t = (lcp - scp)_t * NC_t * 100$ (2)

Where:

[1] Prior to May 15, 2011 the bond portfolio invests into 10 year US Treasuries that have maturity between 5-10 years and are equally weighted

[2] 10 year on the run treasuries that are issued in May and November are selected.

lcp = price of long call option on day t
scp = price of short call option on day t
NC = number of option contracts (pairs) on day t

$$(Cash)_t = \sum_{i=1}^{n} bc_{i,t} + OPS \quad (3)$$

Where:

$bc_{i,t}$= coupon received on bond i on day t
OPS = Option Spread

n = total number of bonds in a portfolios

$$Market\ Cap_t = (CBS)_t + (CLO)_t + (Cash)_t \quad (4)$$

On a settlement day, w, option loss (if any) is added to the bond market cap

$$Market\ Cap_t = (CBS)_t + (OS)_t + (Cash)_t \quad (5)$$

$$TR_t = \frac{Market\ Cap_t}{div_t} \quad (6)$$

Where

div_t = divisor on day t

Base Date and History Availability

Index history availability, base dates and base values are shown in the table below.

Index	Launch Date	Base Date	Base Value
DRVIX (Total Return)	01/27/2023	06/01/2007	1000

Index Governance

The index is governed and managed by a VettaFi Index Committee for the purpose of meeting the goals of the index. For more information, please refer to the Index Committee charter.

Index Policy

Announcements

Announcements of the daily index values are made each day, after the close of US equity markets and the Cboe Futures Exchange.

Holiday Schedule

The index is calculated daily when CBOE is open for options trading.

Contact Information

For any questions regarding an index, please contact: indexgovernance@vettafi.com

Jan 2023

Disclaimer