



SWAN Indices Methodology

- The S-Network BlackSwan Core Index (SWANXT)
- The S-Network International BlackSwan Index (ISWNXT)
- The S-Network BlackSwan Tech & Treasury Index (QSWNXT)

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Introduction

Index Objective

The S-Network SWAN indices seek to realize capital appreciation in line with the performance of underlying ETF while avoiding substantial capital drawdowns.

Index Family

The S-Network SWAN indices are:

- The S-Network BlackSwan Core Index (SWANXT)
- The S-Network International BlackSwan Index (ISWNXT)
- The S-Network BlackSwan Tech & Treasury Index (QSWNXT)

Highlights

The SWAN indices allocate a fixed 100 million notional portfolio across an option component and a bond ladder treasury component. The option component consists of a long-dated call options (LEAPs) on the underlying ETF against 10% of the portfolio notional value. The bond component consists of a portfolio of 10-year US Treasuries Notes against the 90% of the portfolio notional value. The treasuries have maturities between 5 to 10 years.

The options component holds 5% of the notional value in June 70 Delta call option and 5% of the notional value in Dec 70 Delta call option at the start of the strategy. The percentage of options varies subsequently as only one relevant option is reset to 5% and non-traded option component is not reset to 5% at each rebalance.

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 ladder 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

Each index in the SWAN family of indices is comprised of two components:

1. June 70 Delta LEAPs call option and December 70 Delta LEAPs call option
2. Fixed Income, represented by a ladder structure of 10-year US Treasury notes

Index	ETF
The S-Network BlackSwan Core Index	SPY
The S-Network International BlackSwan Index	EFA
The S-Network BlackSwan Tech & Treasury Index (QSWNXT)	QQQ

Dates

Selection Date: 1st business day of June and December

Rebalance Effective Date:

Opening of the 4th business day of rebalancing month of the options are at a net loss.

Opening of the one year plus one day from the previous rebalancing effective date if options are at a net gain. If the one-year-plus-one-day mark occurs on the Wednesday or after of the expiration week, the index will reconstitute on the 4th business day of the reconstitution month regardless of gain/loss on the option.

Weight Date: Two business days prior to the rebalancing effective date

Allocations

Step 1: Select LEAPs Call options on underlying ETF

On a selection day, s , determine the select a 70-delta call option that expires in following June (Dec) with at least 1 year plus 1 day until expiration. Otherwise, the contract with the furthest expiration is selected for a given month. If a 70-delta call option is not available, the closest option above 70 will be selected. On any given rebalance day, the weight of the non-traded tranche of options remains

the same, denoted by w_o . The mid-price of the selected option is denoted by p_n while the price of the non-traded option is denoted by p_o .

Step 2: Determine the Number of Option Contracts

On a weight day, w determines 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 of a new option for a rebalance month, $OEP_n = 0.05$
- OEP_n of the notional portfolio is exposed to the LEAPS option (USD 5 million)
- An option exposure percentage of a non-traded option for a rebalance month is w_o .
- Exposure of non-traded tranche, $OENTT = USD\ w_o * 100,000,000$
- Total options exposure, $TOE = USD\ (5,000,000 + OENNT)$
- Determine the number of option contracts as follows.

Number of contracts for the new option, $NC_n = 5,000,000/p_n$

Number of contracts for the non-traded option, $NC_o = OENTT / p_o$

Step 3: Settle the options from the previous settlement date

- On a selection day s , determine if the previous option position is at a gain or loss.
- On a weight day, w , settle the previous option position, based on the rebalancing month.
- Net gains or losses derived from the reconstitutions of the LEAP call option position will be added to or subtracted from the treasury portfolio at each reconstitution.

Step 4 Determine new bond allocation

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

- The notional portfolio size is reset to USD 100 million.
- Total Bond Allocation, $TBA = USD\ (100\ \text{million} - TOE)$ of the notional portfolio is allocated to the bond portfolio.
- Bond portfolio is equally weighted and is invested into 10 year US Treasuries that have maturity between 5-10 years
- Calculate the new divisor, div_t , 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)

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

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

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

If there are any coupon payments on or before t, after the most recent rebalance, market cap for cash account is calculated as follows.

$$\text{Current Cash Size: } (CCS)_t = \sum_{i=1}^n bu_{i,t} * cp_{i,t} \quad (2)$$

Where:

$cp_{i,t}$ = coupon payment of bond i on or before day t and after the most recent rebalance

$$\text{Options Portfolio: } (CLO)_t = (jcp * NCj + dcp * NCd)_t * 100 \quad (3)$$

Where:

jcp = price of June call option on day t

dcp = price of December call option on day t

NCj = number of June option contracts on day t

NCd = number of December option contracts on day t

$$\text{Market Cap}_t = (CBS)_t + (CCS)_t + (CLO)_t \quad (4)$$

Option gains or losses on the reconstitution date are added to or taken from treasuries as needed in order for allocations to meet index requirements.

$$TR_t = \frac{\text{Market Cap}_t}{div_t} \quad (5)$$

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
SWANXT– Total Return	10/17/2018	06/01/2007	1000
ISWNXT – Total Return	6/5/2020	12/05/2006	1000
QSWNXT – Total Return	6/7/2021	06/07/2021	1000

Index Calculation

Please refer to the Index Maintenance Policy document for information on index calculations.

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 Governance document.

Index Policies

Please refer to the Index Policies document for information regarding Announcements, Holiday Schedules, Unexpected Exchange Closures, and Recalculation Policy.

Contact Information

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

Appendix

Effective Date	Previous	New
Jun 1, 2023	The treasury portion of the portfolio replicates and maintains the initial duration of the 10Year US Treasury	Treasury portion is a laddered portfolio invested into 10 year US Treasuries that have maturity between 5-10 years

Disclaimer

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