

**S&P 500 Dynamic VIX  
Futures Index  
*Methodology***

May 2017

# Table of Contents

Introduction	2
<b>Highlights</b>	<b>2</b>
<b>Family</b>	<b>2</b>
Index Construction	3
<b>Constituents</b>	<b>3</b>
<b>Allocations</b>	<b>3</b>
<b>Excess Return (ER) Calculations</b>	<b>4</b>
<b>Total Return (TR) Calculations</b>	<b>5</b>
<b>Base Date</b>	<b>5</b>
Index Governance	6
<b>Index Committee</b>	<b>6</b>
Index Policy	7
<b>Announcements</b>	<b>7</b>
<b>Holiday Schedule</b>	<b>7</b>
Index Dissemination	8
<b>Tickers</b>	<b>8</b>
<b>FTP</b>	<b>8</b>
<b>Web site</b>	<b>8</b>
S&P Dow Jones Indices' Contact Information	9
<b>Index Management</b>	<b>9</b>
<b>Product Management</b>	<b>9</b>
<b>Media Relations</b>	<b>9</b>
<b>Client Services</b>	<b>9</b>
Disclaimer	10

# Introduction

The S&P 500 Dynamic VIX Futures Index series dynamically allocates between the short-term and mid-term VIX futures indices excess return to provide cost efficient exposure to forward implied volatility. The following indices are included in the series:

- The S&P 500 VIX Short-Term Futures Index Excess Return
- The S&P 500 VIX Mid-Term Futures Index Excess Return

## Highlights

Implied equity volatility has historically had a strongly negative correlation to equity market returns and is considered a useful tool to hedge against the potential downside of the broad equity market. The S&P 500 VIX Futures Indices model the outcome of holding long positions in VIX futures contracts that maintain constant maturity. Exchange traded products based on these indices provide convenient access to implied volatility.

*For more information on the S&P 500 VIX Futures Indices, please refer to S&P 500 VIX Futures Index methodology document located on our Web site, [www.spdji.com](http://www.spdji.com).*

The S&P 500 Dynamic VIX Futures Index monitors the steepness of the implied volatility curve to provide information about future expectations of market volatility and the expected roll cost of VIX futures investments. The index dynamically allocates between positions across the VIX futures curve aiming to lower the holding cost of investments linked to forward implied volatility.

The allocations are evaluated daily, though changes in allocation may occur less frequently.

## Family

The S&P 500 Dynamic VIX Futures Index series belongs to the family of S&P 500 volatility linked indices which includes, among others, VIX<sup>®1</sup> (Chicago Board Options Exchange Volatility Index), the S&P 500 Volatility Arbitrage Index and the S&P 500 VIX Futures Index Series.

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of each index governed by this methodology document. Any changes to or deviations from this methodology are made in the sole judgment and discretion of S&P Dow Jones Indices so that the index continues to achieve its objective.

---

<sup>1</sup> VIX<sup>®</sup> is a registered trademark of Chicago Board Options Exchange, Incorporated. The VIX methodology is the property of the Chicago Board Options Exchange ("CBOE").

# Index Construction

## Constituents

The S&P 500 Dynamic VIX Futures Index is comprised of two components:

1. Short-term volatility, represented by the S&P 500 VIX Short-Term Futures Index Excess Return
2. Mid-term volatility, represented by the S&P 500 VIX Mid-Term Futures Index Excess Return

## Allocations

On any business day,  $t$ , the S&P 500 Dynamic VIX Futures Index allocates between the short-term and mid-term volatility based on of the implied volatility term structure variable ( $IVTS$ ). While the allocations are reviewed daily, they may change on a less frequent basis.

The target allocations to the short-term volatility ( $TS$ ) and the mid-term volatility ( $TM$ ) are determined by the implied volatility term structure ( $IVTS$ ) and implied volatility trend ( $IVT$ ) as follows:

Implied Volatility Term Structure ( $IVTS_{t-1}$ )	Target Short-Term Volatility Allocation ( $TS_t$ )	Target Mid-Term Volatility Allocation ( $TM_t$ )
Less than 90%	-0.30	0.70
$90\% \leq IVTS_{t-1} < 100\%$	-0.20	0.80
$100\% \leq IVTS_{t-1} < 105\%$	0	1.00
$105\% \leq IVTS_{t-1} \leq 115\%$	0.25	0.75
More than 115%	0.50	0.50

The S&P 500 Dynamic VIX Futures Index limits the size of changes to its daily allocation rebalancing. The Short-Term and Mid-Term Volatility Allocations ( $S_t$  and  $M_t$ , respectively) are determined as follows:

$$\begin{aligned}
 S_t &= \begin{cases} S_{t-1} \dots \text{if} \dots S_{t-1} = TS_t \\ \min(S_{t-1} + 0.125, TS_t) \dots \text{if} \dots S_{t-1} < TS_t \\ \max(S_{t-1} - 0.125, TS_t) \dots \text{if} \dots S_{t-1} > TS_t \end{cases} \\
 M_t &= \begin{cases} M_{t-1} \dots \text{if} \dots M_{t-1} = TM_t \\ \min(M_{t-1} + 0.125, TM_t) \dots \text{if} \dots M_{t-1} < TM_t \\ \max(M_{t-1} - 0.125, TM_t) \dots \text{if} \dots M_{t-1} > TM_t \end{cases}
 \end{aligned} \tag{1}$$

## Evaluating implied volatility term structure

The implied volatility term structure measures the slope of the VIX futures curve. Let  $IVTS$  denote the implied volatility term structure, where:

$$IVTS_{t-1} = \frac{VIX_{t-1}}{VXV_{t-1}} \quad (2)$$

where:

$VIX_{t-1}$  and  $VXV_{t-1}$  refer to the CBOE Volatility Index ( $VIX$ ) and the CBOE S&P 500 3-Month Volatility Index ( $VXV$ ), respectively.

## Excess Return (ER) Calculations

On any business day,  $t$ , the excess return index levels are calculated. The excess return indices assume no accruals from cash. The S&P 500 Dynamic VIX Futures Index excess return is calculated as follows:

$$IndexER_t = IndexER_{t-1} * (1 + S_{t-1} * SEDR_t + M_{t-1} * MEDR_t) \quad (3)$$

where:

$IndexER_{t-1}$  = The S&P 500 Dynamic VIX Futures Index Excess Return on the preceding business day,  $t-1$

$S_{t-1}$  = Allocation to the S&P 500 VIX Short-Term Futures Index on the prior business day,  $t-1$

$SEDR_t$  = Short-Term Volatility Daily Excess Return, as determined by the following formula:

$$SEDR_t = \frac{SPVXSP_t}{SPVXSP_{t-1}} - 1 \quad (4)$$

where:

$SPVXSP_t$  = The S&P 500 VIX Short-Term Futures Excess Return Index closing level on the current business day,  $t$ .

$M_{t-1}$  = Allocation to the S&P 500 VIX Mid-Term Futures Index on the prior business day,  $t-1$

$MEDR_t$  = Mid-Term Volatility Daily Excess Return, as determined by the following formula:

$$MEDR_t = \frac{SPVXMP_t}{SPVXMP_{t-1}} - 1 \quad (5)$$

where:

$SPVXMP_t$  = The S&P 500 VIX Mid-Term Futures Excess Return Index closing level on the current business day,  $t$ .

## Total Return (TR) Calculations

A total return index is calculated for the S&P 500 Dynamic VIX Futures Index, which includes interest based on the three-month U.S. Treasury rate.

$$IndexTR_t = IndexTR_{t-1} * (1 + S_{t-1} * SEDR_t + M_{t-1} * MEDR_t + TBR_t) \quad (6)$$

where:

$IndexTR_{t-1}$  = The S&P 500 Dynamic VIX Futures Index Total Return on the preceding business day,  $t-1$

$S_{t-1}$  = Allocation to the S&P 500 VIX Short-Term Futures Index on the prior business day,  $t-1$

$SEDR_t$  = Short-Term Volatility Daily Excess Return, as determined by formula (4)

$M_{t-1}$  = Allocation to the S&P 500 VIX Mid-Term Futures Index on the prior business day,  $t-1$

$MEDR_t$  = Mid-Term Volatility Daily Excess Return, as determined by formula (5)

$TBR_t$  = Treasury Bill Return, as determined by the following formula:

$$TBR_t = \left[ \frac{1}{1 - \frac{91}{360} * TBAR_{t-1}} \right]^{\frac{Delta_t}{91}} - 1 \quad (7)$$

$Delta_t$  = the number of calendar days between the current and previous business days.

$TBAR_{t-1}$  = the most recent weekly high discount rate for 91-day US Treasury bills effective on the preceding business day. Generally the rates are announced by the US Treasury on each Monday. On Mondays that are bank holidays, Friday's rates will apply.

## Base Date

The base date for the indices is December 20, 2005 and the base value is 1,000 for both the excess and total return indices.

# Index Governance

## **Index Committee**

The Commodities Index Committee maintains the indices. All members of the Committee are full-time professionals at S&P Dow Jones Indices. The Committee meets quarterly. At each meeting, the Committee reviews any significant market events. In addition, the Committee may revise index policy for timing of rebalancings or other matters.

S&P Dow Jones Indices considers information about changes to its indices and related matters to be potentially market moving and material. Therefore, all Index Committee discussions are confidential.

*For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Commodities Indices Policies & Practices document located on our Web site, [www.spdji.com](http://www.spdji.com).*

# Index Policy

## **Announcements**

Announcements of the daily index values are made after the close of the CBOE Futures Exchange each day.

## **Holiday Schedule**

The index is calculated daily when the S&P 500 VIX Futures Index Series is calculated.

*For information on Calculations and Pricing Disruptions, Expert Judgment, Data Hierarchy, Unexpected Exchange Closures and Error Corrections, please refer to S&P Dow Jones Indices' Commodities Indices Policies & Practices document located on our Web site, [www.spdji.com](http://www.spdji.com).*



# Index Dissemination

Index levels are available through S&P Dow Jones Indices' Web site at [www.spdji.com](http://www.spdji.com), major quote vendors (see codes below), numerous investment-oriented Web sites, and various print and electronic media.

## Tickers

Index	Bloomberg
S&P 500 Dynamic VIX Futures Index ER	SPDVIXE
S&P 500 Dynamic VIX Futures Index TR	SPDVIXT
S&P 500 Dynamic VIX Futures Index ER (Official Close)	SPDVIXP
S&P 500 Dynamic VIX Futures Index TR (Official Close)	SPDVIXTR

## FTP

Index returns and data are available via FTP subscription.

For product information, please contact S&P Dow Jones Indices, [www.spdji.com/contact-us](http://www.spdji.com/contact-us).

## Web site

For further information, please refer to S&P Dow Jones Indices' Web site at [www.spdji.com](http://www.spdji.com).

# S&P Dow Jones Indices' Contact Information

## **Index Management**

David M. Blitzer, Ph.D. – Managing Director & Chairman of the Index Committee  
david.blitzer@spglobal.com +1.212.438.3907

## **Product Management**

Vinit Srivastava – Managing Director  
vinit.srivastava@spglobal.com +1.212.438.4168

## **Media Relations**

Soogyung Jordan – Communications  
soogyung.jordan@spglobal.com +1.212.438.2297

## **Client Services**

[index\\_services@spglobal.com](mailto:index_services@spglobal.com)

# Disclaimer

Copyright © 2017 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved. STANDARD & POOR'S, S&P, SPDR, S&P 500, S&P EUROPE 350, S&P 100, S&P 1000, S&P COMPOSITE 1500, S&P MIDCAP 400, S&P SMALLCAP 600, GIVI, GLOBAL TITANS, S&P RISK CONTROL INDICES, S&P GLOBAL THEMATIC INDICES, S&P TARGET DATE INDICES, S&P TARGET RISK INDICES, DIVIDEND ARISTOCRATS, STARS, GICS, HOUSINGVIEWS, INDEX ALERT, INDEXOLOGY, MARKET ATTRIBUTES, PRACTICE ESSENTIALS, S&P HEALTHCARE MONITOR, SPICE, and SPIVA are registered trademarks of Standard & Poor's Financial Services LLC, a division of S&P Global ("S&P"). DOW JONES, DJ, DJIA and DOW JONES INDUSTRIAL AVERAGE are registered trademarks of Dow Jones Trademark Holdings LLC ("Dow Jones"). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution, reproduction and/or photocopying in whole or in part are prohibited without written permission. This document does not constitute an offer of services in jurisdictions where S&P Dow Jones Indices LLC, Dow Jones, S&P or their respective affiliates (collectively "S&P Dow Jones Indices") do not have the necessary licenses. All information provided by S&P Dow Jones Indices is impersonal and not tailored to the needs of any person, entity or group of persons. S&P Dow Jones Indices receives compensation in connection with licensing its indices to third parties. Past performance of an index is not a guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index is available through investable instruments based on that index. S&P Dow Jones Indices does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P Dow Jones Indices makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor, and S&P Dow Jones Indices makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. Prospective investors are advised to make an investment in any such fund or other vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or other investment product or vehicle. S&P Dow Jones Indices LLC is not a tax advisor. A tax advisor should be consulted to evaluate the impact of any tax-exempt securities on portfolios and the tax consequences of making any particular investment decision. Inclusion of a security within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security, nor is it considered to be investment advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof ("Content") may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P Dow Jones Indices. The Content shall not be used for any unlawful or unauthorized purposes. S&P Dow Jones Indices and its third-party data providers and licensors (collectively "S&P Dow Jones Indices Parties") do not guarantee the accuracy, completeness, timeliness or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN "AS IS" BASIS. S&P DOW JONES INDICES PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY

**SOFTWARE OR HARDWARE CONFIGURATION.** In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

S&P Global keeps certain activities of its various divisions and business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain non-public information received in connection with each analytical process.

In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate or otherwise address.

VIX is a trademark of Chicago Board Options Exchange, Incorporated and has been licensed for use by S&P Dow Jones Indices.