

S&P Dow Jones Indices

A Division of **S&P Global**

INDEX INVESTMENT STRATEGY

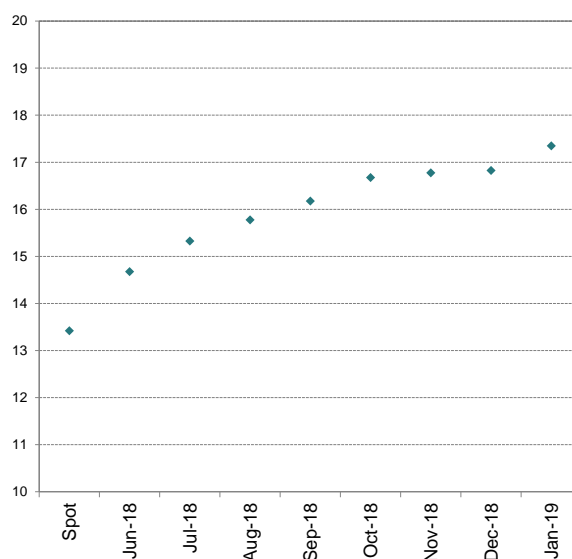
Index Dashboard: Risk & Volatility May 16, 2018

VOLATILITY MEASURES

Implied Volatility Measures	VIX	1m ±	200D Ave	Realized 1Yr
CBOE Volatility Index® (VIX®)	13.42	-2.18	13.74	12.43
CBOE Short-Term Volatility Index (VXST)	12.36	-2.28	13.33	12.43
CBOE 3-month Volatility Index (V3M)	15.14	-1.66	15.30	12.43
CBOE 1-Year Volatility (V1Y)	17.47	-1.03	17.78	12.43
CBOE DJIA Volatility Index (VXD)	14.62	-3.26	14.26	13.16
VSTOXX® (V2X)	13.57	0.53	14.78	10.38
S&P/ASX 200 VIX (A-VIX)	11.34	-0.56	12.69	9.91
S&P/TSX 60 VIX (VIXC)	12.52	0.16	12.93	8.48
HSI Volatility Index (VHSI)	18.11	-0.56	17.43	15.53
CBOE/CME FX Yen Volatility (JYVIX)	7.38	0.19	8.72	7.07
CBOE/CME FX GBP Volatility (BPVIX)	7.90	0.06	8.30	7.81
CBOE/CME FX Euro Volatility (EUVIX)	7.75	1.16	7.53	6.76
CBOE / CBOT 10Yr US Tsy (TYVIX)	4.08	0.42	4.09	3.43
CBOE Interest Rate Swap (SRVIX)	71.95	0.70	71.55	64.25
S&P/JPX JGB VIX® (SPJGB)	1.30	0.05	1.59	1.08
CBOE Gold ETF Volatility Index (GVZ)	11.77	-1.69	12.01	10.05
CBOE Oil ETF Volatility Index (OVX)	25.73	-3.69	26.24	24.43
CBOE VIX of VIX (VVIX)	94.79	2.38	101.40	152.49
Investable Volatility	1m ±	YTD	12m ±	
S&P Daily Inverse Short-Term VIX	12.94%	-95.16%	-92.12%	
S&P 500 Dynamic VEQTOR Index	1.12%	4.93%	16.08%	
S&P 500 Stock Covered Call Index	0.76%	1.72%	11.59%	
CBOE S&P 500 Buy-write Index	0.42%	1.69%	8.97%	
S&P 500 VEQTOR Switch Index	-1.39%	-1.66%	11.11%	
S&P Dynamic VIX Index	-2.12%	-16.15%	-24.93%	
S&P VIX Mid-Term Futures Index	-7.88%	7.38%	-23.16%	
S&P VIX Short-Term Futures Index	-12.68%	27.18%	-33.99%	
S&P 500	0.68%	2.56%	15.64%	

HEDGING COSTS

VIX Futures Term Structure



VIX Futures Indices Roll Costs (Monthly)

Short-term futures	4.43%
Mid-term futures	1.30%

REALIZED MEASURES

S&P 500 Correlations (Month-end)	1 Year	3 Year	10 Year
S&P Europe 350	0.80	0.80	0.89
S&P 500 Bond	0.18	0.28	0.36
S&P GSCI Commodity	0.47	0.23	0.57
U.S. Dollar Index	-0.53	-0.12	-0.55
S&P 500 Single Stocks	21-Day	12M Ave	3Y Ave
Dispersion (annualized)	21.47%	19.28%	19.12%
Volatility (annualized)	23.88%	20.80%	21.35%
Correlation (pairwise)	0.18	0.22	0.26

COMMENTARY

- VIX closed last night at 13.42, down 2.18 from our last report. As 10-year U.S. Treasury yields broke through the 3% barrier, fears that the equity markets would collapse in response proved unfounded. While dividend-paying stocks sold off, the S&P 500's recent leaders - mainly those names with growth, high-momentum and high-beta characteristics - continued to push higher, propping up the benchmark's returns.
- In other words, the lower volatility in U.S. equity benchmarks was due more to a decline in correlations, than a decline in the volatility of individual stocks. The average 21-day annualized volatility of S&P 500 constituents currently stands at 23.88%; well above its trailing average for the past one and three years.
- European equity volatility has ticked up a little, primarily due uncertainty over the political direction Italy will take under the likely emergence of a populist, Eurosceptic government. Euro implied volatility was one of the largest gainers over the past month; last night's close of 7.75 was the highest so far this quarter.
- The strong positive momentum in crude oil prices continued; spot prices have risen by more than 5% in eight of the last ten months and - as things currently stand - May looks set to make that nine from eleven. The OVX volatility index showed the largest absolute decline from our last report; down 3.69 to close yesterday at 25.73.

Sources: S&P Dow Jones Indices LLC and/or its affiliates, Cboe, U.S. Federal Reserve (Dollar index and 10Yr Swap Rate), all as of May 16, 2018. **Volatility measures:** respective VIX and changes in those levels April 18, to May 16, 2018. 200D Average is the moving average based on trading days, colour coded by whether current respective VIX is above or below average. 1 year realized volatility calculated according to previous 1 years daily returns, annualised. **Investable Index performance** based on total return. **Index Correlations** of monthly returns between total return indices, in USD to month-end April 2018. **Stock Correlations, Dispersion and Volatility** based on index-weighted averages as of May 16, 2018. VIX futures **monthly roll costs** are expressed as the weighted sum of the percentage difference in price between each future and the future next closer to expiry, expressed as a fraction of that futures price and weighted according to that future's weight in the either the S&P VIX Short-Term Futures Index, or the S&P VIX Mid-Term Futures Index, as appropriate. Charts and graphs are provided for illustrative purposes. Past performance is no guarantee of future results. For more information, please visit our website at www.spdji.com

About the VIX® Network

The VIX Network is an association of exchanges and index providers dedicated to establishing standards that help investors understand, measure, and manage volatility. The Network's members have obtained, from Chicago Board Options Exchange ("Cboe") and its partner S&P Dow Jones Indices ("S&P DJI"), the rights to use the methodology of the CBOE Volatility Index ("VIX") to calculate their own volatility indices. In addition to CBOE and S&P DJI, members include: Australian Securities Exchange, CME Group, Deutsche Borse AG, Hang Seng Indexes in Hong Kong, National Stock Exchange of India, LIFFE, Taiwan Futures Exchange, and the TMX Group in Canada.

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S&P Dow Jones Indices defines various dates to assist our clients in providing transparency on their products. The First Value Date is the first day for which there is a calculated value (either live or back -tested) for a given index. The Base Date is the date at which a given index is set at a fixed value for calculation purposes. The Launch Date designates the date upon which the values of a given index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via S&P Dow Jones Indices's public website or its datafeed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the index's public release date.

Prospective application of the methodology used to construct the index(es) as well as revisions to economic data may not result in performance commensurate with the back-test returns shown. The back-test period does not necessarily correspond to the entire available history of the index(es). Please refer to the index methodology for the particular index in question, available at www.spdji.com, for more details about such index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

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