

S&P Dow Jones Indices

A Division of **S&P Global**

INDEX INVESTMENT STRATEGY

Index Dashboard: Risk & Volatility September 18, 2019

VOLATILITY MEASURES

U.S. Equity		1m ±	200D Ave	RLZ 1Yr
Cboe Volatility Index® (VIX®)	13.95	-1.85	16.74	16.71
Cboe Short-Term Volatility (VIX9D)	14.13	-1.96	16.39	16.71
Cboe 3-month Volatility (VIX3M)	16.86	-0.86	17.76	16.71
Cboe 1-Year Volatility (VIX1Y)	19.00	0.30	18.79	16.71
Cboe DJIA Volatility (VXD)	14.18	-1.84	16.91	16.70

Global Equity

VSTOXX® (V2X)	15.21	-1.56	15.85	12.78
S&P/ASX 200 VIX (A-VIX)	12.52	-3.77	13.60	12.26
S&P/TSX 60 VIX (VIXC)	11.71	-1.17	14.20	10.56
HSI Volatility (VHSI)	19.05	-1.89	18.96	18.48

Currency

Cboe/CME Yen Volatility (JYVIX)	6.90	-0.97	7.10	5.94
Cboe/CME GBP Volatility (BPVIX)	11.61	0.83	9.89	8.46
Cboe/CME Euro Volatility (EUUVIX)	5.53	-0.57	6.11	5.49

Interest Rate

Cboe/CBOT 10Yr Tsy (TYVIX)	5.66	0.28	4.38	4.22
Cboe IR Swap Volatility (SRVIX)	71.68	1.73	67.61	54.57
S&P/JPX JGB VIX® (SPJGB)	2.66	0.78	1.62	1.31

Commodity

Cboe Gold ETF Volatility (GVZ)	15.10	-0.03	12.17	11.59
Cboe Oil ETF Volatility (OVX)	40.44	8.05	35.39	36.11

Volatility of VIX

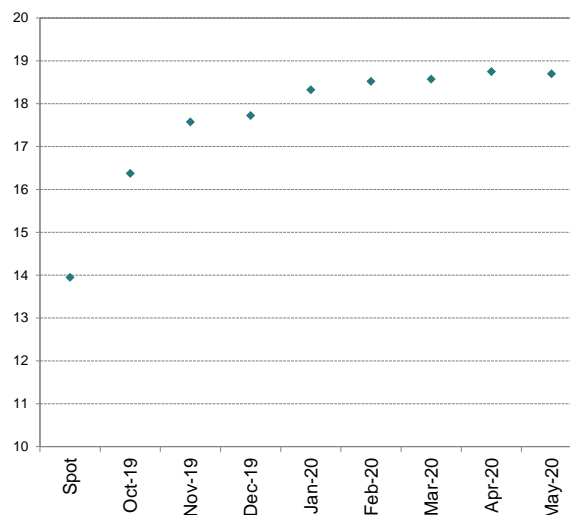
Cboe VIX of VIX (VVIX)	99.09	1.06	90.07	135.07
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INVESTABLE VOLATILITY INDICES

Index	1m ±	YTD	12m ±
S&P Daily Inverse Short-Term VIX	9.78%	61.56%	-15.90%
S&P 500 Dynamic VEQTOR Index	3.06%	6.16%	-4.76%
S&P 500 VEQTOR Switch Index	2.92%	11.50%	2.77%
S&P Dynamic VIX Index	2.64%	-10.12%	-2.32%
Cboe S&P 500 Buy-write Index	1.46%	11.53%	-0.82%
Cboe S&P 500 Put-write Index	1.39%	9.07%	-3.39%
S&P VIX Mid-Term Futures Index	0.99%	-13.60%	11.09%
S&P VIX Short-Term Futures Index	-10.88%	-52.14%	-19.03%
S&P 500	2.97%	21.71%	5.65%

TERM STRUCTURE & SKEW

VIX Futures Term Structure



VIX Futures Indices Roll Costs (Monthly)

Short-term futures	7.33%
Mid-term futures	0.76%

Skew

Level	1M	12m ±	
Cboe Skew Index (SKEW)	118.09	3.15%	-21.99%

REALIZED MEASURES

S&P 500 Correlations (Month-end)	1 Year	3 Year	10 Year
S&P Europe 350®	0.93	0.73	0.83
S&P Emerging BMI	0.87	0.66	0.75
S&P 500 Bond	0.21	0.11	0.11
S&P GSCI Commodity	0.75	0.63	0.55
U.S. Dollar Index	-0.22	-0.18	-0.45
S&P 500 Single Stocks	21-Day	12M Ave	3Y Ave
Dispersion (annualized)	18.79%	21.03%	19.61%
Volatility (annualized)	22.98%	27.31%	22.13%
Correlation (pairwise)	0.33	0.30	0.23

COMMENTARY

- Despite concerns that the current multi-year bull market in U.S. equities may be running out of steam, August's volatility proved short-lived; the S&P 500 is back within one percent of an all-time high, and VIX is back below 14, closing last night at 13.95.
- The U.S. equity market may be less certain of a "Fed put" than it was: volatility of volatility, and skew, have increased.
- Taking a cue from the U.S. markets, our reported equity volatility indicators for European, Australian, Canadian and Hong Kong equities also declined this month. With protests ongoing in Hong Kong, however, the HSI Volatility Index remains above its 200-day trailing average.
- Accompanying closely-watched policy statements this week from the U.S. Federal Reserve and the Bank of Japan, our volatility indicators for 10-Year U.S. Treasury bonds and Japanese government bonds have increased; both closed last night well above their trailing averages.
- With the ongoing "Brexit" negotiations approaching another end-game in late October, and a U.K. election potentially on the cards later this year, there could be further volatility ahead for cable. The Cboe/CME GBP Volatility Index closed last night at 11.61, up by 0.83 from our last report.
- The S&P Daily Inverse Short-Term VIX Index has returned to its winning ways, gaining 10% since our last report to make it 61% so far in 2019.
- Over the past 12 months, however, it was hard to beat a rolling position in mid-term VIX futures; the 11% total return since one year ago for the S&P VIX Mid-Term Futures Index places it top of our investable volatility charts.

Sources: S&P Dow Jones Indices LLC and/or its affiliates, Cboe, U.S. Federal Reserve (Dollar index and 10Yr Swap Rate), VIX Network members, Bloomberg LLC all as of Sep 18, 2019. **Volatility measures:** respective VIX and changes in those levels to Aug 21, 2019 to Sep 18, 2019. 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 year daily returns, annualised. **Investable Index performance** based on total return. **Index Correlations** of monthly returns between total return indices, in USD to month-end August 2019. **Stock Correlations, Dispersion and Volatility** based on index-weighted averages as of Sep 18, 2019. 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.

Another limitation of using back-tested information is that the back-tested calculation is generally prepared with the benefit of hindsight. Back-tested data and/or information reflects the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities, fixed income, or commodities markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

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