

S&P Dow Jones Indices

A Division of **S&P Global**

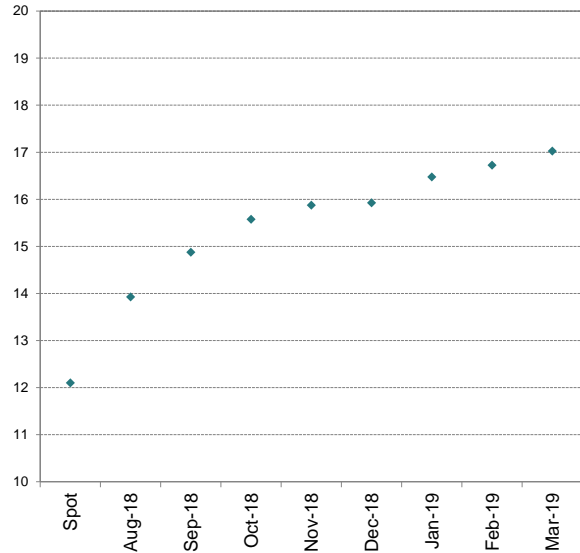
INDEX INVESTMENT STRATEGY

Index Dashboard: Risk & Volatility July 18, 2018

VOLATILITY MEASURES				
Implied Volatility Measures	VIX	1m ±	200D Ave	Realized 1Yr
Cboe Volatility Index® (VIX®)	12.10	-0.69	14.25	12.59
Cboe Short-Term Volatility Index (VIX9D)	10.03	-2.13	13.85	12.59
Cboe 3-month Volatility Index (V3M)	14.39	-0.40	15.66	12.59
Cboe 1-Year Volatility (V1Y)	17.17	-0.60	17.96	12.59
Cboe DJIA Volatility Index (VXD)	13.12	-1.35	14.99	13.65
VSTOXX® (V2X)	11.96	-2.02	14.92	10.83
S&P/ASX 200 VIX (A-VIX)	12.96	1.02	12.49	9.04
S&P/TSX 60 VIX (VIXC)	13.67	2.00	13.17	8.22
HSI Volatility Index (VHSI)	18.95	1.09	18.10	16.62
Cboe/CME FX Yen Volatility (JYVIX)	7.71	0.11	8.27	6.63
Cboe/CME FX GBP Volatility (BPVIX)	8.37	0.13	8.29	7.46
Cboe/CME FX Euro Volatility (EUVIX)	7.20	-1.06	7.40	6.75
Cboe / CBOT 10Yr US Tsy (TYVIX)	3.62	-0.17	4.05	3.60
Cboe Interest Rate Swap (SRVIX)	70.28	-2.06	71.19	55.80
S&P/JPX JGB VIX® (SPJGB)	1.24	-0.01	1.50	1.04
Cboe Gold ETF Volatility Index (GVZ)	12.15	1.07	11.66	9.74
Cboe Oil ETF Volatility Index (OVX)	27.24	-0.82	26.04	24.36
Cboe VIX of VIX (VVIX)	98.08	-0.43	101.70	151.27
Investable Volatility	1m ±	YTD	12m ±	
S&P 500 Dynamic VEQTOR Index	1.76%	6.99%	15.55%	
S&P 500 VEQTOR Switch Index	1.62%	1.96%	11.98%	
Cboe S&P 500 Buy-write Index	1.35%	4.20%	8.85%	
Cboe S&P 500 Put-write Index	1.23%	3.80%	7.26%	
S&P Daily Inverse Short-Term VIX	0.98%	-94.68%	-92.21%	
S&P Dynamic VIX Index	0.80%	-17.01%	-20.47%	
S&P VIX Mid-Term Futures Index	-0.38%	1.82%	-17.01%	
S&P VIX Short-Term Futures Index	-4.32%	9.23%	-33.47%	
S&P 500	1.86%	6.41%	16.67%	

HEDGING COSTS

VIX Futures Term Structure



VIX Futures Indices Roll Costs (Monthly)

Short-term futures	6.82%
Mid-term futures	1.72%

REALIZED MEASURES

S&P 500 Correlations (Month-end)	1 Year	3 Year	10 Year
S&P Europe 350	0.67	0.76	0.88
S&P 500 Bond	0.21	0.25	0.36
S&P GSCI Commodity	0.53	0.23	0.62
U.S. Dollar Index	-0.44	-0.14	-0.57
S&P 500 Single Stocks	21-Day	12M Ave	3Y Ave
Dispersion (annualized)	15.84%	18.87%	19.13%
Volatility (annualized)	20.45%	20.96%	21.42%
Correlation (pairwise)	0.20	0.23	0.25

COMMENTARY

- Getting into a summer swing? The median and average level of the VIX on days in July (16.81 and 17.73, respectively) have historically been the lowest of any month, and it seems this year VIX has packed its beach bags. The volatility benchmark closed last night at 12.10, down 0.69 points since our last report to its fourth-lowest closing level in six months.
- Most of our volatility measures have declined. Unusually, the European VSTOXX volatility index dropped below its U.S. equivalent - a situation that has occurred on only 6% of all days in the last five years. Have the concerns over European politics finally receded, or is it simply because European politicians will soon be off on a summer break?
- Despite the lulls in European and U.S. equity volatility, there were exceptions to the rule. Our volatility indicators for the Japanese yen and pound sterling ticked up, as did those for Australian, Canadian and Hong Kong equities, and gold.
- Through the brief increase and subsequent decline in U.S. volatility this year, the S&P Dynamic VEQTOR Index was able to capitalize on the trends. The index has pipped the benchmark S&P 500 by 58 basis points so far in 2018, and leads all our investable volatility indices year-to-date.

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 July 18, 2018. **Volatility measures:** respective VIX and changes in those levels June 20 to July 18, 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 June 2018. **Stock Correlations, Dispersion and Volatility** based on index-weighted averages as of July 18, 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.

General Disclaimer

Copyright © 2018 by S&P Dow Jones Indices LLC, a part of S&P Global. All rights reserved. Standard & Poor's®, S&P 500® and S&P® are registered trademarks of Standard & Poor's Financial Services LLC ("S&P"), a subsidiary of S&P Global. Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC ("Dow Jones"). Trademarks 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 vehicle. 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 Dow Jones Indices keeps certain activities of its business units separate from each other in order to preserve the independence and objectivity of their respective activities. As a result, certain business units of S&P Dow Jones Indices may have information that is not available to other business units. S&P Dow Jones Indices 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.

Performance Disclosure

Charts and graphs are provided for illustrative purposes. Past performance is not an indication or guarantee of future results. The charts and graphs may reflect hypothetical historical performance. All information presented prior to the launch date is back-tested. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect when the index(es) was officially launched. However, it should be noted that the historic calculations of an Economic Index may change from month to month based on revisions to the underlying economic data used in the calculation of the index. Complete index methodology details are available at www.spdji.com. It is not possible to invest directly in any index.

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.

The index returns shown do not represent the results of actual trading of investable assets/securities. S&P Dow Jones Indices LLC maintains the index(es) and calculates the index levels and performance shown or discussed, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index(es) or investment funds that are intended to track the performance of the index(es). The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).