

S&P Dow Jones Indices

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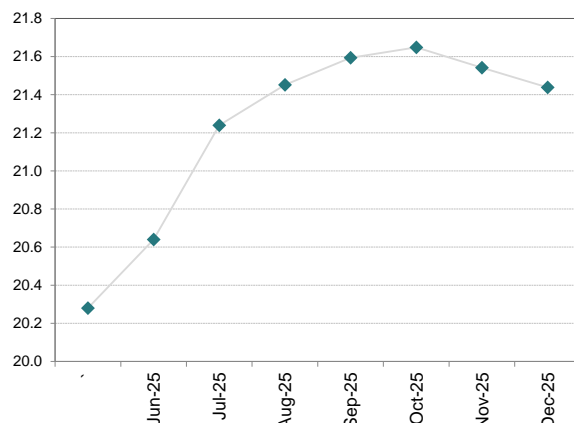
INDEX INVESTMENT STRATEGY

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Index Dashboard: Risk & Volatility May 21, 2025

VOLATILITY MEASURES				
US Equity	VIX	1m ±	200D Ave	Realized (1Yr)
Cboe Volatility Index® (VIX®)	20.87	-11.77	19.47	19.64
Cboe 1-Day Volatility Index (VIX1D)	18.07	-16.90	17.55	19.64
Cboe Short-Term Volatility (VIX9D)	19.56	-13.66	19.33	19.64
Cboe 3-month Volatility (VIX3M)	22.66	-8.28	20.83	19.64
Cboe 1-Year Volatility (VIX1Y)	23.62	-4.20	22.11	19.64
Cboe DJIA Volatility (VXD)	18.76	-9.32	17.47	17.34
Cboe S&P 500 Constituent Volatility (VIXEQ)	39.19	-12.32	37.92	26.71
Global Equity				
VSTOXX® (V2X)	16.69	-9.61	18.99	17.88
S&P/ASX 200 VIX (A-VIX)	11.60	-3.34	12.30	13.64
S&P/BMV IPC VIX (SPBMVVIX)	20.73	10.36	11.86	17.70
HSI Volatility (VHSI)	23.66	-7.93	25.82	29.40
Cboe EM ETF (VXEEM)	17.08	-8.37	20.58	23.07
Interest Rate				
Cboe 20+ Yr US Treasury ETF (VXTLT)	20.23	-1.23	17.08	14.64
S&P/JPX JGB VIX® (SPJGB)	3.91	-2.63	3.86	4.00
Credit				
CDX/Cboe NA IG 1M VIX (VIXIG)	36.57	-23.78	31.42	27.33
CDX/Cboe NA HY 1M VIX (VIXHY)	193.25	-141.68	159.47	141.88
iTraxx/Cboe Europe Main 1M VIX (VIXIE)	27.73	-26.86	33.12	25.10
iTraxx/Cboe Europe X-over 1M VIX (VIXXO)	128.97	-112.32	150.17	110.37
Commodity				
Cboe Gold ETF Volatility (GVZ)	22.23	-4.50	18.01	18.14
Cboe Oil ETF Volatility (OVX)	39.12	-4.44	36.95	31.00
Volatility of VIX				
Cboe VIX of VIX (VVIX)	106.30	-16.61	105.94	161.99
INVESTABLE VOLATILITY INDICES				
Index	1m ±	YTD	12m ±	
S&P 500 VIX Short-Term Futures Index	-24.71%	21.66%	25.19%	
S&P VIX Mid-Term Futures Index	-10.20%	17.64%	24.55%	
S&P Dynamic VIX Index	-7.94%	3.03%	-18.02%	
S&P 500 VIX Futures Term Structure	3.18%	1.36%	-2.67%	
Cboe S&P 500 Put-write Index	2.94%	-4.44%	6.40%	
Cboe S&P 500 Buy-write Index	2.71%	-4.89%	7.92%	
S&P 500 Dynamic VEQTOR Index	-1.43%	-8.71%	-4.53%	
S&P Daily Inverse Short-Term VIX	28.24%	-42.68%	-67.59%	
S&P 500®	10.93%	-0.11%	11.31%	

TERM STRUCTURE & SKEW	
VIX Futures Term Structure	



VIX Futures Indices Roll Costs (Monthly)			
Short-term futures	2.90%		
Mid-term futures	-0.24%		
US Equity Realized Dispersion		Level	1M 12m ±
S&P 500® 1-Day Realized Dispersion Index		23.54	NA NA
S&P 500® 30-Day Realized Dispersion Index		48.14	NA NA
US Equity Implied Dispersion		Level	1M 12m ±
Cboe S&P 500® Dispersion Index (DSPX™)		33.42	-6.36 7.68
Skew			
Cboe Skew Index (SKEW)		137.28	4.54% -8.19%
REALIZED MEASURES			
S&P 500 Correlations (Month-end)		1 Year	3 Year 10 Year
S&P Europe 350®		0.22	0.76 0.82
S&P Emerging BMI		0.11	0.56 0.67
S&P 500 Bond		0.52	0.77 0.59
S&P GSCI Commodity		-0.12	0.31 0.37
U.S. Dollar Index		0.19	-0.39 -0.33
S&P 500 Single Stocks		21-Day	12M Ave 3Y Ave
Dispersion (annualized)		46.70%	27.05% 25.56%
Volatility (annualized)		33.28%	26.71% 27.81%
Correlation (pairwise)		0.26	0.23 0.27

COMMENTARY

- VIX declined 12 points since our last report to close at 21. The S&P 500 soared 10.9% in the same period.
- Implied volatilities declined both in other asset classes and in international equity markets with Mexican equities the sole exception: the S&P/BMV IPC VIX soared 10 points to 21.
- Implied dispersion plunged last month with DSPX dropping 6 points to 33. Realised dispersion, on the other hand, rose significantly: the newly launched S&P 500 30-Day Realized Dispersion Index soared from 30 on its launch date on May 2nd to 48 on May 21st.
- Credit spread implied volatility also declined materially, particularly in investment grade segment. VIXIE plunged by almost 50%, closing at below 28 on May 21st.
- Diversification across asset classes and international equity markets would have been beneficial to a U.S equity portfolio. Index correlations between the S&P 500 and bonds, commodities, European and Emerging equities over the past 12 months remain materially below the levels over the past 3 and 10 years.
- Despite some setback in the past month, the S&P 500 VIX Short-Term Futures Index has a firm YTD lead among our reported investable volatility indices, up 22% so far in 2025.

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 May 21, 2025. **Volatility measures:** respective VIX and changes in those levels Apr. 16, 2025 to May 21, 2025. 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 2025. **Stock Correlations, Dispersion and Volatility** based on index-weighted averages as of May 21, 2025. 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, Japan Exchange Group, 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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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.

The Cboe S&P 500 Dispersion Index was launched on September 27, 2023. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. Complete index methodology details are available at www.spglobal.com/spdji. Past performance of the Index is not an indication of future results. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results. Please refer to the methodology for the Index for more details about the 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. Back-tested performance is for use with institutions only; not for use with retail investors.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. 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 the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an 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 the company's public website or its data feed 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.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate S&P DJI's ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using "Backward Data Assumption" (or pulling back) of ESG data for the calculation of back-tested historical performance. "Backward Data Assumption" is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as "product involvement") were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on "Backward Data Assumption" please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used.

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