

S&P Dow Jones Indices

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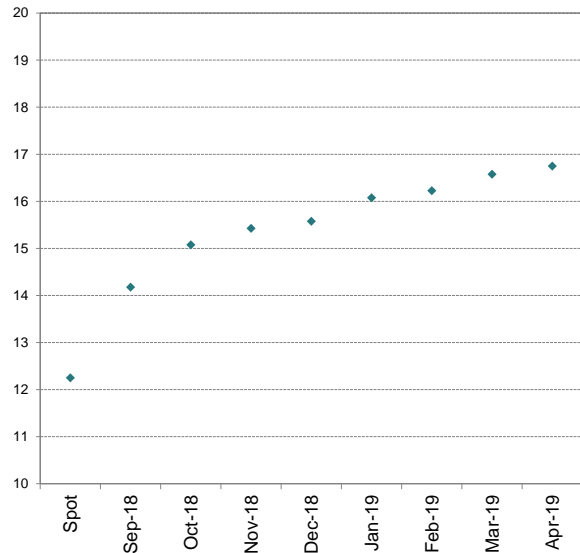
INDEX INVESTMENT STRATEGY

Index Dashboard: Risk & Volatility August 22, 2018

| VOLATILITY MEASURES | | | | |
|---|--------|---------|----------|--------------|
| Implied Volatility Measures | VIX | 1m ± | 200D Ave | Realized 1Yr |
| Cboe Volatility Index® (VIX®) | 12.25 | 0.15 | 14.57 | 12.67 |
| Cboe Short-Term Volatility Index (VXST) | 10.77 | 0.74 | 14.18 | 12.67 |
| Cboe 3-month Volatility Index (VXV) | 15.08 | 0.69 | 15.98 | 12.67 |
| Cboe 1-Year Volatility (VIX1Y) | 17.20 | 0.03 | 18.05 | 12.67 |
| Cboe DJIA Volatility Index (VXD) | 12.75 | -0.37 | 15.31 | 13.82 |
| VSTOXX® (V2X) | 13.85 | 1.89 | 15.11 | 10.66 |
| S&P/ASX 200 VIX (A-VIX) | 12.27 | -0.69 | 12.56 | 8.63 |
| S&P/TSX 60 VIX (VIXC) | 13.29 | -0.38 | 13.35 | 8.37 |
| HSI Volatility Index (VHSI) | 18.99 | 0.04 | 18.69 | 16.95 |
| Cboe/CME FX Yen Volatility (JYVIX) | 7.72 | 0.01 | 8.10 | 6.47 |
| Cboe/CME FX GBP Volatility (BPVIX) | 8.24 | -0.13 | 8.18 | 7.51 |
| Cboe/CME FX Euro Volatility (EUVIX) | 7.97 | 0.77 | 7.42 | 6.80 |
| Cboe / CBOT 10Yr US Tsy (TYVIX) | 3.80 | 0.18 | 4.00 | 3.61 |
| Cboe Interest Rate Swap (SRVIX) | 71.05 | 0.77 | 71.09 | 54.00 |
| S&P/JPX JGB VIX® (SPJGB) | 1.54 | 0.30 | 1.50 | 1.21 |
| Cboe Gold ETF Volatility Index (GVZ) | 11.81 | -0.34 | 11.67 | 9.88 |
| Cboe Oil ETF Volatility Index (OVX) | 24.72 | -2.52 | 26.00 | 24.39 |
| Cboe VIX of VIX (VVIX) | 95.72 | -2.36 | 101.90 | 149.66 |
| Investable Volatility | 1m ± | YTD | 12m ± | |
| S&P Daily Inverse Short-Term VIX | 3.50% | -94.49% | -91.12% | |
| Cboe S&P 500 Buy-write Index | 1.92% | 6.20% | 10.72% | |
| S&P 500 VEQTOR Switch Index | 1.75% | 3.75% | 14.17% | |
| S&P 500 Dynamic VEQTOR Index | 1.70% | 8.81% | 17.32% | |
| Cboe S&P 500 Put-write Index | 1.48% | 5.34% | 9.07% | |
| S&P Dynamic VIX Index | 0.17% | -16.87% | -15.63% | |
| S&P VIX Mid-Term Futures Index | -2.24% | -0.46% | -18.11% | |
| S&P VIX Short-Term Futures Index | -5.27% | 3.48% | -37.60% | |
| S&P 500 | 1.64% | 7.04% | 16.69% | |

HEDGING COSTS

VIX Futures Term Structure



VIX Futures Indices Roll Costs (Monthly)

| | |
|--------------------|-------|
| Short-term futures | 6.35% |
| Mid-term futures | 2.05% |

REALIZED MEASURES

| S&P 500 Correlations (Month-end) | 1 Year | 3 Year | 10 Year |
|----------------------------------|--------|---------|---------|
| S&P Europe 350 | 0.70 | 0.77 | 0.88 |
| S&P 500 Bond | 0.27 | 0.26 | 0.36 |
| S&P GSCI Commodity | 0.25 | 0.28 | 0.62 |
| U.S. Dollar Index | -0.42 | -0.15 | -0.57 |
| S&P 500 Single Stocks | 21-Day | 12M Ave | 3Y Ave |
| Dispersion (annualized) | 22.38% | 19.58% | 19.14% |
| Volatility (annualized) | 22.07% | 21.49% | 21.46% |
| Correlation (pairwise) | 0.11 | 0.22 | 0.24 |

COMMENTARY

- August is often a quiet month for equity markets and - excepting heightened volatility in a few international hotspots - 2018's edition looks set to be typical.
- Since our last report, U.S. equity volatility and VIX continued at suppressed levels. Benchmark risk was dampened by lower correlations between single-equity constituents: over the past 21 days, the average correlation between pairs of S&P 500 stocks was a paltry 0.10 (compared to a typical 0.50, historically). Differentiated responses to a mixed earnings season and the varied impact of trade tensions offered explanations.
- The U.S. dollar has been in focus recently, and the S&P 500 has proved unusually sensitive to its fluctuations. Trade talks this month combined with a bout of emerging market currency volatility to buffet international markets; equity markets in Turkey, Russia and central Asia bore the brunt of the declines.
- Contagion from Asia Minor has proved limited so far, as the low levels of our volatility measures covering developed equity markets attest. The S&P 500 is presently within touching distance of a new all-time closing high, while the VIX futures curve and associated intermediate-term volatility measures indicate the market is not particularly concerned about an imminent bump in the road.

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 August 22 2018. **Volatility measures:** respective VIX and changes in those levels July 18, to August 22, 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 July 2018. **Stock Correlations, Dispersion and Volatility** based on index-weighted averages as of August 22, 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 chart 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

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