SPDR® ETFs Chart Pack
Market Insights & Analytics

April 2019 Edition

Please see Appendix for more information on investment terms used in this Chart Pack.

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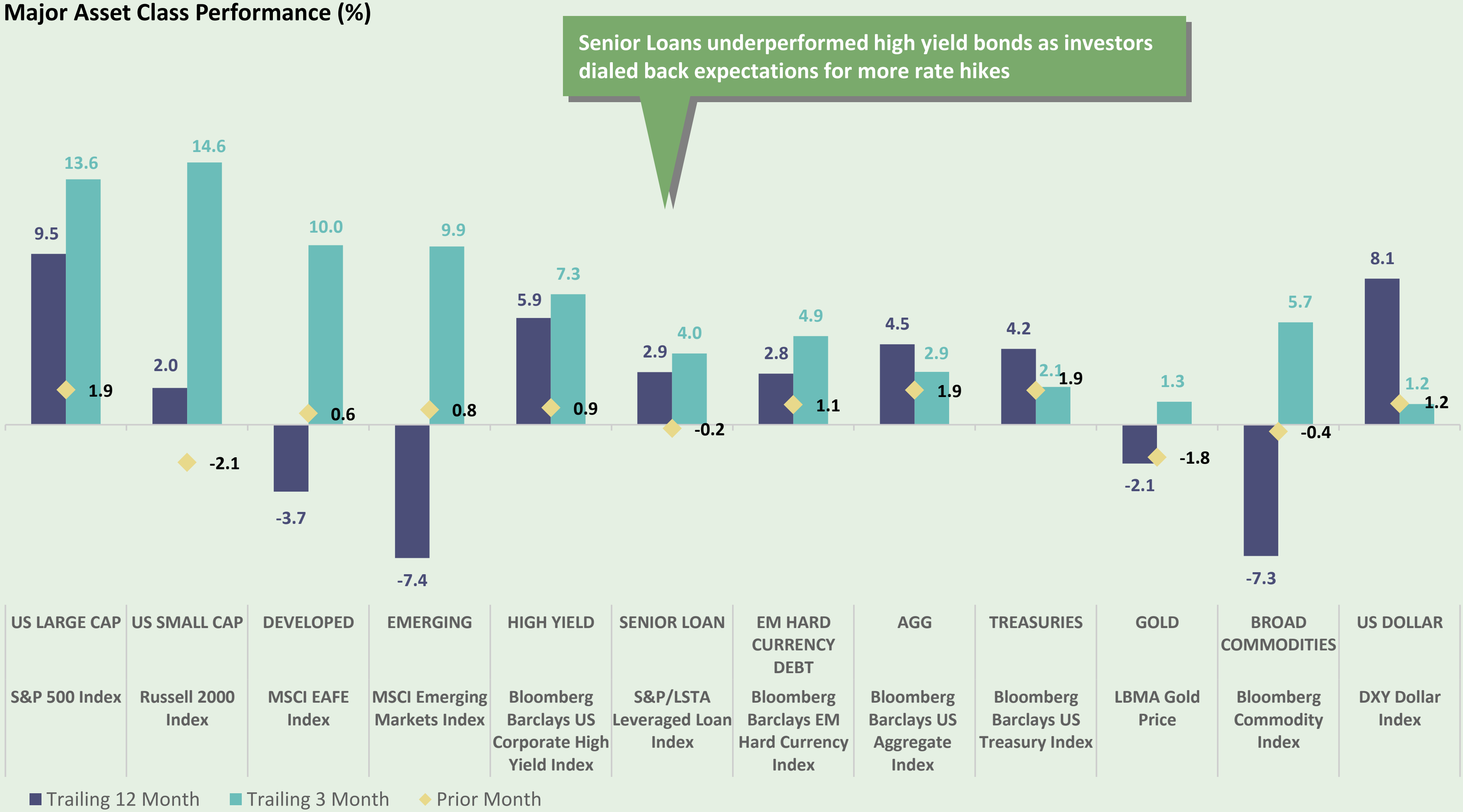
Market Environment

Asset Class Performance — Fixed income has recently been bolstered by a dovish Fed, while US equities have their best quarter since 2009

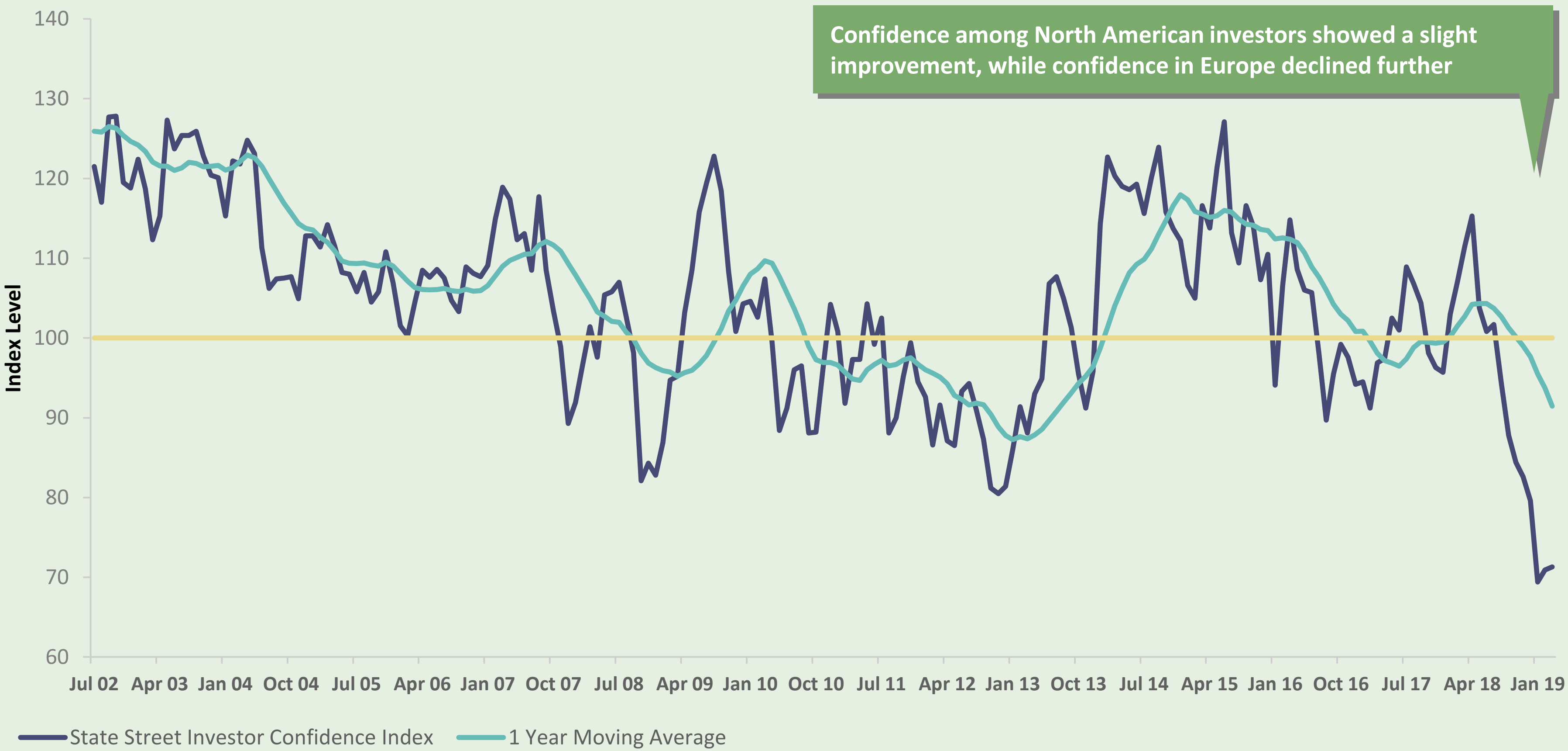
Major Asset Class Performance (%)



Source: Bloomberg Finance, L.P. As of March 29, 2019. Past performance is not a guarantee of future results. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income. Performance returns for periods of less than one year are not annualized.

Investor Confidence — Despite the strong rebound in risky assets, the recovery in investor confidence has been slow

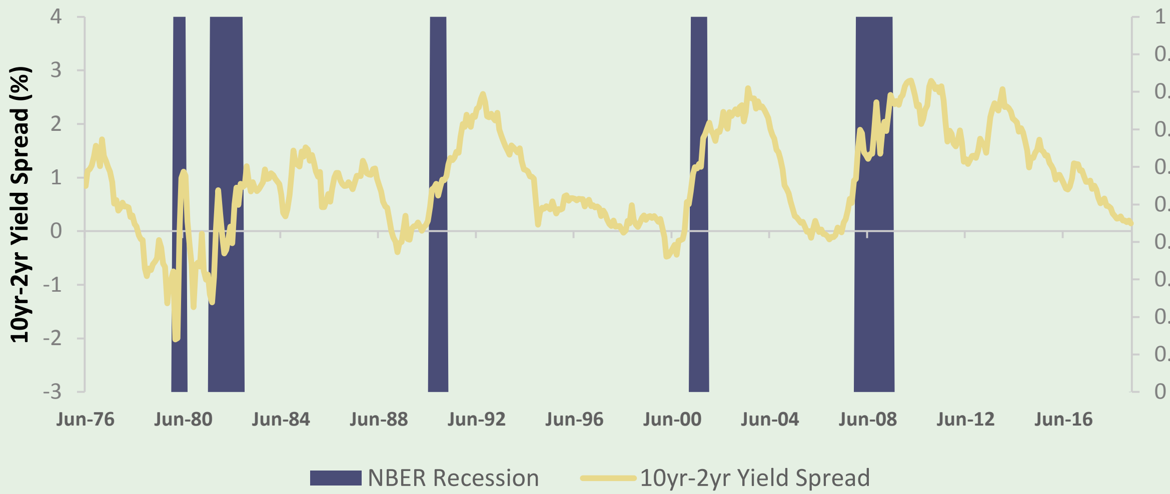
State Street Investor Confidence Index



Source: Bloomberg Finance, L.P. As of March 29, 2019.
State Street Confidence Indexes Measures investor confidence or risk appetite quantitatively by analyzing the actual buying and selling patterns of institutional investors. The index assigns a precise meaning to changes in investor risk appetite: the greater the percentage allocation to equities, the higher risk appetite or confidence. A reading of 100 is neutral; it is the level at which investors are neither increasing nor decreasing their long-term allocations to risky assets. The results shown represent current results generated by State Street Investor Confidence Index. The results shown were achieved by means of a mathematical formula in addition to transactional market data, and are not indicative of actual future results which could differ substantially.

Curve Inversion — While yield curve inversion has historically been followed by a market selloff and economic recession, returns are often positive in the following months

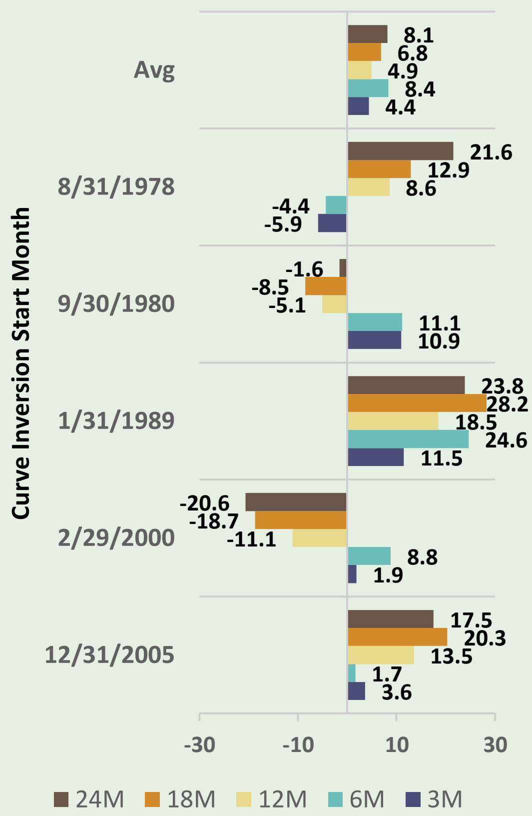
10-2yr Yield Spreads and Historical Recession Periods



10-2yr Curve Inversion Starting Month	# of Month Between 10-2yr Yield Curve Inversion and the Start of Recession	Return Between the Curve Inversion and the Start of Recession (%)	# of Months Between the Start of Inversion and S&P 500 Peak	S&P 500 Peak to Trough Losses (%) Following Curve Inversion
12/31/2005	24	17.52	21	-57.0
2/29/2000	13	-16.79	0	-49.1
1/31/1989	18	28.24	11	-17.9
9/30/1980	10	6.98	1	-27.1
8/31/1978	17	14.34	0	-13.6

Since 1976, there has been an average 16-month lag between the 10-2yr yield curve inversion and the start of economic recession

Cumulative Returns Following Curve Inversion

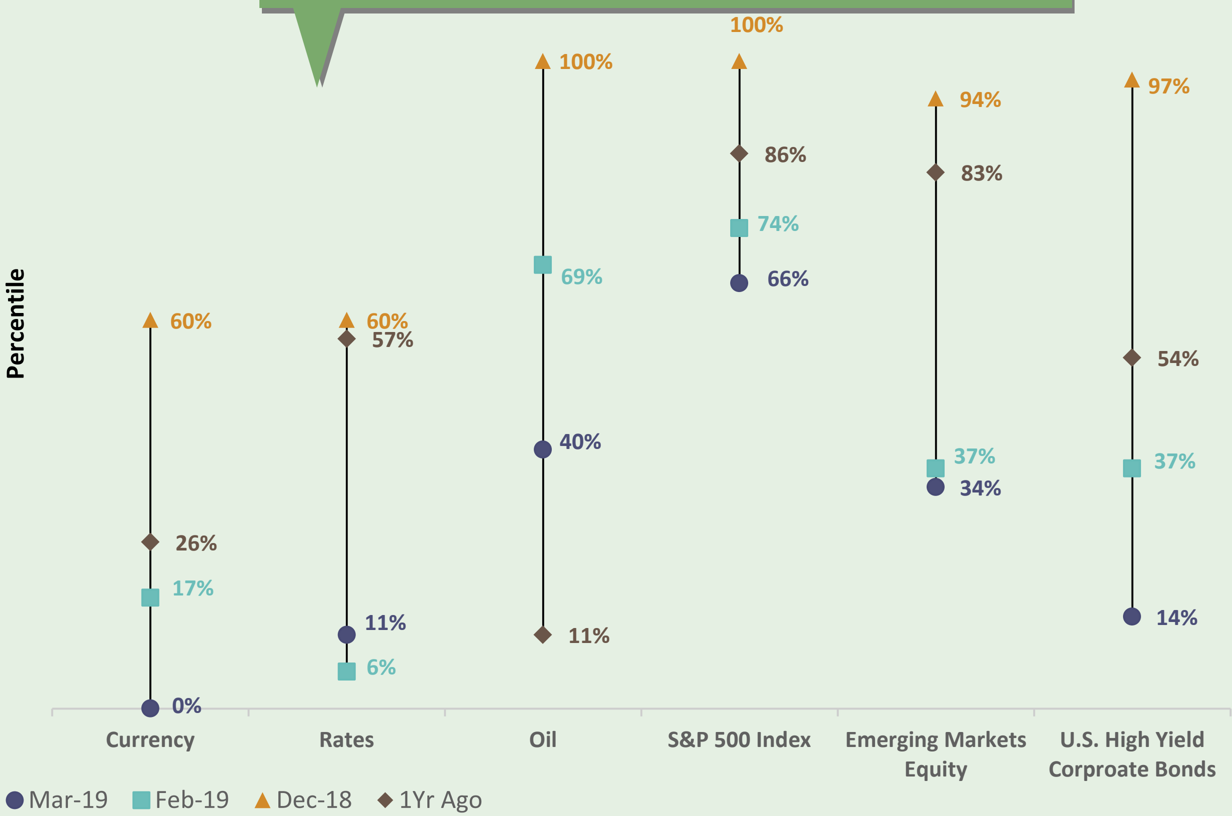


Source: Bloomberg Finance, L.P. As of March 29, 2019. Past performance is not a guarantee of future results. Index returns are unmanaged and do not reflect the deduction of any fees or expenses. Index returns reflect all items of income, gain and loss and the reinvestment of dividends and other income. Performance returns for periods of less than one year are not annualized.

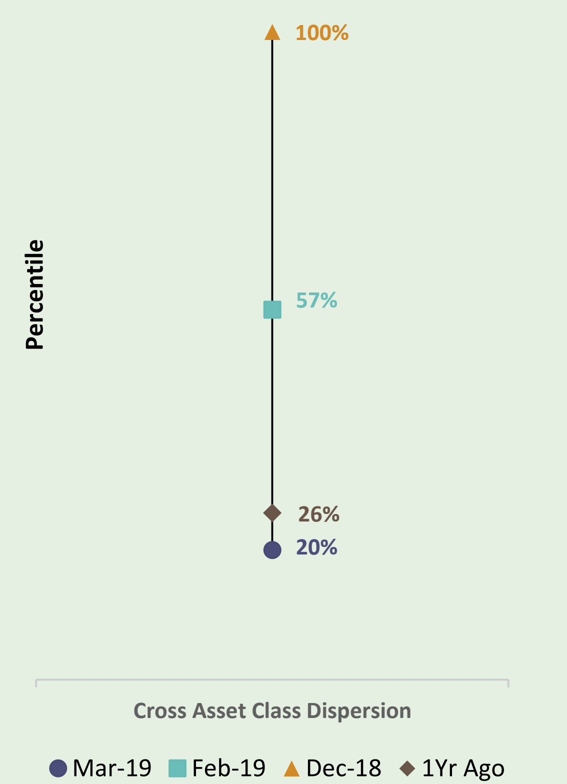
Cross-Asset Volatility — Implied volatility moved lower in March across all asset classes, except rates, while cross-asset dispersion narrowed to the bottom quintile

Cross-Asset Implied Volatility (Percentile Rank of Daily Average, 3-Year)

Implied volatility in the Treasury market jumped to its highest level since January after the Fed meeting in March, but the daily average remained historically low



Cross-Asset Dispersion (Percentile Rank, 3-Year)



Source: Bloomberg Finance, L.P. As of March 29, 2019. **Past performance is not a guarantee of future results.** Currency implied volatility is measured by the J.P. Morgan Global FX Volatility Index. Rates implied volatility is measured by the MOVE Index. Oil implied volatility is derived from oil future contracts. Emerging markets implied volatility is measured by the CBOE Emerging Markets ETF Volatility Index. High Yield bond implied volatility is measured by the CBOE High Yield Corporate Bond ETF Volatility Index. Cross asset dispersion is measured by standard deviation of monthly returns of all major asset classes.

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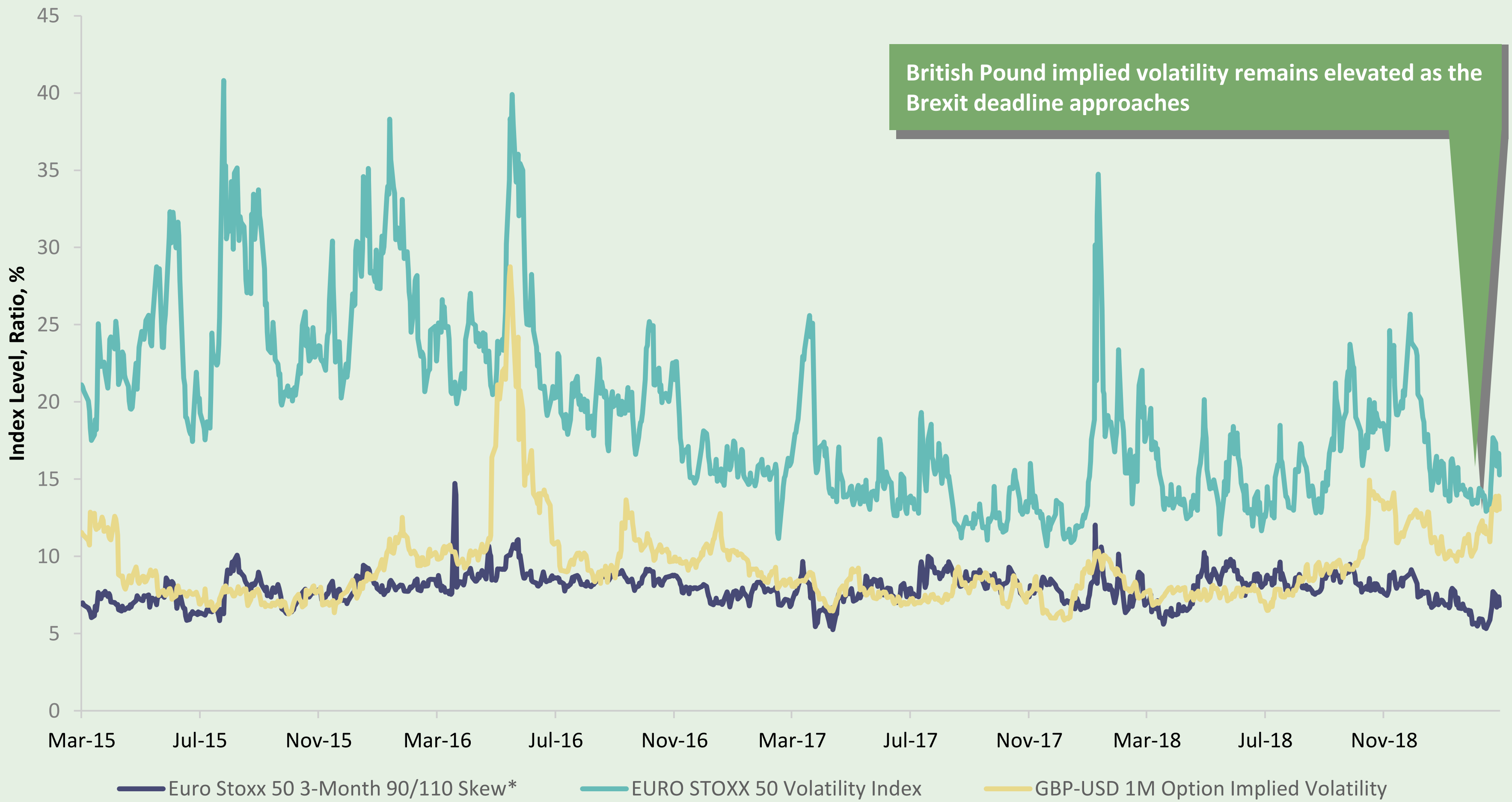
Brexit — While implied volatility and tail risk in Eurozone equities have picked up recently as Brexit uncertainty rose, the increase is less significant than previous peaks

Euro Stoxx Tail Risk and Implied Volatility, GBP Implied Volatility



Source: Bloomberg Finance, L.P. As of March 29, 2019. 3-Month 90/110 Skew is the difference in implied volatility (IV) between 90% moneyness of put options and 110% moneyness of call options. Bigger differences between the two indicate higher tail risk.

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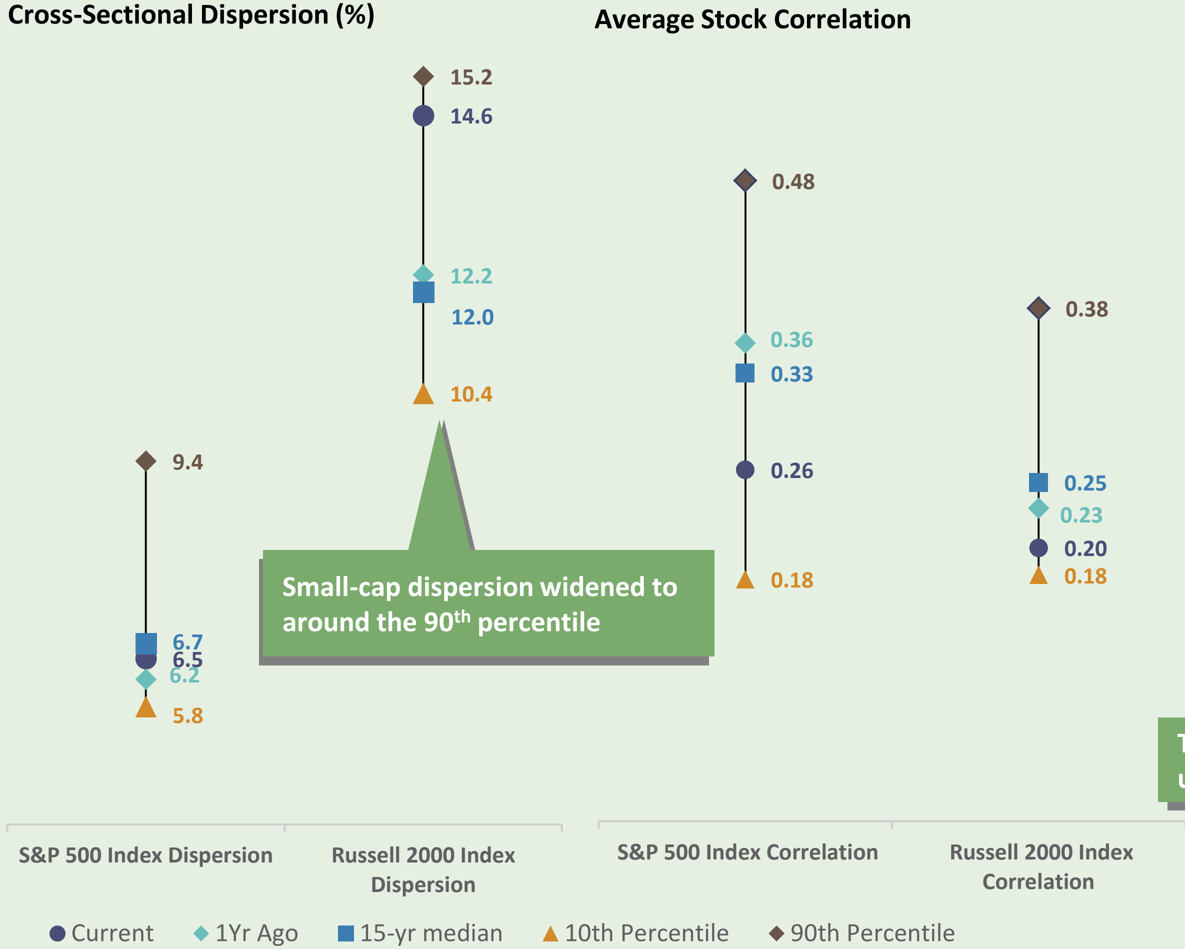
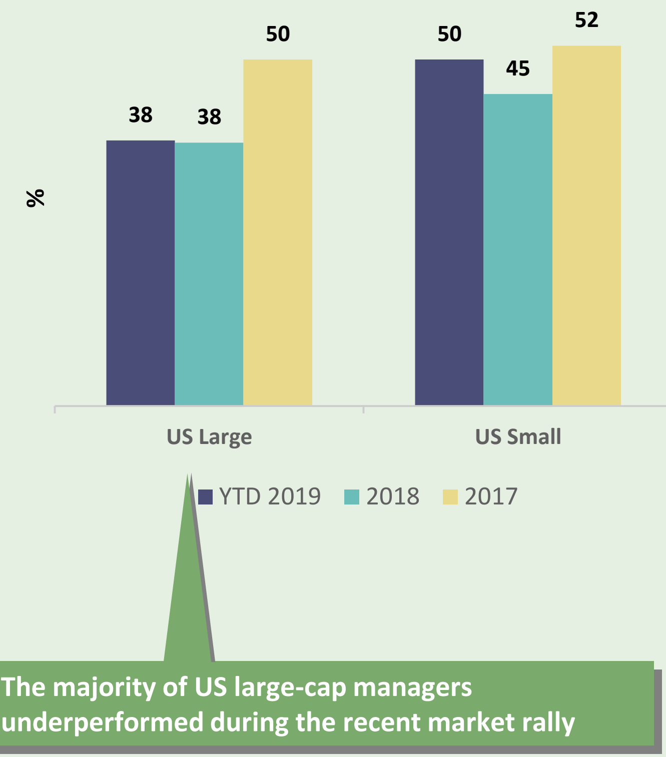
Active Environment Barometer — Widening dispersion and decreasing correlation among small caps have supported small cap managers' performance in Q1

S&P 500 Index and Russell 2000 Index Correlation and Dispersion



Active Funds Outperforming Their Respective Benchmark (%)*



Source: FactSet, Morningstar, as of 03/29/2019. * The universe is based on Morningstar Category.
The Cross-Sectional Dispersion is calculated as the standard deviation of daily returns of index constituents for one month. Average stock correlation is calculated as the average correlation of each pair of constituents in the index over one month. Characteristics are as of the date indicated and should not be relied upon as current thereafter.

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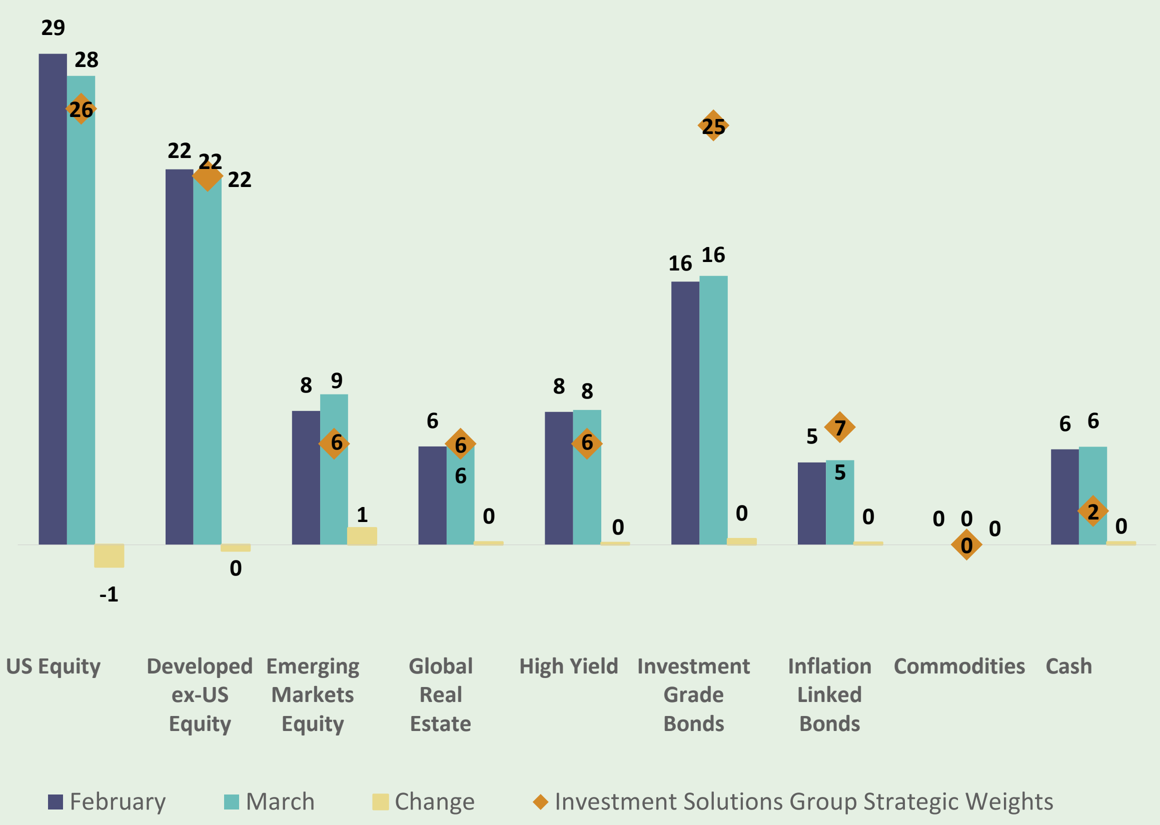
State Street Current Positioning — State Street continues favoring EM equities, while switching long duration exposures for high yield bonds

SPDR SSGA Global Allocation ETF [GAL] Current and Strategic Exposures (%)



March Tactical Rebalance Trades:

Sold US Small Caps

Sold US Long Government Bonds

Bought EM Equities

Bought High Yield Bonds

Sector Rotation Trades:

February	March
Technology	Communication
Health Care	Health Care
Consumer Discretionary	Industrials

Positions are 2% Each for 6% of US Equity Allocation

Our sector model removed Tech after overweighting the sector for two years

Source: State Street Global Advisors. As of March 29, 2019. Exposures are as of the date indicated, are subject to change, and should not be relied upon as current thereafter.
This information should not be considered a recommendation to invest in a particular sector. It is not known whether the sectors shown will be profitable in the future. The information above is rounded to the nearest whole number.

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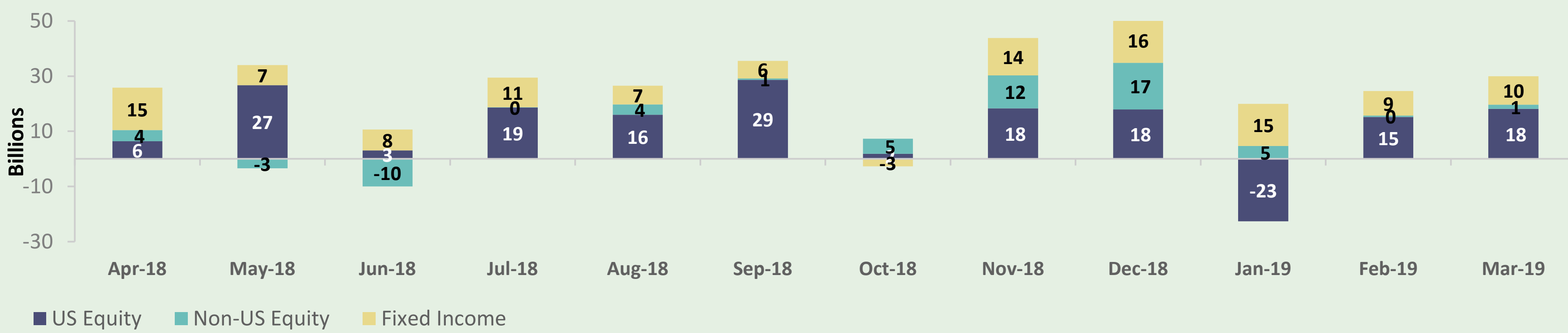
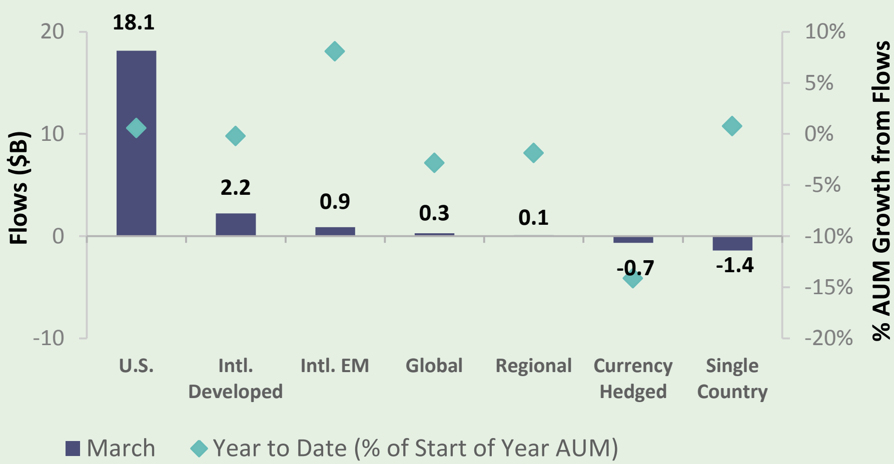
Global Flows & Fundamentals, US Factors

Flow Trends — While equity ETFs took in over $15bn for the second consecutive month, fixed income funds attracted nearly double the flows of equity funds in Q1

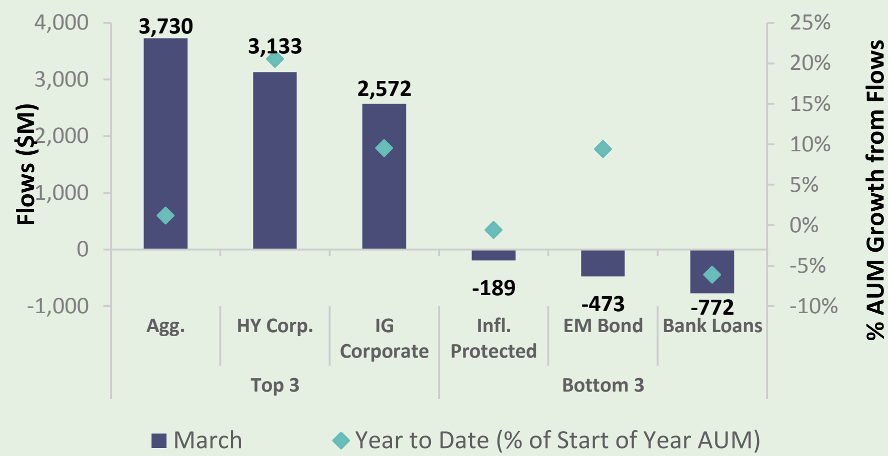
Flows by Asset Class



Flows by Equity Regions



Fixed Income Top and Bottom 3 Sectors by Flows



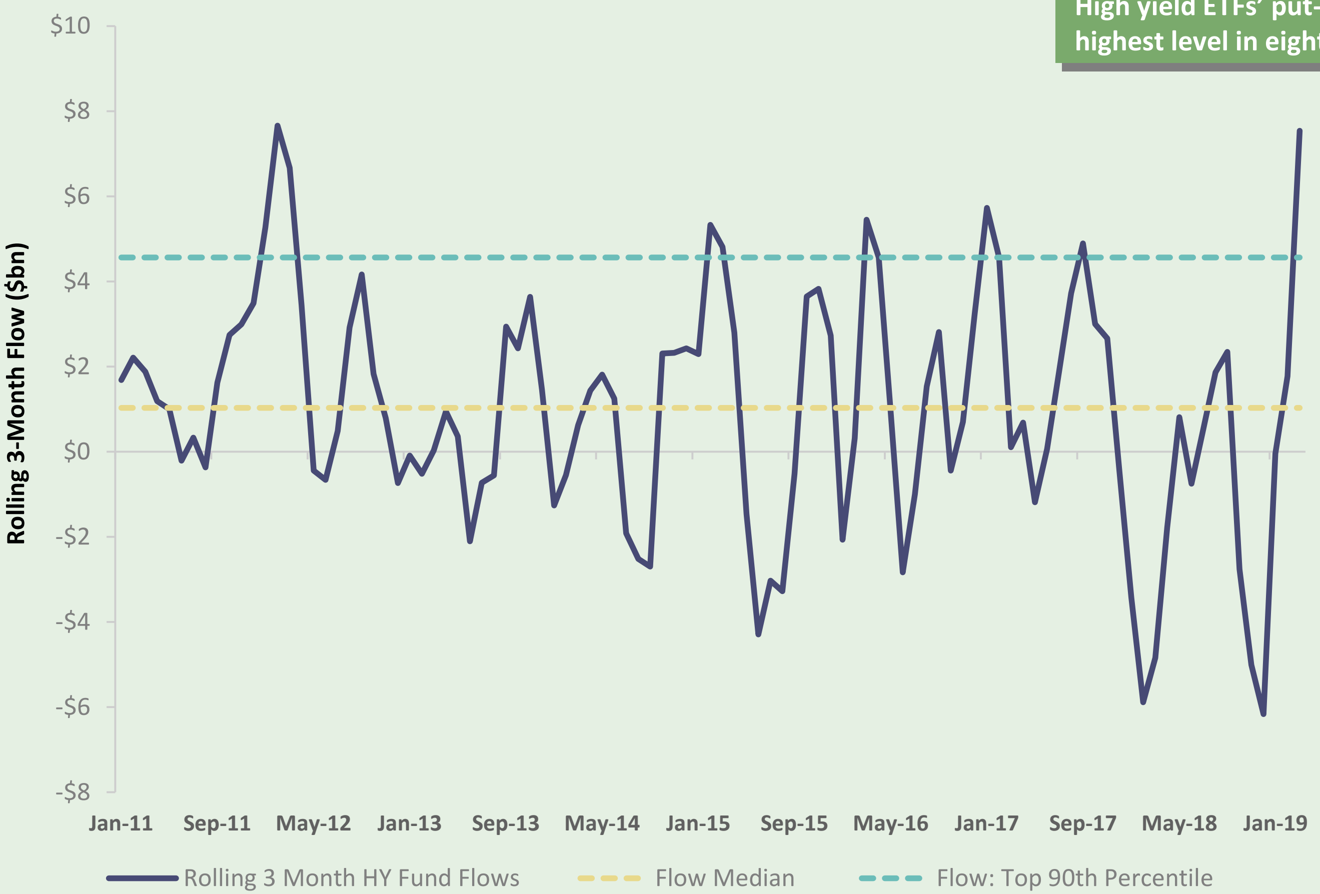
Investors favored US over EM equities in March, reversing the year-to- date equity trend

Investors focused on corporate credit exposures, as YTD IG and HY funds have attracted more flows than equities

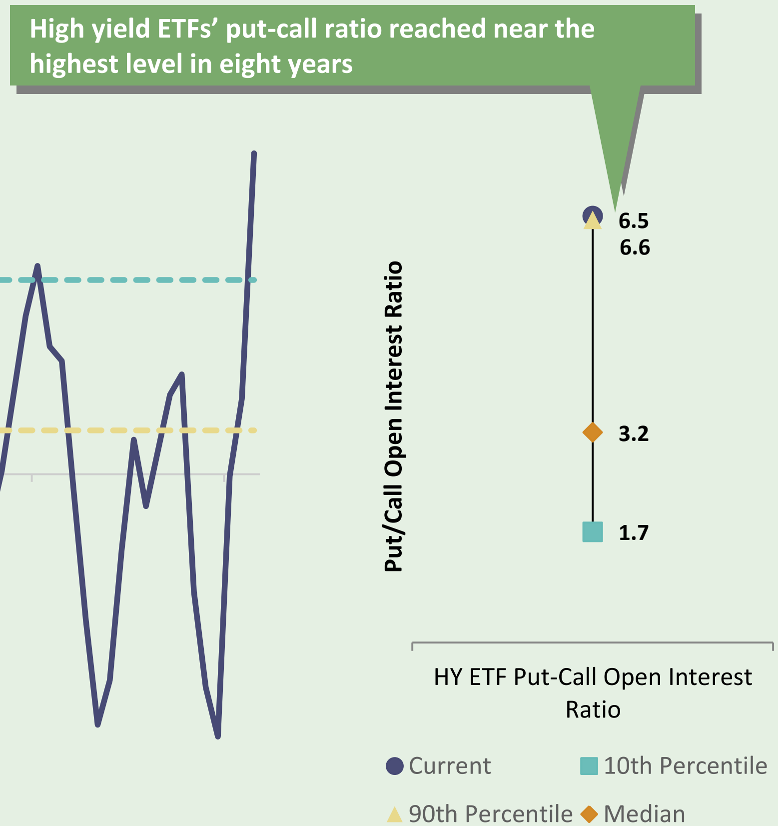
Source: State Street Global Advisors, Bloomberg Finance, L.P. As of March 29, 2019.
Sectors, asset classes and flows are as of the date indicated, are subject to change, and should not be relied upon as current thereafter.

Flow Trends — Although high yield ETF flows were near an all-time high over the past three months, investors are adding protection for their recent gains in the option market

Rolling 3-Month High Yield ETF Flows



High Yield ETF Put-Call Ratio (8 Years)



Source: Bloomberg Finance L.P., as of,3/29/2019.

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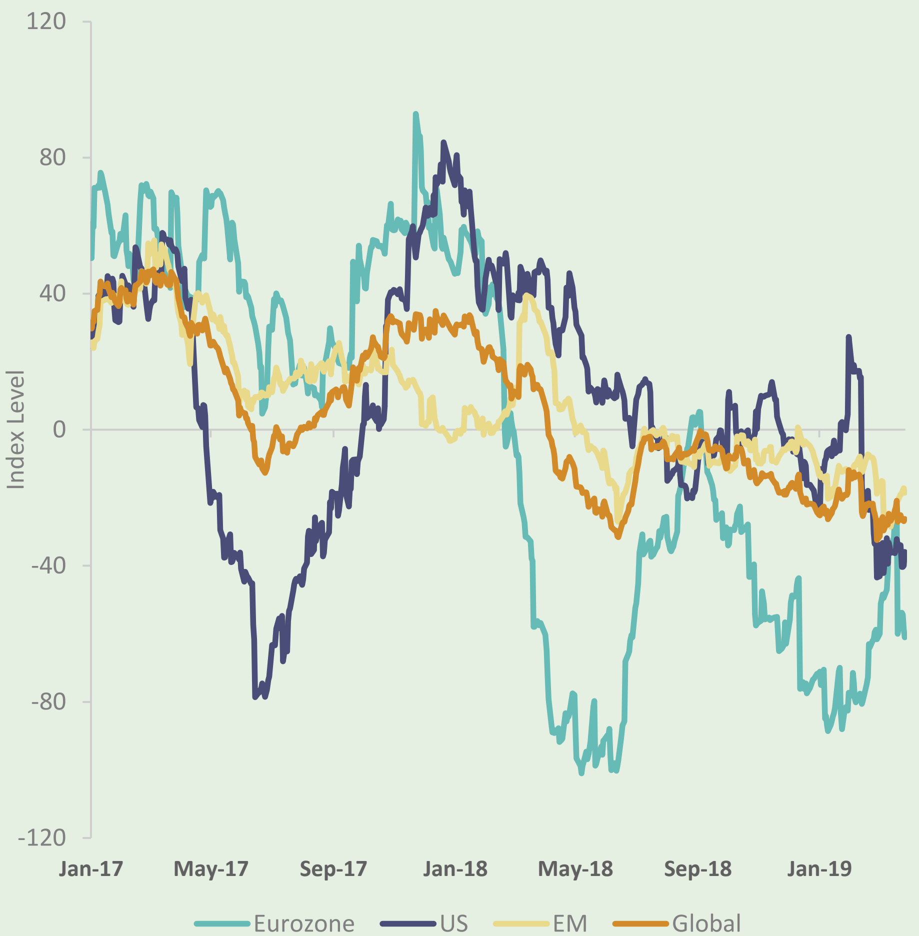
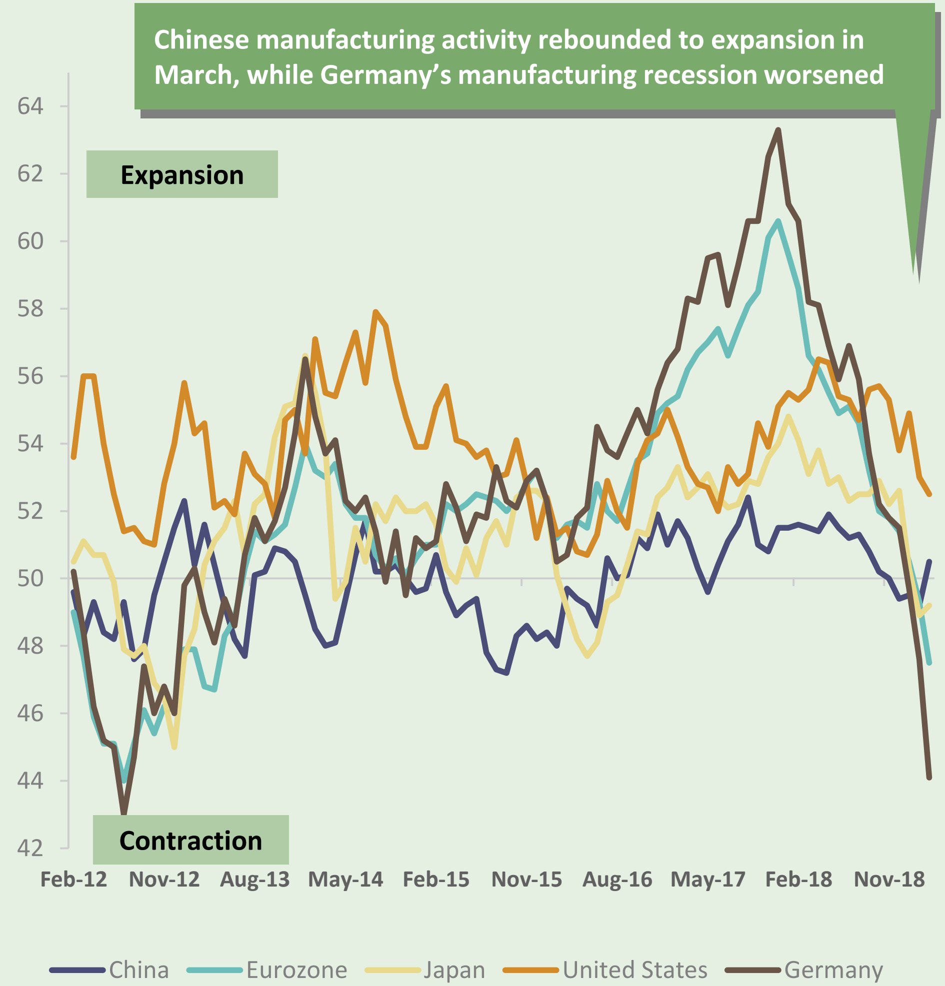
Global Economy — Global economic sentiment stabilized with some signs of recovery in China, but sentiment overall remains negative

Citigroup Economic Surprise Indices



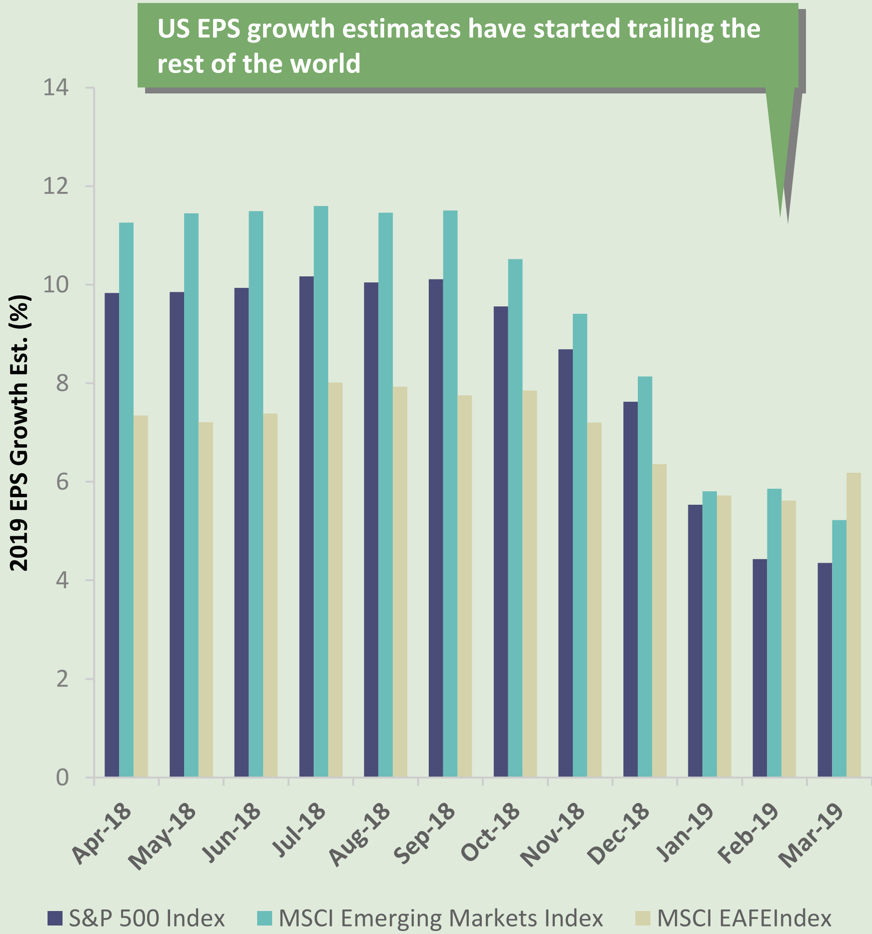
Manufacturing PMI Indices



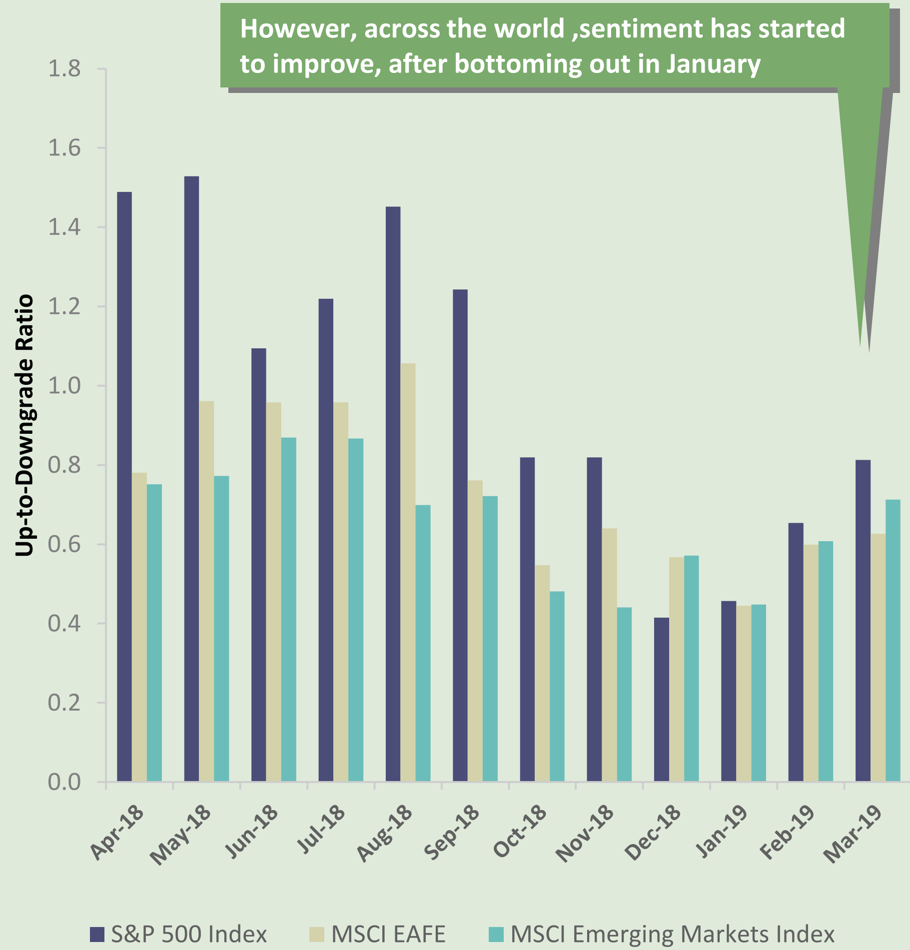
Source: Bloomberg Finance L.P., as of 03/29/2019.

Global Earnings — Analysts downgraded US earnings growth for 2019 further, but earnings sentiment (upgrade to downgrade) has improved across regions

2019 EPS Growth Est.



2019 Earnings Up-to-Downgrade Ratios



Source: FactSet, as of March 27, 2019. Characteristics are as of the date indicated, are subject to change, and should not be relied upon as current thereafter. EPS growth estimates are based on Consensus Analyst Estimates compiled by FactSet.

Global Valuation — The recent rally stretched US valuations, but EM stocks remain below or near historical medians

Absolute and Relative Valuation Z-Score* and 15-Year Percentile Ranking

	Valuation to Region History (Percentile)				Absolute Valuation Composite Z-Score	Valuation Relative to the S&P 500 (Percentile)				Valuation Relative to the S&P 500 Composite Z-Score
	P/E	NTM P/E	P/B	P/S		P/E	NTM P/E	P/B	P/S	
S&P 500 Index	23%	18%	2%	7%	-1.42	N/A	N/A	N/A	N/A	
S&P MidCap 400 Index	70%	62%	56%	37%	0.64	87%	98%	98%	100%	0.57
Russell 2000 Index	45%	38%	47%	40%	0.03	65%	93%	92%	100%	0.23
S&P 500 Value Index	59%	45%	12%	16%	-0.47	98%	99%	81%	99%	0.46
S&P 500 Growth	13%	1%	8%	2%	-1.78	3%	1%	29%	0%	-2.84
MSCI World ex-US	77%	58%	70%	26%	0.63	88%	96%	99%	97%	0.54
Euro Stoxx Index	43%	39%	86%	47%	0.52	76%	95%	98%	97%	0.39
MSCI EM Index	52%	40%	64%	42%	0.33	71%	74%	97%	94%	0.13
MSCI Japan Index	93%	88%	62%	36%	1.27	92%	99%	100%	96%	0.60
MSCI UK Index	72%	37%	51%	15%	-0.05	85%	76%	100%	76%	0.16
MSCI Germany Index	68%	49%	72%	18%	0.30	87%	95%	100%	90%	0.47
MSCI China Index	33%	42%	43%	45%	0.00	47%	56%	71%	80%	-0.71

EM equities are trading near historical medians across multiple valuation ratios

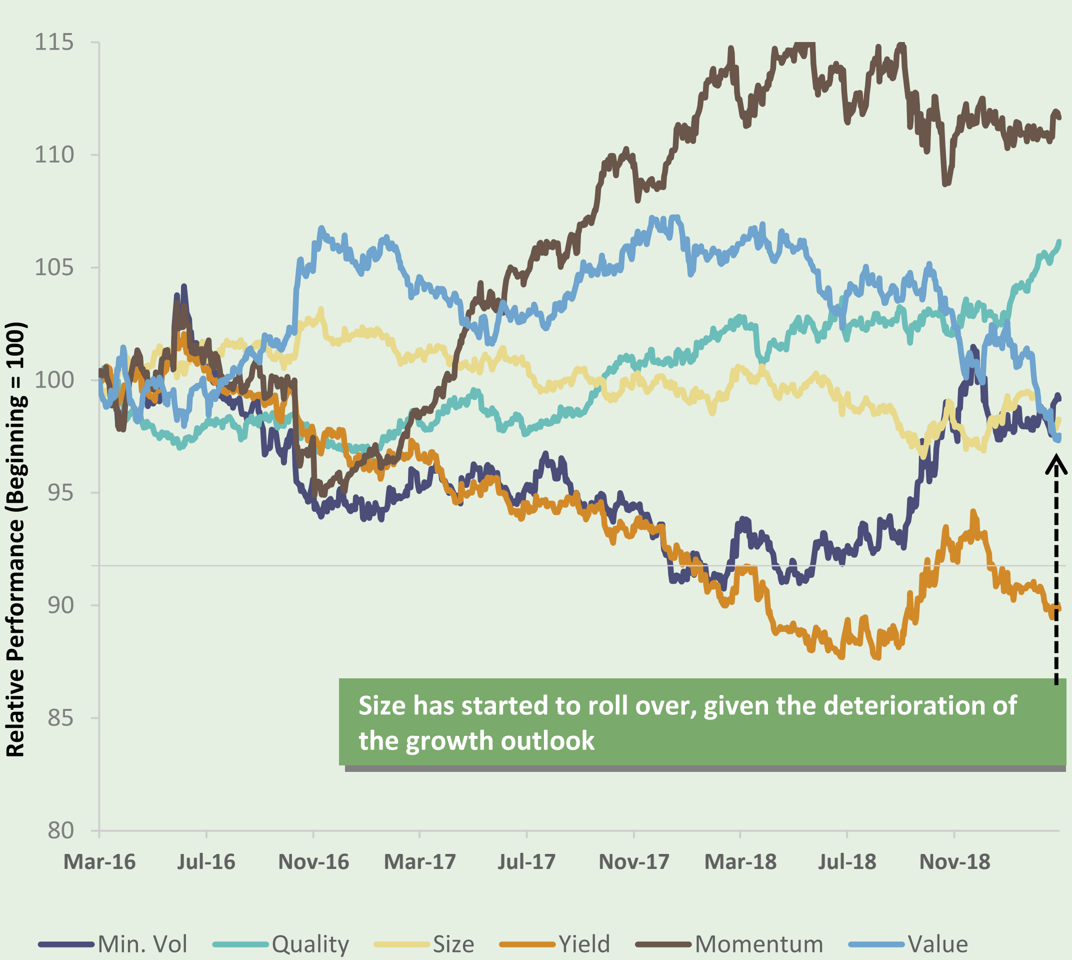
Higher percentile ranking indicates more attractive valuations

Top 3 Attractive Valuation	Bottom 3 Expensive Valuation

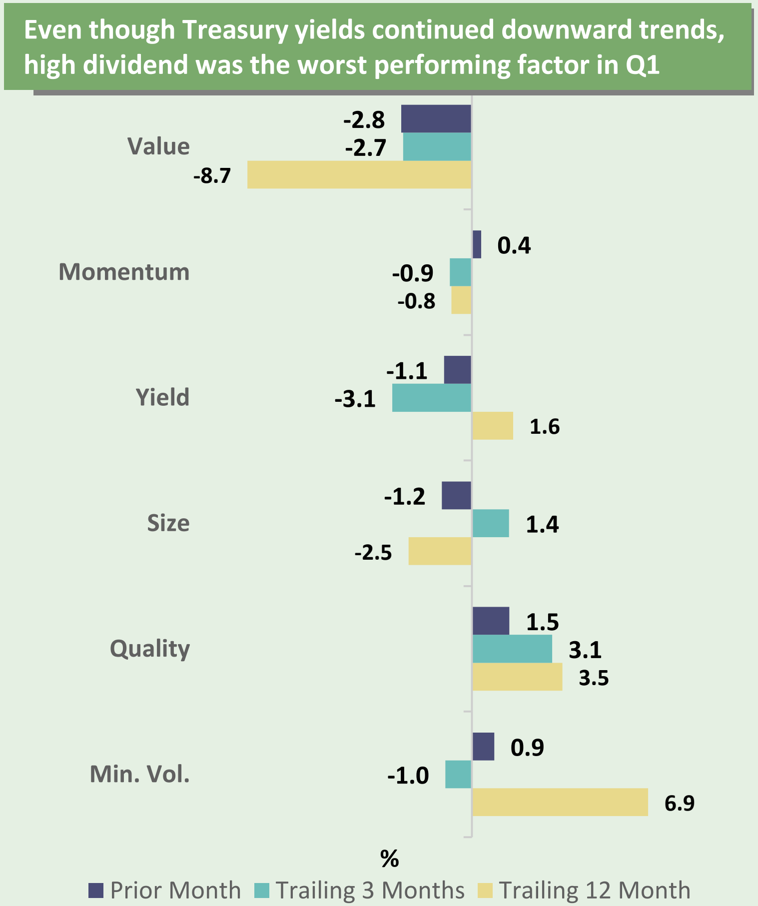
Source: State Street Global Advisors, FactSet, as of March 29, 2019.
* The z-score is calculated as the average z-score of percentile ranking of P/B, P/E, NTM P/E and P/S valuations last 15 years and valuations relative to the S&P 500 last 15 years. Z-score indicates how many standard deviations an element is from the mean. A z-score can be calculated from the following formula. z = (X - µ) / σ where z is the z-score, X is the segment valuation percentile. µ is the mean of valuation percentile, and σ is the standard deviation of sectors' valuation percentile.

US Factor Trends — Quality continued to lead last month, while value extended its losses as investors are searching for growth and high quality companies

MSCI USA Factor Index versus MSCI USA Index (3 Years)



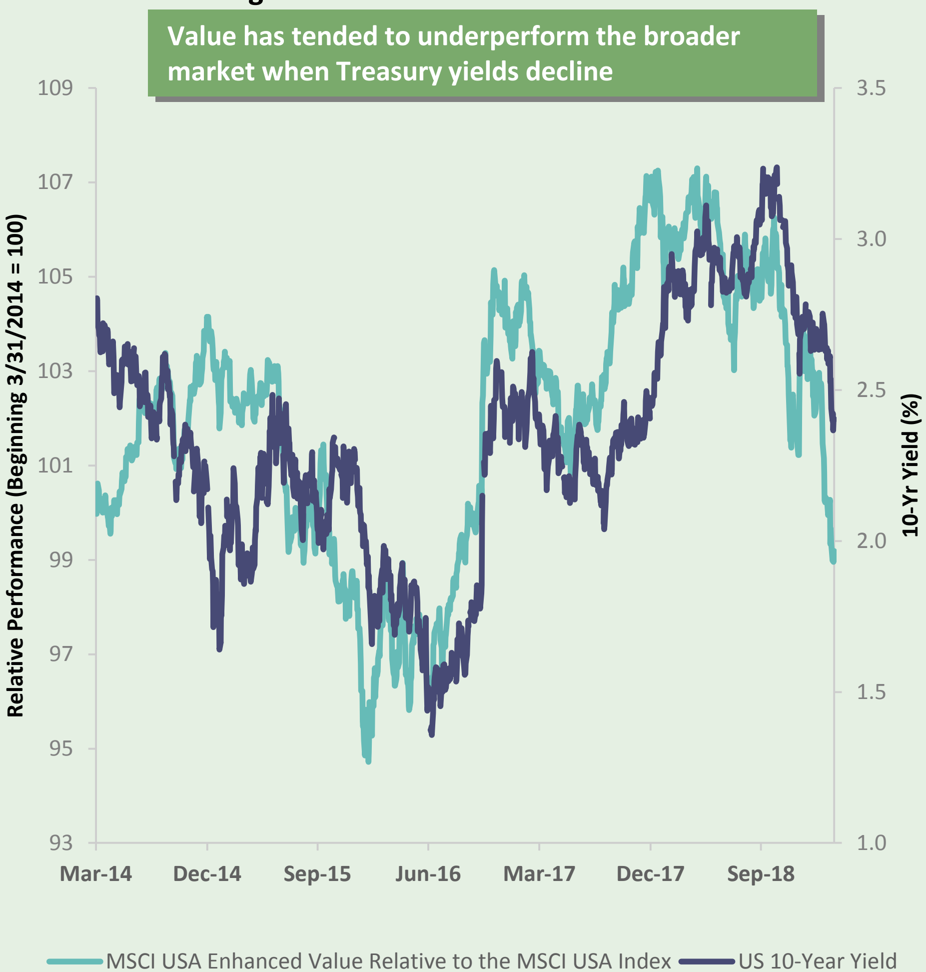
Period Excess Returns versus MSCI USA Index



Source: Bloomberg Finance, L.P. As of March 29, 2019.
Past performance is not a guarantee of future results. MSCI USA Minimum Volatility Index, MSCI USA Enhanced Value Index, MSCI USA Quality Index, MSCI USA Equal Weighted Index, MSCI USA High Dividend Yield Index, and MSCI USA Momentum Index were used above compared to the MSCI USA Index. Index returns are unmanaged and do not reflect the deduction of any fees or expenses.

US Factor Trends — Value has shown high correlation to Treasury yields, while Momentum has become more defensive since the last rebalancing in November

Value Moved Along with 10-Yr Yields



60-Day Correlation of Factor Excess Return over the S&P 500*

*Momentum is represented by the MSCI USA Momentum Factor Index. High Beta is represented by the S&P 500 High Beta Index. Min. Vol. is represented by the MSCI USA Min. Volatility Index.
Source: Bloomberg Finance L.P. As of 03/28/2019. **Past performance is not a guarantee of future results.**

Sectors

Sector Flow and Returns Heat Map — Despite the continuing rally among cyclical sectors, investors positioned defensively in Q1

	Positioning				Returns		
	Prior Month Flow ($M)	Trailing 3-Month Flow ($M)	Current Short Interest (%)	1M Prior Short Interest (%)	Prior Month Return (%)	3-Month Return (%)	12-Month Return (%)
Consumer Discretionary	(192)	(1,071)	11.8%	10.0%	4.11	15.73	13.19
Consumer Staples	(97)	329	6.6%	6.7%	4.09	12.01	10.48
Energy	(378)	(3,713)	10.1%	10.7%	2.11	16.43	1.32
Financial	(2,238)	(5,550)	8.4%	7.2%	-2.61	8.56	-4.68
Health Care	539	956	11.5%	10.9%	0.49	6.59	14.89
Industrials	(411)	(1,706)	10.2%	8.2%	-1.14	17.20	3.20
Materials	(948)	(2,065)	6.3%	6.2%	1.23	10.30	-0.43
Real Estate	169	3,020	3.4%	4.2%	4.92	17.53	20.99
Technology	(1,152)	(3,834)	7.7%	7.6%	4.83	19.86	15.44
Communication	994	2,525	2.2%	2.3%	2.43	13.98	N/A
Utilities	167	671	17.6%	16.4%	2.89	10.84	19.33

In March, sector ETFs had their fifth monthly net outflows out the last six, with Financials contributing 63% of net outflows

Tech has regained its leadership in Q1, while the performance of Real Estate remains strong

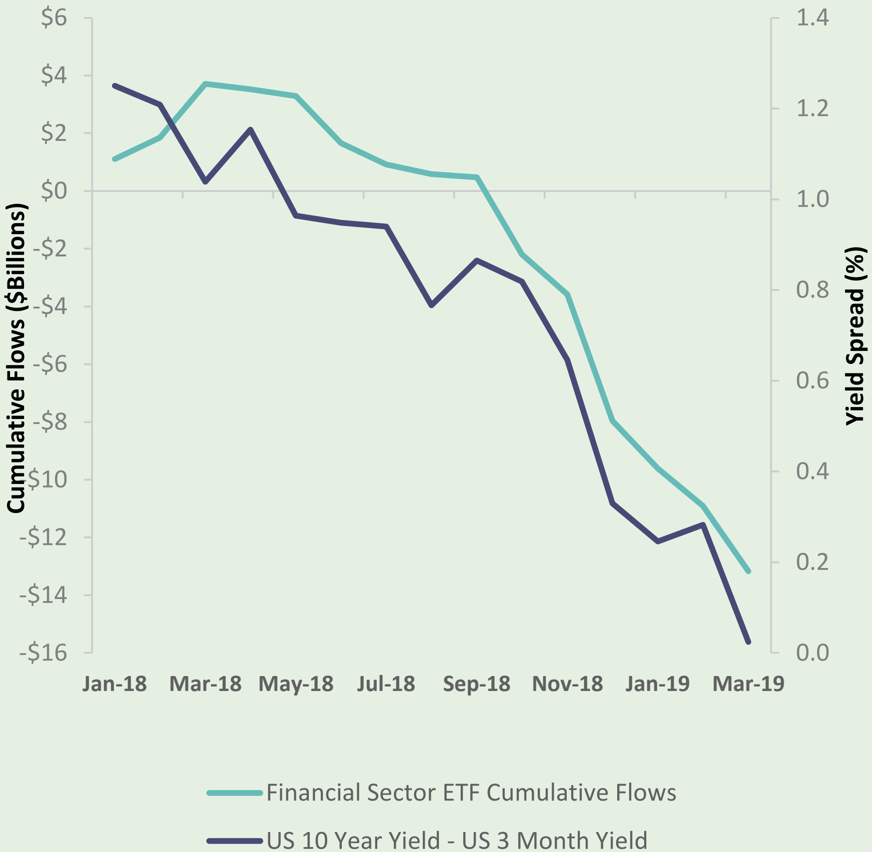
Best Performing Sector
Most Flows in Period

Worst Performing Sector
Least Flows in Period

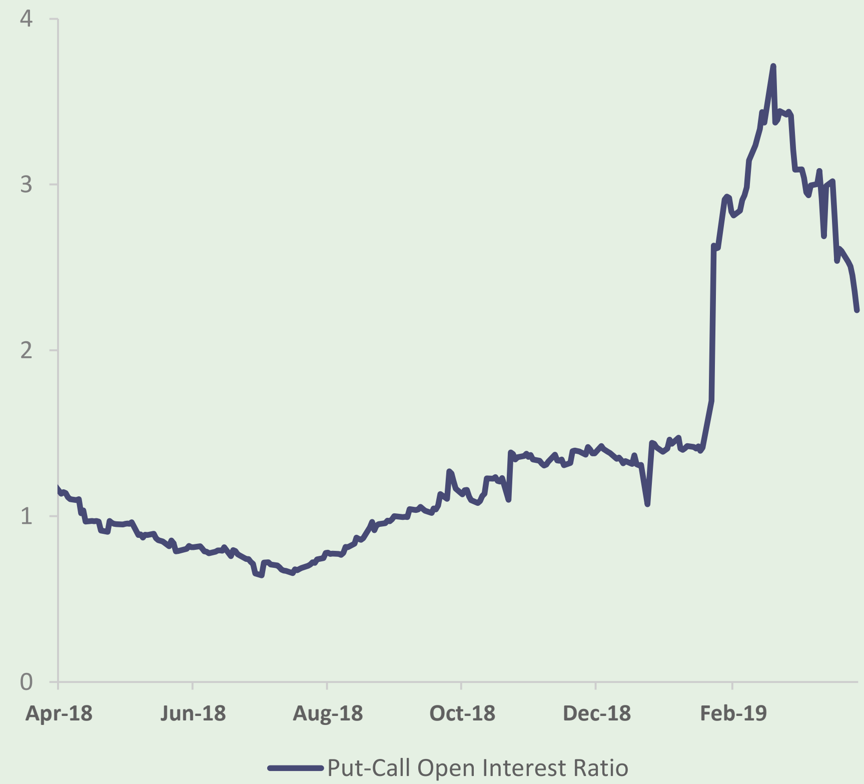
Source: State Street Global Advisors, Bloomberg Finance, L.P., as of March 29, 2019. **Past performance is not a guarantee of future results.**

Sector Trends — A flattening yield curve has driven overwhelmingly bearish sentiment in Financials, as indicated by negative ETF flows and elevated put-call ratio

Cumulative Financial Sector Flows vs. the Yield Curve



Financial Sector ETF Put-Call Open Interest Ratio



Financial sector ETF put-call ratio is in its top quintile over the past one year

Source: Bloomberg Finance L.P. As of 03/29/2019. **Past performance is not a guarantee of future results.**

Sector Scorecard — Tech moved up the ladder in momentum, while Industrials and Communication Services' earnings sentiment have improved over the quarter

Sector Composite Z-Score*

	Valuation Composite Score	Momentum Composite Score	Earnings Sentiment Composite Score	Volatility Composite Score
Consumer Discretionary	-1.15	-0.11	0.36	-1.28
Consumer Staples	0.03	-0.25	-0.08	-0.92
Energy	0.37	-1.12	-0.32	0.88
Financials	1.37	-1.05	-0.53	1.21
Health Care	-0.02	-0.19	0.33	0.70
Industrials	0.26	0.49	0.45	-0.08
Information Technology	-0.72	0.59	0.34	-1.01
Materials	0.65	-0.78	-0.78	0.10
Communication	0.27	-0.01	1.26	N/A
Real Estate	-0.10	1.10	-0.80	0.20
Utilities	-0.97	1.32	-0.22	0.18

Valuations of Financials appear attractive relative to its own history and the broad market

Upward earnings revisions and strong earnings beats lifted Comm. Svs' earnings sentiment

Source: State Street Global Advisors, FactSet, as of March 29, 2019. Green shading is top 3, red shading is bottom 3.
*The scorecard uses z-score for each metric to standardize numbers across sectors and show relativeness among sectors. Composite score is calculated by equally weighting each metric in the same category. Z-score indicates how many standard deviations an element is from the mean. A z-score can be calculated from the following formula. z = (X - μ) / σ where X is the value of the sector. μ is the mean of the eleven sectors. σ is the standard deviation of eleven sectors. S&P 500 sector indices are used to calculate sector scores. Please refer to Appendix C for the metrics used to measure valuation, momentum and earnings sentiment. Volatility score is not available for the communication services sector due to data availability.

Sector Trends — Momentum in cyclical sectors continues improving, as relative performance between cyclical and defensive sectors moved just above its “golden cross” level

Cyclical vs. Defensive Performance

Sector Technicals

Cons. Staples, Health Care and Industrials moved above the “golden cross” level (50 Day > 200 day) in March

	Last Px % Diff to 50 Day MVA	Last Px % Diff to 200 Day MVA	% Diff Between 50 and 200 Day MVA
Cons. Disc.	4.8%	4.5%	-0.3%
Cons. Staples	4.1%	5.1%	0.9%
Energy	3.1%	-3.3%	-6.2%
Financials	0.4%	-1.6%	-1.9%
Health Care	1.1%	2.2%	1.1%
Industrials	3.6%	4.4%	0.8%
Tech.	7.3%	7.0%	-0.3%
Materials	3.1%	0.9%	-2.2%
Comm Svs.	2.9%	1.2%	-1.7%
Real Estate	3.3%	8.4%	5.0%
Utilities	3.0%	7.0%	4.0%

Source: Bloomberg Finance L.P. As of 03/29/2019. **Past performance is not a guarantee of future results.**

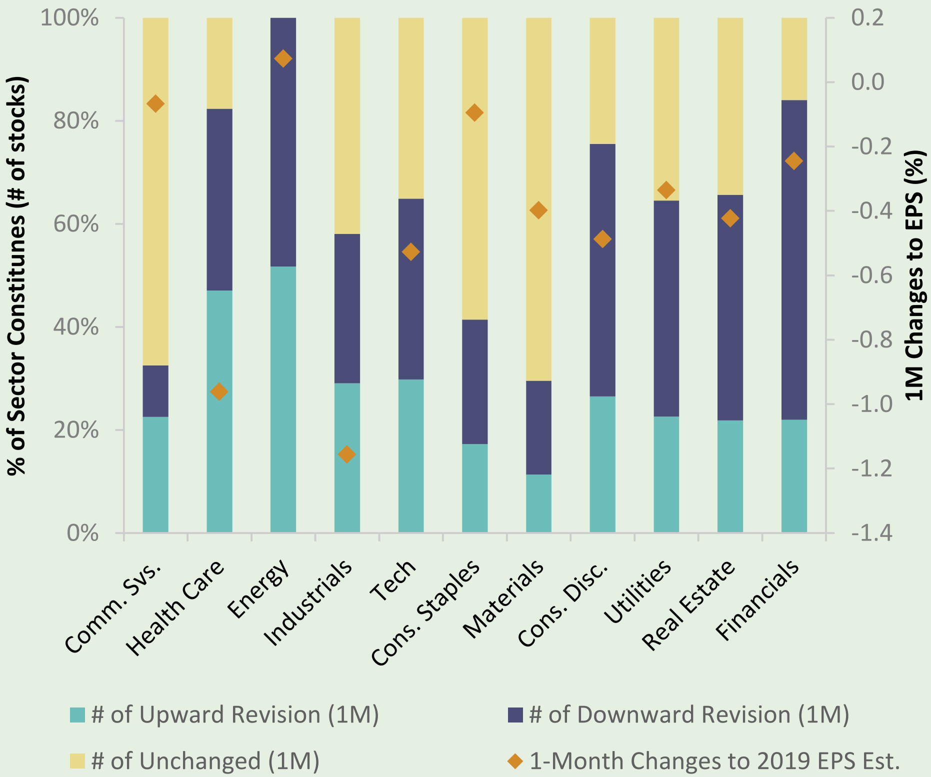
Sector Earnings — 2019 EPS estimates have been downgraded throughout Q1, except for Utilities, but the majority of sectors are still expected to post positive growth for 2019

Analyst Consensus S&P 500 Sector Earnings Growth in 2019* (%)

	2019	Q1 '19	Q2 '19	Q3 '19	Q4 '19
Comm. Svs.	4.0	-3.2	1.2	0.4	3.7
Cons. Disc.	7.6	-6.2	3.1	9.0	12.9
Cons. Staples	1.4	-4.3	0.0	1.9	4.2
Energy	-12.3	-19.5	-5.2	-17.0	-10.6
Financials	7.9	-2.8	3.7	5.2	18.1
Health Care	5.5	4.8	3.1	6.1	9.8
Industrials	8.5	0.7	6.7	9.5	10.3
Tech	2.3	-10.1	-8.4	-5.1	5.4
Materials	-2.6	-12.4	-3.4	5.1	7.9
Real Estate	1.8	1.5	1.7	4.0	2.3
Utilities	6.0	3.2	1.6	3.5	17.7
S&P 500	**4.0**	**-3.9**	**0.3**	**1.9**	**8.2**

Cyclical sectors , like Industrials, Financials and Cons. Disc. are expected to lead EPS growth in 2019

2019 Earnings Revision



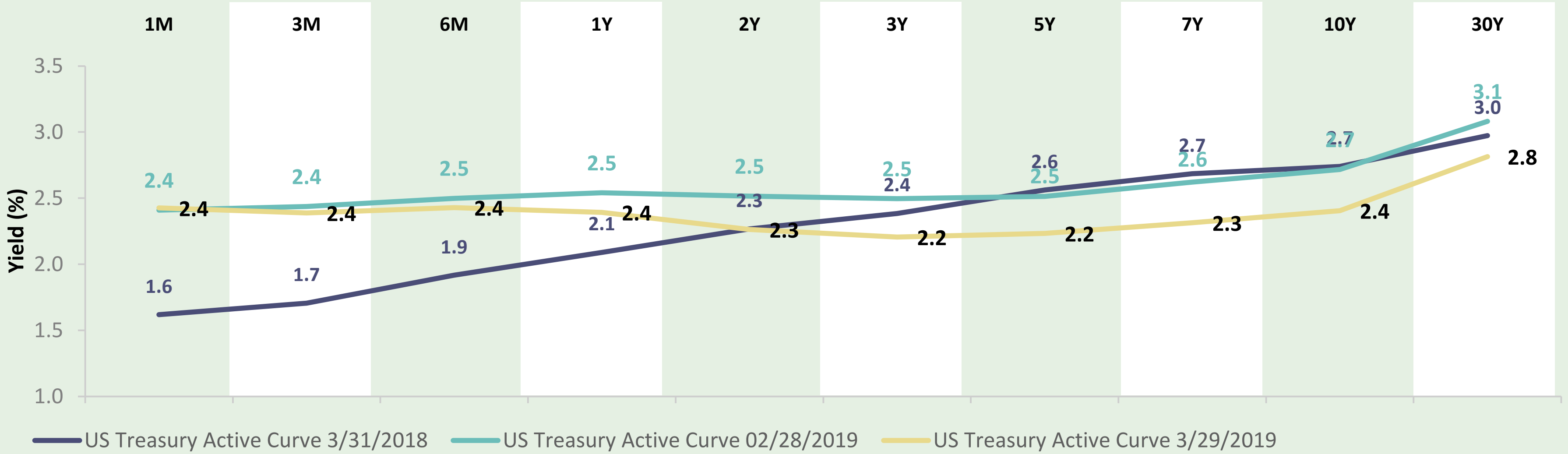
As oil prices moved above $60 per barrel, analysts are upgrading Energy company earnings

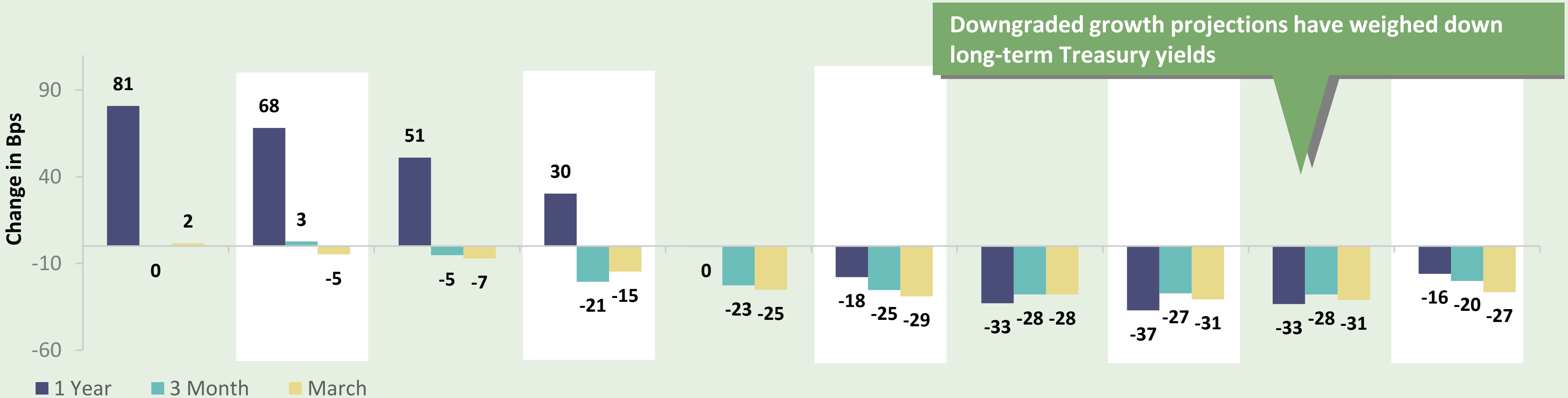
Source: FactSet. As of 03/29/2019. Characteristics are as of the date indicated, are subject to change, and should not be relied upon as current thereafter. EPS growth estimates are based on Consensus Analyst Estimates compiled by FactSet. * Low growth sectors for each period are shaded in red. High growth sectors are shaded in green..

Fixed Income

Yield Curve — As no rate hikes are expected for 2019 and the Fed downgraded its growth projections, the yield curve flattened, pulled down by long-term yields

US Treasury Curve

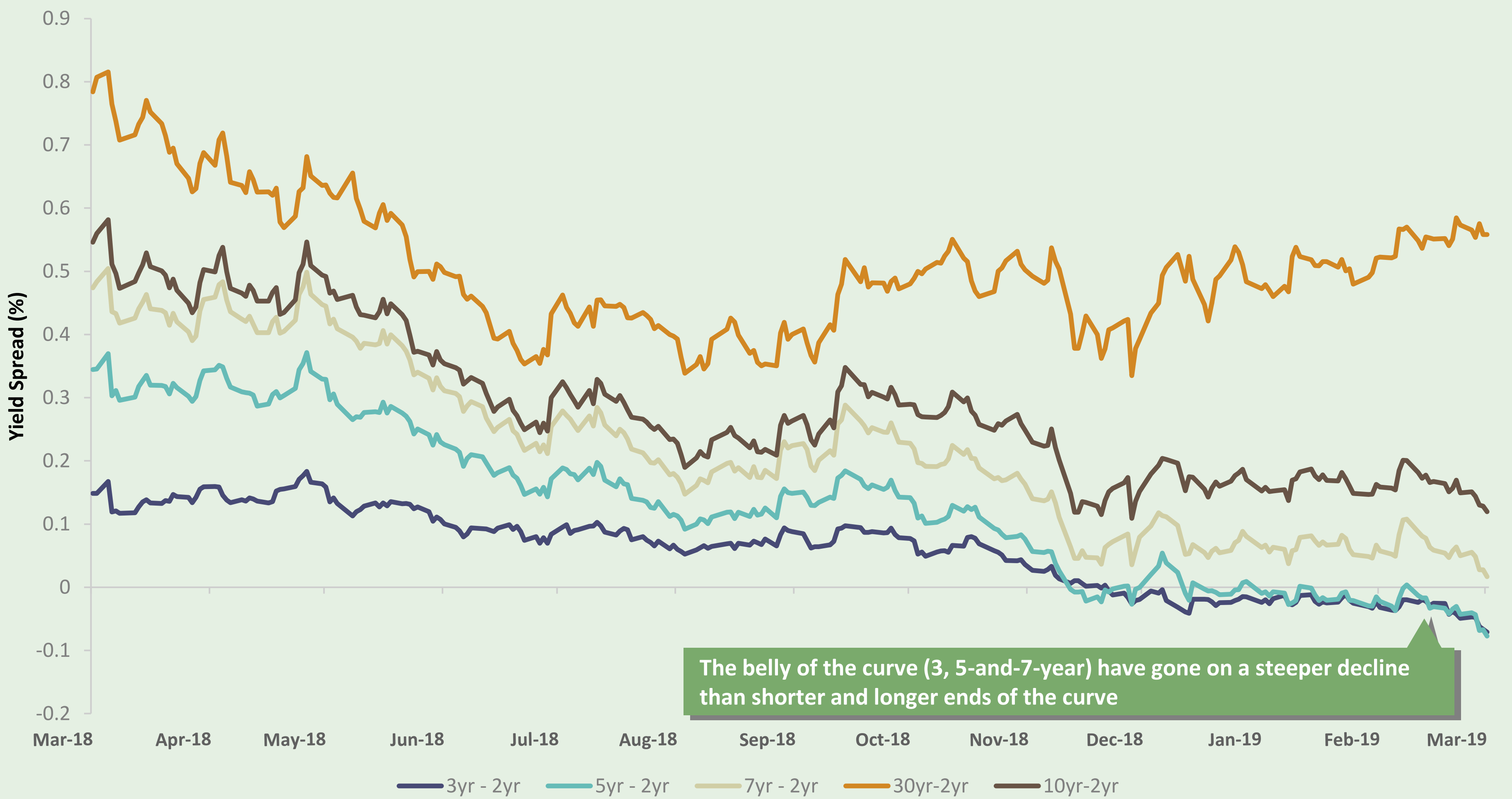




Source: Bloomberg Finance, L.P. As of March 29, 2019. **Past performance is not a guarantee of future results.**

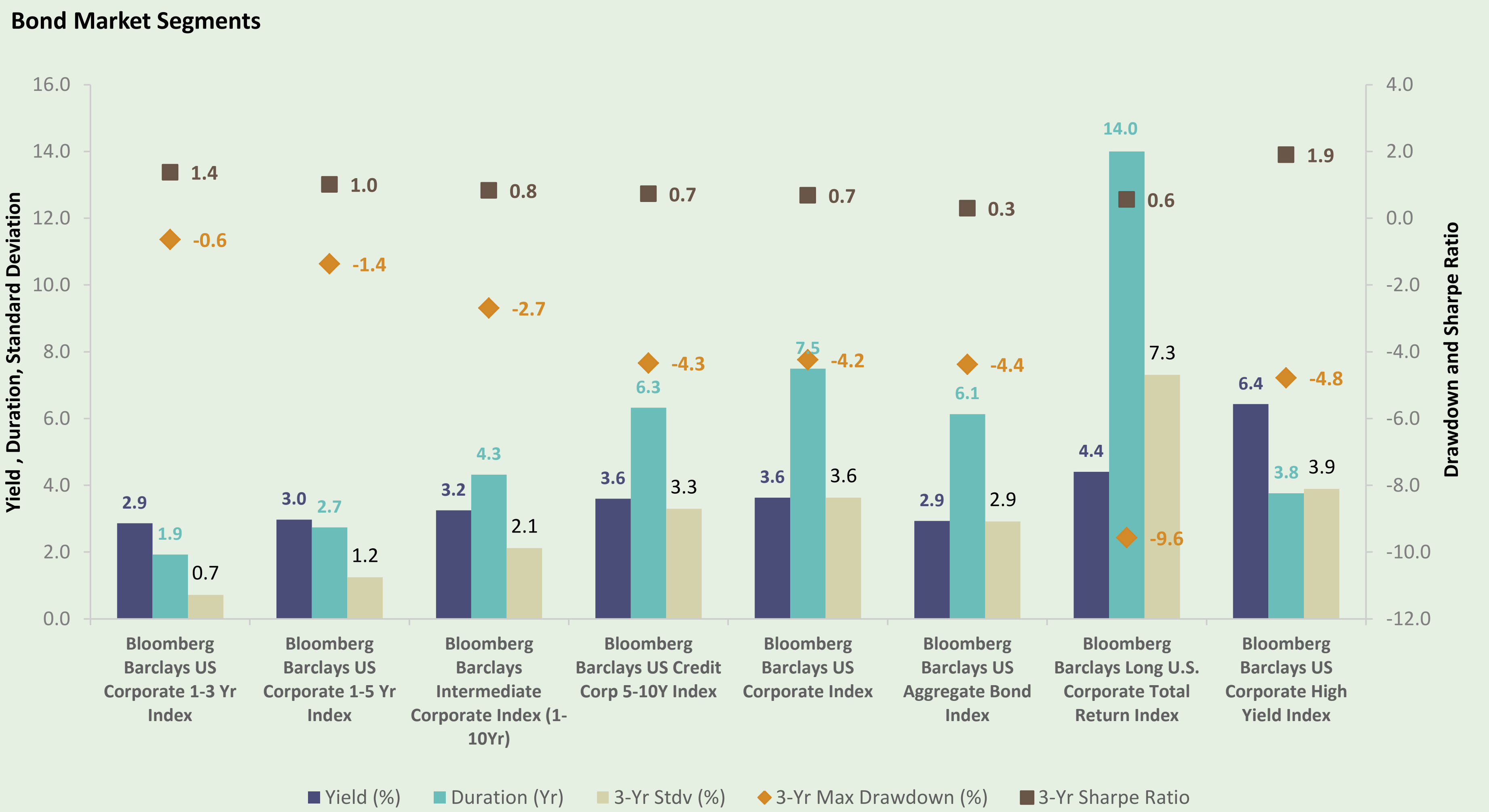
Yield Curve — The Fed's "patient" stance pressured yields in the belly of the curve, causing portions of the belly to be inverted

US Treasury Curve (10-and-2 Year Spreads)



Source: Bloomberg Finance, L.P. As of February 28, 2019. **Past performance is not a guarantee of future results.** The term premium is the excess yield that investors require to commit to holding a long-term bond instead of a series of shorter-term bonds.

Bond Market — Intermediate corporate bonds may benefit more from downward shift in the belly of the curve without extending duration and drawdown risks



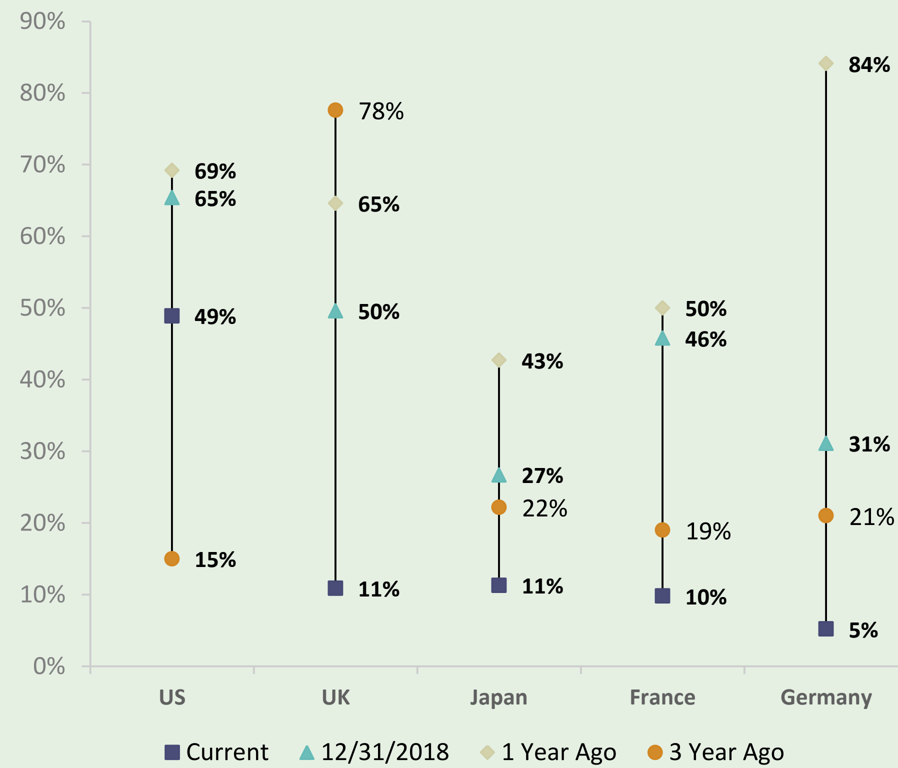
Source: Bloomberg Finance, L.P. As of March 29, 2019. **Past performance is not a guarantee of future results.** Index returns are unmanaged and do not reflect the deduction of any fees or expenses.

Global Rates — Global central banks turned dovish this year, lifting the total market value of negative yielding debt to a new record

Global Negative Yield Debt

The market value of global negative yield debt reached new highs amid tumbling yields

3-Yr Percentile Ranks* of 10-Yr Government Yields



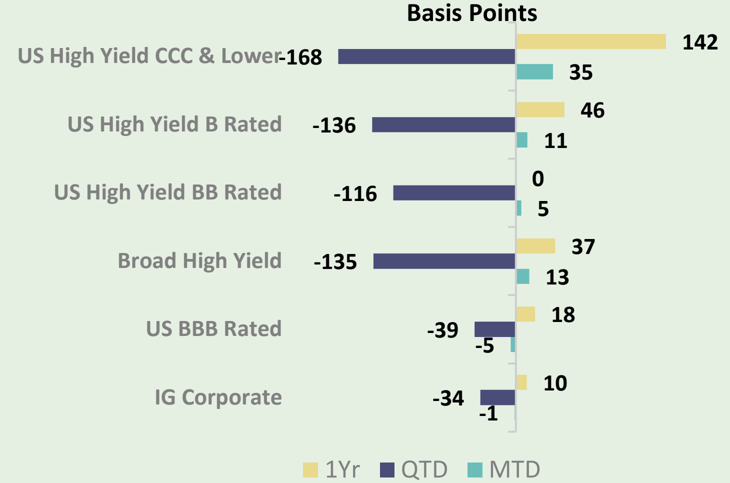
German and Japan 10-Yr yields turned negative in Q1

Source: Bloomberg Finance, L.P. As of March 28, 2019. Higher percentile indicates higher yields

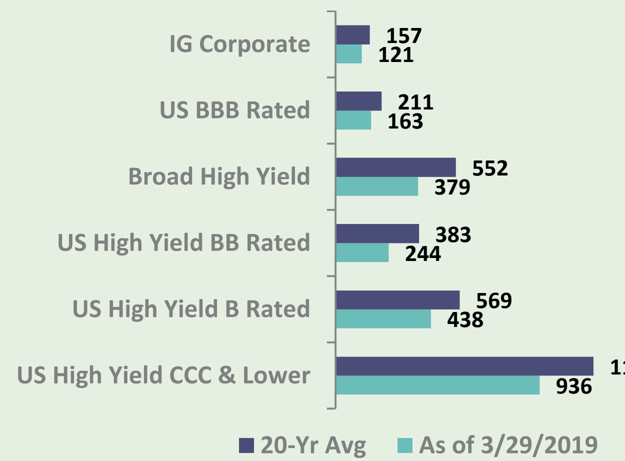
Credit Trends — Despite modest widening last month, high yield spreads have tightened to 30% below their long-term averages in Q1

Credit Spreads

Credit Spread Changes in Basis Points



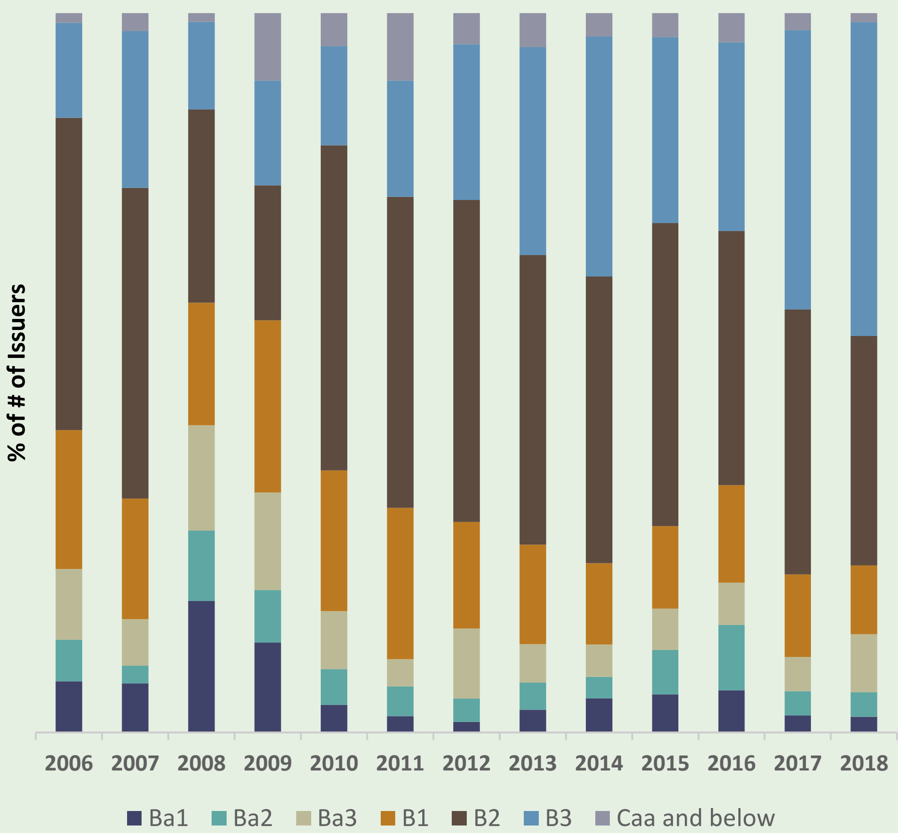
Credit Spreads Current vs. 20-Yr Averages



Source: Bloomberg Finance, L.P. BofA Merrill Lynch, as of March 29, 2019. US High Yield CCC & Lower = BofA ML US High Yield CCC & Lower Rated Index. US High Yield B Rated = BofAML US High Yield B Rated Index. BBB Rated = BofA ML US Investment Grade BBB Rated Index. Broad high yield = Bloomberg Barclays US Corporate High Yield Index. IG Corporate = Bloomberg Barclays US Corporate Index.

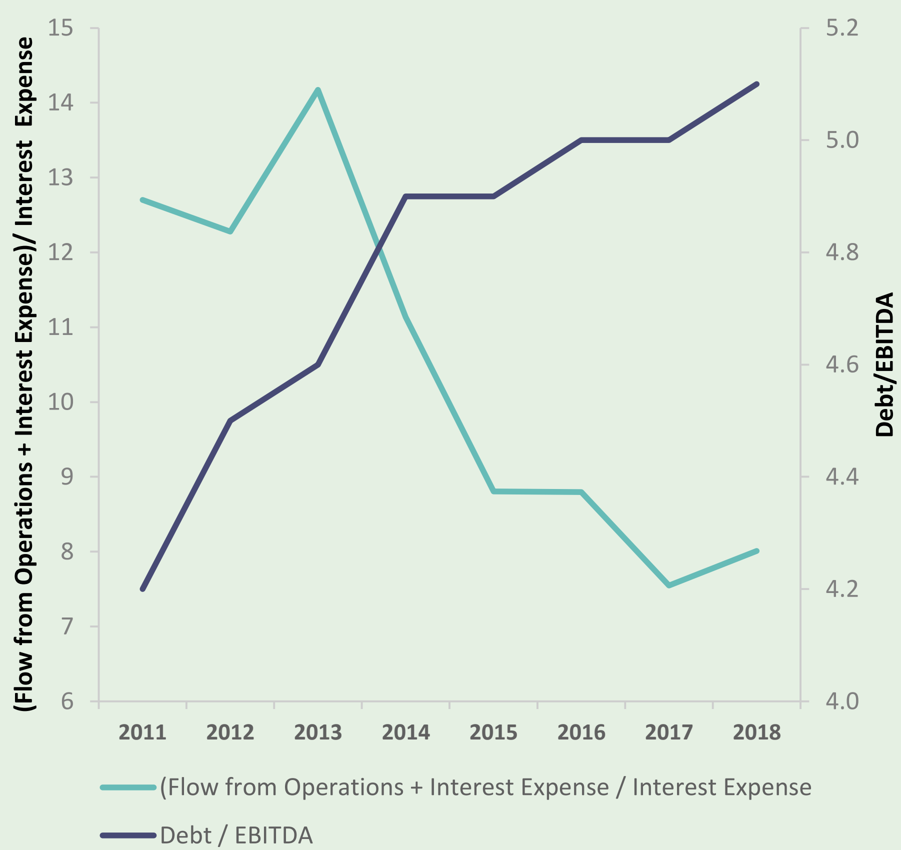
Credit Trends — High yield issuers' credit quality is declining, as their financial leverage has increased over the past four years, underscoring a late cycle environment

Increasing Low Credit Quality New Issuers in the High Yield Market



Global High Yield Issuers' Leverage

As declining earnings are expected for 2019, high yield issuers are facing higher default risk



Source: Moodys Investor Service, as of,12/31/2018. Ratings are based on Moody's ratings.

Appendices

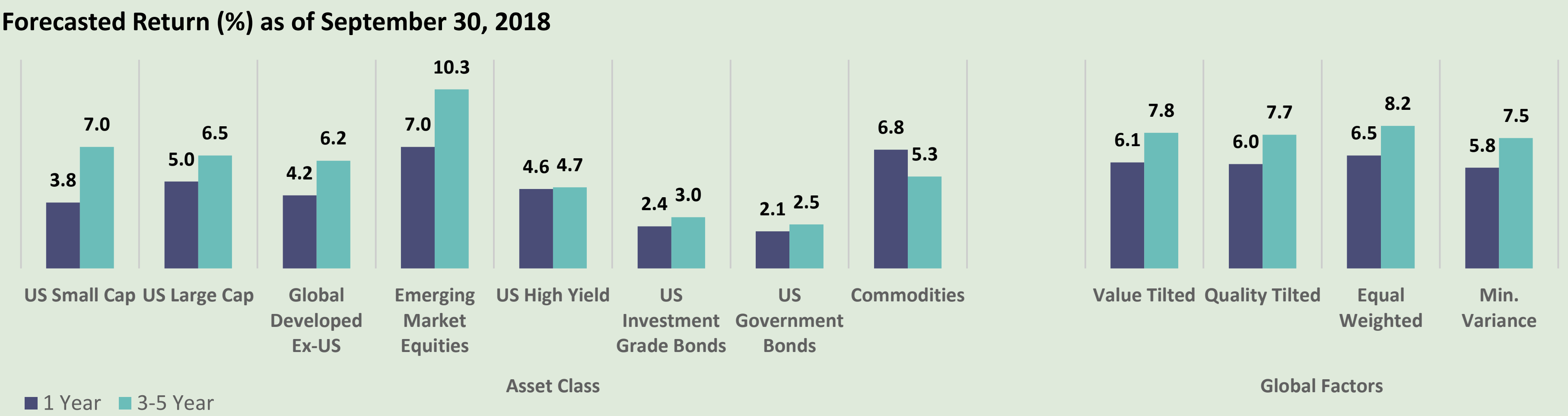
Fund Flow Summary

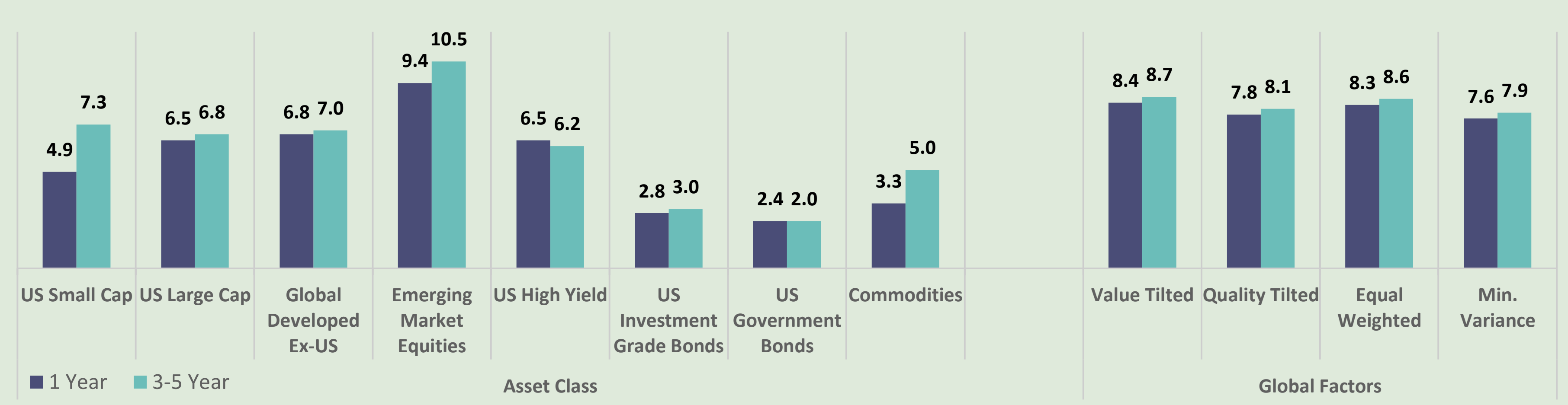
Asset Category

Equity Region	Prior Month ($M)	Trailing 3 Months ($M)	Trailing 12 Month ($M)
US		9,436	146,872
Global	299	-2,226	6,783
International-Developed	2,228	-129	29,560
International-Emerging Markets	869	13,217	16,861
International-Region	114	-567	-10,071
International-Single Country	-1,395	666	5,927
Currency Hedged	-655	-3,468	-12,781
US Size and Style			
Broad Market	2,781	7,375	31,582
Large-Cap	16,055	7,208	87,430
Mid-Cap	1,081	4,222	15,148
Small-Cap	1,013	-564	20,304
Growth	-377	-4,565	10,438
Value	534	-108	27,596
Fixed Income Sectors			
Aggregate	3,730	3,261	28,030
Government	122	6,716	49,616
Inflation Protected	-189	-418	1,052
Mortgage-Backed	442	4,720	8,219
IG Corporate	2,572	12,295	20,859
High Yield Corp.	3,133	8,063	3,681
Bank Loans	-772	-646	-2,880
EM Bond	-473	1,974	3,703
Preferred	399	-0	-2,251
Convertible	50	-235	-21
Municipals	1,365	1,172	7,064
Government ETF Maturity Focus			
Ultra Short	802	-960	15,890
Short Term	1,743	4,621	22,183
Intermediate	-840	1,780	7,910
Long Term (>10 yr)	-1,448	1,658	5,309

Source: State Street Global Advisors, Bloomberg Finance, L.P. As of March 29, 2019
Sectors, asset classes and flows are as of the date indicated, are subject to change, and should not be relied upon as current thereafter.

SSGA Asset Class Forecasts





Source: State Street Global Advisors (SSGA) Investment Solutions Group. **The forecasted returns are based on SSGA's Investment Solutions Group's December 31, 2018 forecasted returns and long-term standard deviations. The forecasted performance data is reported on a gross of fees basis. Additional fees, such as the advisory fee, would reduce the return**. For example, if an annualized gross return of 10% was achieved over a 5-year period and a management fee of 1% per year was charged and deducted annually, then the resulting return would be reduced from 61% to 54%. The performance includes the reinvestment of dividends and other corporate earnings and is calculated in the local (or regional) currency presented. It does not take into consideration currency effects. **The forecasted performance is not necessarily indicative of future performance, which could differ substantially.** Please reference Appendix B for the assumptions used by SSGA Investment Solutions Group to create asset class forecasts.

Asset Class Forecast Assumptions

Forecast Assumptions

For Fixed Income:
Our return forecasts for fixed income derive from current yield conditions together with expectations as to how real and nominal yield curves could evolve relative to historical averages. For corporate bonds, we also analyze credit spreads and their term structures, with separate assessments of investment-grade and high-yield bonds.

For Equities:
Our long-term equity forecasts begin with expectations for developed market large capitalization stocks. The foundation for these forecasts are estimates of real return potential, derived from current dividend yields, forecast real earnings growth rates, and potential for expansion or contraction of valuation multiples. Our forecasting method incorporates long run estimates of potential economic growth based on forecast labor and capital inputs to estimate real earning growth.

For Factor Returns:
Over a one to three-year forecast horizon, we look to see how cheap each factor is relative to its own history. Specifically, we focus on book/price spreads for each factor and relate that to their subsequent returns. We find that valuation ratios are useful for forecasting market returns.

For Commodities:
Our long-term commodity forecast is based on the level of world GDP, as a proxy for consumption demand, as well as on our inflation outlook. Additional factors affecting the returns to a commodities investor include how commodities are held (e.g., physically, synthetically, or via futures) and the various construction methodologies of different commodity benchmarks.

SPDR Sector Scorecard

	Composite Score	Metrics
	Valuation	**Relative Valuation** (P/B, P/E, NTM P/E, P/S)
	Valuation	**Absolute Valuation** (P/B, P/E, NTM P/E, P/S)
	Earnings Sentiment	**Earnings Revision** (Changes to EPS Estimates, Upgrade to Downgrade Ratio)
	Earnings Sentiment	**Earnings Surprise** (The Magnitude and Breadth of Earnings Surprise)
	Momentum	**Price Returns** 3-Months, 6-Months, 12-Months
VOLATILITY	Realized Volatility	**Standard Deviation** 30-Days Annualized
VOLATILITY	Implied Volatility	**3-Month-at-the-money** Implied Volatility for Options

The metrics shown are z-scores, which are calculated using the mean and standard deviation of the relevant metrics within S&P 500 sectors. Using Z-scores to standardize results across all sectors allows for easier relative assessment. Sectors with cheaper valuation, higher price momentum, higher sentiment and higher volatility will have higher z-scores.

We calculate a composite score by equally weighting each metric z-score in the same category.

The scorecard does not represent the investment views of State Street. Metrics used in the scorecard have not been backtested for any sector strategies by State Street. These are for illustrative and educational purposes as we seek to bring greater transparency to the sector investing landscape and the due diligence required to build sophisticated portfolios to meet specific client objectives.

Source: SPDR America Research.

Definitions

S&P500 Index: A popular benchmark for US large-cap equities that includes 500 companies from leading industries and captures approximately 80% coverage of available market capitalization.

CBOE VIX Index: The Chicago Board Options Exchange (CBOE) Volatility Index shows the market's expectation of 30-day volatility. It is constructed using the implied volatilities of a wide range of S&P 500 index options.

Implied Volatility: A way of estimating volatility of a security's price based on a number of predictive variables. Implied volatility rises when the market is falling when investors believe that the asset's price will decline over time, and it falls when the market is rising when investors believe that the security's price will rise over time. This is due to the common belief that bearish markets are riskier than bullish markets.

MSCI Emerging Market Index: The MSCI Emerging Markets Index captures large and mid-cap representation across 23 emerging markets countries. With 834 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

Russell 2000 Index: A benchmark that measures the performance of the small-cap segment of the US equity universe.

MSCI EAFE Index: An equities benchmark that captures large- and mid-cap representation across developed market countries around the world, excluding the US and Canada.

Bloomberg U.S. High Yield Index: The Bloomberg USD High Yield Corporate Bond Index is a rules-based, market-value weighted index engineered to measure publicly issued non-investment grade USD fixed-rate, taxable, corporate bonds. To be included in the index a security must have a minimum par amount of 250MM.

Bloomberg Barclays U.S. Aggregate Index: A benchmark that provides a measure of the performance of the US dollar denominated investment grade bond market, which includes investment grade government bonds, investment grade corporate bonds, mortgage pass through securities, commercial mortgage backed securities and asset backed securities that are publicly for sale in the US.

Bloomberg U.S. Treasury Index: The Bloomberg US Treasury Bond Index is a rules-based, market-value weighted index engineered to measure the performance and characteristics of fixed rate coupon US Treasuries which have a maturity greater than 12 months. To be included in the index a security must have a minimum par amount of 1,000MM.

Bloomberg Commodity Index: Bloomberg Commodity Index (BCOM) is calculated on an excess return basis and reflects commodity futures price movements. The index rebalances annually weighted 2/3 by trading volume and 1/3 by world production and weight-caps are applied at the commodity, sector and group level for diversification.

MSCI Europe Index: The MSCI Europe Index is a free-float weighted equity index designed to measure the equity market performance of the developed markets in Europe.

Euro STOXX 50 Index: Europe's leading blue-chip index for the Eurozone, provides a blue-chip representation of super-sector leaders in the Eurozone. The index covers 50 stocks from 12 Eurozone countries.

MSCI Japan Index: The MSCI Europe Index is a free-float weighted equity index designed to measure the equity market performance of the developed markets in Japan.

Bloomberg Dollar Spot Index: The Bloomberg Dollar Spot Index tracks the performance of a basket of ten leading global currencies versus the US Dollar. Each currency in the basket and their weight is determined annually based on their share of international trade and FX liquidity.

Bloomberg Barclays Global Aggregate Bond Index: A benchmark that provides a broad-based measure of the global investment-grade fixed income markets. The three major components of this index are the US Aggregate, the Pan-European Aggregate, and the Asian-Pacific Aggregate Indices. The index also includes Eurodollar and Euro-Yen corporate bonds, Canadian government, agency and corporate securities, and USD investment-grade 144A securities.

State Street Confidence Indexes: Measures investor confidence or risk appetite quantitatively by analyzing the actual buying and selling patterns of institutional investors. The index assigns a precise meaning to changes in investor risk appetite: the greater the percentage allocation to equities, the higher risk appetite or confidence. A reading of 100 is neutral; it is the level at which investors are neither increasing nor decreasing their long-term allocations to risky assets. The results shown represent current results generated by State Street Investor Confidence Index. The results shown were achieved by means of a mathematical formula in addition to transactional market data, and are not indicative of actual future results which could differ substantially.

Yield to worst: Yield to worst is an estimate of the lowest yield that you can expect to earn from a bond when holding to maturity, absent a default. It is a measure that is used in place of yield to maturity with callable bonds.

The **S&P 500 Quality Index** is designed to track high quality stocks in the S&P 500 by quality score, which is calculated based on return on equity, accruals ratio and financial leverage ratio.

The **S&P 500 High Beta Index** measures the performance of 100 constituents in the S&P 500 that are most sensitive to changes in market returns.

The **S&P 500 Low Volatility Index** measures performance of the 100 least volatile stocks in the S&P 500.

Death Cross: The death cross is a technical chart pattern indicating the potential for a major selloff. The death cross appears on a chart when a stock's short-term moving average crosses below its long-term moving average.

Definitions

MSCI USA Index: The MSCI World Index, which is part of The Modern Index Strategy, is a broad global equity benchmark that represents large and mid-cap equity performance across 23 developed markets countries. It covers approximately 85% of the free float-adjusted market capitalization in each country and MSCI World benchmark does not offer exposure to emerging markets.

MSCI USA Minimum Volatility Index: The MSCI USA Minimum Volatility (USD) Index aims to reflect the performance characteristics of a minimum variance strategy applied to the MSCI large and mid cap equity universe. The index is calculated by optimizing the MSCI USA Index, its parent index, for the lowest absolute risk (within a given set of constraints). Historically, the index has shown lower beta and volatility characteristics relative to the MSCI World Index.

MSCI USA Enhanced Value Weighted Index: The MSCI USA Enhanced Value Weighted Index captures large and mid-cap representation across the US equity markets exhibiting overall value style characteristics. The index is designed to represent the performance of securities that exhibit higher value characteristics relative to their peers within the corresponding GICS® sector.

MSCI USA Quality Index: The MSCI USA Quality Index is based on MSCI USA, its parent index. The index aims to capture the performance of quality growth stocks by identifying stocks with high quality scores based on three main fundamental variables: high return on equity (ROE), stable year-over-year earnings growth and low financial leverage.

MSCI USA Equal Weighted Index: The MSCI USA Equal Weighted Index represents an alternative weighting scheme to its market cap weighted parent index, the MSCI USA Index. At each quarterly rebalance date, all index constituents are weighted equally, effectively removing the influence of each constituent's current price (high or low).

MSCI USA High Dividend Yield Index: The MSCI World High Dividend Yield Index is based on the MSCI USA Index, its parent index, and includes large and mid cap stocks. The index is designed to reflect the performance of equities in the parent index (excluding REITs) with higher dividend income and quality characteristics than average dividend yields that are both sustainable and persistent. The index also applies quality screens and reviews 12-month past performance to omit stocks with potentially deteriorating fundamentals that could force them to cut or reduce dividends.

Price-to-book ratio (P/B Ratio): The price-to-book ratio (P/B Ratio) is a ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share. Also known as the "price-equity ratio.

Price-earnings ratio (P/E Ratio): The price-earnings ratio (P/E Ratio) is the ratio for valuing a company that measures its current share price relative to its per-share earnings. The price-earnings ratio can be calculated as: Market Value per Share/Earnings per Share.

Russell 1000 Growth Index: The index is a style index designed to track the performance of stocks that exhibit the strongest growth characteristics by using a style-attractiveness-weighting scheme.

Russell 1000 Value Index: The index is a style-concentrated index designed to track the performance of stocks that exhibit the strongest value characteristics by using a style-attractiveness-weighting scheme.

Russell 1000 Defensive Index and Russell 1000 Dynamic Index: The index measures a portion of the market based on the sensitivity to economic cycles, credit cycles, and market volatility, referred to as stability. Stability is measured at the company level in terms of volatility (price and earnings), leverage, and return on assets. The more stable half of the index is called the Defensive Index® and the less stable half is called the Dynamic Index®.

Z-score: It indicates how many standard deviations an element is from the mean. A z-score can be calculated from the following formula. $z = (X - \mu) / \sigma$ where z is the z-score, X is the sector relative performance. μ is the mean of the eleven sector relative performance, and σ is the standard deviation of sectors' relative performance.

Implied Volatility: The estimated volatility of a security's price. In general, implied volatility increases when the market is bearish and decreases when the market is bullish. This is due to the common belief that bearish markets are more risky than bullish markets.

Minimum Volatility Factor: A category of stocks that are characterized by relatively less movement in share price than many other equities.

Quality Factor: One of the six widely recognized, research-based smart beta factors that refers to "quality" equities. Companies whose stocks qualify exhibit consistent profitability, stability of earnings, low financial leverage and other characteristics consistent with long-term reliability such as ethical corporate governance.

Size Factor: A smart beta factor based on the tendency of small-cap stocks to outperform their large-cap peers over long time periods.

Yield Factor: A factor which screens for companies with a higher than average dividend yield relative to the broad market, and which have demonstrated dividend sustainability and persistence.

Momentum Factor: The tendency for a security to maintain a certain direction of price trajectory. This tendency is well documented in academic research, which has made "momentum" one of the six smart beta factors that are systematically being isolated in new-generation strategic indexes.

Value Factor: One of the basic elements of "style"-focused investing that focuses on companies that may be priced below intrinsic value. The most commonly used methodology to assess value is by examining price-to-book (P/B) ratios, which compare a company's total market value with its assessed book value.

Snapback Rally: When the market recovers quickly from a downturn.

Risk on: is used to describe investment sentiment when investors' risk tolerance increases.

Definitions

Standard Deviation: Measures the historical dispersion of a security, fund or index around an average. Investors use standard deviation to measure expected risk or volatility, and a higher standard deviation means the security has tended to show higher volatility or price swings in the past.

Excess Returns: A security's return minus the return from another security in the same time period.

Current Short Interest (%): The percentage of tradable outstanding shares which have been shorted. Used as a measure of investor sentiment.

Yield: The income produced by an investment, typically calculated as the interest received annually divided by the investment's price.

Basis Point: One hundredth of one percent, or 0.01%.

Yield Curve: A graph or line that plots the interest rates or yields of bonds with similar credit quality but different durations, typically from shortest to longest duration. When the yield curve is said to be flat, it means the difference in yields between bonds with shorter and longer durations is relatively narrow. When the yield curve is said to be steepened, it means the difference in yields between short term and long term bonds increases.

Spread Changes: Changes in the spread between Treasury securities and non-Treasury securities that are identical in all respects except for quality rating.

Bloomberg Barclays Global Aggregate Bond Index: The Bloomberg Barclays Global Aggregate Index is a flagship measure of global investment grade debt from twenty-four local currency markets. This multi-currency benchmark includes treasury, government-related, corporate and securitized fixed-rate bonds from both developed and emerging markets issuers.

Bloomberg Barclays U.S. Corporate High Yield Index: The index consists of fixed rate, high yield, USD-denominated, taxable securities issued by US corporate issuers.

Bloomberg Barclays EM USD Aggregate Index: The index is a hard currency emerging markets debt benchmark that includes US dollar-denominated debt from sovereign, quasi-sovereign, and corporate issuers in the developing markets.

Bloomberg Barclays U.S. Corporate Bond Index: The Bloomberg Barclays US Corporate Bond Index measures the investment grade, US dollar-denominated, fixed-rate, taxable corporate and government related bond markets. It is composed of the US Corporate Index and a non-corporate component that includes foreign agencies, sovereigns, supranationals and local authorities.

The Global Industry Classification Standard (GICS): An industry taxonomy developed in 1999 by MSCI and Standard & Poor's (S&P) for use by the global financial community. The GICS structure consists of 10 sectors, 24 industry groups, 67 industries and 156 sub-industries [1]into which S&P has categorized all major public companies.

Credit Spread: A credit spread is the difference in yield between a US Treasury bond and a debt security with the same maturity but of lesser quality.

S&P 500 Health Care Sector Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® health care sector.

S&P 500 Consumer Discretionary Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® consumer discretionary sector.

S&P 500 Consumer Staples Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® consumer staples sector.

S&P 500 Financial Sector Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® financial sector.

S&P 500 Utilities Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® utilities sector.

S&P500 Information Technology Sector Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® information technology sector.

S&P 500 Industrial Sector Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® industrial sector.

S&P 500 Materials Sector Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® materials sector.

S&P 500 Real Estate Sector Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® real estate sector.

S&P 500 Communication Services Sector Index: The Index comprises of those companies included in the S&P 500 that are classified as members of the GICS® Communication Services sector.

Breakeven Inflation Rate: It is a market based measure of expected inflation. It is the difference between the yield of a nominal bond and an inflation linked bond of the same maturity.

Put-Call ratio is calculated by dividing the total number of open interest of put options by the number of call options. It is usually used to gause investor sentiment on underlying securities.

Definitions

Citigroup Economic Surprise Index: The Citi Economic Surprise Indices measure data surprises relative to market expectations. A positive reading means that data releases have been stronger than expected and a negative reading means that data releases have been worse than expected.

Bloomberg Economics China Credit Impulse: New credit as a percentage of GDP (Credit Impulse), provides a gauge of the boost that lending is providing to growth.

MSCI USA Cyclical Sector Index: The MSCI USA Cyclical Sectors Index is based on MSCI USA Index, its parent index and captures large and mid-cap segments of the US market. The index is designed to reflect the performance of the opportunity set of global cyclical companies across various GICS® sectors. All constituent securities from Consumer Discretionary, Financials, Industrials, Information Technology and Materials are included in the Index

MSCI USA Defensive Sector Index: The MSCI USA Defensive Sectors Index is based on MSCI USA Index, its parent index and captures large and mid-cap segments of the US market. The index is designed to reflect the performance of the opportunity set of global defensive companies across various GICS® sectors. All constituent securities from Consumer Staples, Energy, Healthcare, Telecommunication Services and Utilities are included in the Index.

The Cyclical Sectors-Defensive Sectors Return Spread Index aims to represent the performance of a strategy based on the return spread between a long position on constituents of one underlying component Index (MSCI USA Cyclical Sectors Index) while taking a short position on constituents of another component Index (MSCI USA Defensive Sectors Index).

S&P 500 Low Volatility Index: The S&P 500® Low Volatility Index measures performance of the 100 least volatile stocks in the S&P 500. The index benchmarks low volatility or low variance strategies for the U.S. stock market. Constituents are weighted relative to the inverse of their corresponding volatility, with the least volatile stocks receiving the highest weights.

Bloomberg Barclays US Treasury Bill 1–3 Months Index: The Bloomberg Barclays 1–3 Month U.S. Treasury Bill Index (the "Index") is designed to measure the performance of public obligations of the U.S. Treasury that have a remaining maturity of greater than or equal to 1 month and less than 3 months.

Bloomberg Barclays US FRN < 5yr Index: The Bloomberg Barclays U.S. Dollar Floating Rate Note < 5 Years Index consists of debt instruments that pay a variable coupon rate, a majority of which are based on the 3-month LIBOR, with a fixed spread.

S&P/LSTA U.S. Leveraged Loan 100 Index: The S&P/LSTA U.S. Leveraged Loan 100 Index is designed to reflect the largest facilities in the leveraged loan market.

Bloomberg Barclays US Corporate 1–3 Year Index: The Index includes publicly issued U.S. dollar denominated corporate issues that have a remaining maturity of greater than or equal to 1 year and less than 3 years, are rated investment grade.

Bloomberg Barclays US Treasury 1–3 Year Index: The Index is designed to measure the performance of short term (1–3 years) public obligations of the U.S. Treasury.

Bloomberg Barclays U S Corporate High Yield Index: The Index measures the USD-denominated high yield, fixed-rate corporate bond market.

Bloomberg Barclays US Aggregate Bond Index: The Bloomberg Barclays U.S. Aggregate Bond Index (the "Index") is designed to measure the performance of the U.S. dollar denominated investment grade bond market, which includes investment government bonds, investment grade corporate bonds, mortgage pass through securities, commercial mortgage backed securities and other asset backed securities that are publicly for sale in the United States.

Bloomberg Barclays EM USD Aggregate Index: The index includes fixed and floating –rate US dollar0-denominated debt issued from sovereign, quasi-sovereign, and corporate EM issuers.

Bloomberg Barclays US Corporate Index: The index is designed to measure the performance of the investment grade corporate bond market. The Index includes publicly issued, investment grade, fixed-rate, taxable, U.S. dollar-denominated corporate bonds issued by U.S. and non-U.S. industrial, utility, and financial institutions.

Put/Call ratio: The put-call ratio is calculated by dividing the number of traded put options by the number of traded call options.

Short Interest: Short interest is the number of shares that have been sold short but have not yet covered or closed out.

Bloomberg Barclays EM Local Currency Sovereign Index: The index is designed to measure the performance of the fixed-rate local currency sovereign debt of emerging market countries.

The **Morgan Stanley US Quality Short Basket** selects the bottom 15% of the most liquid stocks from the Russell 3000 index based on standard measures of Quality. The basket is designed to be highly liquid and is rebalanced quarterly.

The **Morgan Stanley US Quality Long Basket** selects the top 15% of the most liquid stocks from the Russell 3000 index based on standard measures of Quality. The basket is designed to be highly liquid and is rebalanced quarterly.

The **Morgan Stanley US Quality Long-Short Basket** is a custom index that represents an equal notional pair trade of going long the US Quality Long and Short the US Quality Short basket. Performance reflects each side rebalanced back to equal notional at the close of each trading day.

Important Disclosures

The views expressed in this material are the views of SPDR Americas Research Team and are subject to change based on market and other conditions. This document contains certain statements that may be deemed forward-looking statements. Please note that any such statements are not guarantees of any future performance and actual results or developments may differ materially from those projected.

The information provided does not constitute investment advice and it should not be relied on as such. It should not be considered a solicitation to buy or an offer to sell a security. It does not take into account any investor's particular investment objectives, strategies, tax status or investment horizon. You should consult your tax and financial advisor.

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