

SPDR® Sector Scorecard

Sector investing is a powerful portfolio construction tool to enhance your core equity exposure. Our scorecard provides transparent and quantitative measurements of each sector's **valuation, momentum, sentiment, volatility** and **current positioning**.

The metrics shown are z-scores, which are calculated using the mean and standard deviation of the relevant metrics within S&P 500 sectors.

Monthly Insights

The Financials and Health Care sectors continue to exhibit attractive valuations. Despite attractive valuations, poor momentum and weak earnings sentiment continue to weigh on the Energy sector.

| | Valuation Composite Score | Momentum Composite Score | Earnings Sentiment Composite Score |
|------------------------|---------------------------|--------------------------|------------------------------------|
| Consumer Discretionary | -0.95 | -0.18 | -0.16 |
| Consumer Staples | -0.48 | 0.76 | 0.39 |
| Energy | 1.09 | -2.30 | -1.55 |
| Financials | 1.02 | 0.15 | -0.17 |
| Health Care | 0.65 | -0.97 | 1.26 |
| Industrials | 0.10 | -0.29 | -0.42 |
| Information Technology | -0.94 | 0.48 | 0.70 |
| Materials | 0.53 | -0.27 | -0.37 |
| Communication Services | -0.04 | 0.10 | -0.35 |
| Real Estate | 0.05 | 1.09 | 0.11 |
| Utilities | -1.04 | 1.43 | 0.55 |

Source: FactSet, SPDR America Research, as of October 31, 2019. Green shading is top 3, orange shading is bottom 3. Orange and green shading is meant to be read vertically.

Absolute Valuation Composite Score

Financials and Energy valuations continue to appear attractive relative to their own history based on all metrics. Utilities and Consumer Staples appear expensive as investors continue to position defensively.

| | P/E | NTM P/E | P/B | P/S | Absolute Valuation Composite Score |
|------------------------|-------|---------|-------|-------|------------------------------------|
| Consumer Discretionary | -0.98 | -0.91 | -0.44 | -0.75 | -0.77 |
| Consumer Staples | -1.09 | -0.34 | -0.70 | -0.78 | -0.73 |
| Energy | 0.45 | 0.76 | 2.15 | 2.52 | 1.47 |
| Financial | 1.47 | 1.33 | 0.24 | 0.42 | 0.86 |
| Health Care | -0.23 | 2.22 | -0.57 | 1.16 | 0.65 |
| Industrials | -0.21 | 0.27 | -0.64 | -0.32 | -0.23 |
| Technology | -0.86 | -0.91 | -0.72 | -0.75 | -0.81 |
| Materials | 0.20 | -0.20 | 1.84 | 0.34 | 0.55 |
| Communication Services | 0.16 | -0.38 | 0.21 | -0.64 | -0.16 |
| Real Estate | 2.12 | -0.87 | -0.70 | -0.43 | 0.03 |
| Utilities | -1.04 | -0.98 | -0.65 | -0.78 | -0.86 |

Source: FactSet, SPDR America Research, as of October 31, 2019. Green shading is top 3, orange shading is bottom 3. Orange and green shading is meant to be read vertically. Sector z-score for each metric is calculated across sectors.

Relative Valuation Composite Score

In addition to absolute valuations. Financials and Energy look attractive relative to the S&P 500. Consumer Discretionary and Utilities look expensive based on various metrics.

| | P/E | NTM P/E | P/B | P/S | Relative Valuation Composite Score |
|------------------------|-------|---------|-------|-------|------------------------------------|
| Consumer Discretionary | -1.45 | -1.41 | -0.56 | -1.08 | -1.13 |
| Consumer Staples | -1.09 | 0.32 | -0.68 | 0.48 | -0.24 |
| Energy | 0.95 | -0.53 | 1.45 | 0.98 | 0.71 |
| Financial | 1.35 | 1.41 | 1.30 | 0.67 | 1.18 |
| Health Care | 0.03 | 1.08 | 0.59 | 0.91 | 0.65 |
| Industrials | 0.81 | 1.30 | -1.17 | 0.79 | 0.43 |
| Technology | -0.80 | -0.58 | -1.62 | -1.25 | -1.06 |
| Materials | 0.48 | -0.69 | 1.35 | 0.90 | 0.51 |
| Communication Services | 0.41 | 0.91 | -0.13 | -0.89 | 0.08 |
| Real Estate | 0.90 | -0.41 | -0.51 | 0.34 | 0.08 |
| Utilities | -1.57 | -1.40 | -0.01 | -1.86 | -1.21 |

Source: FactSet, SPDR America Research, as of October 31, 2019. Green shading is top 3, orange shading is bottom 3. Orange and green shading is meant to be read vertically. Sector z-score for each metric is calculated across sectors.

Momentum Composite Score

Energy momentum continues to lag as a global growth slowdown causes concerns about oil demand. Utilities and Real Estate have gained momentum both over the shorter and longer term as investors search for yield.

| | 3M | 6M | 12M | Momentum Composite Score |
|------------------------|-------|-------|-------|--------------------------|
| Consumer Discretionary | -0.32 | 0.04 | -0.27 | -0.18 |
| Consumer Staples | 0.91 | 0.61 | 0.78 | 0.76 |
| Energy | -2.08 | -2.61 | -2.20 | -2.30 |
| Financial | -0.02 | 0.69 | -0.21 | 0.15 |
| Health Care | -1.01 | -1.12 | -0.79 | -0.97 |
| Industrials | -0.25 | -0.22 | -0.40 | -0.29 |
| Technology | 0.34 | 0.66 | 0.43 | 0.48 |
| Materials | -0.53 | 0.03 | -0.31 | -0.27 |
| Communication Services | 0.07 | 0.21 | 0.03 | 0.10 |
| Real Estate | 1.27 | 0.62 | 1.38 | 1.09 |
| Utilities | 1.63 | 1.08 | 1.57 | 1.43 |

Source: Bloomberg Finance L.P., SPDR America Research, as of October 31, 2019. Green shading is top 3, orange shading is bottom 3. Orange and green shading is meant to be read vertically. Sector z-score for each metric is calculated across sectors.

Sentiment Composite Score

Health care sentiment continues to remain strong despite the recent regulatory headline risk. Energy sentiment continues to be dragged down due in part to a lack of earnings beats.

| | 2019 EPS Est. 3 Month Change | 2019 EPS Est. Upgrade to Downgrade Ratio | Current Earnings Season Magnitude of Earnings Surprise | Current Earnings Season % of Companies with Earnings Beats | Sentiment Composite Score |
|------------------------|------------------------------|--|--|--|---------------------------|
| Consumer Discretionary | -0.61 | -0.92 | 0.87 | -0.01 | -0.16 |
| Consumer Staples | 0.22 | -0.79 | 0.69 | 1.44 | 0.39 |
| Energy | -2.60 | -1.24 | -0.11 | -2.25 | -1.55 |
| Financial | 0.54 | 0.18 | -1.49 | 0.11 | -0.17 |
| Health Care | 0.68 | 2.13 | 1.17 | 1.05 | 1.26 |
| Industrials | -0.34 | -0.77 | -0.58 | 0.01 | -0.42 |
| Technology | 0.40 | -0.01 | 1.31 | 1.13 | 0.70 |
| Materials | -0.18 | -0.73 | 0.17 | -0.74 | -0.37 |
| Communication Services | -0.16 | 0.18 | -1.76 | 0.36 | -0.35 |
| Real Estate | 1.58 | 0.56 | -0.83 | -0.87 | 0.11 |
| Utilities | 0.47 | 1.41 | 0.56 | -0.23 | 0.55 |

Source: FactSet, SPDR America Research, as of October 31, 2019. Green shading is top 3, orange shading is bottom 3. Orange and green shading is meant to be read vertically. Sector z-score for each metric is calculated across sectors.

Volatility Composite Score

Consumer Discretionary volatility is subdued as valuations remain stretched. Realized and implied volatility in Health Care is elevated as approximately two-thirds of companies have reported Q3 earnings.

| | 30-Day Realized Volatility Relative to the S&P 500 (Percentile) | 3M Implied Volatility Relative to the S&P 500 (Percentile) | Realized Volatility z-Score | Implied Volatility z-Score | Volatility Composite Score |
|------------------------|---|--|-----------------------------|----------------------------|----------------------------|
| Consumer Discretionary | 18% | 1% | -2.45 | -2.29 | -2.37 |
| Consumer Staples | 92% | 41% | 0.97 | -0.29 | 0.34 |
| Energy | 96% | 58% | 1.17 | 0.60 | 0.89 |
| Financials | 82% | 66% | 0.52 | 1.03 | 0.77 |
| Health Care | 90% | 67% | 0.88 | 1.09 | 0.98 |
| Industrials | 80% | 57% | 0.43 | 0.54 | 0.48 |
| Information Technology | 54% | 57% | -0.78 | 0.54 | -0.12 |
| Materials | 61% | 46% | -0.47 | -0.02 | -0.24 |
| Communication Services | 59% | 49% | -0.54 | 0.16 | -0.19 |
| Real Estate | 65% | 16% | -0.25 | -1.56 | -0.90 |
| Utilities | 82% | 50% | 0.52 | 0.21 | 0.37 |

Source: Bloomberg Finance L.P., FactSet, SPDR America Research, as of October 31, 2019. Green shading is least volatile, orange shading is most volatile. Orange and green shading is meant to be read vertically. Sector z-score for each metric is calculated across sectors.

Sector Positioning

Positioning in Health Care and Financials remain bearish as put/call open interest and short interest levels remain in the top quintile over the past year. Positioning in Utilities and Consumer Staples remain bullish as investors become more concerned about recession risk.

| Sectors | Put/Call Open Interest Ratio | | Short Interest as % Shares Outstanding | | |
|------------------------|------------------------------|----------------------------|--|-----------------|----------------------------|
| | Current Level | 1Yr Percentile Ranking (%) | Current Level (%) | Prior Month (%) | 1Yr Percentile Ranking (%) |
| Consumer Discretionary | 1.32 | 35% | 15.1% | 15.8% | 38% |
| Consumer Staples | 1.38 | 14% | 7.1% | 8.9% | 8% |
| Energy | 1.16 | 56% | 8.7% | 9.5% | 88% |
| Financials | 3.12 | 89% | 11.2% | 8.1% | 88% |
| Health Care | 1.83 | 84% | 15.6% | 15.4% | 92% |
| Industrials | 1.40 | 38% | 13.2% | 13.0% | 38% |
| Information Technology | 1.56 | 88% | 7.3% | 7.5% | 13% |
| Materials | 1.25 | 57% | 12.2% | 12.2% | 100% |
| Communication Services | 3.26 | 98% | 2.0% | 1.7% | 54% |
| Real Estate | 3.99 | 98% | 4.8% | 5.1% | 29% |
| Utilities | 1.44 | 34% | 16.1% | 17.7% | 13% |

Source: Bloomberg Finance L.P., as of October 31, 2019. Select Sector SPDR Funds' Put-call open interest is used to represent the sector. Short interest of all US-listed sector ETFs are used to calculate short interest as % of shares outstanding. Current levels of short interest as % of shares outstanding are in green if short interest decreases from last quarter in orange if short interest increases from last quarter. Sectors with lowest percentile ranking based of put/call ratio and % of short interest are shaded in green and highest ranking in orange.

Scorecard Methodology

Z-scores 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.

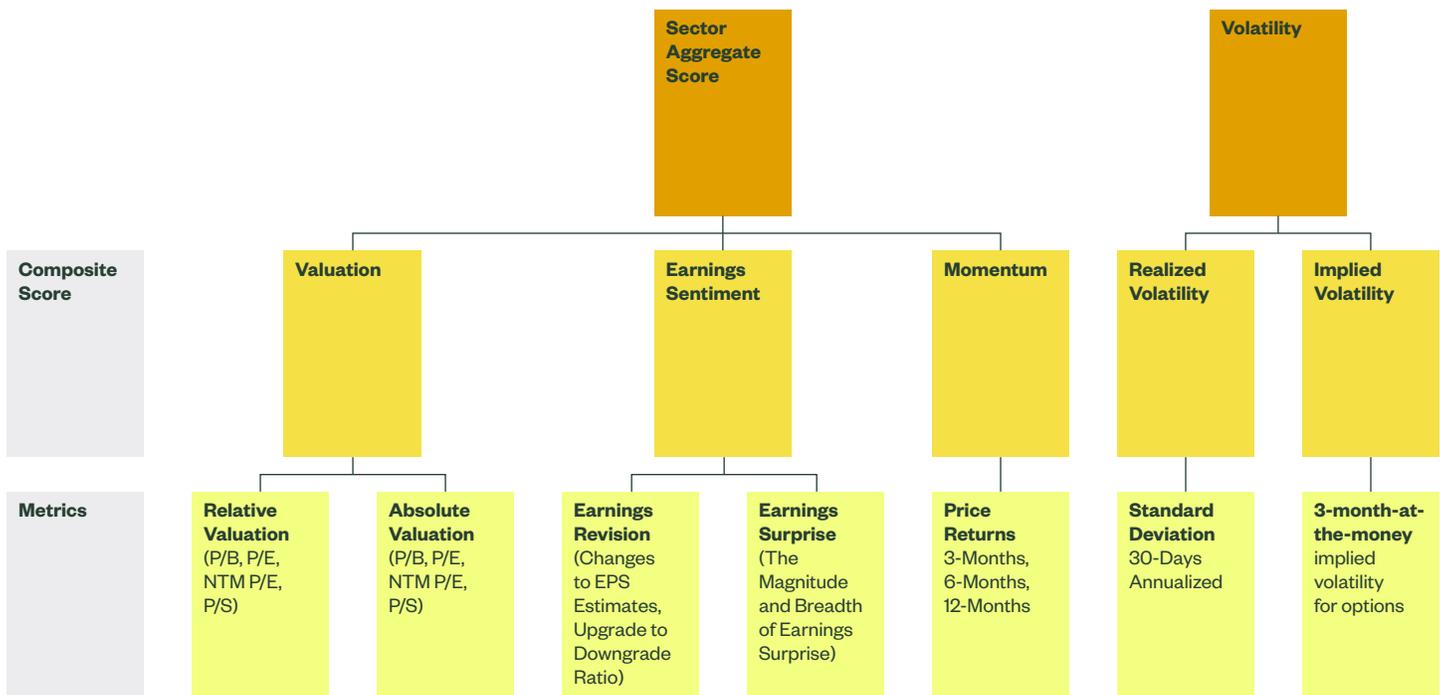
Our rationale for these parameters guides our examinations:

Value Stocks that trade at a lower price relative to their fundamentals may outperform high valuation sectors

Momentum Stocks that have performed well may tend to continue doing well in the near term

Earnings sentiment Stocks with strong earnings sentiment may indicate improving earnings growth prospects in the near term

Volatility Realized volatility provides an insight on sector historical volatility level, while implied volatility indicates forward-looking risk levels



Source: SPDR America Research.

To calculate the **Absolute Valuation Composite Score**, we examined the percentile ranking of sector trailing price-to-earnings (P/E), next twelve month price-to-earnings (NTM P/E), price-to-book (P/B) and price-to-sales (P/S) over the past 15 years. A higher score indicates more attractive valuations at present relative to the sector's historical norm.

To calculate the **Relative Valuation Composite Score**, we examined the percentile ranking of sector valuations relative to the S&P 500 over the past 15 years based on trailing P/E, NTM P/E, P/B and P/S. A higher score indicates more attractive relative valuations compared to the sector's historical norm.

The **Momentum Composite Score** is calculated by combining recent, not including the most recent month, 3-months, 6-months and 12-months price performance of the sector. A higher score indicates higher price momentum.

To calculate the **Sentiment Composite Score**, we examined changes to the NTM EPS estimates over the prior three months, the EPS upgrade to downgrade ratio, and the magnitude and breadth of earnings beats in the current earnings season. A higher score indicates higher earnings sentiment in the sector.

To calculate the **Volatility Composite Score** we examined the percentile ranking of each sector's 30-day realized volatility and 3-month implied volatility relative to the S&P 500 over the last twelve months. A z-score was calculated based off that percentile. A higher score indicates higher than normal levels of realized or implied volatility.

US Sector ETFs' put and call total open interest is used to calculate **Put/Call Open Interest Ratio**. Short interest of all US-listed sector ETFs are used to calculate **Short Interest as a Percentage of Shares Outstanding**.

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Glossary

Implied Volatility (IV) is measured by the 3-month at-the-money implied volatility for options tied to the corresponding Select Sector SPDR ETFs. It represents the market's forward-looking expectation of volatility based on current options pricing.

NTM Price to Earnings Ratio (NTM P/E) The ratio of the price of a stock and the firms earnings per share over the next twelve months. A lower NTM P/E indicates cheaper valuation.

Price to Book Ratio (P/B) A financial ratio used to compare a company's current market price to its book value which is the carrying value of an asset according to its balance sheet account balance. A lower P/B indicates cheaper valuation.

Price to Earnings Ratio (P/E) The ratio of the price of a stock and the firms earnings per share. A lower P/E indicates cheaper valuation.

Price to Sales Ratio (P/S) The ratio of the price of a stock and the firms sales per share. A lower P/S indicates cheaper valuation.

Z-score measures how many standard deviations an element is above or below the population mean. A sector z-score can be calculated from the following formula. $z = (X - \mu) / \sigma$, where X is the sector value of the metrics. μ is the mean of 11 sector values for a certain metric. σ is the standard deviation of the value of eleven sectors.

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