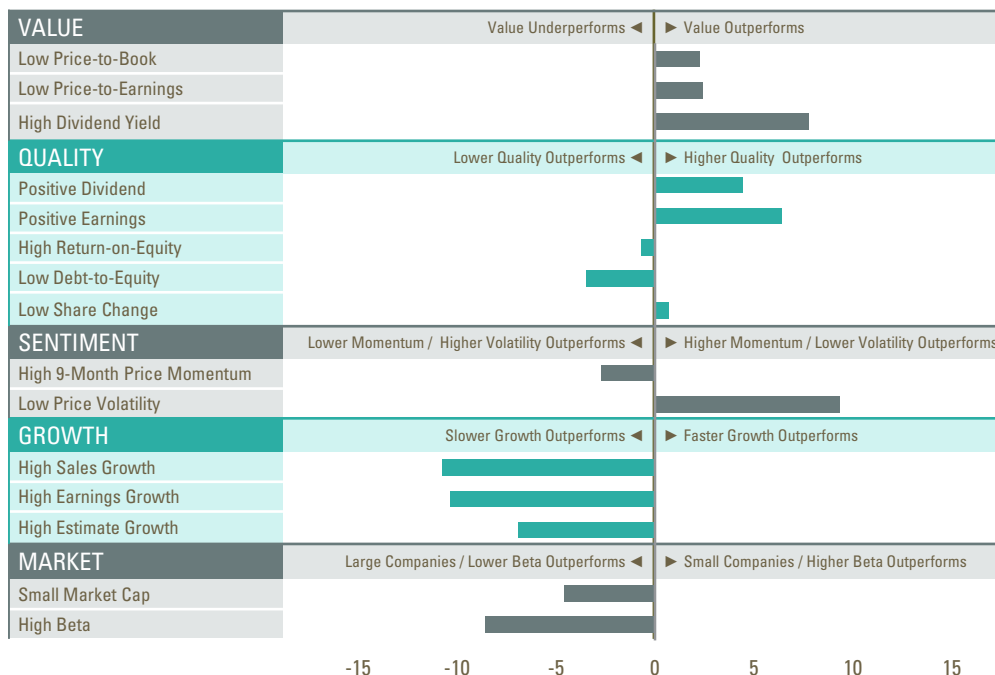


# Quantitative Review of U.S. Equities

Fourth Quarter 2018

- The S&P 500 reached an all-time high late in the third quarter, but the U.S. equity market experienced a significant correction in the fourth quarter with the S&P 500 and the U.S. Russell indices down 10% to 20%.
- Growth factors, which had provided the strongest performance in 2017 and the first three quarters of 2018, were sharply weaker in the fourth quarter. However, value factors provided only mixed returns in the quarter, doing well in some segments of the U.S. market but poorly in others.
- The fourth quarter market decline erased earlier gains, leaving the indices negative for the year. For 2018 as a whole, both the growth and value factors were significantly negative.
- With the stock market down for the quarter and year, most quality factors performed relatively well in both periods after mostly lagging earlier in 2018.
- Unexpectedly, given the sharp market reversal, stocks with higher price momentum actually did fairly well for the quarter, particularly in December.
- Consistent with typical historical patterns, smaller caps and higher beta both underperformed in a negative equity market.
- With value factors underperforming in 2017 and 2018, we revisit our research on these factors' historical returns after a period of trailing the market.

**Figure 1 Broad Market U.S. Equity Factor Returns**  
 QTD; % Return Difference between Factor's<sup>1</sup> High and Low Quartile; Russell 1000 Index; As of 12/31/2018



Source: Brandywine Global, FactSet, FTSE Russell

## A NOTE FROM BRANDYWINE GLOBAL'S DIVERSIFIED EQUITY TEAM

This paper is the quarterly report by Brandywine Global's Diversified Equity team on quantitative factors impacting the U.S. equity markets. In each publication, we will provide a standardized report on factor behavior for the quarterly and year-to-date periods. In addition, we will provide brief comments highlighting important and interesting trends in factor behavior and discuss recent work we are engaged in to better understand these trends. Understanding market performance through the unique lens of factor returns often brings early illumination to equity opportunities as well as areas of risk concentration. We use a longer-term perspective on the behavior of various factor returns to develop Diversified Equity strategies at Brandywine Global.

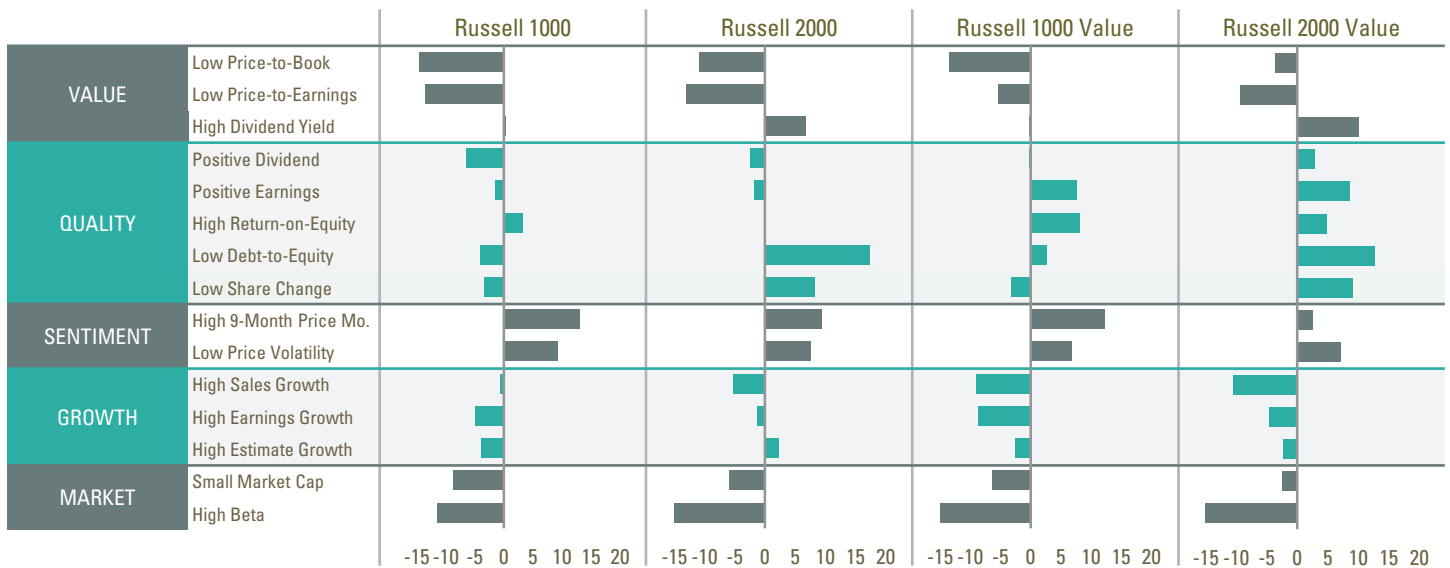


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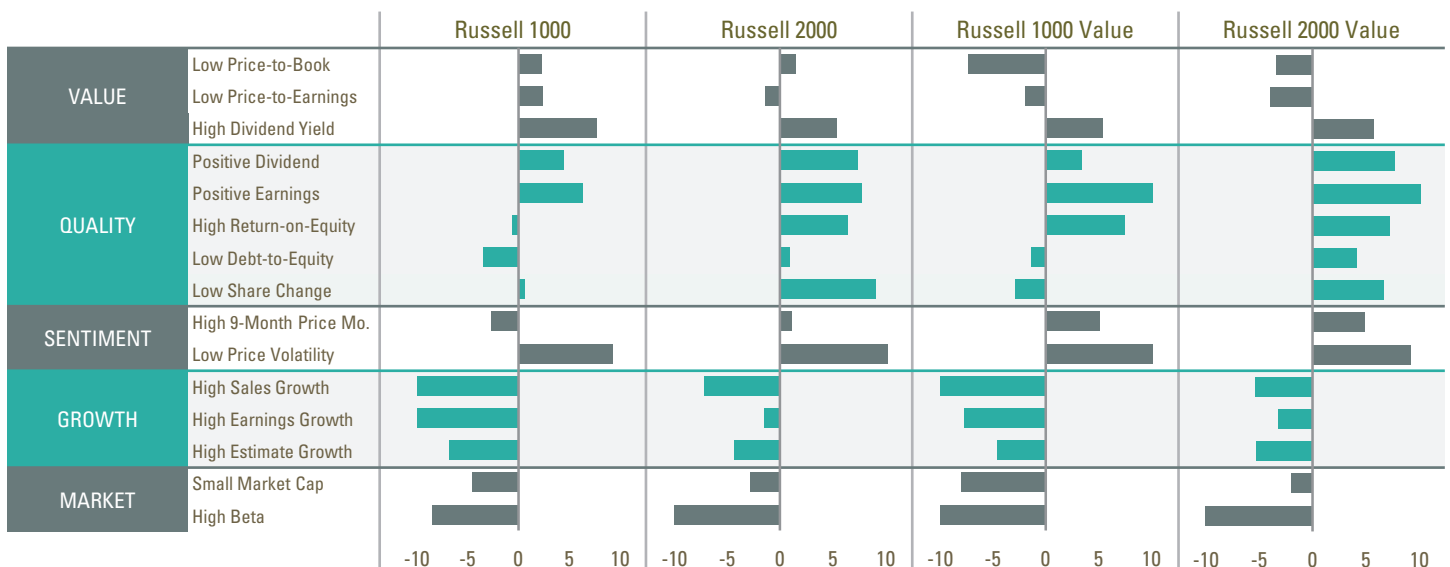
**Figure 2A U.S. Equity Factor Returns**

YTD; % Return Difference between Factor's High and Low Quartile; As of 12/31/2018



**Figure 2B U.S. Equity Factor Returns**

QTD; % Return Difference between Factor's High and Low Quartile; As of 12/31/2018



Source: Brandywine Global, FactSet, FTSE Russell

### FOURTH QUARTER 2018 FACTOR RETURNS

After the broad market reached all-time highs in the third quarter, U.S. equity indices fell from 10% to 20% in the fourth quarter. Concerns about the sustainability of a robust U.S. economy, tightening Federal Reserve (Fed) policy, slowing global growth, continued trade tensions, and the federal budget impasse all contributed to the fourth quarter contraction. Both large- and small-cap growth stocks, which had led the market higher since early 2017, were hardest hit, though the damage was widespread. With the prospect of lower economic growth, the 10-year U.S. Treasury yield fell to 2.7% from just over 3.0%. This decline coupled with the Fed's four rate hikes during 2018 significantly narrowed the spread between the 2- and 10-year Treasuries. The possibility of an inverted yield curve only reinforced fears of a potential economic slowdown.

The growth stocks' retracement resulted from both their extended valuations as well as individual company difficulties, such as Apple's lowered margin, revenue, and earnings guidance and Facebook's data privacy questions. The Russell Growth indices fell more than the value benchmarks this quarter after significantly outperforming for 2017 and earlier in 2018, though they are still ahead of the value benchmarks for 2018 overall. High sales growth, earnings growth, and estimate growth were negative factors for the quarter and for the year as well. Technology and the small group of FAANG stocks (Facebook, Amazon, Apple, Netflix, Alphabet) have been among the market's highest performers the last few years but these stocks experienced large reversals in the fourth quarter (see **Figure 3**).

**Figure 3 Total Return**

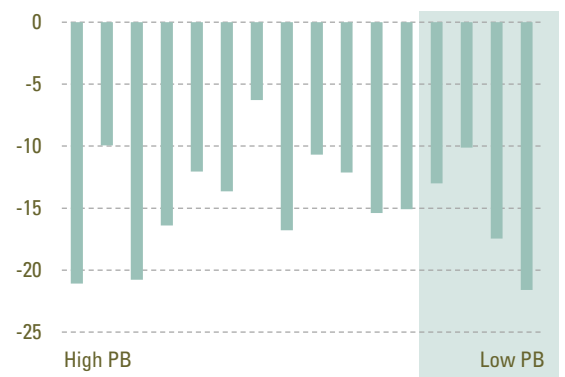
As of 12/31/2018	12/31/2017 to 9/30/2018	9/30/2018 to 12/31/2018
Amazon	71.27%	-25.21%
Alphabet	14.05%	-13.23%
Facebook	-6.80%	-20.29%
Netflix	94.90%	-28.46%
Apple	33.40%	-30.12%

Source: FTSE Russell

Higher-dividend stocks did well with the decline in long-term interest rates, outperforming for both the quarter and the year. This outperformance was a reversal from earlier in the year when rising long-term rates led to poor returns from the dividend factor. Other value factors, such as low price-to-earnings (P/E) and low price-to-book (P/B), only outperformed this quarter within the broad large-cap market while generally trailing in all other U.S. segments and underperforming across the market for the year. This year's results highlight that value and growth factors are not simply opposites but capture unique stock characteristics that tend to be only somewhat correlated. For instance, a stock with low P/E is not necessarily a low sales-growth stock nor is a high-earnings growth stock necessarily a high P/B stock. Although these two sets of factors often perform in opposite directions, as this year shows, they can both underperform—or outperform—at the same time. This is most clearly evident in December when the growth and value factors, except higher dividend yield, were both solidly negative. A group of low-sales growth, higher P/B stocks in consumer staples, such as Coca Cola, Altria, and PepsiCo, were down less than the overall market this month while higher sales growth, lower P/B stocks, including some financials, were down more, leading both growth and value factors to underperform.

While low P/E and P/B stocks did outperform for the quarter within the Russell 1000 Index, these factors lagged within the Russell 1000 Value Index. Ranking stocks by P/B within the Russell 1000 and sorting them into 16 groups reveals the source of this apparent inconsistency. Stocks with low P/B did outperform stocks with high P/B, however, the stocks in the middle range fell less than the stocks at either extreme as shown in **Figure 4**. Thus when looking at just the low P/B end of the distribution—the lowest four P/B groups of the 16, which are shaded in the diagram—the highest P/B group actually did do better than the lowest P/B stocks.

**Figure 4 Low Price-to-Book Returns: 16 Fractiles**  
 4th Quarter 2018 | As of 12/31/2018



Source: FTSE Russell

As shown in **Figure 5**, the value indices outperformed in the fourth quarter since value factors outperformed in the broad market, but the growth indices were ahead for the year because of their earlier strength even though value and growth factors both performed poorly for the year.

**Figure 5**

As of 12/31/2018	4th Quarter 2018		2018	
	Growth	Value	Growth	Value
Russell 1000 Index	-15.9%	-11.7%	-1.5%	-8.3%
Russell Midcap Index	-16.0%	-15.0%	-4.8%	-12.3%
Russell 2000 Index	-21.7%	-18.7%	-9.3%	-12.9%
Russell Microcap Index	-24.9%	-19.5%	-14.2%	-12.0%

Source: FTSE Russell

As might be expected in a sharp stock sell-off, quality factors displayed their generally defensive characteristics and were positive for the quarter as were positive dividends and earnings, higher return-on-equity (ROE), and lower debt-to-equity, share issuance, and stock price volatility all were down less than the overall market. Year to date, these factors are more mixed as they were generally poor performers during the market rally through the first three quarters.

Also consistent with historical results, small-cap stocks and higher-beta stocks underperformed in the fourth quarter's down market. Generally, smaller caps are more sensitive to market movements and will accentuate the market returns, up or down. The result is some correlation between the small-cap and high-beta factors, since smaller caps tend to have this higher beta to the market. The smaller-cap Russell indices trailed badly in the fourth quarter and lagged for 2018 after mixed performance earlier in the year (Figure 6).

Figure 6

As of 12/31/2018	4th Quarter 2018	2018
Russell 1000 Index	-13.8%	-4.8%
Russell Midcap Index	-15.4%	-9.1%
Russell 2000 Index	-20.2%	-11.0%
Russell Microcap Index	-22.1%	-13.1%

Source: FTSE Russell

More surprising were the generally positive fourth quarter returns from stocks with high price momentum. Normally when the market makes a sharp correction, those stocks that had led the way higher in the prior bull market retreat the most in the correction. Meanwhile, the more defensive stocks that had lagged in the rally fall the least in the contraction. As a result, the price momentum factors generally go from highly positive to highly negative. The stock performance reversal did happen this quarter as the growth technology names that had driven higher returns, fell the most this quarter. Meanwhile, defensive sectors such as consumer staples and utilities—which had lagged earlier in the year—now provided a defensive cushion. However, these relative performance reversals were so strong that by December, the stocks categorized as high and low momentum had almost completely switched. Because of their defensiveness, consumer staples and utilities were the highest momentum stocks at the beginning of December based on 9-month returns while many of the previous market leaders had fallen sufficiently that they were now among the lower-momentum stocks. As the market decline accelerated in December, the newly high-momentum, defensive stocks continued to decline less than the overall market and the high-momentum factor stocks produced strong returns.

### CYCLES IN VALUE FACTOR RETURNS

Figure 7 shows that the Russell Growth indices have substantially outperformed the Russell Value indices since the beginning of 2017, even after Russell Value indices' outperformance in the fourth quarter of 2018.

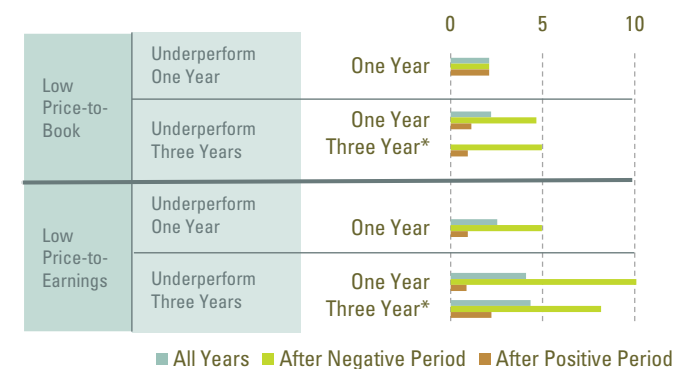
Figure 7 Annualized Returns: 2017-2018

As of 12/31/2018	Growth	Value
Russell 1000 Index	13.2%	2.1%
Russell 2000 Index	5.3%	-3.1%

Source: FTSE Russell

Given the poor performance from value stocks over the last two years, we look at how large-cap stocks with lower valuations historically behaved after periods of weak relative returns. In particular, we examine the return spread between the stocks in the lowest quartile in value based on P/E and P/B and the stocks in the highest quartile for each valuation measure from 1963 through 2018. Our analysis examines how the value factors perform within large-cap stocks one year after a year of poor returns, and one and three years after three years of cumulative poor performance, all calculated using monthly rolling periods. In Figure 8, both low P/E and low P/B stocks rebound after a bad year's performance to outperform in the next year. For P/E, the average rebound performance was better than the average excess return for all periods while for P/B average next year's return was nearly equal to the long-term average.

Figure 8 Value Factor Returns within Large Cap Stocks 1963 to 2018



\*Annualized Return  
 Source: FTSE Russell

Following a three-year period of weak value performance, the following one- and three-year value performance was much stronger than normal for both P/E and P/B. In addition, though not shown in the chart, the deeper the underperformance in the prior period, the stronger value bounce-back in the following one- or three-year period for both low P/E and P/B. Note that after a period of strong value returns for both factors

on either a one- or three-year basis, the subsequent period on average still saw positive value returns though generally on a smaller scale than the long-term average. In short, our research shows that poor value performance tends to be followed by positive value returns, with the comeback bigger if the underperformance was deeper or more extended. However, strong value performance is not followed by negative value returns. Of course, these results are averages over the long term, and the returns in any particular period have varied considerably from these averages.

As of 2018 year end, both low P/E (-14.8%) and low P/B (-17.5%) had negative factor returns for the trailing 12 months. However, for the trailing three years, low P/B was negative (-14.3% total underperformance) while the low P/E factor was actually slightly positive (0.6%); as low P/B has underperformed more severely over the last two years—both factors last outperformed in 2016. Given the deep recent underperformance for both low P/E and low P/B and the longer-term difficulties for low P/B, long-term history suggests a strong possibility for better value performance in 2019 and perhaps beyond.

<sup>1</sup>Factor returns represent return differences between top quartile (75%) and low quartile (25%) equities by each characteristic. **Market:** Market Capitalization and Market Beta (*Market Sensitivity Coefficient*); **Value:** Price-to-Earnings (*P/E based on trailing 12-month operating earnings*), Price-to-Book, Dividend Yield (*Among dividend-paying stocks*); **Quality:** Positive Earnings (*Positive earnings stocks - Stocks with no earnings*), Positive Dividend (*Dividend-paying stocks - Stocks with no dividend*), Share Change (*12-month change in shares outstanding*), Return-on-Equity, Debt-to-Equity; **Sentiment:** Price Momentum (*9-month price change*), Price Volatility; and **Growth:** Earnings Growth (*1-year earnings growth*), Sales Growth (*1-year sales growth*).

<sup>2</sup>Russell 1000 Growth Index ex Top 10 Contributors calculated by Brandywine Global

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