Quantitative Review of U.S. Equities

- U.S. equity returns were positive in the fourth quarter with the S&P 500 gaining 7.6%. For the year, U.S. markets remained down with the S&P 500 declining 18.1% in 2022.
- Factor returns were remarkably consistent for the fourth quarter and the year overall. Fourth quarter factor returns looked much like the full year even though this last quarter produced positive returns and the market was down for the year.
- Growth factors sales growth and estimate growth were quite weak in the quarter and year to date. Earnings growth did somewhat better in the quarter and was marginally positive for the year. Growth stocks, which had dominated the U.S. market over the last decade, were off significantly this year.
- While growth lagged, value factors low price-to-earnings, low price-to-book, and high dividend yield all were strongly positive for the year and quarter.
- In the fourth quarter, the Russell 1000 Value Index gained 12.2% compared to the Russell 1000 Growth Index's 2.2% increase limiting the Russell 1000 Value index's 2022 loss to -7.4% while the Russell 1000 Growth Index fell -29.4%.
- As might be expected in a down year, quality factors generally performed well in 2022, but they were also mostly positive in the fourth quarter's up market.
- Just as a declining market generally favors quality factors, lower price volatility, large cap, and lower beta stocks also outperformed in the year and quarter. Smaller caps outperformed within the broad large-cap market because the mega-cap growth names sustained such large losses.
- Given the general consistency of factor and sector performance this year, price momentum factors were positive for the year and quarter.
- **Research Spotlight: Stock Market Returns when the Federal Reserve Completes its Tightening Cycle.** Earlier this year we discussed how the market reacts to the Federal Reserve's (Fed's) move to raise short-term rates. As the Fed approaches its expected final target rate near 5.0%, we examine how the stock market behaved historically when the Fed stopped raising the federal funds rate.

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 quarter 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.

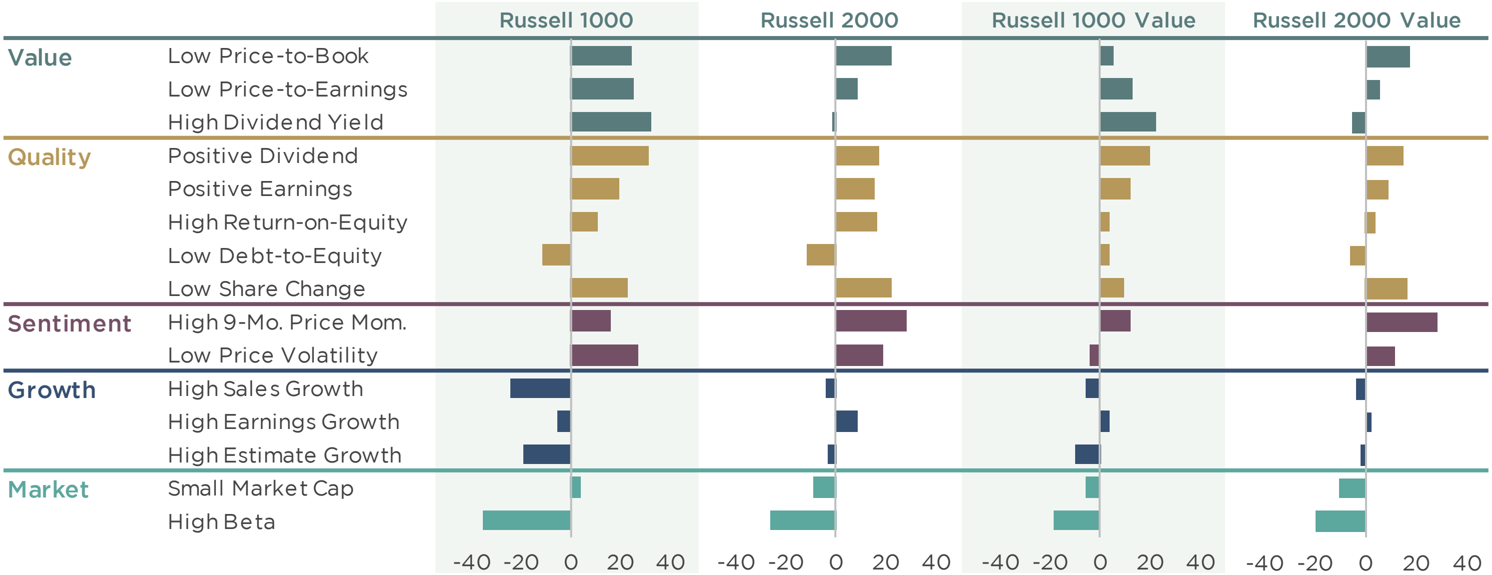
1 Fourth Quarter 2022 Russell 1000 Index Factor Returns

QTD; % Return Difference Between Factors[1] High and Low Quartiles; Russell 1000 Index; As of 12/31/2022

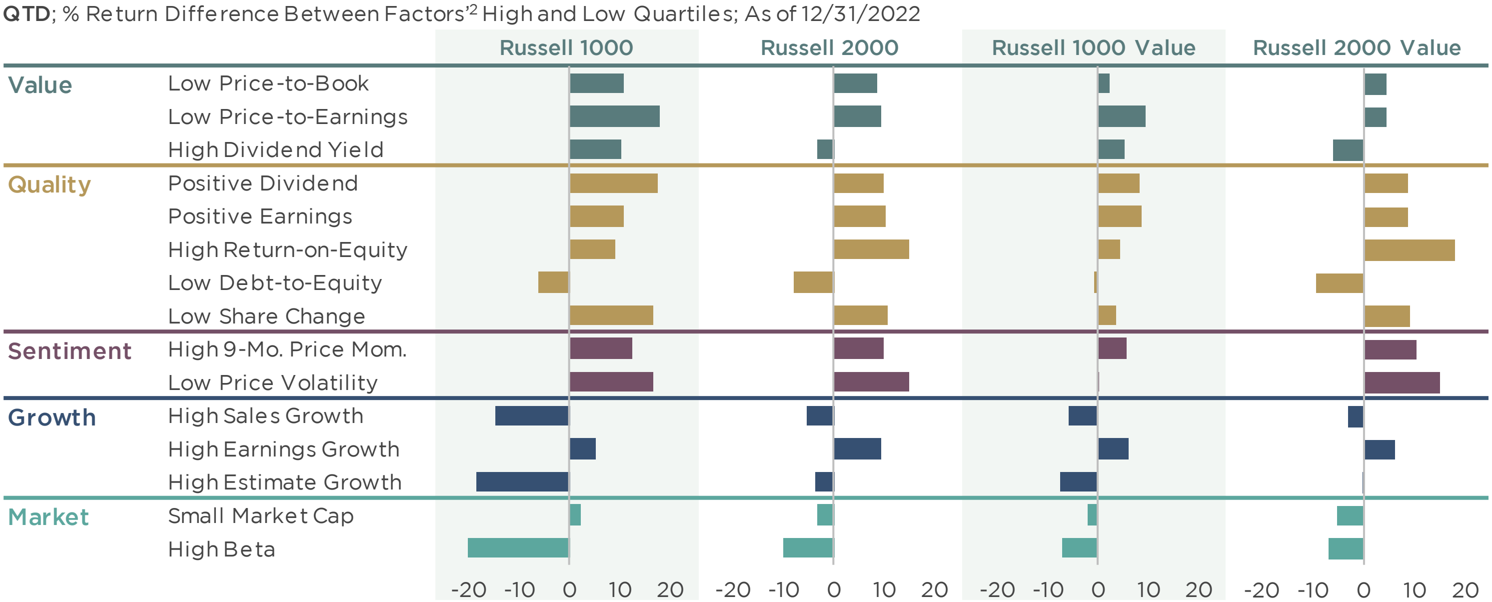
Source: Brandywine Global, FactSet, FTSE Russell

2 **Russell Index 2022 Factor Returns**

YTD; % Return Difference Between Factors'[1] High and Low Quartiles; As of 12/31/2022



QTD; % Return Difference Between Factors'[2] High and Low Quartiles; As of 12/31/2022



Source: Brandywine Global, FactSet, FTSE Russell

Fourth Quarter 2022 Factor Returns

The Fed Board raised short term rates seven times this year to 4.0% from close to zero to restrain rising inflation that peaked at over 9.0%. Longer-term rates also increased substantially with the U.S. 10-year Treasury rising from 1.5% as the year began to peak at over 4.2% before falling back to 3.9% at year end. Gross domestic product growth was negative in 2022's first two quarters, but it turned positive in Q3 and the fourth quarter is also expected to be modestly positive. Concern remains that the economy may turn negative again in 2023. Crude oil prices currently are trading in the mid-$70 per barrel, well down from 2022's high of over $120 per barrel, however current prices are still well above the average level over the five prior years.

These significant moves in interest rates and oil prices had a defining impact on the U.S. equity market in 2022. First, the threat of recession, increasing interest rates, and rising inflation were key contributors to the 2022 stock market losses. Rising interest rates also had a profound effect on the mega-cap growth stocks that dominated the U.S. market over the last decade. Growth stocks are distinguished by higher expected future earnings, so they perform best with low interest rates and low market uncertainty. That is exactly the environment we experienced over the last decade. The Fed kept interest rates very low and provided heavy monetary stimulus each time the market or economy faltered, boosting growth stocks returns. Now the Fed has pivoted to control inflation. Interest rates are rising (and unlikely to go back to the last decade's lows) and the Fed cannot return to an expansionary policy to counter stock market downdrafts. As a result, the higher interest rates, inflation, and volatility recently hurt growth stocks and benefited value stocks, and these factors should continue to help value stocks do better than growth stocks going forward. Finally, higher crude oil prices led to very strong returns within the energy section, up 64.3% for the year and 21.1% for the quarter within the Russell 1000 Index.

At the start of 2022, the well-known FAANG stocks (Meta/Facebook, Amazon, Apple, and Alphabet/Google) were four of the six largest U.S. public companies, with Microsoft and Tesla the two others. These growth stocks all benefited from the very low interest rates of the prior decade and most generated a return of over 1,000% (28% annualized) in the decade ending December 31, 2021. Their steepest gains came in 2020 in the aftermath of the pandemic when the 10-year Treasury yield plunged below 1.0% and the federal funds rate was near zero. With this year's rapid interest rate increases, these stocks dropped sharply as shown in **FIGURE 3**. These returns drove the underperformance in the high sales growth and high estimate growth factors.

3 FAANG Stocks Returns

As of 12/31/2022

	2022 Return	Q4 Return
Facebook/Meta	-64.2%	-11.3%
Apple	-26.4%	-5.8%
Amazon	-49.6%	-25.7%
Netflix	-51.1%	25.2%
Google/Alphabet	-38.7%	-7.7%
Microsoft	-28.0%	3.3%
Tesla	-65.0%	-53.6%
Russell 1000 Index	-19.1%	7.2%

Source: Bloomberg

The high earnings growth factor was slightly positive for the quarter and year in most segments because many of these mega-cap growth stocks are no longer top ranked on earnings growth. This fundamental problem of maintaining very high earnings growth rates in very large companies also contributed to the stocks' underperformance this year.

The value factors of low price-to-earnings, low price-to-book, and high dividend yield (among large-cap stocks) performed well this year and quarter in part because the FAANG and FAANG-like stocks had very high valuations and generally low dividend yields. In addition, energy stocks with their very strong positive returns had low valuations. While the financial sector's performance was not as strong as energy's, it outperformed the broad market with its lower valuations and helped fuel strong fourth quarter results for value factors. **FIGURE 4** presents the returns from the various domestic Russell equity indices and shows the large disparity between value and growth stocks for both periods.

4 Russell Index Returns by Style

As of 12/31/2022

	Fourth Quarter		Year to Date	
	Growth	Value	Growth	Value
Russell 1000 Index	2.2%	12.4%	-29.1%	-7.5%
Russell Midcap Index	6.9%	10.5%	-26.7%	-12.0%
Russell 2000 Index	4.1%	8.4%	-26.4%	-14.5%
Russell Microcap Index	2.7%	6.1%	-29.8%	-16.7%

Source: FTSE Russell

With the market down in 2022, quality factors would be expected to do well given their typical defensiveness. More surprising is that these factors continued to perform positively as the market partially rallied in the fourth quarter. This quarter the higher-quality stocks with earnings and dividends outperformed stocks without either despite a rising market because those without had a large weight in technology, one of the quarter's worst-performing sectors. The one quality factor that underperformed in both the quarter and year, stocks with low debt-to-equity, included some of the large-growth names that performed poorly in both periods, including Meta/Facebook, Alphabet/Google, and Tesla.

Other generally defensive variables such as higher market cap, low beta, and low stock price volatility also outperformed. This result would be expected for the year given the down market, but like some of the quality variables, these factors also did well in the fourth quarter rally, perhaps because the quarter closed sharply lower in December. Small did outperform for the quarter and year in the Russell 1000 Index because the large-cap stocks were heavily weighted to the growth names that were down so significantly this year. **FIGURE 5** presents the Russell Index returns by different cap ranges.

5 **Russell Index Returns by Size**

As of 12/31/2022

	Fourth Quarter	Year to Date
Russell 1000 Index	7.2%	-19.1%
Russell Midcap Index	9.2%	-17.3%
Russell 2000 Index	6.2%	-20.4%
Russell Microcap Index	4.7%	-22.0%

Source: FTSE Russell

Because factor and sector returns were similar for the quarter and the year, the price momentum variable was strongly positive in both periods. Sectors with strong price momentum that continued to outperform include energy and health care, while technology, consumer discretionary, and communication services, driven by the weak large cap growth stocks, were low momentum groups that continued to underperform.

Research Spotlight: Stock Market Returns when the Federal Reserve Completes its Tightening Cycle.

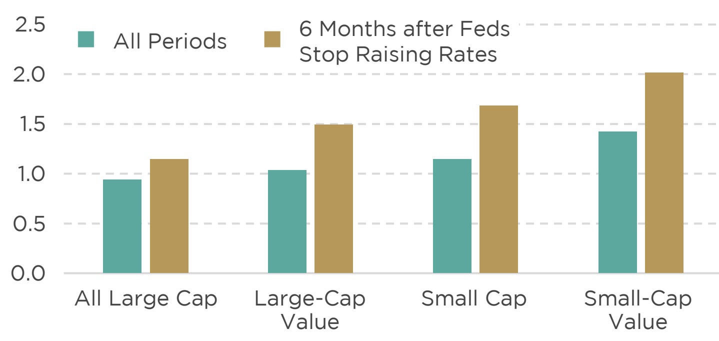
Earlier this year we examined how the U.S. stock market reacted historically when the Fed began raising its short-term federal funds rate. These increases, usually intended to slow the economy and reign in accelerating inflation, often had a dampening effect on stock market returns. In the first six months of the Fed's tightening cycle, U.S. stock market, on average, still had positive returns but much lower than the market's long-term average.

With seven increases in 2022, the Fed brought the federal funds rate to 4.5% as its upper target from close to zero as the year began. Market estimates predict a terminal rate somewhere around 5.0%, which means the Fed is getting close to completing this tightening round. We look back historically from 1963-2021 to see how the market typically behaved in the six months after the Fed stopped raising rates. The analysis does not require that the Fed begin reducing rates, only that it was no longer initiating increases. The Fed will likely keep rates steady for a time after reaching the terminal level before it begins reducing rates this cycle.

As seen in **FIGURE 6**, on average, in those first six months after the Fed ceased raising rates, the overall U.S. stock market outperformed its long-term average. This result would seem to reflect that an end to interest rate hikes triggered optimism that the economy was more likely to recover sooner. Certainly market experience in 2022 seems consistent with this scenario. Whenever market consensus grew that the Fed might be finished with tightening, the stock market surged, usually to fall back again when the Fed reiterated its determination to hold steady on its tightening course. While the overall market performed better in these post-tightening periods, value stocks and small stocks outperformed by more than their usual premium of the broad market as well.

6 **Average Monthly Returns**

Jan 1963 – Dec 2021



Source: Compustat, FactSet, Brandywine Global

Board of Governors of the Federal Reserve System (US), Federal Funds Effective Rate [DFF], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/DFF, January 8, 2023.

As **FIGURE 7** shows, despite the recent dismal performance by large-cap growth stocks, their valuations relative to value stocks remain quite high, near the growth valuation peak reached during the 1999-2000 tech bubble. The potential for better value and small-cap performance once the Fed reaches its target federal funds rate suggests that the recent rally in these long under appreciated market segments could continue into the future.

7 Ratio of Avg Price-to-Book: Russell 1000 Growth vs. Russell 1000 Value

Dec 31, 1997 – Dec 31, 2022

Source: FRED, Federal Reserve Bank of St. Louis

[1] 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).

Data for Russell Index simulation prior to 1985 is obtained from Compustat (©2021) through FactSet Research (©2021) using Alpha Tester and CRSP NYSE Market Capitalization Decile information, all of which is believed to be reliable and accurate. FactSet provides fundamental stock and return calculations. Compustat provides fundamental stock information and price history. CRSP (Center for Research in Security Pricing) provides historical market capitalization groupings based on NYSE listed companies. Backtest simulation of index first calculates the top 1,000 stocks by market capitalization or the equivalent NYSE market-cap decile cut point to produce the same relative market capitalization range in earlier years when there were fewer listed companies. The value index is calculated using the lower half of companies in the market-cap range when ranked by price-to-book value. Rebalancing occurs annually at the end of June to maintain consistency with the Russell methodology. FTSE Russell was not involved in the simulation of the index prior to 1985. The views expressed represent the opinions of certain portfolio managers at Brandywine Global Investment Management, LLC ("Brandywine Global") and are not intended as a forecast or guarantee of future results. The opinions expressed above may be contrary to active positioning within one or more of Brandywine Global's strategies managed by a separate investment team. Data contained in this report is obtained from sources believed to be accurate and reliable. Brandywine Global will not undertake to supplement, update or revise such information at a later date. This information should not be considered a solicitation or an offer to provide any Brandywine Global service in any jurisdiction where it would be unlawful to do so under the laws of that jurisdiction. It should not be assumed that investments in any of the sectors or industries listed were or will prove profitable. The Russell 1000 Index measures the performance of the large-cap value segment of the U.S. equity universe. The Russell 2000 Index measures the performance of the small-cap value segment of the U.S. equity universe. The Russell 1000 Value Index and Russell 2000 Value Index include those companies with lower price-to-book ratios and lower forecasted growth values. The Russell 1000 Growth Index and Russell 2000 Growth Index include companies with higher price-to-book ratios and higher forecasted earnings growth values within their respective broad universes. The Russell Midcap Index measures the performance of the mid-cap segment of the U.S. equity universe. The Russell Microcap Index measures the performance of the microcap segment of the U.S. equity market. There is no guarantee that holding securities with relatively high (or low) price-to-earnings, price-to-book, or price-to-cash flow ratios will cause a security to outperform its benchmark or index. Standard and Poor's 500 Index is a capitalization-weighted index of 500 stocks. The index is designed to measure performance of the broad domestic economy through changes in the aggregate market value of 500 stocks representing all major industries. Standard & Poor's S&P 500® Index is a registered trademark of Standard & Poor's, a division of the McGraw-Hill Companies Inc. Indices are unmanaged and not available for direct investment. **Past performance is no guarantee of future results.**

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