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QM Equity Quarterly Newsletter

Q3 2022

T. Rowe Price Quantitative Equity Team

Quarterly Factor Returns

(Fig. 1) July 1, 2022–September 30, 2022

Universe	Total Return	Valuation	Growth	Momentum	Quality	Profitability	Risk	Size
MSCI Japan	-1.47%	-5.53%	2.09%	-0.03%	5.29%	-0.20%	-4.08%	-2.79%
Russell 2500	-2.82%	-11.03%	7.94%	4.35%	-6.07%	-9.86%	5.29%	-0.54%
Russell 1000 Growth	-3.60%	-4.94%	7.51%	6.68%	-1.00%	-3.30%	0.87%	0.81%
MSCI Europe	-4.10%	-3.16%	2.98%	6.10%	1.49%	3.38%	0.57%	7.98%
MSCI Pacific ex-Japan	-4.43%	-4.15%	5.92%	-0.57%	-4.00%	-2.41%	6.11%	-2.32%
Russell 1000	-4.61%	-6.34%	8.22%	3.88%	-1.36%	-3.33%	3.17%	1.19%
Russell 1000 Value	-5.62%	-3.80%	6.43%	3.47%	-0.82%	-1.09%	3.04%	2.09%
MSCI Emerging Markets	-8.02%	0.30%	-5.35%	15.42%	4.53%	0.80%	-14.73%	6.52%

Past performance is not a reliable indicator of future performance.
Sources: Refinitiv/IDC data, Compustat, Worldscope, Russell, MSCI. Analysis by T. Rowe Price. See Additional Disclosures.
Factor returns are calculated as equal-weighted quintile spreads. Please see Appendix for more details on the factors.

Following the first-half sell-off, the third quarter of 2022 was a tale of two periods:

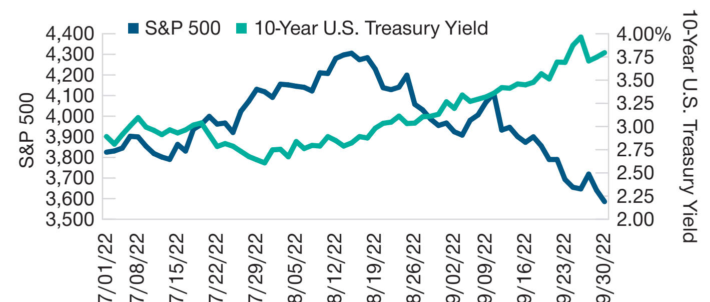
- The beginning of the quarter was marked by "hope" that the Federal Reserve would engineer a soft landing and thoughts that sentiment had become too negative during the second-quarter market drawdown. This led to a strong market rally, falling U.S. Treasury yields, and leadership by high-growth, high-risk, and highly shorted stocks.
- The second half of the quarter was a complete reversal, as the Fed reiterated its commitment to reining in inflation, which led to a steep market decline, rising interest rates, and leadership by high-quality and less expensive stocks.

Looking at the time series, the market has been swinging between factors:

- Risk, growth, and short interest have been abnormally correlated, as have profitability, size, value, and momentum.
- These factor correlations contributed to the distinct "tale of two periods" shown in Figures 3 and 4.
- The underlying driver appears to be interest rates and, relatedly, the market's pricing of a potential recession in 2022–2023.

S&P 500 Index vs. Interest Rates

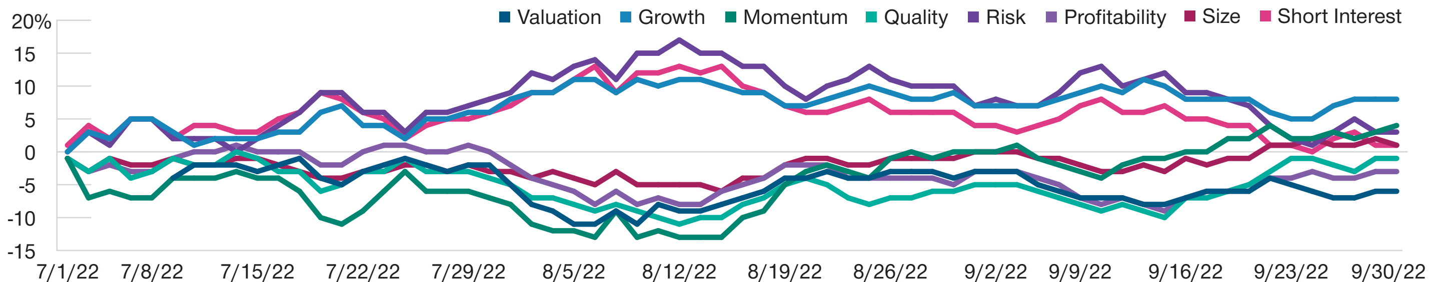
(Fig. 2) July 1, 2022–September 30, 2022



Past performance is not a reliable indicator of future performance.
Sources: FactSet, S&P.

Russell 1000 Index Factor Performance

(Fig. 3) July 1, 2022–September 30, 2022



Past performance is not a reliable indicator of future performance.

Sources: Refinitiv/IDC data, Compustat, Russell, T. Rowe Price analysis. See Additional Disclosures.

Factor returns are calculated as equal-weighted quintile spreads. Please see Appendix for more details on the factors.

For the quarter, growth outperformed value, and optimism won the day. We are not convinced this will continue in the fourth quarter.

- As shown in Figure 1 and the time series in Figures 3 and 4, despite the mid-quarter change in sentiment, the aggregate environment favored growth over value and risk over quality.
- We see more uncertainty in the fourth quarter and beyond: Continued Fed tightening and rising rates should continue to challenge longer-duration and more expensive growth stocks, while Fed tightening economic implications should drive negative earnings revisions in more cyclical value stocks. Our expectation of negative earnings revisions is the subject of our Market Insight section.

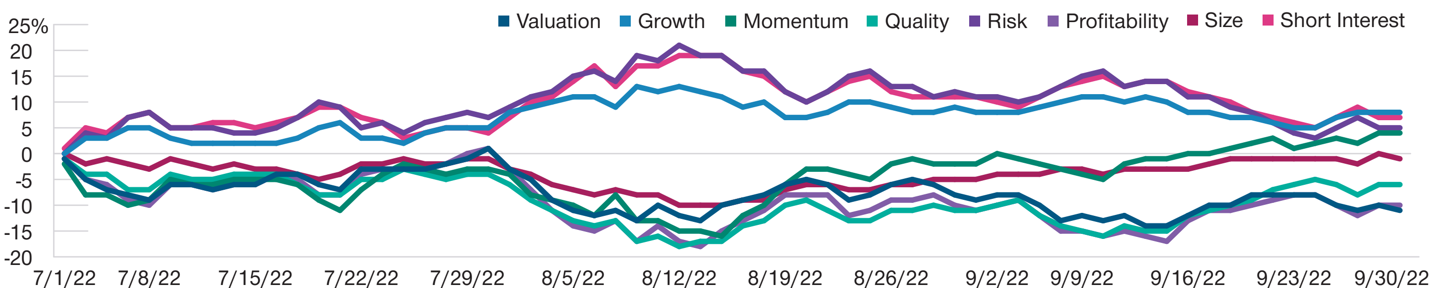
Market Insight—What We're Monitoring

In our second-quarter 2022 newsletter, we highlighted that the first-quarter market decline was driven entirely by multiple contraction and that we expected negative earnings revisions to drive the next stage of the market's decline. That view has now become close to consensus.

In this quarter's note, we frame potential negative earnings revisions using the "outside view." Our integrated investment approach combines the "inside view" (bottom-up knowledge of individual companies and current market conditions) with the outside view (probability of what is most likely to happen given historical precedents of similar situations). In this particular situation, the outside view is what has historically happened to earnings estimates during typical years. This needs to be paired with the inside view, which is today's unusual macro environment featuring high inflation, supply chain dislocations, historical stimulus followed by Fed tightening, margin risk, and geopolitical tensions. One particular concern is margins, which have risen for 25 years through declining costs of goods sold; lower interest rates; muted labor costs in selling, general, and administrative expenses; and declining taxes. All four margin tailwinds are likely to be headwinds looking forward, although

Russell 2500 Index Factor Performance

(Fig. 4) July 1, 2022–September 30, 2022



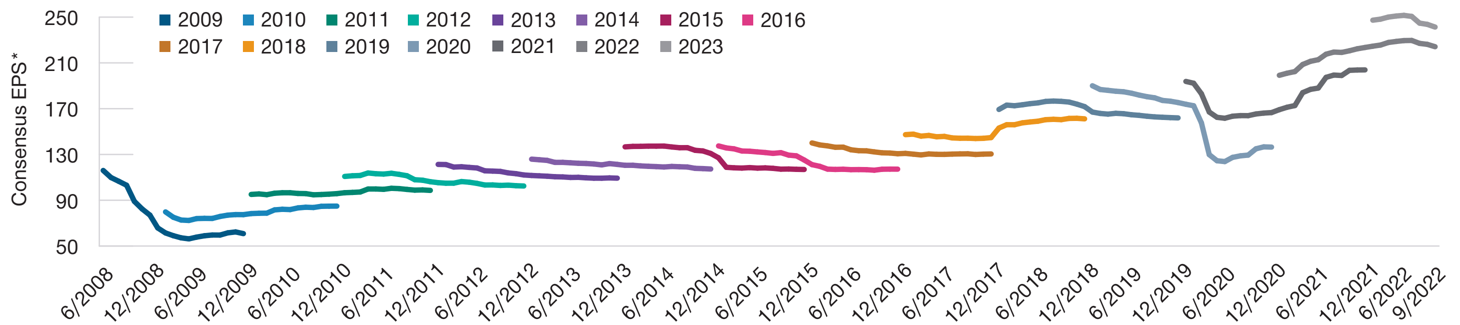
Past performance is not a reliable indicator of future performance.

Sources: Refinitiv/IDC data, Compustat, Russell, T. Rowe Price analysis. See Additional Disclosures.

Factor returns are calculated as equal-weighted quintile spreads. Please see Appendix for more details on the factors.

S&P 500 Index Historical Earnings Revisions

(Fig. 5) June 30, 2008–September 30, 2022



Past performance is not a reliable indicator of future performance. Actual outcomes may differ materially from estimates.
Sources: S&P Global Market Intelligence, S&P Capital IQ Estimates, FactSet.
*EPS is earnings per share.

inflation will be an offset to nominal sales and earnings. In aggregate, we find the outside view instructive, and the inside view suggests this earnings drawdown could be somewhat worse than historical precedents.

Considering the last 15 years, we can frame likely earnings declines in the "average" year (independent of any recession forecast). Every year, as shown in Figure 5, sell-side analysts forecast year-end earnings for the 24 months leading up to year-end; for example, analysts will forecast 2023 earnings throughout the years 2022 and 2023.

We highlight three main observations:

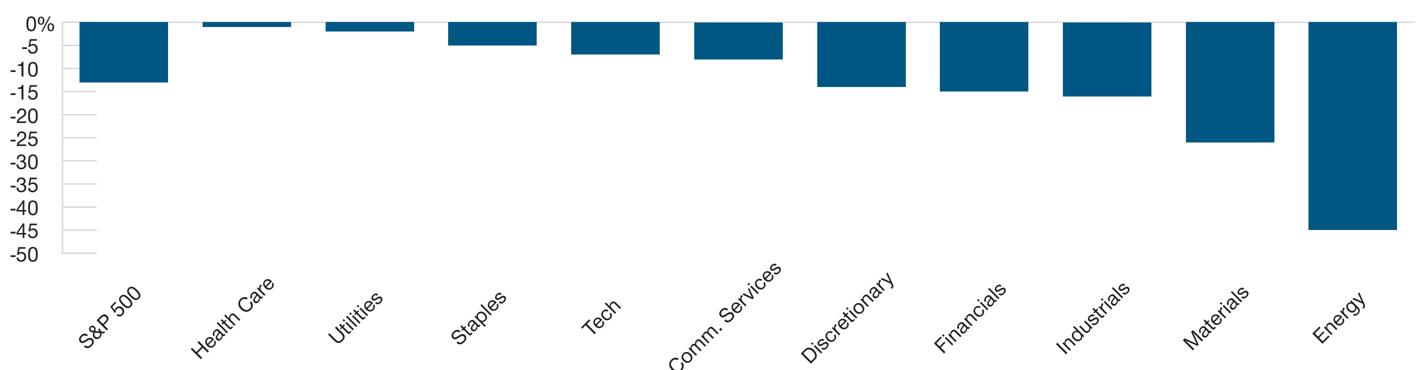
- In most years, analysts start overly optimistic, but they lower their estimates as reality sets in (i.e., the outside view is that sell-side estimates for a given year-end should decline)
- These declines were most precipitous heading into recessions (e.g., 2008, 2020)
- The uncommon increases typically occurred as the economy emerged from recession (2009, 2021)

Using this outside view approach, we can calculate the average earnings decline over the 15 months prior to each year-end (i.e., the remaining period for 2023). For this analysis, we include both normal and recessionary periods to reflect the range of potential outcomes without making a call on recession probability, but we remove the years with positive revisions (as it's not plausible that the economy is emerging from recession right now).

As expected, defensive sectors' earnings held up well (health care, utilities, and consumer staples) while cyclical sectors

Average Estimate Revision—15 Months Prior to Each Fiscal Year-End

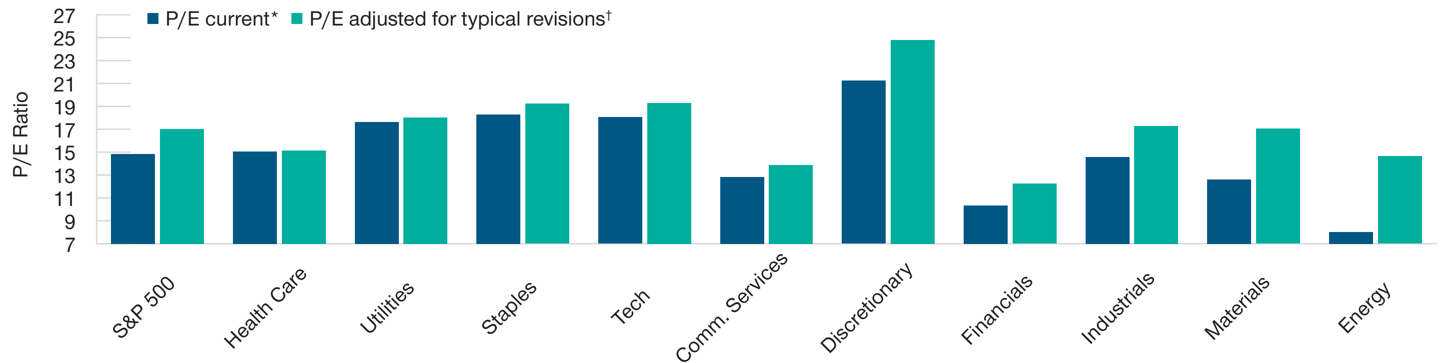
(Fig. 6) June 30, 2008–December 31, 2021



Past performance is not a reliable indicator of future performance. Actual outcomes may differ materially from estimates.
Sources: S&P Global Market Intelligence, S&P Capital IQ Estimates, FactSet. S&P Capital IQ Consensus Estimates represent the aggregation of individual estimates provided by sell-side analysts that are covering a public company.

Current and Adjusted P/E Ratios

(Fig. 7) As of September 30, 2022



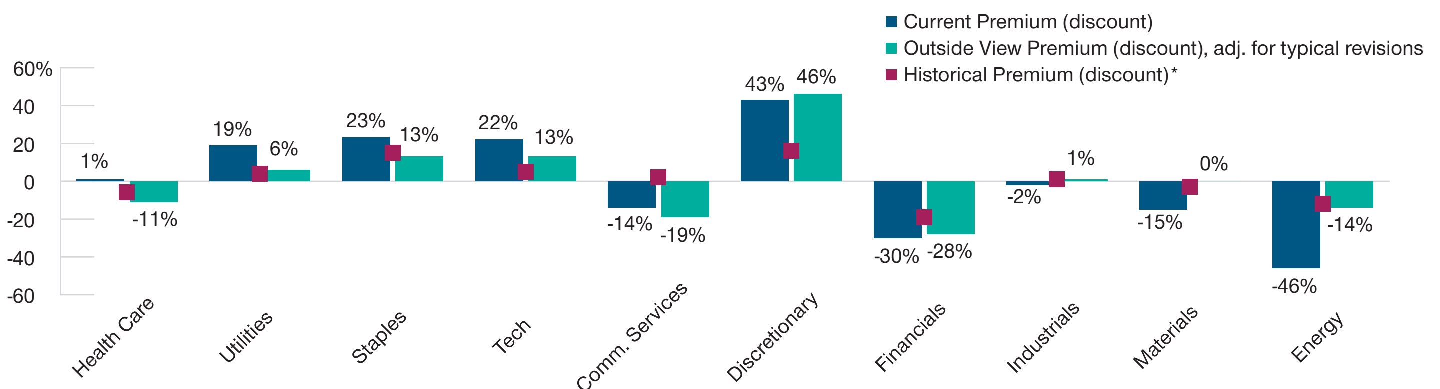
Past performance is not a reliable indicator of future performance. Actual future outcomes may differ materially from estimates shown.
Sources: S&P Global Market Intelligence, S&P Capital IQ Estimates, FactSet.
*P/E current is the current price over consensus earnings estimates for 2023.
† P/E adjusted for typical revisions is the current price over earnings estimates for 2023, adjusted for estimate revisions illustrated in Figure 6 and assuming the weights of the sectors in the S&P 500 as of September 30, 2022, for the index adjusted P/E.

declined the most (energy, materials, industrials, financials, and consumer discretionary). However, we realize no two periods are perfect comparisons and next year will have its own nuances. For example, it is likely that tech earnings will prove to be more cyclical than they were over the past decade, while energy may no longer be cyclical amid a decade-long bear market. The value of this model is to apply the outside view as a base rate and then apply the inside view on where those key differences may arise.

Using this framework, we can look at each sector's valuation using both current and adjusted 2023 earnings estimates. Figure 7 illustrates how the S&P 500 and sector price-to-earnings (P/E) ratios could change—the defensive sectors' P/E ratios stay relatively constant as earnings hold up, while the cyclical sectors become more expensive as earnings decline. Figure 8 shows relative P/E ratios compared with the market (S&P 500)—for example, while utilities currently look 19% more expensive than the market, after accounting for their earnings stability they may only be 6% more expensive.

Current and Adjusted P/E Ratios—Relative to the S&P 500 Index

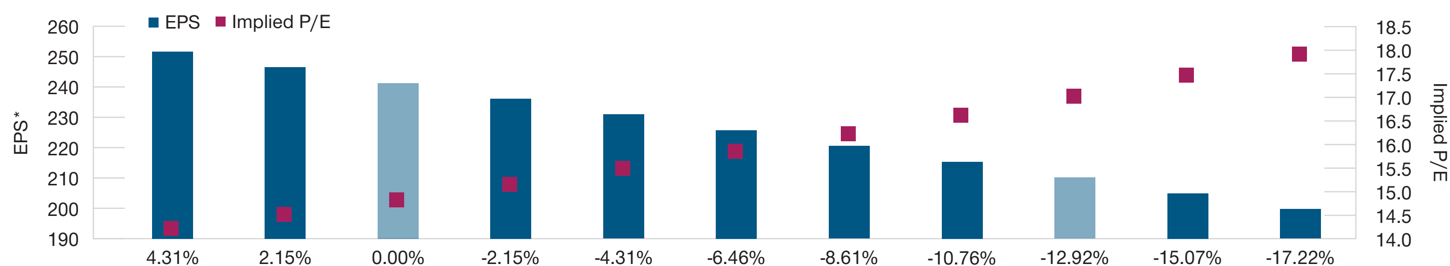
(Fig. 8) Discount or premium to the market, as of September 30, 2022



Past performance is not a reliable indicator of future performance. Actual future outcomes may differ materially from estimates shown.
Sources: S&P Global Market Intelligence, S&P Capital IQ Estimates, FactSet.
Please see Figure 7 for the details on the P/Es used for the analysis. This analysis compares the current and adjusted P/E ratios for each sector, shown in Figure 7, as a multiple of the respective P/E ratio for the S&P 500 Index, also shown in Figure 7.
*Historical premium (discount) is based on historical earnings revision data from June 30, 2008-September 30, 2022.

S&P 500 2023 Earnings Expectations vs. Implied P/E

(Fig. 9) Earnings and implied P/E for various levels of earnings change



Sources: S&P Global Market Intelligence, S&P Capital IQ Estimates, FactSet, T. Rowe Price analysis. Actual outcomes may differ materially.

*EPS is earnings per share.

Figure 9 shows potential EPS levels and implied P/E ratios for a variety of hypothetical EPS changes, assuming today's current market price. The two highlighted bars are 0.00% (corresponding to no change in earnings) and -12.92% (corresponding to the outside view from Figure 6).

What does this imply about current market valuations? As shown in Figure 7, the S&P 500 multiple would rise from 14.8 to 17.0 based on estimated earnings declines using solely the outside view. When incorporating our inside view reflecting macro headwinds, we believe earnings risk is to the downside. Furthermore, multiples often overshoot on the downside entering recessions until there is more visibility on the earnings floor. While we don't forecast price levels for the market, our outside view suggests S&P 500 earnings for 2023 could fall from $241 to $210 per share.

Despite these concerns, there are always attractive opportunities in the market. Right now we are focused on reasonably priced defensive stocks (e.g., we prefer defense and health care to utilities and staples), along with cyclical stocks that we believe are already pricing in an earnings recession.

T. Rowe Price cautions that economic estimates and forward-looking statements are subject to numerous assumptions, risks, and uncertainties, which change over time. Actual outcomes could differ materially from those anticipated in estimates and forward-looking statements, and future results could differ materially from historical performance. The information presented herein is shown for illustrative, informational purposes only.Forecasts are based on subjective estimates about market environments that may never occur. The historical data used as a basis for this analysis is based on information gathered by T. Rowe Price and from third-party sources and have not been independently verified. Forward-looking statements speak only as of the date they are made, and T. Rowe Price assumes no duty to and does not undertake to update forward-looking statements.

Appendix

Factors are our internally constructed metrics defined as follows:

Valuation: Proprietary composite of valuation metrics based on earnings, sales, book value, and dividends. Specific value factor weighting may vary by region and sector.

Growth: Proprietary composite of growth metrics based on historical and forward-looking earnings and sales growth. Factor selection and weighting vary by region and industry.

Momentum: Proprietary measure of medium-term price momentum.

Quality: Proprietary measure of quality based on fundamental and stock price stability, balance sheet strength, various measures of profitability, capital usage, and earnings quality.

Profitability: Return on equity.

Risk: Proprietary composite capturing stock return stability over multiple time horizons (positive return means risky stocks outperform stable stocks).

Size: Market capitalization (positive return means larger stocks outperform smaller stocks).

Short Interest: Total number of shares of a security that investors have sold short divided by the float-adjusted shares outstanding as of a given date.

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