Does the Economy Affect Factor Returns?

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by Larry Swedroe

With all the attention that is paid to macroeconomic variables and forecasted growth, it's vitally important to understand the role that the economy plays in portfolio returns – in particular, the returns of the value, beta and size factors.

Many investors look to changes in interest rates when making tactical asset allocation decisions, which begs the question: Do changes in interest rates provide explanatory power in the cross-section of stock returns? To answer that question, Dimensional examined the performance of the stock market and the beta, size and value factors based on changes in the federal funds rate as well as one-, five- and 10-year Treasuries. The data sample covered the period August 1954 through December 2018. Following is a summary of their findings:

- While the realized beta, size, value and profitability premiums have been positive on average, there has been substantial dispersion of their realized returns over time.
- There has been no discernable pattern in the historical data suggesting that the size, value and profitability premiums behaved differently in months when the effective federal funds rate went up versus when it went down. The same is true when we replace federal funds with one five- and 10-year Treasuries. Thus, interest rate levels have explained almost none of the variation in the size, value and profitability premiums.
- Over the period 1963 through 2018, the R-squared values (correlations) of the size, value and profitability premiums to interest rate changes have been virtually zero in each case. This indicates there is a lot of "noise" in the relationship.
- The same pattern of wide dispersion in returns was observed when the value premium was measured against the slope of the yield curve. There was no explanatory power.

Further evidence

In his paper, What Happens to Stocks when Interest Rates Rise? published in the summer 2018 issue of *The Journal of Investing*, Andrew Berkin found that while the conventional wisdom is that higher interest rates are bad for stocks, the reality is different. He found that over the prior 90 years, interest rates had little predictability for U.S. stock returns. "Whether yields were up or down, stocks did quite well on average. The mean return to the S&P 500 was 10.81% when yields fell and somewhat higher at 12.22% when yields rose." He found similar results in 22 developed markets. He added: "Stocks have had a wide range of returns both positive and negative during times of rising rates. However, some segments of the market such as high dividend payers have historically lagged when rates rise, and thus do pose potential risks." And finally, he found no distinguishing pattern between interest rate changes and the value, profitability and investment factors. In the case of small stocks, "results are quite mixed, and often do not conform to the logic that has been given."

Efficient markets incorporate new information quickly

A predictive link between the macro environment and factor returns is unlikely because asset prices usually incorporate information quickly. Yet, investors tend to try to explain performance by creating a narrative. It's just human nature to see patterns, even when none exist.

The fact that a macroeconomic factor such as interest rates has low or no correlation of returns to an equity factor (such as value) doesn't necessarily mean that the relationship has no value in terms of how portfolios are constructed. The reason is that return correlations are estimated based on the *average* behavior of returns across all time periods. However, we may observe that two factors produce losses in bad times, even when they have low correlation on average – just when you need the benefits of diversification (low correlation), they may disappear.

Noël Amenc, Mikheil Esakia, Felix Goltz and Ben Luyten contribute to the literature with their study "Macroeconomic Risks in Equity Factor Investing," which appears in the September 2019 issue of *The Journal of Portfolio Management*. They state that because levels of macroeconomic variables are too persistent to affect prices, markets will not react if expectations remain the same. (This is true if expected returns are only changing due to changes in expected future cash flows. But we know the discount rate can change independently. If the rate of return demanded per unit of risk changes,

then prices can change even if the expectation of future cash flows remain static.) Thus, they examined how unexpected changes (*surprises* or *shocks*) impact returns to factors. They defined surprises as deviationsfrom investor expectations. For example, they obtained expected interest rates from a statistical model that takes into account how interest rates depend on their past levels and on other macro variables. They then considered the difference of realized interest rates from this expectation the surprise. In the same fashion, they obtained surprises for the term spread, credit spread, dividend yield, volatility, and two measures of illiquidity.

Following is a summary of their findings:

- Factor returns differ significantly across states, as defined by their macroeconomic surprise indicators.
- An investor looking to harvest the unconditional value or low investment factor premium is exposed to strong deviations of outcomes depending on macroeconomic conditions. Macroeconomic risks clearly matter for factor investors.
- The value factor shows strong sensitivity to surprises to the term spread. The spread of 9.2% is significant at the 5% confidence level. This finding is consistent with the differences in cash flow patterns between value and growth firms. For value firms, expected cash flows occur earlier than those expected from growth firms, which makes value stocks less sensitive to the long end of the yield curve relative to growth stocks. (Note that if aggregate risk aversion increases, you may see both term spreads narrowing and discount rates increasing for value stocks.)
- Returns to the low investment factor in times of positive term spread surprises are higher by 7.8% per annum compared to returns of the factor during times of negative term spread surprises. An explanation for this positive dependency on term spread surprises is that firms that invest conservatively will expect cash flows sooner in the future compared to firms that invest aggressively.
- While value and investment are positively correlated with shocks to the term spread, momentum and high profitability are negatively correlated, performing poorly when the curve unexpectedly steepens.
- The low-risk factor shows negative sensitivity to surprises in the short rate, consistent with the characterization of low-risk stocks as bond-like. Therefore, low-risk stocks will perform relatively worse in times of positive rate shocks compared to high-risk stocks, and they will perform relatively better in times of negative rate shocks.
- With the exception of the size factor, equity factor premiums cannot be explained by exposure to shocks to illiquidity risk.
- Combining high profitability with momentum leads to a 23% reduction in volatility, and combining it with value leads to a 27% reduction in volatility (volatility reduction of the combination of factors is measured relative to the average volatility across factors).
- Because exposures of high profitability and momentum factors to the risk-tolerance indicator (based on the size of the equity risk premium – the higher it is, the lower the risk tolerance) are similar, combining the two leads to only a minor (less than 4%) reduction in macroeconomic risk. On the contrary, because of their opposite macro sensitivity, combining the high profitability and the value factor led to more than a 43% reduction in macro deviation.

The authors concluded: “Information on macroeconomic dependencies allows investors to analyze how different factor combinations influence the overall macro sensitivity of their portfolio. Suitable combinations of factors may allow [investors] to target investment outcomes that are well diversified not just across factors but also across macroeconomic conditions.”

Explaining recent value underperformance

The finding that the value premium is correlated with shocks to the term spread provides at least one explanation for the premium’s underperformance since 2017. At the beginning of 2017, the two-year Treasury yield was 1.22%, percentage points below that of the 10-year Treasury, and 1.82 percentage points below that of the 30-year Treasury. As of this writing, on February 14, 2020, the two-year to 10-year spread was just 17 basis points, and the two-year to 30-year spread was just 65 basis points.

Summary

The above findings demonstrate the importance of understanding how the correlations of factor returns are impacted by surprises in macro regime shifts. For example, because value and investment are positively correlated with positive shocks to the term spread, they mix better with longer-term bonds than the momentum and high profitability factors, which are negatively correlated with positive shocks to the term spread. In other words, when constructing portfolios, it is not sufficient to consider only long-term correlations. It’s also important to understand how shocks leading to regime shifts impact correlations. With that understanding, investors can construct more efficient portfolios.

The other takeaway is that because surprise shocks to macroeconomic variables are by definition unpredictable, without perfect foresight, the above findings cannot be used to tactically shift allocations. And because surprises are unpredictable, factor performance in general is not predictable. Thus, a multifactor approach may increase the likelihood of outperforming the market. This is true no matter what drives the performance of factors.

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