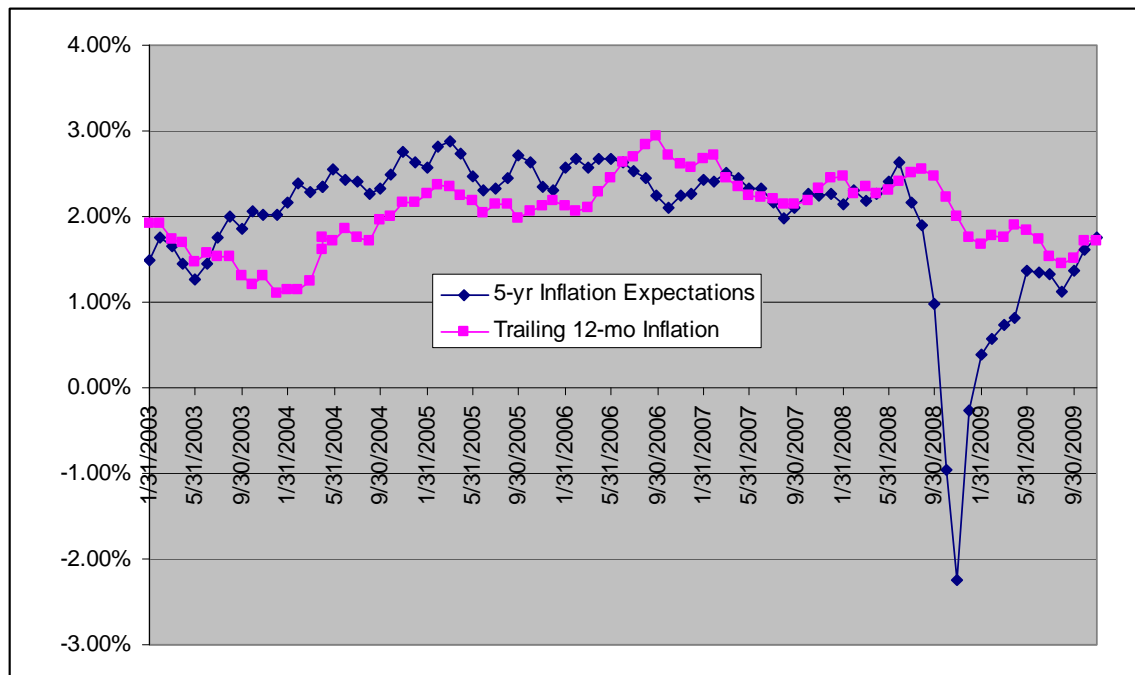


Which Stocks Best Hedge Changes in Expected Inflation ?

Since the introduction of Treasury Inflation Protected Securities (TIPS), the market's expectation of future inflation can be extracted from the relative prices of TIPS and nominal Treasury bonds of the same tenor. The Fed has been publishing real bond yields since January, 2003. The month-end implied 5-year inflation expectations from 2003 through 2009 are plotted on Figure 1, along with the realized core inflation (excluding the volatile food and energy sectors) for the trailing 12-months.

Figure 1: Inflation Expectations and Trailing Core Inflation 2003-2009



A couple of features stand out in Figure 1:

First, inflation expectations have been both below and above recent inflation, but these two inflation measures stay quite close to each other. With the exception of one period, inflation expectations have been within about 1% of the realized core inflation for the prior 12-month period. The exception was during the financial crisis of late 2008 and early 2009, when the prospect of a depression and the associated deflation became a real concern. As the economy stabilized in the summer of 2009, the expectation of future inflation returned to levels close to the realized inflation.

Second, inflation expectations tend to be lower in a recessionary environment, and tend to increase coming out of a recession. Persistent increases in inflation expectations occurred in 2003 as the economy emerged from the recession of 2001-2002. The same is

true for the recent period, as the economy began to stabilize in 2009 inflation expectations also rose. (and may rise further as the economy continues to improve)

Future Expectations

Naturally, inflation is somewhat subdued at this point, due to the high current unemployment rate and excess industrial capacity. However, there may be reasons to believe that inflation expectations will increase more than usual coming out of this recession. Many economists and financial experts believe that the monetary and fiscal policies that have been implemented by the U.S. government are inflationary and that it will be difficult for the government to unwind the extremely accommodative monetary policy in time to avoid inflation.

Investment Strategy Implications

As investors consider the potential mix of investments, they may want to consider the uncertainty about potential changes in inflation expectations. A couple of investment classes that might immediately come to mind for hedging inflation are Gold and TIPS. But let's say the investor wants to hold an equity portfolio that reflects alphas and various investment objectives; which groups of stocks in the portfolio are likely to best hedge ("insure against") surprise changes in inflation expectations? Or looked at from the other direction, which groups of stocks have the most exposure to uncertainty about inflation expectations?—the higher the exposure the greater the premium that a rational investor would demand to hold ("self-insure") those high exposure stocks.

Quantal provides a conditional equity risk model that uses historical global equity returns as input to extract latent return factors and determine the exposures of stocks to those factors. It is a straightforward exercise for Quantal to forecast the sensitivities of each of the stocks in a portfolio to an index, and then use those sensitivities and the portfolio weights to generate a sensitivity (or beta) for the portfolio to the index. As it turns out, it is also straightforward for Quantal to calculate sensitivities for individual stocks or portfolios to inflation expectations. This is done by feeding a time series of data on inflation expectations into the model to generate factor exposures for inflation expectations. In so doing we are using the collective market's assessment of the exposure to shifts in expectations, as opposed to doing a micro analysis of each company to determine which companies will likely respond better to unexpected inflation, due to their cost and pricing structure or other factors.

We used the Dow Jones U.S. Total Market Index as the investment universe for this study. This index covers approximately the top 95% of the market capitalization of the U.S. equities market. We calculated the sensitivities of each of the stocks in this universe to inflation expectations, and then calculated portfolio sensitivities for subsets of that universe split into sector bins and style bins. Dow Jones Sector and Style classifications were used. The sensitivity of the index itself to inflation expectations is 6.9, meaning that we predict that stocks will respond well to increases in inflation expectations in the current market environment. With a sensitivity of 6.9, the index would be expected to

have a return of 0.69% for a 0.1% increase in inflation expectations. The sensitivities to inflation expectations for the sector and style portfolios are tabulated in Tables 1 and 2 below:

Table 1: Sensitivities of Economic Sector Portfolios to Inflation Expectations

Sector	Sensitivity
Basic Materials	11.77
Oil and Gas	9.35
Financials	8.38
Industrials	8.14
Technology	6.62
Consumer Services	6.46
Utilities	5.45
Consumer Goods	4.67
Health Care	4.08
Telecom	3.84

The results in Table 1 pass the “smell test.” Natural Resource stocks like Basic Materials and Oil & Gas tend to do well during periods of high inflation expectations, since the expected future value of the material they are mining or pumping is rising. The value of Health Care stocks, such as pharmaceutical manufacturers may be more insensitive to inflation, since their ability to generate future revenues and profits is more tied to new discoveries and patents, and can also be influenced by government policy. Health Care stocks are regarded as defensive stocks, and tend to perform better than other sectors during recessions. The low sensitivity of the telecommunications sector to inflation expectations may be explained by the relatively high percentage of fixed costs compared to other sectors.

Table 2: Sensitivities of Investment Style Portfolios to Inflation Expectations

Investment Style	Sensitivity
Large Growth	5.88
Large Value	6.08
Mid Growth	8.45
Mid Value	8.95
Small Growth	7.96
Small Value	10.56

The results of the investment style analysis also accord with intuition. For example, small value stocks are often manufacturing companies that have low stock prices during a recession. Capacity utilization will likely rise in concert with inflation expectations, and capacity utilization is a significant profit driver for these companies.

Portfolio Construction Implications

The Quantal system makes forecasts of these inflation expectation hedge sensitivities at the individual stock level, thus providing flexibility beyond standardized sector and style groupings in incorporating the inflation expectations into portfolio construction. But even staying at the group level, you can see that if you believe that inflation expectations will be rising over the next year or two, you might want to overweight sectors like basic materials and oil & gas, and underweight sectors like health care and telecommunications. Another approach would be to construct an optimal portfolio using your investment process and constraints, but adding a constraint on the weighted average sensitivity to inflation expectations. As an example, say you wanted to track the Dow Jones U.S. Total Market Index, which has a sensitivity to inflation expectations of 6.9, but you want more exposure to inflation expectations, perhaps a sensitivity of 8.0 instead. This portfolio can be constructed with a forecasted tracking error of less than 2% versus the index. Risk, expected return and the sensitivity to inflation are all being considered in this portfolio construction exercise. Therefore the optimal portfolio will not necessarily overweight sectors that have high exposure to inflation expectations. For example, in this case, Basic Materials was actually underweighted versus the index, yet the portfolio as a whole had a higher sensitivity to inflation expectations than the index.