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INFLATION TRACKING PORTFOLIOS

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ABSTRACT

We propose a new approach to constructing inflation tracking portfolios. The key to this approach is the insight that asset returns track expected inflation far better than they track current realized inflation. Thus, we can construct portfolios that track next month's inflation much more closely than they track this month's inflation. We show this staggered hedging approach can eliminate nearly 90 percent of the tracking error of more conventional inflation hedging strategies. We also find that long-short positions in equities play a dominant role in the effective hedging of inflation risk over extended horizons. These results suggest that the goal of protecting portfolios against inflation may be more feasible that is commonly believed.

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1 Introduction

One of the most fundamental risks facing investors in financial markets is the erosion of the real value of their portfolios through the effects of inflation. Recently, fears about the resurgence of higher inflation in the U.S. have been heightened by a number of factors including the growth in Treasury debt, multiple rounds of quantitative easing by the Federal Reserve, and volatile global oil prices. In light of this, it is not suprising that many investors view protecting their portfolios against inflation risk as a priority.

Inflation, however, has proven to be very difficult to hedge, as it has a low correlation with the returns from most asset classes. In fact, a number of important asset classes, such as US equities, have returns that are slightly negatively correlated with realized inflation.

This paper presents a new approach for creating portfolios that track realized inflation and protect investors against declines in the real value of their wealth. This approach takes a fundamentally different perspective on what it means to track realized inflation over time. Specifically, while stock returns have little contemporaneous correlation with inflation, they can be strongly correlated with realized inflation in subsequent months. Intuitively, one reason for this may be that stock prices react more to *expectations* for future price developments than to contemporaneous realizations of inflation. Goods and services price changes may reflect forcastable information, and stock prices probably incorporate this information more efficiently than the survey-based price indexes that are commonly used to measure inflation. Thus, stock returns and inflation may be "out of synch" with each other.

In light of this basic insight, we construct portfolios of assets that are optimized to track subsequent, as opposed to contemporaneous, inflation rates. When applied over a longer time period, such as ten years, this approach may result in weaker tracking during the first month since the portfolio and realized inflation are "out of synch." However, the strategy can then attain excellent inflation tracking over the subsequent 119 months as each month's portfolio return hedges the next month's realized inflation. Thus we attain far better cumulative inflation tracking over the next ten years than with the usual approach of trying to track contemporaneous inflation. We show that this approach can eliminate nearly 90 percent of the inflation-tracking error that would result from following the traditional approach over a long horizon.

To illustrate these ideas, we consider a simple look-ahead portfolio that includes both Treasury bills and the Fama-French 30-industry equity portfolios. The portfolio weights in the look-ahead tracking portfolio are intuitive and load most heavily on industries that represent important components of the CPI such as energy, transportation, and household products. The portfolio also places significant weight on Treasury bills, which are effective in tracking expected inflation and, therefore, subsequent realized inflation. We find that effective inflation tracking requires taking long positions in some industry equity portfolios and short positions in others. In particular, we find that long-equity-only portfolios are not nearly as successful in hedging inflation.

This paper contributes to an extensive literature on tracking macroeconomic variables using portfolios of financial securities. An important example of this literature is Lamont (2001) whose economic tracking portfolios have many parallels with our approach. Other important papers on hedging inflation include Fama (1975, 1981), Bodie (1976, 1983), Fama and Schwert (1977), Titman and Warga (1989), Yobaccio, Rubens, and Ketcham (1995), Bruno and Chincarini (2001), Gorton and Rouwenhorst (2006), and Bekaert and Wang (2010).

2 Contemporaneous Correlations with Inflation

The contemporaneous correlations between many asset classes and realized inflation tend to be very low. This makes it particularly difficult to construct portfolios that are able to hedge realized inflation month by month. Figure 1 plots scatterplots of monthly inflation against S&P 500, Treasury bond, real estate, commodity index, gold, and TIPS returns. We proxy for the inflation rate using the Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (not seasonally adjusted). The Treasury bond returns are computed from the Bloomberg total return index for all Treasury bonds with maturities of one year or more. The real estate returns are computed using the Case-Shiller ten-city index prior to February 2000 and the Dow Jones U.S. Real Estate total return index thereafter. We measure gold returns using the Bloomberg values for the spot dollar price of physical gold. The commodity returns are computed using the S&P GSCI Commodity Total Return index (which is about 70 percent weighted towards energy). TIPS returns are computed from the Barclays Capital U.S. Treasury Inflation Notes Index.[1] The S&P 500 index, gold, and commodity returns range from January 1985 to December 2011. The Treasury returns range from January 1992 to December 2011, while the real estate returns range from March 1987 to July 2011. The TIPS returns range from April 1997 to November 2011. Table 1 displays correlations between inflation and these returns.

The scatterplots in Figure 1 and the data in Table 1 show that the contemporaneous correlations of returns with realized inflation are relatively small. For example, S&P 500

[1] Barclays also offers a somewhat shorter-tenor index, covering TIPS from 0-5 years. Though our results are qualitatively similar using this index, we do not focus on it because the index offers a much shorter history.

index returns have a slightly negative correlation of −2.59 percent with inflation. This negative correlation is consistent with earlier results in the literature, such as Fama and Schwert (1977), arguing that stocks have little ability to hedge against contemporaneous realized inflation. Treasury bond returns are also negatively correlated with realized inflation. Of the six asset classes, the highest correlation coefficient is for the commodity index returns with a value of 29.11 percent.

Surprisingly, the correlation of TIPS returns with realized inflation is only 9.89 percent. This result may seem counterintuitive since TIPS explicitly carry inflation protection. The reason for this low correlation, however, is that TIPS prices are also very sensitive to changes in real interest rates and real term premia. In fact, these changes have been more important drivers of TIPS prices since these securities were first issued in 1997 than the inflation-protection component of their returns.[2] Thus, TIPS have been relatively ineffective at hedging monthly realized inflation.

3 Benchmarking the Standard Approach

To provide a benchmark for comparison with later results, we begin by examining the inflation-tracking performance of a portfolio of assets chosen to provide the best hedge against contemporaneous realized inflation. This standard approach is frequently recommended in the financial press.[3]

Without singling out any specific strategy, we observe that many recommended inflation-tracking strategies include a number of common elements. In particular, these strategies typically attempt to track inflation contemporaneously through the returns of asset classes such as commodities, real estate, gold, TIPS, Treasury bonds, and equities.

We illustrate the inflation-tracking performance of these types of strategies as follows. First, we focus on the major asset classes whose correlations with inflation are shown in Table 1. Second, we limit the analysis to the twenty-year period from January 1992 to December 2011 in order to include returns for as many of these asset classes as possible. Even with

[2]Further underscoring this point, the annualized volatility of monthly TIPS returns is 5.9 percent (for the shorter-tenor Barclays index mentioned in footnote 1, from its inception in 2002 to the end of our sample period the volatility is 3.7 percent). Over the same period, the volatility of inflation is only 1.6 percent.

[3]For example, see Pollock (2011) in *The Wall Street Journal*:
`http://online.wsj.com/article/SB10001424052748705662604576256912139434434.html`,
Fisher (2012) in *Forbes*:
`http://www.forbes.com/sites/greggfisher/2012/03/05/hedging-inflation/`,
Andriotis (2011) at SmartMoney.com:
`http://www.smartmoney.com/invest/markets/inflation-hedges-the-truth-and-lies-1297893705390/`,
and Kristof (2012) in *The Los Angeles Times*:
`http://www.latimes.com/la-diverse-story3,0,7475319.story`.

this limitation, portfolios over the first five years of this period include only five of the six asset classes until the TIPS index returns become available in April 1997.

Third, using the first 60 months of the sample period as a training period, we regress the monthly inflation rate on the contemporaneous asset returns. Specifically, let CPI_t denote the realized inflation rate for month t based on the (seasonally unadjusted) CPI-U index. Let R_{it} denote the return for month t for the i-th asset class. The regression specification is given by

$$CPI_t \; = \; \sum_{i=1}^{n} \; \beta_i \; R_{it} \; + \; \epsilon_t, \tag{1}$$

where the regression is estimated without an intercept. By leaving out the intercept, we can interpret the slope coefficients β_i as portfolio weights for the respective asset classes in a portfolio that best tracks the contemporaneous inflation rate. We then form the tracking portfolio for month 61 using these weights estimated from the prior 60 months and compute the realized return for the tracking portfolio for month 61. We then roll the process forward one month and restimate the regression using the data from months 2 through 61, and again use the slope coefficients as weights to form the tracking portfolio for month 62. We repeat the process for all months in the sample period. By forming the portfolio for month t on the basis of information available prior to month t, we can then assess the actual out-of-sample performance of the inflation-tracking strategy.

Figure 2 plots the cumulative change in the price level during the portfolio tracking period (solid line labeled 'Inflation'), along with the cumulative return of the tracking portfolio (dashed line labeled 'Tracking'). Summary statistics for the percentage tracking error are provided in Table 2, where the tracking error is defined as the percentage difference in the cumulative price level and value of the tracking portfolio (the ratio of the two levels, where the levels are normalized to one in the first period).

As Figure 2 and Table 2 show, the out-of-sample inflation tracking performance of this strategy is not particularly impressive. On average, the value of the tracking portfolio differs from the price level by more than eight percent. While the errors tend to be in the positive direction throughout most of the sample period, the tracking portfolio also has long periods in which it fails to protect against realized inflation. Specifically, during 2002, the tracking portfolio had a cumulative value more than 12 percent below the price level, or equivalently, had lost over 12 percent of its real value. Thus, an investor who exited the strategy at this point in time would have realized a large loss in purchasing power. Although the tracking portfolio was able to preserve (and increase) the real value of the investor's portfolio over the entire sample period, there are clearly extremely large swings in the real value of the portfolio. The standard deviation of the cumulative tracking error over the entire period is about 14.5 percent. The root-mean-squared error (RMSE) of the tracking portfolio is nearly 16.6 percent.

4 Look-Ahead Correlations with Inflation

In contrast to the low contemporaneous correlations with inflation, a number of investments have returns that are strongly correlated with *subsequent* realized inflation. In particular, stock returns for a broad cross section of industries are significantly correlated with next month's reported inflation.

This feature is illustrated in Figure 3 which plots the long-run correlations (1960-2011) between the monthly returns of the equally-weighted 30 Fama-French industry portfolios and both the current and subsequent month's inflation rate. As shown in the upper panel, the correlations with the current month's inflation rate are generally very low. In contrast, the correlations with the next month's realized inflation rate, shown in the lower panel, are often dramatically higher. All except one of these look-ahead correlations are positive in sign, in contrast with the contemporaneous correlations which are almost all slightly negative. The industries with the highest look-ahead correlations include Oil, Coal, and Mines with correlations ranging from 0.15 to almost 0.3.

One possible reason for the strong correlations between stock returns and the subsequent month's inflation rate could be that stock returns reflect expected inflation rates. Inflation rates are measured using survey data on goods and services prices. Consider, for example, the published inflation rate for the month of July. The July rate is based on surveys of prices collected during the month of July and published in the middle of August. The information in these surveys, however, may aggregate information about consumer prices that could be predictable on the basis of detailed information available at the producer, manufacturer, or wholesale level. If stock prices are efficient, then this information would be largely impounded into stock prices earlier than the month of July. If so, then in July stock prices would be responding not to contemporaneous inflation, but to changes in expected inflation rates.

5 Constructing the Look-Ahead Inflation-Tracking Portfolio

We can use the insight that security returns are more correlated with subsequent inflation than current inflation to create more effective inflation-tracking portfolios. In doing this, we adopt a broader perspective on what it means to track inflation. If one views the objective as being the ability to track inflation each month, then the standard approach is probably the right way to approach the problem (albeit not a particularly successful one). On the other hand, if the objective is to construct a portfolio that minimizes the cumulative tracking error *over a long horizon*, then alternative strategies are potentially superior.

In particular, consider the case of a tracking portfolio that is able to track the subsequent month's inflation rate, but not the current month's. If the tracking strategy were followed for a 60 month period, then the result could be that we have one month of poor tracking (the first month), but then effective tracking over the next 59 months. In essence, we would be following a staggered tracking strategy in which the return for month t hedges realized inflation for month $t+1$ by taking advantage of the fact that returns and realized inflation are one month "out of synch" with each other. Despite the one-month offset between returns and realized inflation, the cumulative tracking over the entire 60-month period would likely be much better than if we attempted to track inflation month by month.

To illustrate our approach, we proceed in two stages. In the first stage, we form an inflation-tracking portfolio using only short-term Treasury bills. This may seem puzzling since realized inflation has only a relative modest 17.7 percent correlation with contemporaneous one-month Treasury-bill rates. Fama (1975), however, demonstrated that returns on short-term Treasury-bill rates are driven primarily by investors' expectations of future inflation. Thus, including Treasury bills in the tracking portfolio reflects our focus on expected, rather than contemporaneous, inflation tracking. In the second stage, we introduce a broad cross-section of industry stock portfolios into the tracking portfolio to take advantage of the strong correlation between industry-portfolio stock returns and subsequent realized inflation. The sample period for this analysis is from 1980 to 2011, where five years of data are again used as a training period in estimating the portfolio weights. Thus, we report inflation-tracking results for the 1985-2011 period.

We follow a procedure similar to that described in Section 3, except that we now regress the inflation rate for month $t+1$ (not month t) on the return for month t. Let r_t denote the return on a one-month Treasury bill during month t, and observe that the return on a one-month Treasury bill held to maturity at the end of month t is simply the one-month Treasury-bill yield at the end of month $t-1$. The regression specification for the tracking portfolio weights is given by

$$CPI_{t+1} \;=\; \beta_0 \, r_t \;+\; \epsilon_{t+1}, \tag{2}$$

which is again estimated without an intercept. As before, we estimate the slope coefficient β_0 using data for the 60 months prior to the month in which it is used as the tracking-portfolio weight to ensure that our tracking results are completely out of sample.

Figure 4 plots the cumulative change in the price level and the cumulative return of the tracking portfolio. Table 3 reports summary statistics for the percentage tracking error. This simple tracking portfolio significantly outperforms the conventional tracking portfolio described earlier. The average tracking error over the sample period is −4.126 percent and the standard deviation is 2.808 percent. The largest tracking error is −11.386 percent, occurring in 2011. Intuitively, this error is likely the result of the low policy rates adopted by the Federal Reserve during the ongoing financial crisis, which leads to short-term Treasury bills having essentially zero returns during this period. A similar pattern can also be observed during the 2001–2004 Greenspan period in which policy rates were also at historically low levels.

In the second stage, we retain the Treasury bill returns in the regression specification and then add the Fama-French 30-industry equally-weighted portfolios into the forecasting model,

$$CPI_{t+1} \; = \; \beta_0 \; r_t \; + \; \sum_{i=1}^{30} \; \beta_i \; R_{it} \; + \; \epsilon_{t+1}, \tag{3}$$

where R_{it} now denotes the return for month t for the i-th industry portfolio. In doing this, we allow for industry stock portfolios to serve as hedging instruments for the subsequent month's realized inflation rate.

Figure 5 plots the cumulative change in the price level and the cumulative return of the tracking portfolio. Table 4 reports summary statistics for the tracking error. The average tracking error of the equity-industry-only portfolio is only 0.62 percent, much better than the over 8 percent error for the contemporaneous approach. The standard deviation of the tracking error is now 2.132 percent and the RMSE is 2.220 percent. This RMSE is only about 13.5 percent as large as the 16.564 percent RMSE for the more conventional tracking portfolio reported in Table 2. Thus, the use of the look-ahead tracking portfolio with both industry equity portfolios and Treasury bills reduces the RMSE of inflation tracking by nearly 90 percent.

Table 5 provides summary statistics for the weights of the 30 industry portfolios. The industries with the largest average portfolio weights (in absolute terms) are fabricated products, oil, utilities, carriers, and household, with average weights of 2.240, 2.064, −1.424, −1.210, and 1.067 percent, respectively. The sum of the average weights over all 30 industries is only 0.528 percent. The sum of the absolute values of the portfolio weights, however, is 17.57 percent. Thus, the equity component of the inflation-tracking portfolio can essentially be viewed as a long-short portfolio of industries, rather than as an outright position in equities.

Figure 6 plots the time series of portfolio weights for Treasury bills in the tracking portfolio. Observe that the coefficient is always smaller than one, and averages 57.16 percent.

During the latter part of the sample, the weight placed on Treasury bills declines, reflecting the near-zero policy rate followed by the Federal Reserve. Thus, the tracking portfolio is generally not fully invested in stocks and Treasury bills, thereby allowing for the remaining funds to be invested in other assets.[4]

6 Robustness Results

We have presented results illustrating the performance of the tracking strategy over a 25-year horizon using the simplest possible out-of-sample methodology. The performance of the strategy, however, is robust to a wide range of specifications.

For example, we also implemented the strategy using all prior data in the training period based on an exponential-weighting scheme with a three-year half life instead of the rolling five-year-window approach described above. We found that the performance of the inflation-tracking strategy was similar. In addition, we implemented the strategy for a variety of different starting dates ranging from 1970 to 1995 in steps of five years. The hedging performance of the strategy was very similar across all choices of starting dates, indicating that the results are not sub-period specific. Finally, we also tried alternative specifications for estimating the portfolio weights of the tracking portfolio such as a least-angle-regression approach that places constraints on the sum of the absolute values of the portfolio weights. These alternative specifications produced results comparable to those we report.

Going beyond these robustness checks, we also examined how the results are affected by a number of major changes to the basic hedging strategy. For example, we considered a specification in which short positions were not allowed. This restriction significantly impaired the tracking performance of the strategy, with the overall RMSE essentially doubling. We also considered a specification in which we used S&P 500 index returns rather than the Fama-French industry portfolio returns, which resulted in significantly worse tracking performance. Furthermore, we also implemented a tracking strategy in which we used only the six Fama-French industry portfolios with the highest look-ahead correlations with realized inflation. Using only six industry portfolios resulted in a modest decline in the hedging portfolio of the strategy, with the RMSE increasing by about 40 percent. Intuitively, these results suggest that the long-short nature of the strategy is fundamental to its success, and that tracking inflation effectively requires being able to exploit differences across industries in terms of how their returns respond to expected inflation.

We note that our analysis has ignored the impact of transaction costs. Given that the

[4]Since our focus is on the performance of the inflation-tracking strategy, however, we will abstract from the issue of how the remaining funds are invested.

bulk of the portfolio is made up of highly liquid instruments, we expect transaction costs and other trading frictions such as short-sale constraints to have only a small effect on tracking performance. We abstract from these issues in order to focus on the basic insight.

7 Conclusion

Hedging investment portfolios against inflation has become an important priority for many investors. Traditional approaches to hedging inflation, however, have struggled with the low contemporaneous correlation between realized inflation and returns for many major asset classes such as equities, bonds, commodities, real estate, and even TIPS.

In this paper, we present a new approach for hedging inflation that is based on the insight that some asset returns have strong look-ahead correlations with future realized inflation. Intuitively, this is because these assets have returns that are driven by expected inflation rather than comporaneous inflation. We construct inflation tracking portfolios that maximize the correlation between the return on the portfolio and the realized inflation rate for the subsquent month. This staggered approach leads to significantly better tracking over an extended period such as 60 months since 59 of the realized inflation rates are well hedged by the one-month out-of-phase returns. Nearly 90 percent of the tracking error is eliminated through the use of a simple look-ahead inflation tracking portfolio.

We have focused only on the most vanilla implementation of this inflation strategy in order to demonstrate the concept as clearly as possible. There are, of course, many ways in which this approach might be refined to further improve its performance. For example, we have included only Treasury bills and industry equity portfolios in the tracking portfolio. An enhanced strategy might include other asset classes such as Treasury and corporate bonds, commodities, TIPS, and real estate. In conclusion, these results illustrate that the goal of hedging portfolio values against inflation may be much more achievable than commonly believed.

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Figure 1: Scatterplots of Inflation and Returns

Each graph shows a scatterplot of monthly inflation and the returns to the indicated asset class. The inflation rate is based on the Bureau of Labor Statistics Consumer Price Index for All Urban Consumers and is not seasonally adjusted. The returns series are described in the main text.

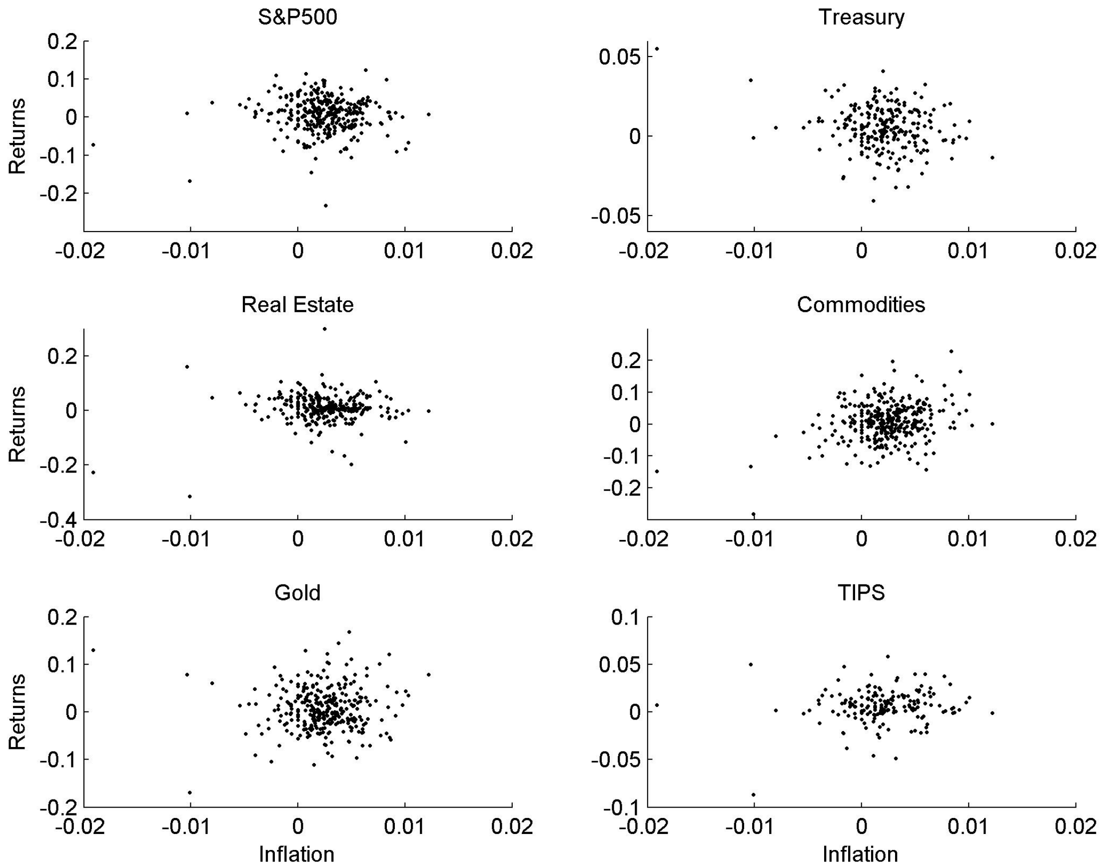

Figure 2: Contemporaneous Tracking Model Performance

The figure shows the cumulative change in the price level (solid line) and the cumulative return to the tracking portfolio (dashed line). The tracking-portfolio weights are calibrated to contemporaneous inflation using rolling-window, no-intercept regressions with a window-length of 60 months. The explanatory variables are the asset returns shown in Table 1 and described in the main text.

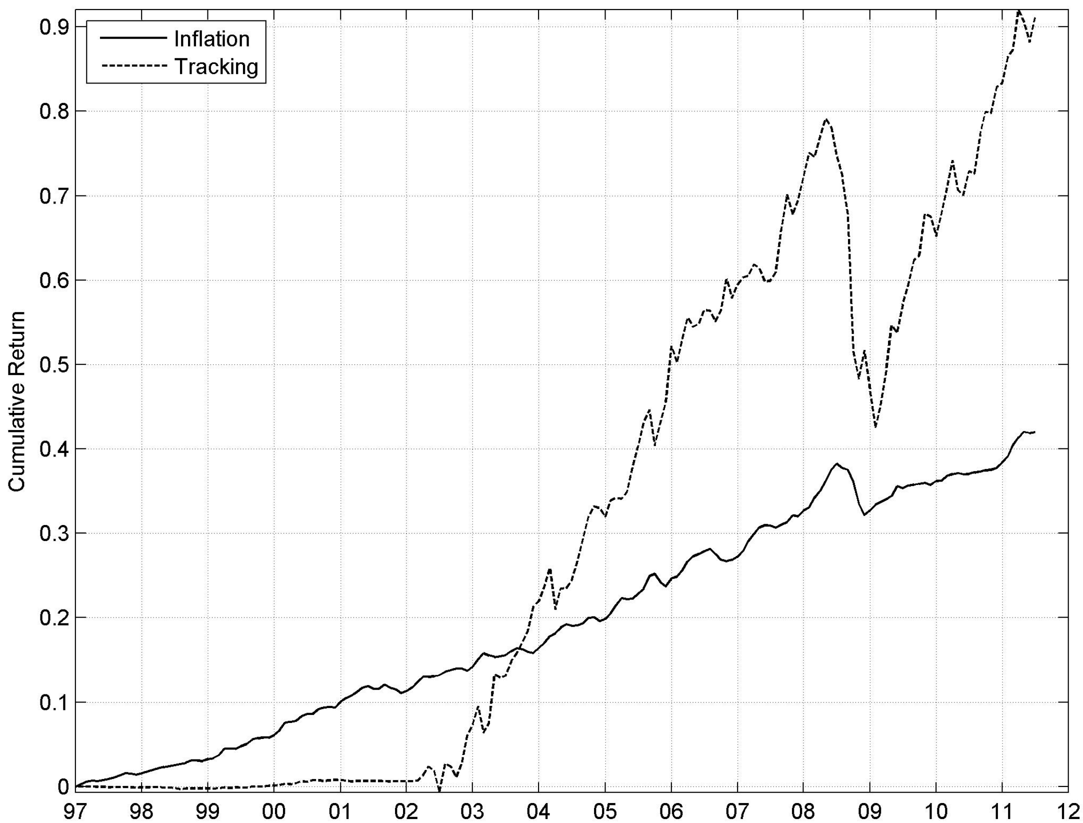

Figure 3: Correlations of Equity Returns and Inflation

The top panel shows the contemporaneous correlation of each industry equity portfolio with inflation. The lower panel shows the correlations of the month-t equity portfolio returns with month-$t+1$ inflation. The underlying data are monthly from January 1960 through July 2011.

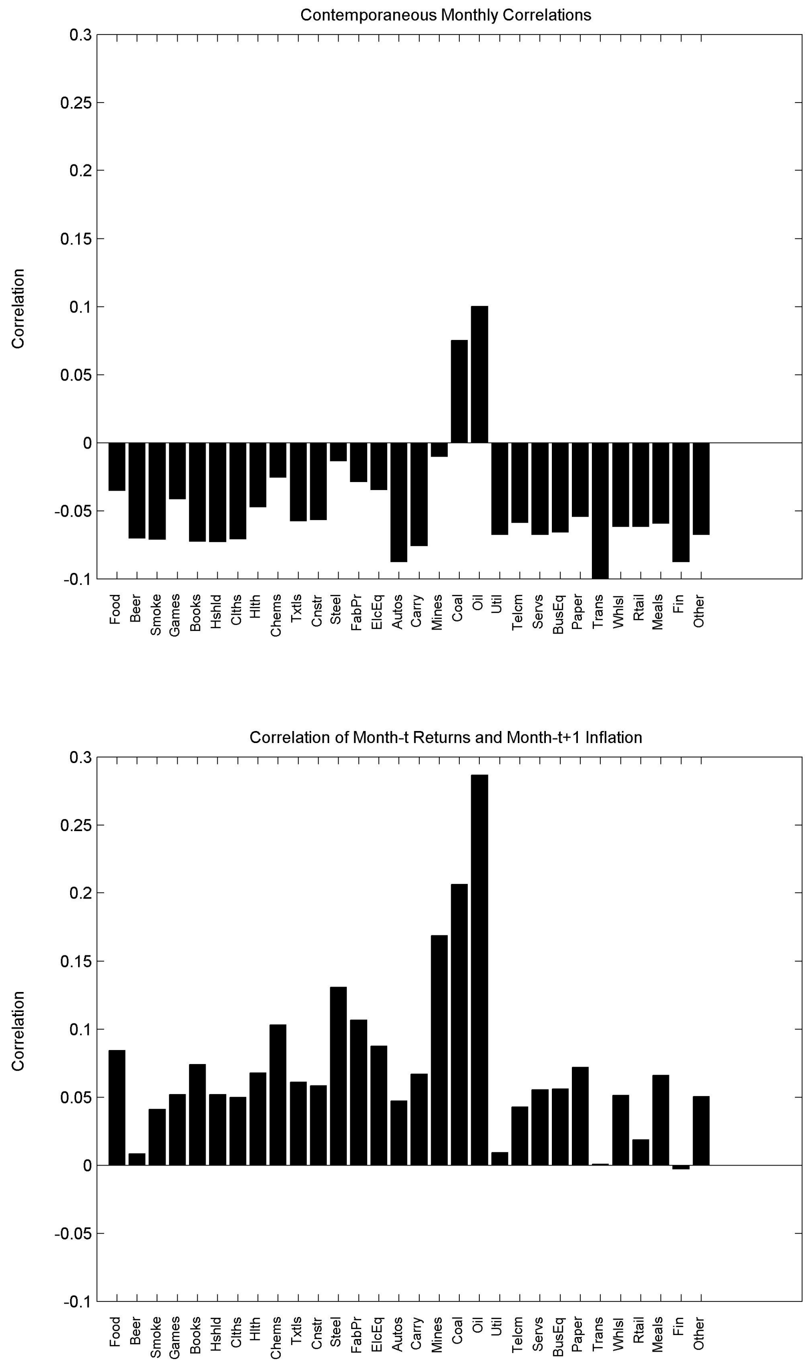

Figure 4: Tracking Inflation with Treasury Bills

The figure plots the cumulative change in the price level (solid line) and the cumulative return to the Treasury-bill tracking portfolio. The tracking portfolio is calibrated against look-ahead inflation using 60-month rolling-window regressions with no intercept, as shown in Equation (2) above, reproduced here for convenience:

$$CPI_{t+1} \;=\; \beta_0 \; r_t \;+\; \epsilon_{t+1},$$

where CPI_{t+1} denotes time $t+1$ inflation, r_t denotes the time-t Treasury-bill return, and ϵ_{t+1} is error. The estimated slope coefficient, β_0, is the Treasury-bill holding for the subsequent month; the return to this holding over the subsequent month is the tracking-portfolio return.

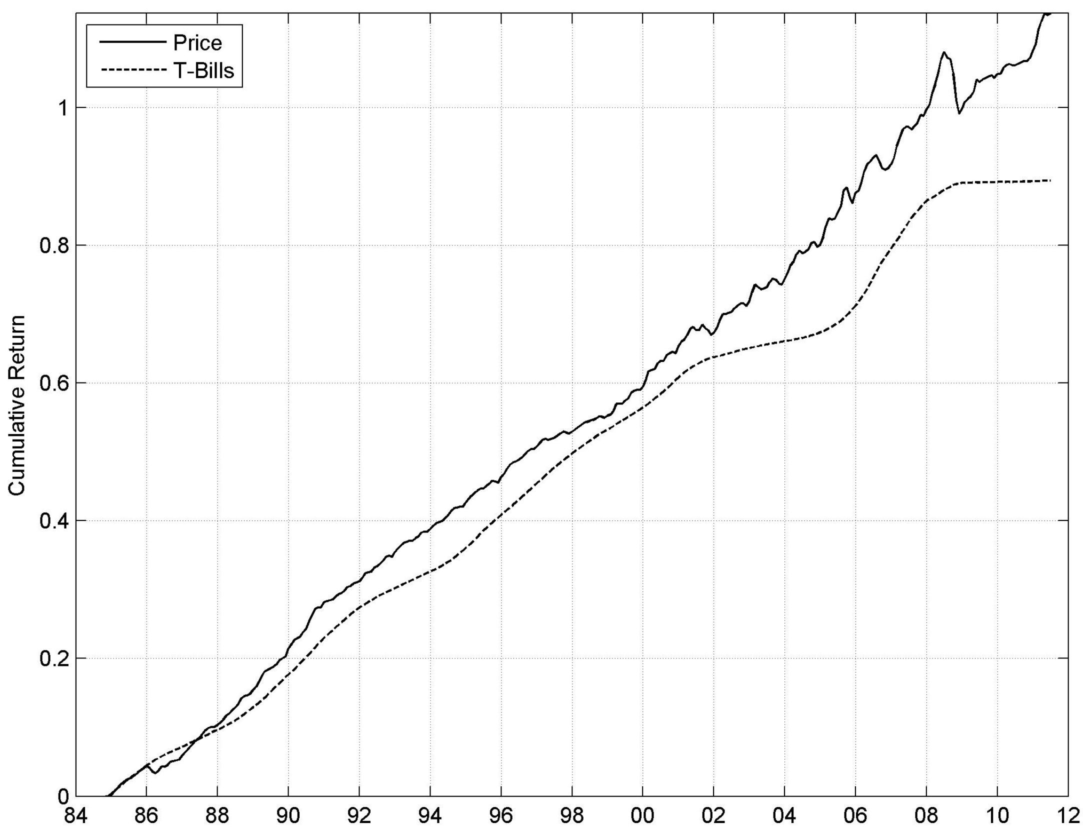

Figure 5: Tracking Inflation with Treasury Bills and Equities

The figure plots the cumulative change in the price level (solid line) and the cumulative return to the Treasury bill and equity tracking portfolio. The tracking portfolio is calibrated against look-ahead inflation using 60-month rolling-window regressions with no intercept, as shown in Equation (3) in the text, reproduced here for convenience:

$$CPI_{t+1} \ = \ \beta_0 \ r_t \ + \ \sum_{i=1}^{30} \ \beta_i \ R_{it} \ + \ \epsilon_{t+1},$$

where CPI_{t+1} is time $t+1$ inflation, r_t and R_{it} are time-t Treasury-bill and equity portfolio returns, respectively, and ϵ_{t+1} is error. The slope coefficients are the Treasury-bill and equity holdings for the subsequent month. The return to this portfolio over the subsequent month is the tracking-portfolio return. The rolling estimates of β_0 are shown in Figure 6 below; average estimates of the β_i coefficients are shown in Table 5.

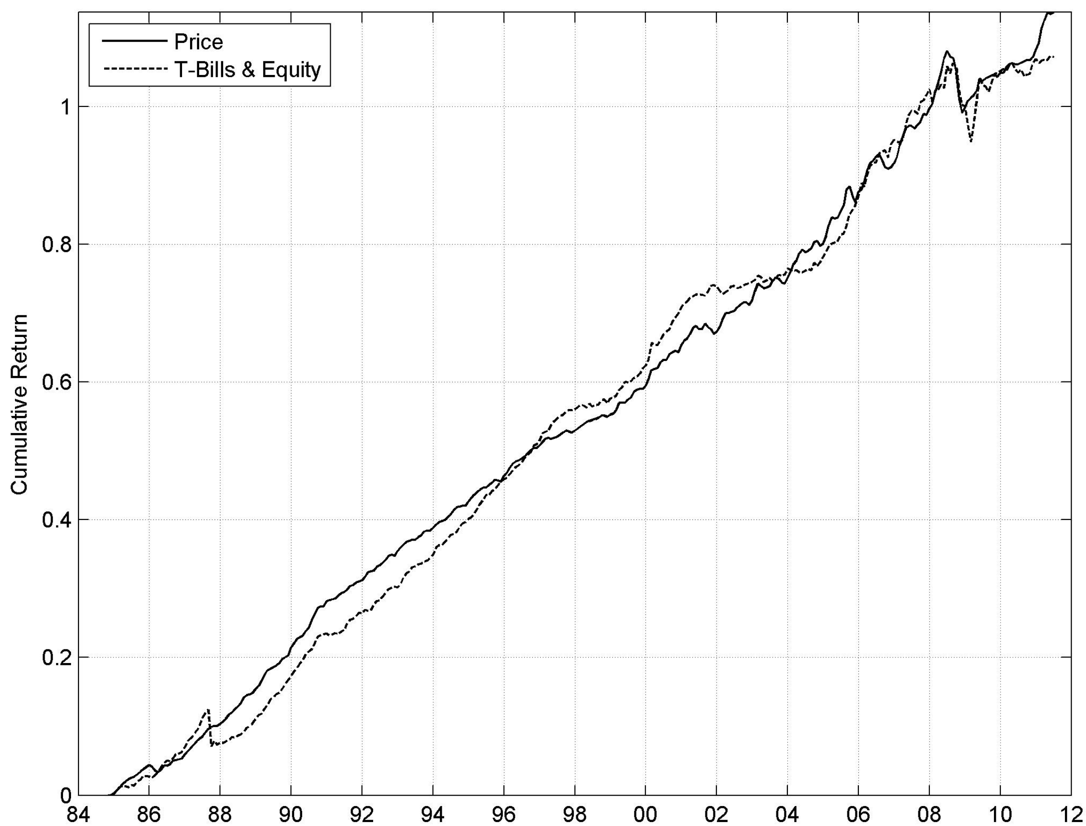

Figure 6: Treasury Bill Weights over Time

The figure shows the estimated regression coefficients for Treasury-bills in the inflation-tracking portfolio.

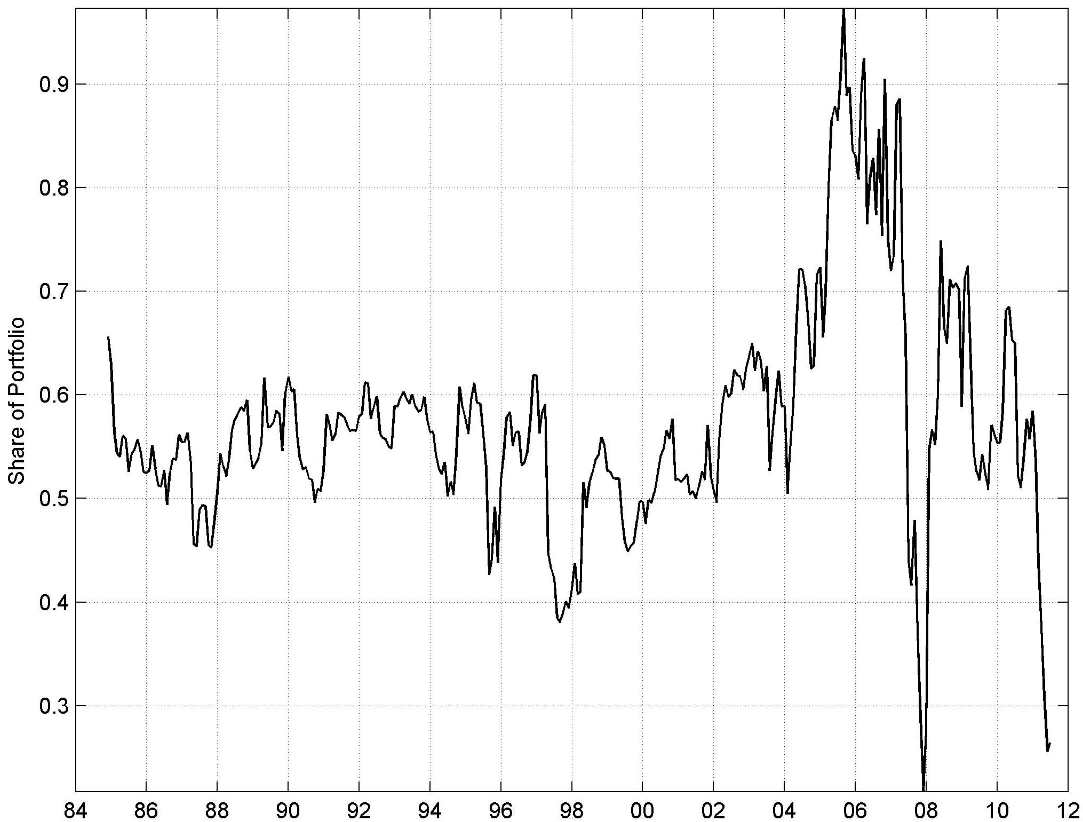

Table 1

Correlations of Monthly Asset Returns with Contemporaneous Realized Inflation. This table reports the correlation between monthly returns for the indicated asset classes and the contemporaneous inflation rate. The inflation rate is based on the CPI-U seasonally unadjusted index from the Bureau of Labor Statistics. The sources for the asset returns are described in the text. The data are monthly for the 1985–2011 period, although some asset return time series begin later than 1985. N denotes the number of monthly observations.

Asset Returns	Correlation	N
S&P 500	−0.0259	323
Treasury Bonds	−0.1970	240
Real Estate	0.0556	293
Commodity Index	0.2911	323
Gold	0.0157	323
TIPS	0.0989	176

Table 2

Percentage Tracking Error from Contemporaneous Inflation Tracking Approach. This table reports summary statistics for the percentage tracking errors from a portfolio formed using returns from the S&P 500, Treasury bonds, the real estate index, the S&P 500 GSCI commodity total return index, gold, and TIPS. RMSE denotes the root mean squared error of the tracking errors. N denotes the number of monthly observations.

Summary Statistic	Value
Average	8.011
Std. Deviation	14.498
RMSE	16.564
Minimum	−12.257
Median	4.690
Maximum	35.869
N	174

Table 3

Percentage Tracking Error from Look-Ahead Inflation Tracking Portfolio using Treasury Bills. This table reports summary statistics for the percentage tracking errors from a look-ahead inflation tracking portfolio using Treasury bill returns. RMSE denotes the root mean squared error of the tracking errors. N denotes the number of monthly observations.

Summary Statistic	Value
Average	−4.126
Std. Deviation	2.808
RMSE	4.991
Minimum	−11.386
Median	−3.767
Maximum	1.891
N	319

Table 4

Percentage Tracking Error from Look-Ahead Inflation Tracking Portfolio using Industry Stock Portfolios and Treasury Bills. This table reports summary statistics for the percentage tracking errors from a look-ahead inflation tracking portfolio using returns from the Fama-French 30 industry portfolios and Treasury bills. RMSE denotes the root mean squared error of the tracking errors. N denotes the number of monthly observations.

Summary Statistic	Value
Average	−0.619
Std. Deviation	2.132
RMSE	2.220
Minimum	−4.364
Median	−0.432
Maximum	4.247
N	319

Table 5

Average Portfolio Weights for the Look-Ahead Inflation Tracking Portfolio. This tables shows the average value of the percentage portfolio weights for the industry components of the look-ahead inflation tracking portfolio as well as the Treasury bill component. The averages are based on the monthly rolling regressions.

Returns	Portfolio Weight
Food	0.303
Beer	−0.240
Smoke	0.376
Games	−0.529
Books	0.790
Household	1.067
Clothing	0.153
Health	0.697
Chemicals	−0.721
Textiles	−0.136
Construction	−0.857
Steel	0.057
Fabricated Products	2.240
Electrical Equipment	−0.576
Autos	−0.207
Carriers	−1.210
Mines	0.013
Coal	0.093
Oil	2.064
Utilities	−1.424
Telecommunication	−0.246
Services	0.180
Business Equipment	−0.945
Paper	0.367
Transportation	−0.406
Wholesale	0.038
Retail	0.572
Meals	0.042
Financial	−0.694
Other	−0.331
Treasury Bills	57.161