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INFLATION: Avoid that Sinking Feeling

For nonprofit investors managing perpetual pools of assets, the potential for higher inflation is an ominous thought. Not only is it hard to hedge inflation, it's even difficult to define it. But, those who are flexible in their approach may be rewarded — as long as the inflation cycles are effectively evaluated.

In early 2003, it seemed that every newspaper was pounding us with the risk that the United States was entering a period of deflation that was going to bring substantial and devastating asset depreciation. The analogy most referred to was the decade-plus deflationary environment that Japan had been through. At Commonfund, we believed that this risk was drastically overstated and that the combination of very accommodative monetary policy (a one percent Fed funds rate) and fiscal policy (tax cuts) would stem deflationary tendencies. However, the argument that Treasuries could at least temporarily be held to protect against deflation was validated by the rapid price acceleration of fixed income instruments into mid-2003.

Now, in a 180-degree shift, we are reading daily about the risks of inflation. This article explores the many questions associated with inflation and their impact on mission-based organizations, such as endowments, foundations, nonprofit healthcare organizations and other charities supported by perpetual pools of assets. In particular, this article will look at four aspects of inflation that are often very confused. The first is "what is inflation?" The second is "what assets are correlated to inflation?" The third is to look at the impact of unanticipated inflation on the nominal returns of a portfolio of financial assets. And the fourth is the impact of inflation on the concept of generating net real returns and the preservation of purchasing power or intergenerational equity over longer periods of time.

WHAT IS INFLATION?

The first question that needs to be addressed is what is inflation? The easy answer is that inflation is an increase in the price of goods and services. In any economy, the prices of specific items are always in flux: Some are going up and some are going down, impacting consumers differently. The most widely followed inflation measure is the Consumer Price Index (CPI). This is basically a measure of the price change associated with a basket of goods and services used by the "average" U.S. consumer and is designed to capture the change in the cost of day-to-day living expenses. The U.S. Department of Labor determines what's in the basket and changes it every couple of years. The CPI and its components are used to adjust other economic series for price changes and to translate these series into inflation-free dollars. The change in the value of consumer goods and services that a dollar will buy at different dates can be used to measure the purchasing power of consumers over time.

Despite the focus on the CPI, this measure is not necessarily the best gauge of inflation. And we question whether "core CPI" (CPI excluding food and energy) is relevant since, the last time we checked, consumers continued to eat, use transportation and heat their homes.

Many economists argue that the GDP price deflator is somewhat better at tracking inflation. The GDP price deflator captures price movements associated with consumption, investment, government spending and trade flows, but improperly incorporates the price changes for imports and exports. Accordingly, the GDP price index at times will not provide an accurate measure of domestic inflation as it should include the cost of imports (products we buy) and exclude the cost of exports (products bought abroad that have no impact on inflation in the U.S.).

We believe the best inflation measure to focus on is the price index for gross domestic purchases, as this index makes the appropriate adjustment to imports and exports and is, therefore, viewed as the most accurate measure of inflation.

However, the building blocks for all these deflators begin with component prices that are captured from the CPI data. Hence, we will focus our discussion of inflation on movement in the CPI.

The CPI measures a fixed basket of goods and services. Thus, as the price of a certain product goes up, the index follows — but end-users of the product might change to a lower priced product, a switch that would not be reflected by CPI. This is called the substitution effect. Many economists have argued that the impact of the substitution effect causes CPI to overstate inflation. In recent years, however, two other computational problems suggest that CPI might be understating the true inflation rate. The housing sector represents about 42 percent of the CPI, the largest component of which is called "owners' equivalent renters' costs." This subcomponent represents almost 25 percent of CPI and is computed from an estimated rental value of a home rather than incorporating actual home prices, which have been increasing at two to three times the pace of owners' equivalent renters' costs.

Secondly, embedded in the CPI calculation is a "quality adjustment" that at times artificially lowers the price of inflation. For example, the shift to radial tires in the auto industry 25 years ago represents a quality adjustment as the tires last longer. But are power windows a quality adjustment? They do not last longer and, in many cases, you cannot buy a car without power windows — hence, you have no choice but to pay the higher price. It is this type of "quality adjustment" that serves to temper the stated inflation rate, but at the same time increases current dollar outlays for a "new and improved" product that might not be truly new and improved.

CPI VERSUS HEPI

An index that is used by many Commonfund investors is the Higher Education Price Index (HEPI). This index, compiled on an annual basis, is a measure of price changes in a fixed market basket of goods and services purchased by colleges and universities through current fund expenditures, excluding research. Moreover, the HEPI attempts to capture educational and general operating costs of an institution, including administrative costs, staff salaries and benefits, maintenance of the physical plant and equipment, and library costs. Despite the very different baskets of goods and services represented by the HEPI and the CPI, the HEPI has had a .92 correlation with the CPI. Historically, the HEPI has been about one to two percentage points higher than the CPI due in part to the fact that this inflation measure does not receive the benefit of the "quality adjustment" (price reduction) embedded in the CPI statistics. Since this index was first calculated in 1961, the CPI has been greater than the HEPI in only nine of the 43 observations; six of the nine years occurred in the high inflation environment of the '70s and early '80s. For the 10 years ended June 30, 2004, the HEPI has grown at an average of 3.6 percent per year average while the CPI has been at 2.5 percent. For the year ended June 30, 2004, the HEPI was 4.6 percent versus the CPI at 2.2 percent. Many universities use this price index to evaluate the overall budget increases that are required to maintain quality equilibrium before programmatic adjustments. Some universities that utilize the hybrid spending model use this measure to determine the size of the annual increase in their endowment distribution.

INFLATION IS IN THE EYE OF THE BEHOLDER

How to untangle this inflation measurement problem? We have to start by recognizing that inflation is in the eye of the beholder. The daily headlines heralding the arrival of the highest oil prices in decades have led many to the conclusion that we may be entering a period of higher prices for the consumer and for businesses where oil and gas are key components of the basket of goods and services they might consume. These price increases, combined with robust economic activity, have started to fuel stronger increases in the CPI. On a year-over-year basis, the CPI has accelerated from a 1.7 percent pace in March 2004 to a 3.3 percent pace in June 2004, confirming that there is inflationary pressure in several components of the economy, as witnessed by energy, medical care, education, housing and apparel costs.

For those goods that were dependent on some raw commodities, the price of production went up substantially in early 2004. For other products and services that don't depend on raw material input, the rise in prices has been more moderate. Price pressures are starting to flow through to the labor market as seen by the recent acceleration in average hourly earnings.

From the perspective of a fiduciary with responsibility for a perpetual pool of assets supporting a mission-based organization, inflation can be viewed from a slightly different perspective. In most cases, the objective of the perpetual pool is to provide a consistent level of support across a long-term time frame (often referred to in the educational environment as intergenerational equity). This level of support across time needs to be adjusted for purchasing power. In other words, resources across time must take into account the underlying nonproductive price increases that reflect inflation in the market basket that those assets buy. So, the underlying inflation in the basket of goods and services must be offset by undistributed returns of the perpetual pool of assets. That is, the return from the investment assets must be at a level equal to the distribution rate plus inflation to achieve intergenerational equity.

But what price increases are we speaking about? In most cases, the CPI is generically used as the basis to determine real returns. However, as we have discussed, inflation is in the eye of the beholder (the purchaser of goods and services). Price increases will differ substantially depending on the nonprofit institution that we are examining. Today, a nonprofit that purchases heating oil for the poor will have a much different perception of inflation and its ability to maintain intergenerational equity than a charity that purchases computers for elementary schools.

So, examining the component parts that drive the prices of goods and services purchased for a specific institution is very important when it comes to understanding the inflation question. It is also a part that tends to get simplified and defined in terms of the CPI by most institutions. As discussed earlier, the inflation impacting the education portion of the nonprofit market (HEPI) has historically been higher than consumer inflation. This makes purchasing power parity more challenging.

The biggest challenge in looking at any historical data in which inflation is one of the variables is recent history. The U.S. economy has been in a long period of disinflation — or declining rates of inflation — since the early '80s. The mid- to late '70s to 1981 was the last period in which the economy experienced the type of destructive inflationary pressures that we have come to equate with significant losses of real value or purchasing power. As you will recall, the most effective hedge against those sharp price increases was in the commodity sector, particularly gold, which rocketed to levels that have not been seen since. The other interesting commodity was oil, which was one of the key components driving the inflationary cycle.

Clearly, the U.S. economy and the influences behind the CPI since the last experience associated with hyperinflation have changed significantly in the last 20 years. Since the mid-80s, we have had a couple of brief inflation scares driven by events such as price increases in either oil and natural gas or labor market pressures when the economy expanded beyond its non-inflationary growth potential (1988 and 1994), although neither lasted very long.

ASSETS THAT HEDGE AGAINST HIGH INFLATION

If real returns are the only thing that matter over long periods of time, constructing a portfolio that increases the probability of achieving higher real returns is something that is worth pursuing. One way of doing this is to place in the portfolio assets that hedge against high inflation rates. Historically,

Cumulative Inflation-Adjusted Performance

(70% Equity/30% Fixed Income, 5% Spending)
December 31,1965–June 30, 2004

Source: Ibbotson, Bloomberg

The equity portion of the hypothetical portfolio is based on monthly returns of the S&P 500 Index (12/65-6/04), and the fixed income portion is based on monthly returns of the Lehman Brothers Aggregate Index (1/73-6/04) and the Ibbotson Associates Long Term Corporate Bond Index (12/65-12/72). The hypothetical portfolio is rebalanced to 70/30 annually on January 1 and 5% is distributed annually on January 1.

most portfolio evaluation systems look primarily at nominal returns and the distribution of those returns. Once the portfolio is constructed, the median nominal return is then examined assuming a flat inflation rate (usually around three percent). The challenge is that formulating nominal returns based on a constant inflation rate is not realistic. Individual asset classes can have substantially divergent real returns.

We should not underestimate the challenge of generating real returns necessary to meet post-distribution intergenerational equity. Based on history, we know that we can have relatively long periods of time in which financial assets lose real purchasing parity value even before distributions are taken into account. And, certainly, after distributions are taken into account the real decline in a portfolio would be greater. The graph above examines a straight 70/30 U.S. equity and fixed income pool of assets with a five percent distribution rate. The value of the assets was not maintained in real terms relative to the CPI for the period since 1965.

The table below examines the historical correlations (viewed quarterly) of various asset classes to the CPI for periods of time that data is available, with the longest running data going back to 1970. For the purpose of this analysis, we focused on liquid assets where the market reflects short-term asset price changes. Private assets — such as real estate, timber and natural resources — can effectively act to enhance real returns; however, they are more difficult to evaluate since their prices tend to adjust slowly to changes in market conditions. The first column, entitled "No Lead" is the coincident current quarterly correlation of the asset listed to inflation. The second column, entitled "3-Month Lead," measures the correlation of the index value to the rate of consumer inflation one quarter later. The concept here is to determine whether certain asset classes can provide a good hedge against current inflation (no lead) or future inflation (3-month lead).

Historical Correlation between Selected Asset Classes and the CPI

1970–2004

Index	No Lead	3-Month Lead	Beginning Date
CRB (Commodity Research Bureau)	0.14	0.23	Jan-70
GSCI (Goldman Sachs Commodity)	0.14	0.25	Jan-70
Dow Jones AIG Commodity (Total Return)	0.25	0.33	Feb-91
Gold	0.28	0.18	Jan-70
Silver	0.16	0.23	Jan-70
West Texas Intermediate Oil	0.30	0.19	Jan-70
Copper	0.01	0.09	Jan-70
Wheat Futures	0.09	0.12	Jan-70
TIPS (Treasury Inflation Protected Securities)	0.39	0.00	Mar-97
NAREIT	(0.21)	(0.19)	Jan-72
S&P 500	(0.22)	(0.14)	Jan-70
Lehman Aggregate Bond	(0.23)	(0.35)	Jan-73
MSCI World ex-U.S.	(0.21)	(0.04)	Jan-70
Citigroup WGBI ex-U.S. Hedged	(0.25)	(0.27)	Jan-70
Cash (3-Month Treasury Bill)	0.60	0.51	Jan-70

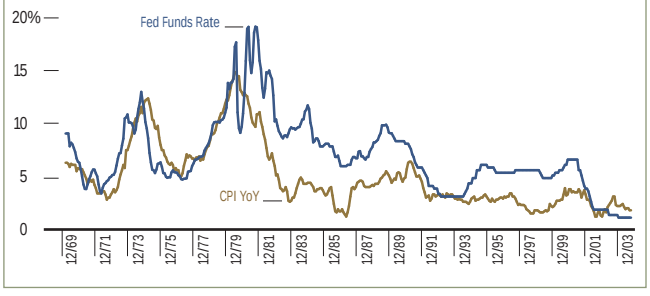
There are not many surprises in the table below. As you would expect, financial assets tend to be negatively correlated to the CPI, with the S&P 500 Index at -.22 and the Lehman Aggregate Bond Index at -.23. Commodity-based assets are, as expected, positively correlated to the CPI, with the three diversified investable indexes of the Goldman Sachs Commodity Index, Dow Jones AIG Commodity Index and the CRB Index at .14, .25 and .14, respectively. In all cases the 3-month lead correlation are higher, indicating that quarterly price changes in commodities presage higher prices in the general economy. The individual commodities of gold and oil have correlations that are slightly higher, .28 and .30, respectively. As you also would expect, the U.S. Treasury Inflation Protected Securities (TIPS) Index has a correlation to the CPI of .39, although the data for this instrument goes back only to the creation of TIPS in 1997. Interestingly, REITS were inversely correlated with inflation at -.21, meaning REITS were a poor hedge against inflation during the 1972 to 2004 period. However, the NCREIF Index, which began in 1978 (and which is not included in the table because it is an illiquid asset), had a very solid .38 correlation to inflation, suggesting that private ownership of commercial office, retail and industrial real estate could be a good hedge against inflation.

CASH AND INFLATION

There is one other number worth noting. The highest positive correlation to inflation as measured by the CPI is the risk-free rate (cash). While on the surface this may seem a little strange, it makes sense when you think about it in reference to a given

Fed Funds Rate Versus 12-Month Average CPI

December 1, 1969 – March 1, 2004



level of inflation. Cash instruments will quickly adjust to changes in the inflation rate as investors demand higher short-term returns to compensate for a loss of purchasing power. However, while cash seems to be the best hedge for the continuation of the current pace of inflation or the near-term market expectation for inflation, the long-term cost of such an allocation will certainly significantly reduce the opportunity to meet the asset pool's longterm objectives. Moreover, as described in the next section, cash does not hedge against an unexpected change in the rate of inflation. Cash returns will adjust to an increase in the rate of inflation, but they will lag during the period of actual acceleration in inflation.

UNANTICIPATED INFLATION IMPACTS FINANCIAL ASSETS

The second important aspect of the inflation question is to examine the impact of unanticipated inflation. Theory states that it is unanticipated changes in the inflation rate that are most devastating to traditional equity and fixed income assets in the portfolio. Once inflation has been built into the system, financial assets adjust to price levels that reflect the future anticipated rate of price changes. Bond yields move up, P/E ratios move down and some underlying companies are able to effect their pricing to deal with future cost increases. It is when unanticipated inflation hits and these asset values are changing that a portfolio needs a hedge to offset some of the losses in financial assets as they adjust to acceleration in price levels. While there has certainly been a significant amount of discussion about ways to hedge unexpected inflation, the search for the perfect hedge has eluded everyone. Thus, we now turn to the various instruments that may be key to dealing with this vexing problem.

First, we need to clarify how we define unanticipated inflation. We know it when we see it. But, for purposes of this work, we need a more precise definition. Thus, for each period we looked at the T-bill rate as a gauge of what holders of riskless assets expect to receive in return to preserve purchasing power for that period of time. We then compared that rate to actual inflation as defined by the CPI at the end of the period. If the CPI is greater than the T-bill rate for that period, it is defined as having unanticipated inflation. If the T-bill rate is greater than the inflation rate, it is defined as lower than expected inflation, a deceleration in inflation or unexpected disinflation.

The table below examines the correlations between changes in unanticipated inflation as defined above and various investable asset classes using quarterly data. We evaluated the majority of the asset classes starting in 1970, a period that encompassed significant unexpected acceleration in actual consumer inflation. Once again, the first column, entitled "No Lead" is the coincident current quarterly correlation of the asset listed to unanticipated inflation. The second column, entitled "3-Month Lead," measures the correlation of the index value to the rate of unexpected inflation next quarter.

Correlation of Selected Asset Classes and Unexpected Inflation
1970–2004

Index	No Lead	3-Month Lead	Beginning Date
CRB (Commodity Research Bureau)	0.33	0.29	Jan-70
GSCI (Goldman Sachs Commodity)	0.23	0.11	Jan-70
Dow Jones AIG Commodity (Total Return)	0.31	0.13	Feb-91
Gold	0.34	0.37	Jan-70
Silver	0.27	0.30	Jan-70
West Texas Intermediate Oil	0.32	0.20	Jan-70
Copper	0.13	0.14	Jan-70
Wheat Futures	0.16	0.22	Jan-70
TIPS (Treasury Inflation Protected Securities)	0.42	0.22	Mar-97
NAREIT	(0.21)	0.04	Jan-72
S&P 500	(0.25)	(0.08)	Jan-70
Lehman Aggregate Bond	(0.45)	(0.06)	Jan-73
MSCI World ex-U.S.	(0.23)	(0.09)	Jan-70
Citigroup WGBI ex-U.S. Hedged	(0.51)	(0.18)	Jan-70
Cash (3-Month Treasury Bill)	(0.22)	(0.38)	Jan-70

CORRELATION OF SELECTED ASSET CLASSES AND UNEXPECTED INFLATION

Again, the data support the view that both unexpected inflation and deflation have a negative correlation to financial assets. The Lehman Aggregate Bond Index has a relatively high negative correlation to unanticipated inflation at -.45 followed by the S&P 500 Index at -.25 and the MSCI World ex-U.S. Index at -.23.

It is apparent from this data that one of the most effective hedges against unexpected inflation falls into the commodity areas, with the Goldman Sachs Commodity Index at a positive .23, the CRB Index at .33 and the recently introduced Dow Jones AIG Commodity Index at .31. On a three-month forecasting basis, the correlations between commodities and unexpected inflation are positive but lower than the no lead numbers.

TIPS SHOW HIGH CORRELATION TO UNEXPECTED INFLATION

The other asset class that shows a high positive correlation to unexpected inflation is TIPS at .42. Again, this is as one would expect. As unexpected inflation increases, the market should reflect higher valuations for these instruments, which have an inflation adjustment defined by the CPI built into the total rate of return. However, because TIPS are new financial instruments (since 1997) their history is limited. Secondly, the real return on TIPS has been, in part, driven by their relative undervaluation early in their life. Moreover, TIPS have a higher correlation with the movement in Treasuries.

Since mid-2003, the TIPS market has moved from implying a 1.5 percent CPI for the next 10 years to implying 2.5 percent CPI inflation.* This was a shift in market expectations from deflationary fear to reflationary hope, and TIPS have performed better as the market has implied higher levels of inflation. Over the shorter run, the performance of TIPS is driven by the market-determined level of real rates, which is inextricably tied to the level of nominal rates offered by conventional Treasuries. The Federal Reserve sets the rate of cash and the market forecasts the impact that the Fed will have on future inflation and, therefore, the level of real yield that investors require to hold a government guaranteed instrument promising payments in real terms.

** Breakeven inflation is the difference between the nominal yield of a Treasury security and the real yield of a Treasury Inflation Protected Security of the same maturity. It can be considered an unbiased market estimate of future inflation.*

In the June–July 2003 and April–May 2004 periods, the market repriced what bonds should offer based on a changing view of the economy and the Fed's monetary policy. There wasn't a significant change in the market expectation of future inflation. Therefore, TIPS suffered right alongside nominal Treasuries. Conversely, last fall, the market started forecasting higher inflation and the real yield on TIPS fell relative to nominal Treasury yields, as investors signaled inflation was on the rise. TIPS, however, do not always hedge for unanticipated inflation, an increase in future expectations of inflation or a sell-off in the Treasury market. In fact, since late March, the Treasury bond market has had a sharp sell-off; investors have been hit with unexpected inflation worries and a rise in inflation expectations. Despite the apparent safe haven status of TIPS, these factors have helped to fuel a 17-point sell-off in the price of the outstanding 30-year TIPS bond since late March.

In mid-June, the current 30-year TIPS was trading at 2.4 percent, which equates to a future expected CPI rate of about 3.0 percent. In other words, if the annual inflation rate is greater than 3.0 percent over the next 30 years, the holder would outperform relative to a fixed income security of the same maturity. There is, of course, duration risk associated with the fixed income portion of the TIPS security. As has become abundantly clear recently, duration risk can result in significant loss of principal when interest rates move up during an inflation scare. In fact, over their short history TIPS have a positive correlation not only to the CPI but also to the Lehman Aggregate Bond Index at .64 (higher than the CPI at .39) and the S&P 500 at .19. On a theoretical basis, this instrument should be a hedge for the CPI; however, the levels at which it trades will impact its ability to provide an effective inflation hedge.

ROLE OF CASH VARIES WITH THE CYCLE

The other interesting data point is correlation between the risk-free rate (cash) and unanticipated inflation at -.22. This is the exact opposite of what we found when we examined the historical correlations between inflation and cash. These results show that while cash may be a very good hedge against inflation *ex post* as short-term rates adjust after inflation is known, it doesn't *ex ante* effectively hedge for unexpected changes in the inflation rate. Publicly traded REITs — which some have argued are a good inflation hedge — in this analysis show a negative correlation to unexpected inflation at -.21, but they have a relatively high correlation to the S&P 500 Index.

In contrast, commodity measures have a high correlation with inflation, but virtually no correlation with the stock market. More specifically, the Goldman Sachs Commodities Index has a .23 correlation to unexpected inflation, while the Dow Jones AIG Commodities Index has an even higher correlation with unexpected inflation at .31. Both of these commodity indexes have virtually no correlation with the S&P 500 Index.

The broad-based investable inflation indexes appear to offer some of the highest correlations to the CPI as well as to unanticipated changes in CPI over the periods that we examined. These commodity indexes allow an investor to gain exposure to a broad group of commodity-based futures, generally with three months to expiration. They also provide for returns associated with the uninvested cash resulting from the leverage associated with futures positions. Therefore, long investors get returns on the futures position (positive or negative) plus a cash return on the total value of the investment.

WEIGHTING OF COMMODITIES DIFFERENTIATES INDEXES

The major difference in the three commodity indexes in the previous table is the weighting of the underlying commodities included in them. The CRB is an equal-weighted average of 17 component commodities' price levels, with a significant weighting to agricultural commodities. The Goldman Sachs Commodity Index (GSCI) is weighted by worldwide industrial production valued at current prices. This tends to result in a significant proportion of the index being allocated to hydrocarbons (oil, heating oil and natural gas, etc.), particularly when prices of these commodities are very high. The Dow Jones AIG Commodity Index limits the exposure to any one broad group to 33 percent and, therefore, has more exposure to commodities other than hydrocarbons when compared with the GSCI.

RECENT STUDIES OF COMMODITIES FOR THE LONG TERM

Recently, there has been a significant amount of work done by Gary Gorton of The Wharton School and Geert Rouwenhorst of Yale University examining commodities for the long term. They constructed an equally weighted index of commodity futures having corresponding publicly traded futures. Including cash returns going back to 1959 they found that this index outperformed stocks (over this period of time). The conclusion is that investing in long futures contracts trading with expiration three months out has a very good long-term return and is substantially better than trading the corresponding spot index. They also found much of the same correlation data that we have outlined.

The other interesting fact that they uncovered using their hypothetical index is that commodity prices correspond to changes in the business cycle and tend to do best in the late portion of the expansionary periods of the business cycle when stock and bond returns tend to lag. (The Gorton and Rouwenhorst data show stocks and bonds perform worst

early in recessions and best late in recessions.) Certainly, the prices of many commodities have skyrocketed over the last 12 months, led by industrial commodities. The GSCI is up 35 percent and the Dow Jones AIG Index is up 27 percent for the 12 months ended July 31, 2004. The question for investors is whether this increase is the precursor to a continued cycle of inflation or a short-term run-up related to the fact that we are in the middle of an expansionary world economy. As with any investment, the purchase price can influence long-term returns.

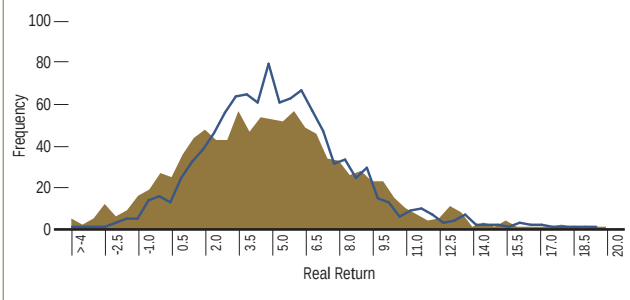
A few additional observations: The equity indexes that are composed of underlying companies that are tied to commodities or inflation-hedged assets, such as real estate or oil and natural gas companies, tend to be more influenced by the overall stock market than by inflation or unexpected inflation. Thus, in many cases they will not represent an effective inflation hedge. The one exception is the index composed of gold and silver producers, which has a high correlation to gold prices but not necessarily to inflation.

PORTFOLIO IMPACT OF REDUCING DOWNSIDE RISK

When constructing a policy portfolio, one approach is to add asset classes that are likely to generate higher real returns in a long period of higher inflation. Conceptually, adding these asset classes to the portfolio should reduce the amount of the left tail (downside) risk when looking at a distribution of potential future real returns. In this context, when we are talking about left tail risk we are looking at the portion of future potential returns where real returns are negative. One cause of negative real returns is a higher inflation environment. Adding assets that might do well in an unexpectedly higher inflationary environment could reduce the number of potential events with negative real returns. To examine the concept of adding inflation-based instruments to the portfolio to reduce left tail risk caused by those periods of higher levels of inflation, we used the Commonfund Allocation Planning Model (APM). Part of the uniqueness of the APM is that it evaluates a portfolio's real returns, not just nominal returns. As we discussed earlier, asset classes will have very different return patterns when examined through the lens of inflation as opposed to strictly looking at nominal returns. This proprietary model examines possible future outcomes by using a Monte Carlo simulator to generate random changes in the yield curve and inflation rates. It then examines the impact of changes in the yield curve on the various asset classes in the policy portfolio.

Distribution of Real Returns With and Without Inflation Hedges

20-Year Projection



2004 Commonfund Benchmarks Study®—Educational Endowment Report (Portfolio Asset Size Between $51–$100 Million)

Inflation-Hedged Portfolio with 10% TIPS and 10% Commodities

Source: Commonfund Allocation Planning Model (APM)

To examine the impact of adding inflation-hedging assets using the APM, we constructed two hypothetical portfolios. For the first portfolio, we used the average asset allocation from the Commonfund Benchmarks Study® for those educational endowments that have between $51 million and $100 million of assets under management. We chose this allocation because, on average, it has little exposure to assets that fit into the inflation hedge category. To this portfolio we added two inflation-hedging asset classes, commodities and TIPS. These two were selected, at least in part, because of the positive correlations that they have historically had to the CPI. We dedicated 10 percent of the portfolio to each of these asset classes and adjusted each of the other asset categories downward proportionately. The graph shows the distribution of real returns of the 1,000 scenarios generated by the APM over 20 years.

PORTFOLIO EFFECTS OF INFLATION-HEDGING STRATEGIES

While the median real return for the two asset allocations is roughly the same (5.0 percent for the non-hedged portfolio versus 5.3 percent for the inflation-hedged portfolio), the distributions of the real returns are quite different. The portfolio that contains the additional 20 percent inflation hedge has substantially less left tail risk than the base portfolio. The cost of reducing the left tail risk is a reduction in potential upside at the ninety-fifth percentile in the right tail. The same general distribution patterns can be seen for five-, 10- and 15-year time frames. Thus, incorporating inflation hedging strategies reduces the downside risk to a portfolio during periods of inflation at the expense of lowering the upside potential of the portfolio in a low or modest inflation environment. As a way to generate a better understanding of the impact of asset allocation and inflation on the distributions displayed in the graph, we examined the tails of outcomes. In this case, we looked at the more extreme cases of inflation and at the average returns of the two policy portfolio allocations. For purposes of this analysis, we dissected the top and bottom quartile of the inflation outcomes (the portfolio returns for the top and bottom 250 inflation scenarios).

Average Returns for Low Inflationary Scenarios

	5 Years	10 Years
Inflation	0.89%	0.56%
Non-Hedged Portfolio	9.16	9.39
Inflation-Hedged Portfolio	8.67	8.81

Average Returns for High Inflationary Scenarios

	5 Years	10 Years
Inflation	5.42%	5.73%
Non-Hedged Portfolio	5.69	6.92
Inflation-Hedged Portfolio	7.16	8.30

These results again demonstrate that when inflation was below long-term averages, the inflation-hedged portfolio (those with TIPS and commodities) underperformed the non-hedged portfolio by almost 60 basis points per year. In contrast, in higher inflation environments — in which the CPI averaged 5.73 percent — the inflation hedged portfolio outperformed the non-hedged portfolio by 138 basis points per year for the 10-year period. However, in high inflation environments it is not realistic to expect to generate real returns of more than five percent to cover the spending requirements of the portfolio, even with a 20 percent allocation to inflation-hedging assets. This suggests that even if a given portfolio was properly positioned for a reasonable reacceleration in inflation, the real purchasing parity/intergenerational value of the portfolio would still likely decline in a high inflation environment.

ANALYSIS LEADS TO SEVERAL CONCLUSIONS

What conclusions can we draw from this analysis? First, inflation is a very hard concept to define. It means different things to different people based on the basket of goods and services one is purchasing. Second, as managers of perpetual pools of assets our main objective is to generate real returns. Nominal returns are important, but the only true gauge of success is to preserve the real purchasing power of the assets that support the mission of our institutions. History has proven that this is not an easy task. Reviewing our APM data shows that median future real returns are in the five percent range before any spending. Third, adding asset classes that have inflation-hedging capabilities does reduce left tail risk (poor real performance) at the cost of reducing right tail opportunities (exceptional real performance). Therefore, putting inflation-hedged assets in the portfolio really depends on the overall investment objectives of the portfolio and the specific type of inflation to which an institution is exposed. Fourth, if the focus is on nominal returns, the challenge is to place assets in the portfolio to hedge against unanticipated inflation. While some of these assets may be similar to those used to help generate real returns, they are not always the same.

Finally, the short-term execution of inflation-hedging strategies is very challenging. The economic cycles and factors that drive inflation will vary depending on the forces driving the economy. So, while it makes sense in most cases to look for long-term inflation hedges, the execution of the hedge can be very difficult. Flexibility in execution will be rewarded if cycles are effectively evaluated. In conclusion, the ultimate objective of a perpetual pool of assets is to generate real returns; however, there is no universally accepted way to execute a hedging strategy for inflation or, as importantly, an unexpected increase in inflation. There appears to be very strong evidence that nonprofit investment pools should have a portion of their long-term asset allocation in assets that will protect real purchasing power and intergenerational equity as well as offset poor performance of financial assets when unanticipated inflation occurs. The challenge is, of course, how to execute a strategy that deals with the complexity of the issues. We are continuing to study these issues with an eye toward the development of a series of recommendations.

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