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INFLATION IN 2010 AND BEYOND? PRACTICAL CONSIDERATIONS FOR INSTITUTIONAL ASSET ALLOCATION

PART I of II

Investors' Next Concern

While there's no shortage of topics to analyze as a result of the 2008-2009 global recession, the unprecedented monetary stimulus has justifiably focused investor attention on potential inflation. As an institutional asset manager with strategies incorporating inflation-linked assets, we are frequently asked how best to hedge against inflation.

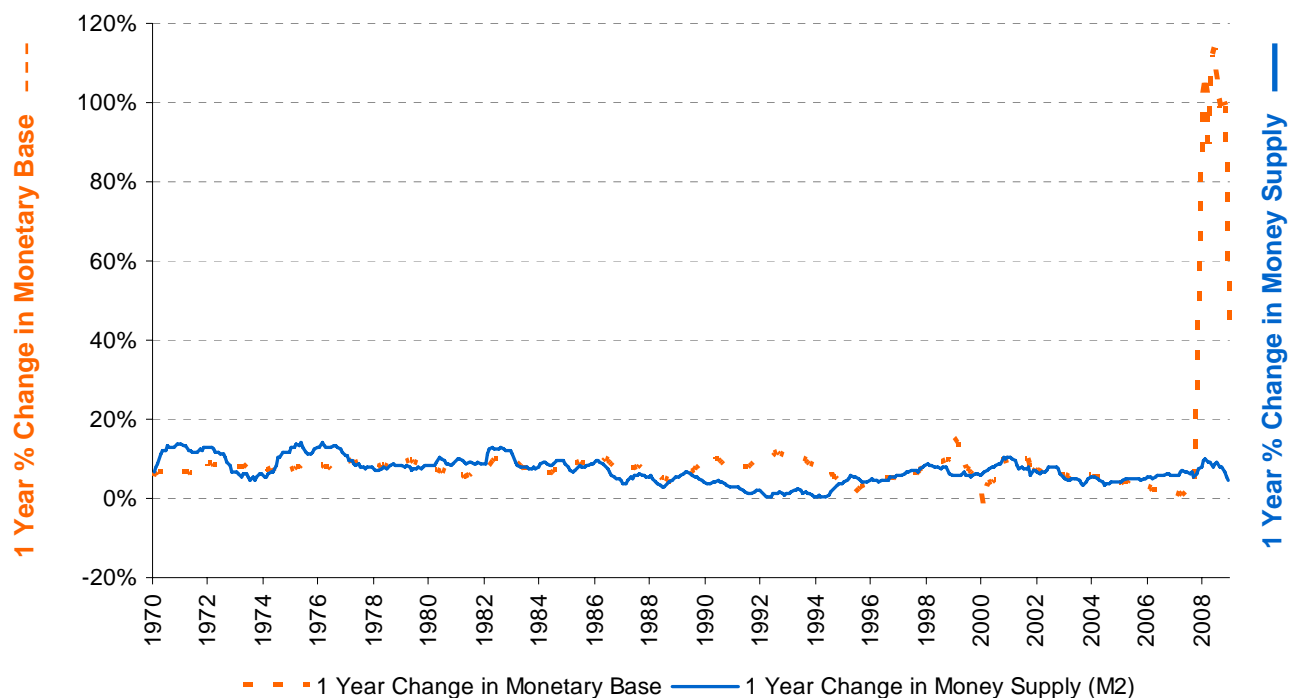
There is undoubtedly a case to be made for higher future inflation; there are also strong arguments for more moderate levels. Our aim in Part I of this series is not to predict, but rather to outline what we believe are the key issues surrounding the inflation debate, and to clarify some misconceptions about inflation and inflation-linked assets. We also offer some analysis which investors may find helpful in deciding how to position a portfolio for various inflationary environments. In a follow-up paper to this series, Part II will discuss the potential rewards and risks of holding various assets in a portfolio during distinct inflation and economic environments.

What Causes Inflation?

Inflation is caused by an increase in money supply relative to output (i.e. real GDP) and the velocity of money (the speed at which money changes hands). Money supply is a product of the monetary base and the money multiplier (how much banks lend relative to their reserves). In the absence of economic growth, if output and the velocity of money are kept steady while the money supply grows, prices should increase. However, if money supply grows at the same rate as economic activity, prices should remain stable.

It is important to emphasize that inflation rates are a product of the relationship between GDP growth and the overall increase in money supply, not simply the physical monetary base. In the U.S., there has in fact been a dramatic increase in the monetary base as the Fed has pursued monetary stimulus by lowering the Fed Funds and discount window short-term lending rates. It has also pursued “quantitative easing,” the direct purchase of longer-term government and private debt to provide liquidity to the market. However, despite the Fed’s efforts, the overall velocity of money and the money multiplier in the U.S. economy have dramatically declined as banks have been reluctant to extend credit and economic activity has slowed. Put simply, the Fed has “printed” a lot of money, but it isn’t being fully deployed into the economy. Figure 1 below shows the annual percentage change in the U.S. monetary base (MB) and money supply (M2).¹ Despite the unprecedented increase in the monetary base, the growth in overall money supply remains in line with historical values.

Figure 1: Monetary Base and Money Supply



Source: Datastream

Why No Inflation in 2009?

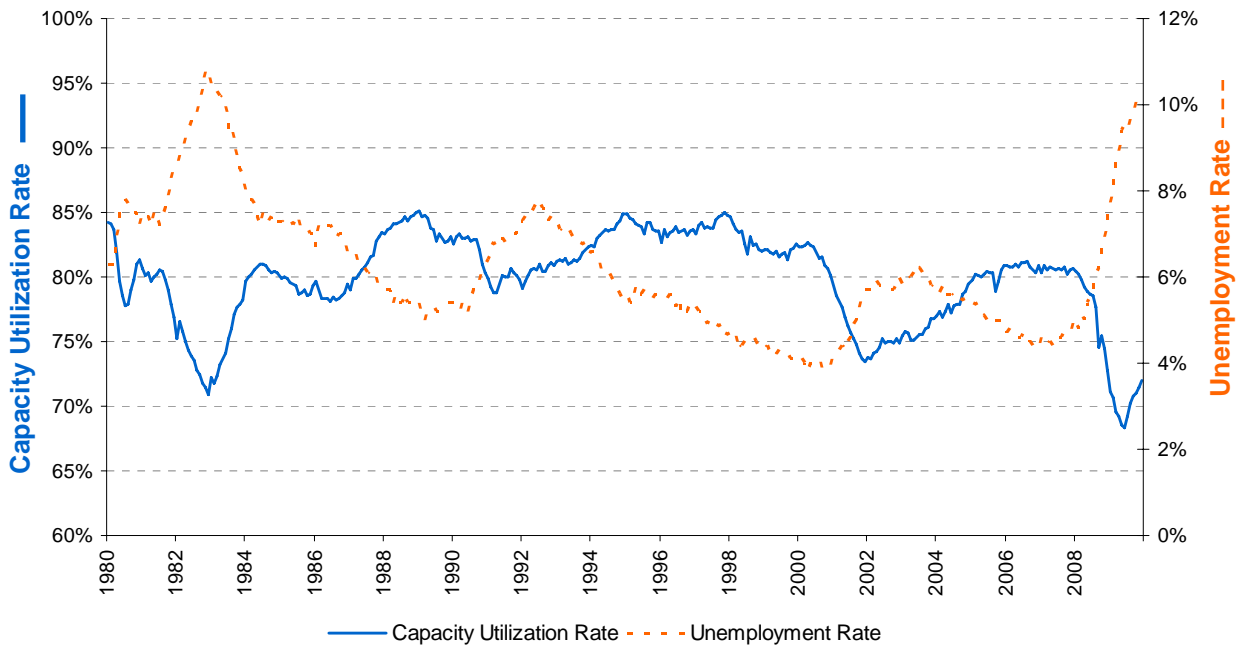
Despite the significant growth in the U.S. monetary base, money supply has grown modestly. Furthermore, there is excess capacity in the economy evidenced by an approximate 70% capacity utilization and an “official”² 10% unemployment rate (see Figure 2). As a result, 2009 did not see a significant positive realization of inflation by year-end, though the inflation growth rate changed from negative to positive. Figure 3 displays the annual inflation rate and consumer price index (CPI)

¹ Monetary base is currency in circulation and bank reserves deposited with the Fed. Money supply (M2) includes all liquid money including checking and saving accounts, money market accounts and certificate of deposit under \$100,000.

² Unemployment is often said to underestimate the “under-employed” rate – or the rate including those who are working part-time because they cannot find full-time work and those who have given up looking for work. Some economists estimate the under-employed rate at over 17% in the U.S.

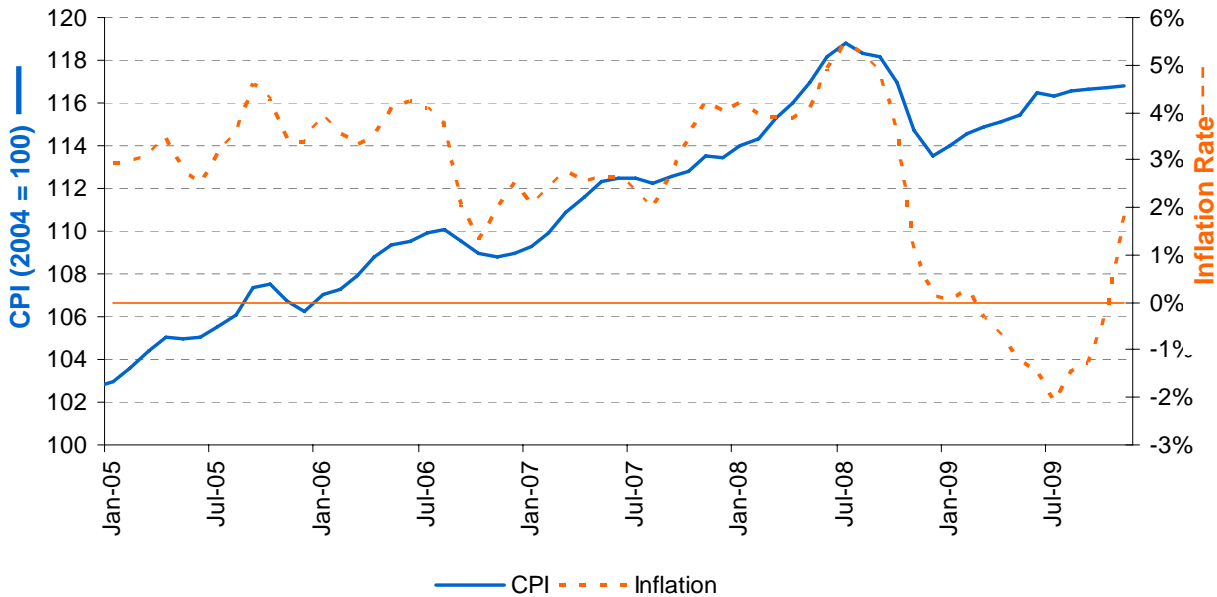
since 2005. Inflation rates remain below pre-crisis levels, and the trend in the CPI index is not currently showing signs of a dramatic increase in inflationary pressures.

Figure 2: Measures of Slack in the US Economy



Source: Datastream

Figure 3: CPI and Year-on-Year Inflation in the US



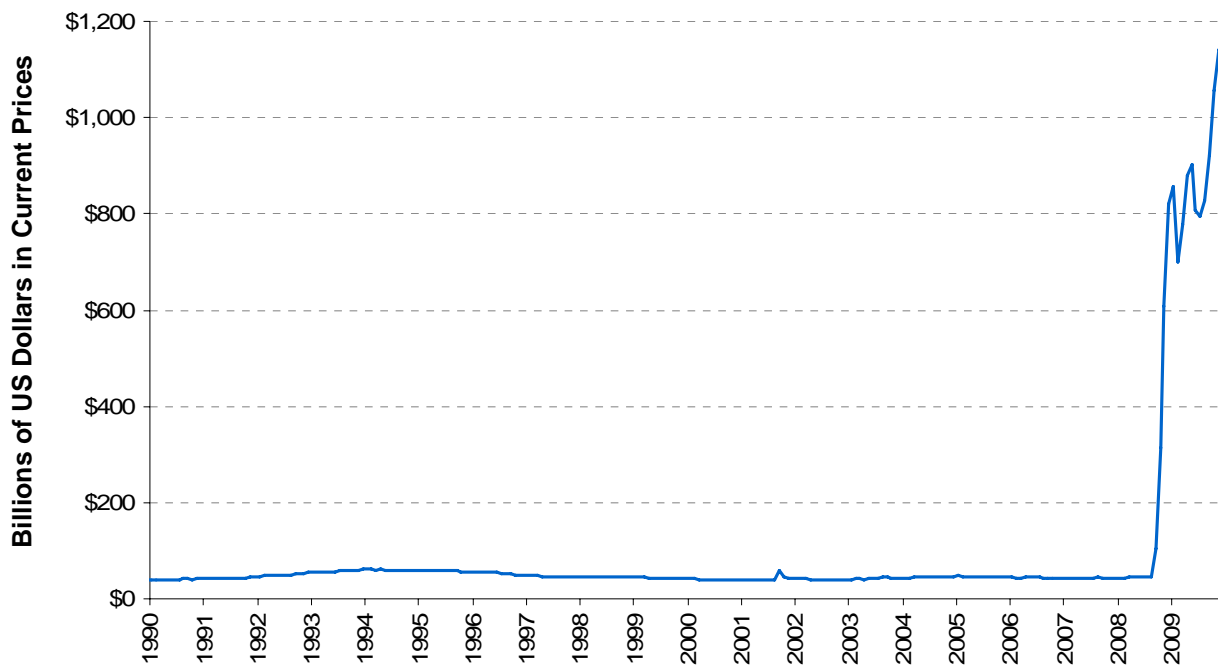
Source: Datastream

However, significant questions about inflation remain: Is there a case for a future spike in inflation? If the velocity of money picks up as the economy recovers and banks resume lending, will inflation follow? The Fed is well aware of the need to withdraw liquidity to manage inflation and inflation

expectations.³ In recent meeting ‘minutes’ the Fed has expressed the need for a measured end to its emergency monetary policies in order to manage inflation expectations (the often-discussed “Exit Strategy”). In fact, the Fed has broadly outlined the steps it will take to drain liquidity in 2010 and beyond including ending the emergency asset purchase program, among other measures. The Fed’s current unprecedented stimulus posture may not generate abnormal inflation pressures if the Fed can, in an effective and timely manner, withdraw excess liquidity from the economy as money velocity and bank lending begin to increase.

There is another more technical reason that the increased monetary base may not generate the same abnormal inflation pressures it would have generated in the past: the Fed is currently paying interest on bank reserves. If the Fed continues this policy in conjunction with raising the rates it pays on reserves, banks may be willing to hold a higher percentage of their assets in cash. Prior to October 6th 2008, when the Fed began paying interest on cash reserves, the Fed primarily used open market operations – buying and selling of Treasury Bills to manage the monetary base. The Fed’s selling of T-bills reduced the reserves held by banks, thereby lowering the monetary base. By paying interest on bank reserves, the Fed has implicitly made reserves a substitute for T-bills. Banks might therefore be inclined to hold more cash than they would have done in the past. If this holds true, the economy could absorb a larger monetary base without generating abnormal inflation pressure. Figure 4 displays the total amount of reserves held by U.S. banks and other depository institutions, demonstrating a significant increase in cash assets held.

Figure 4: Reserves of Depository Institutions in the US



Source: Datastream

³ Inflation expectations are a key factor monitored closely by central banks. Inflation is one of the factors that exhibit “self fulfilling expectations.” For example, if employees expect inflation to be high they are likely to demand wage increases which leads to inflation. Adjusting inflation expectations downward when inflation is high can be very costly as experienced during the Paul Volker years at the Fed. The Fed would want to avoid this cost of bringing inflation expectations down in the future.

Although the Fed has indicated its desire to keep inflation at bay, investors have expressed concern that it might be slow to reduce the monetary base given its mandate to simultaneously strive for stable prices and full employment.⁴ The question is whether the Fed will be sufficiently hawkish on inflation to begin raising rates and draining liquidity on the first signs of significant inflation, even if it occurs in a high unemployment environment. This is a valid concern, especially as long as the Fed also perceives a risk of potential deflation (for example, deflation risk might stem from a double dip in the housing market, commercial real estate, or other asset-backed market). Deflation is generally perceived by the Fed as a worse outcome than inflation at similar magnitudes, which might lead the Fed to err toward modest increases in inflation. Perhaps it goes without saying, but the Fed failing to drain liquidity in a timely manner once there are early signs of inflation could result in a cycle of higher inflation expectations and subsequently increasing inflation realizations, a state of the world the Fed has claimed it wishes to avoid.

Will the Fed Inflate Debt Away?

In addition to concern about the Fed's monetary stimulus, investors are also justifiably focused on dramatic budget deficits and increasing debt levels. They fear these deficits may provide incentive for the government to "inflate its debt away" by lowering the real value of future debt repayments. However, this concern seemingly fails to recognize that the Fed is run as an independent Board of Governors and merely reports to Congress on its policies and procedures (though cynicism about the degree of its independence is one contributor to potentially higher inflation expectations). The importance of having an independent monetary authority is well understood in the U.S. and around the world. As long as the Fed has independence over monetary policy decisions, it will likely try to maintain *relative* price stability. If there is a concern about monetizing the debt, it should be evaluated based on the probability that the Fed will be stripped of its independence (oddly, the goal of many Fed cynics). Even within the current political environment we believe this is a low-probability outcome.

In summary, while we have experienced an unprecedented monetary stimulus in the U.S. economy, we have not yet seen a significant increase in realized inflation or in money supply, a leading indicator of future inflation levels. And though there is good reason to question whether we *may* face higher levels of inflation in the future, we do not believe that current economic indicators provide a clear case for a significant increase in the near term.

Is Inflation "Priced In" to Certain Assets?

Many market participants point to the breakeven rate, the difference between the yield of nominal and inflation-linked bonds, as the market expectation of inflation. Although breakeven rates are indeed correlated with inflation expectations, they contain an additional, and often overlooked, cost – the *inflation risk premium*. In much the same way as a policy holder must pay to insure one's property,⁵ the inflation risk premium is the premium a holder of an inflation-protected asset must "pay" (or more accurately forego) for the protection itself⁶.

⁴ The Fed has two mandates: price stability and full employment. This is the often mentioned "Dual Mandate".

⁵ The actual premium that a home owner pays includes an expected loss and an additional premium for passing the risk to the insurer. This additional premium is what we refer to here as the cost of insurance, not the out-of-pocket payment to the insurance company.

⁶ Another interpretation of the inflation risk premium is that it is the compensation nominal asset holders require to bear inflation risk.

The inflation risk premium is only one of the factors that affect the returns from holding inflation sensitive instruments. In the discussion that follows, we describe these factors for nominal and inflation-linked government bonds (TIPS in the U.S.), since these assets are directly comparable and are inversely affected by inflation. The following factors are the primary components which may determine the yield of these government bonds above the risk-free rate (excess yield):

1. “Real” Term Premium – compensation for the risk associated with holding a longer-term bond and taking the risk of real rates moving
2. Inflation Expectation – compensation for expected rise in prices
3. Inflation Risk Premium – compensation for assuming the risk of changing inflation (inflation uncertainty)
4. Liquidity Premium – compensation for holding an asset that is harder to trade during adverse environments

There are essentially two sources of risk that nominal and inflation-linked bonds do not have in common: inflation and liquidity. The inflation risk premium is compensation that nominal bond holders expect to receive since they accept inflation risk relative to holding inflation-linked bonds. However, inflation-linked bonds are generally less liquid than nominal bonds on the secondary market due to the dramatic difference in market depth. As of December 31st 2009, the total amount of outstanding U.S. nominal treasury securities held by the public was \$7.3 trillion. In contrast, the size of the TIPS market was only \$560 billion (less than 8% of the nominal market size)⁷. Holders of inflation-linked bonds are exposed to liquidity risk and in general expect to be compensated for taking this risk relative to holding nominal bonds. This liquidity effect puts upward pressure on inflation-linked bond yields (downward pressure on prices) and vice-versa for nominal bonds. Over time, as we expect the size and depth of the TIPS market in the U.S. will continue to increase, the liquidity effects should diminish, resulting in the inflation breakeven rate between nominal bonds and TIPS serving as a more accurate indication of inflation expectations and the inflation risk premium. Figure 5 presents the direction of the risk premia and inflation expectation effects on inflation-linked and nominal government bond yields, as well as the effect on breakeven rates (Nominal – TIPS).

One important clarification is in order. If the inflation rate an investor is concerned with is accurately represented by CPI, inflation-linked bonds held to maturity are effectively the risk-free asset (though a higher real return may be achievable by holding nominal government bonds). However, although the real yield on an inflation-linked bond is known in advance and is not exposed to inflation risk, the bond may still, in practical terms, be “risky” for an investor who may need to sell it prior to maturity. This is due to mark-to-market pricing risk if inflation expectations and/or the magnitude of the real term or liquidity premia have changed.

Figure 5. Determinants of Government Bond Yields in Excess of Risk-Free Rate

	Inflation Linked Government Bonds	Nominal Government Bonds	Inflation Breakeven Rate (Nominal-TIPS)
"Real" Term Premium	Increase Yield	Increase Yield	No Effect
Expected Inflation	No Effect	Increase Yield	Increase Yield
Inflation Risk Premium	No Effect	Increase Yield	Increase Yield
Liquidity Premium	Increase Yield	No Effect	Decrease Yield

⁷ Source: U.S. Treasury Department

Before using breakeven rates to infer future expected inflation rates, it is important to note the effect that the inflation and liquidity risk premia have on the breakeven rate. In times of heightened uncertainty, the inflation risk premium can significantly increase as there is heightened demand for inflation protection. This effect increases the relative price of inflation protection but is not actually forecasting higher future inflation. As mentioned above, there is also a positive liquidity premium to holding inflation-linked bonds which tends to decrease breakeven rates. Given high levels of inflation uncertainty – an environment we may currently be in – the inflation risk premium is higher than average, which signals that buying nominal bonds is cheaper than average. It also follows that the opportunity cost of holding inflation-linked bonds versus nominal bonds is higher than average (since investors forego potentially higher yields of nominal bonds). In other words, TIPS may have lower yields than normal versus nominal bonds not because the market is *forecasting* high inflation, but because the market is willing to pay more than usual to hedge the *possibility* of higher inflation.

The magnitude of the inflation risk premium effect on assets can be significant over the long term. To illustrate the relative importance of the premium, we compare the hypothetical⁸ long-term excess return from holding inflation-linked bonds vs. simply holding nominal bonds, each with similar duration to that of 10 year bonds. The average outperformance of nominal bonds vs. inflation-linked bonds can be thought of as the net ex-post “cost” of buying inflation protection. The ex-post cost is a function of both varying risk premia and ex-post inflation realizations which differ from what was priced in. Inflation surprises which exceed priced-in expectations favor inflation-linked bonds (holding other factors constant).

Since inflation-linked bonds were not introduced in the U.S. until the late 1990’s, we can examine United Kingdom inflation-linked bonds (introduced in 1981) to gather the most data points. During this period, the average annual total return was 5.6% on a U.K. nominal bond and 3.5% for a U.K. inflation-linked bond.⁹ Hence the “cost” of inflation protection net of liquidity concerns was 2.1% in annual returns. This cost was due in part to a surprising decline in inflation during the early 1980’s (a realization lower than priced-in expectations) and in part to the inflation risk premium which favors nominal bonds. Therefore, the effective realized cost of inflation protection for a U.K. investor holding a fixed duration inflation-linked bond portfolio was 60% of its total return. Performing the same analysis in the U.S. from 1997 (when TIPS were first introduced), the cost of inflation protection has been 0.8% per year. Most academic studies seeking to quantify the magnitude of the inflation risk premium estimate it at approximately 0.5% annually for a 10-year nominal bond¹⁰. Of course, actual realizations of inflation which differ from market expectations will determine the final cost or benefit from holding inflation-linked versus nominal bonds net of risk premia effects.

Year-end U.S. breakeven rates (including both inflation risk and liquidity risk premia) for U.S. inflation over both the short- and long-term can be seen in Figure 6 and 7. Figure 6 shows the one-year breakeven and economists’ forecasted one-year U.S. inflation rate as reported by Consensus Economics. Of course, both TIPS and nominal bonds are offered at different maturities, implying different breakeven inflation rates at each maturity. Figure 7 shows the term structure of breakeven rates for the U.S., which incorporates longer-term breakeven rates.¹¹

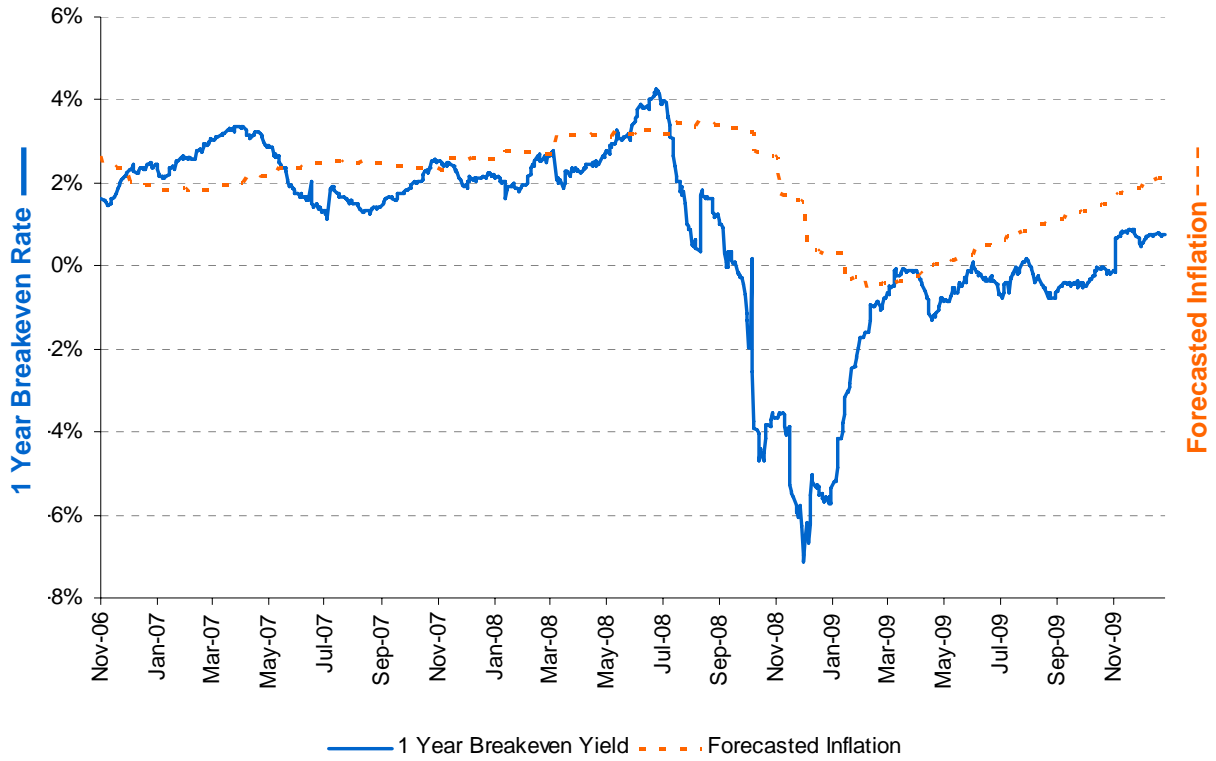
⁸ Hypothetical performance is for illustrative purposes only and is not based on an actual portfolio being traded.

⁹ Source: Barclays Capital. The statistics are calculated over the period April 1982 through December 2009.

¹⁰ Source: Barclays Capital, based on a set of rolling bonds over the period March 1997 through December 2009.

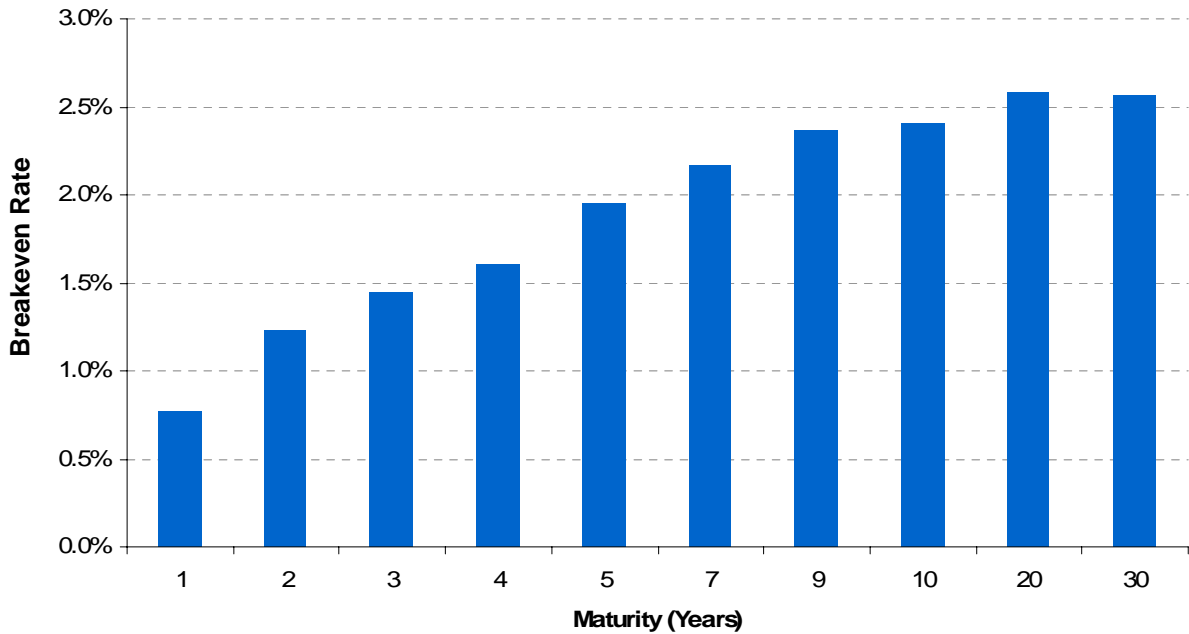
¹¹ Consensus Economics surveys multiple professional forecasters including banks’ economists, private and public forecasting services, and large financial institutions. In the U.S. as of the end of 2009, this includes 26 individual institutions.

Figure 6: One-Year US Breakeven Rate and Forecasted Inflation



Source: Bloomberg and Consensus Economics

Figure 7: Term Structure of the US Breakeven Rate (As of 12/31/09)

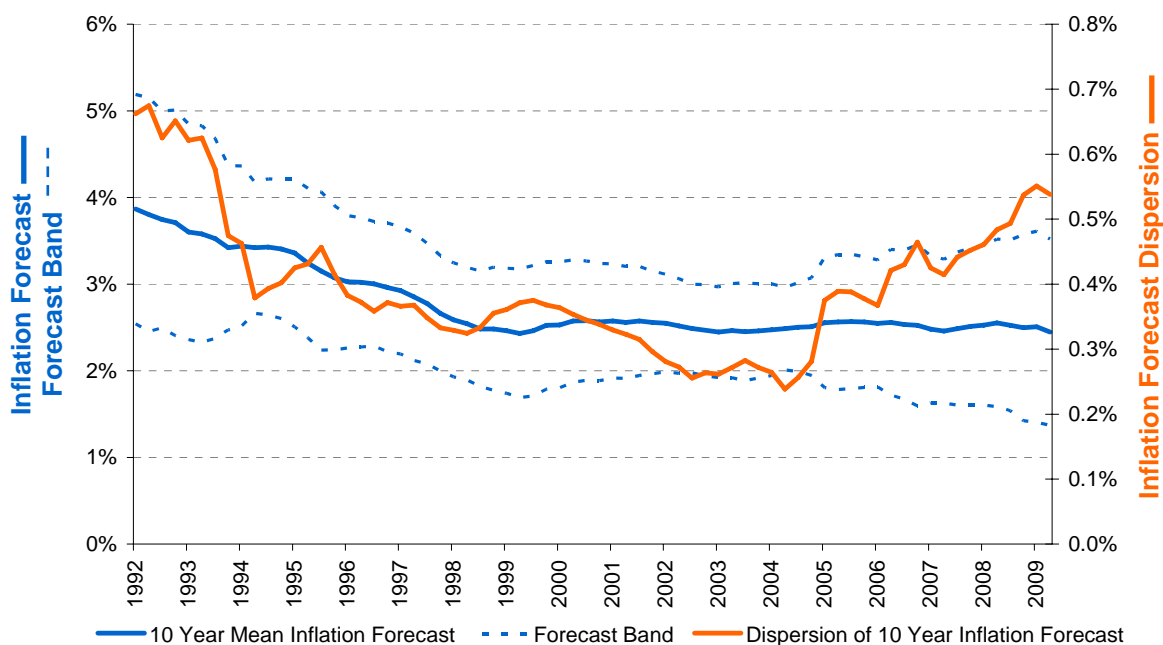


Source: Bloomberg

Although Figure 7 suggests moderate inflation expectations even over longer horizons, it is important to note that the breakeven rate is not simply a prediction of future inflation. Rather, as outlined previously in Figure 5, the inflation breakeven rate is also affected by the inflation risk premium (which increases the rate) and the liquidity premium (which decreases the rate). Depending on the market environment, the relative magnitude of each factor will vary and lead to divergence of breakeven rates from expected inflation. Nevertheless, a number of striking facts are observable in Figures 6 and 7. First, despite the discussion about inflation uncertainty (and fear of longer-term inflation), breakeven rates are moderate over most horizons. That can be a result of moderate inflation expectations, a low inflation-risk premium or a high liquidity premium associated with nominal bonds. Second, if we accept the inflation forecasts from Consensus Economics as the expected outcome, one-year TIPS may be attractively priced as of 12/31/09 (meaning that inflation expectations are higher than the breakeven rate). Of course, the Consensus Economics forecast may differ substantially from inflation realizations. Inflation surveys from the Survey of Professional Forecasters¹² that provide longer-term forecasts for U.S. inflation show that inflation expectations approximately match the average 2.4% priced into the term structure of breakeven rates reflected in Figure 7, suggesting expected inflation is fully “priced in” over this period.

While the level of future expected inflation priced into the market may be modest, there are indications that the uncertainty around the market’s estimates has increased, which implies greater demand for inflation protection and higher expected returns on nominal bonds relative to TIPS. Figure 8 shows the 10-year inflation forecasts from the Survey of Professional Forecasters with a confidence bound around it and a measure of dispersion in the forecasts. Although there is little evidence of a change in the average 10-year inflation forecast, there is indeed an increase in the dispersion of forecasts which suggests heightened uncertainty. This implies a higher inflation-risk premium today than on average (lowering the expected return from holding inflation-linked bonds).

Figure 8: Ten-Year Inflation Forecast and Inflation Uncertainty



Source: Survey of Professional Forecasters

¹² The Survey of Professional Forecasters is the oldest quarterly survey of macroeconomic forecasts in the United States. The survey began in 1968 and was conducted by the American Statistical Association and the National Bureau of Economic Research. The Federal Reserve Bank of Philadelphia took over the survey in 1990.

Inflation Protection in a Portfolio

Although the scope of this paper is only to outline the key considerations related to inflation and inflation-protected assets, it is important to reiterate that what matters most to the performance of various asset classes is not the level of future inflation, but rather the unexpected level of realized inflation. Simply stated, if the market price for goods and services reflects the average or consensus view for potential future inflation, only a deviation from the consensus will lead to value gained – or lost – by holding inflation sensitive assets. In Part II of this series we will build upon these insights and examine the strategic case for inflation-protected assets in portfolio construction and the performance of various asset classes in different inflation and economic environments.

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