

By **Christopher Iovanna**, *Fixed Income Product Manager, CFA, Pioneer Investments*

The Federal Reserve is the central bank of the United States. It is consistently in the financial news, as it plays the major role in setting monetary policy, which significantly affects not only the U.S., but also the global economy and thus, the ways in which individuals conduct their day-to-day lives. The Fed, which was founded by Congress in 1913, states its four main duties as:

- 1. Conducting the nation's monetary policy**
- 2. Supervising and regulating banking institutions**
- 3. Maintaining the stability of the financial system and containing systematic risk**
- 4. Providing financial services to various institutions**

Ultimately, the Fed attempts to foster economic growth while keeping inflation under control. This mandate is in contrast with the European Central Bank (ECB), which has an inflation-only directive. The functions of the Fed have changed dramatically over time with the passage of a multitude of laws, such as the Banking Act of 1935 and the Full Employment and Balanced Growth Act of 1978. In fact, for better or for worse, the Fed (along with the Treasury) has played a pivotal role in managing our recent credit crisis and guiding the economy through the current recession. Currently, the President and Congress are looking at ways to increase the Fed's range of responsibilities to include market supervision, company oversight, and systematic risk assessment. As the Fed continues to play an integral (and expanding) role in investors' lives, the following report aims to provide some background on the institution's current structure and mandates as well as a look at how its decisions have affected the bond market.

### The Fed Funds Rate: A Main Driver of Bond Market Behavior

The Federal Reserve System is composed of a Board of Governors and twelve regional Reserve Banks, located in major U.S. cities. These entities are responsible for the supervision and regulation of certain financial institutions. While the Fed's endeavors are important to the financial viability of the country, the bond market is most concerned with the Federal Reserve's potential impact on interest rates. This potential influence is achieved through the Federal Funds Rate, one of the main drivers of the bond market. The **Federal Funds Rate** is the rate that banks charge each other for overnight loans. This rate directly affects, either through its current state or market expectations of future changes, the yields on short-term bonds. This, in turn, can affect intermediate-term bonds and, to a much lesser degree, long-term bonds. In this primer we will look at how the Federal Reserve, via several methods, affects the bond market and the yields on fixed income investments.

### Rate Increases Result from FOMC Meetings

The Fed decides to increase, decrease or leave the Fed Funds Rate unchanged at Federal Open Market Committee (FOMC) meetings. With rare exception, however, the Fed might change rates outside of one of the FOMC meetings during periods of financial stress, as it did with the unscheduled October meeting during the 2008 credit crisis. The FOMC consists of twelve members—the seven members of the Board of Governors of the Federal Reserve System; the president of the Federal Reserve Bank of New York; and four of the remaining eleven Reserve Bank presidents, who serve one-year terms on a rotating basis. The purpose of the FOMC is to facilitate the long-term objectives of price stability and sustainable economic growth. The group holds its meetings eight times per year in Washington D.C.

#### FOMC 2009 Meeting Dates

January 27	August 10
March 16	September 21
April 28	November 3
June 23	December 14

All 12 presidents of the Reserve Banks contribute to these meeting but only the voting members, which consist of the Board of Governors, president of the New York Federal Bank and four rotating presidents, can vote on monetary policy decisions. The following table lists the current 2009 FOMC voting members.

**2009 FOMC Voting Members**

Ben Bernanke, Board of Governors, Chairman	Kevin Warsh, Board of Governors
William Dudley, New York, Vice Chairman	Dennis Lockhart, Atlanta
Elizabeth Duke, Board of Governors	Jeffrey Lacker, Richmond
Donald Kohn, Board of Governors	Charles Evans, Chicago
Daniel Tarullo, Board of Governors	Janet Yellen, San Francisco

The Fed concludes each FOMC meeting at 2:15 pm ET and releases an official statement indicating any interest rate action it may have taken and summarizing its view on the economic environment as well as the motivation for any change in the Fed Funds rate. Included in the statement are opinions on economic growth, inflation, and the state of monetary policy. Also included is a Balance of Risks assessment, often referred to as a “bias”, which sheds light on the Fed’s opinion of growth and inflation, and is of importance to bond market participants. The Fed will state whether there are upside or downside risks regarding economic growth and price stability, or whether risks are equal. An “upside” risk to sustainable growth would imply fast economic growth and inflation pressures (triggering an interest rate increase) whereas downside risks could warn of a recession (triggering an interest rate cut).

Bond market participants carefully scrutinize the Fed statement for clues to future monetary policy/interest rate changes. More recent statements have been concerned with the recession and risks to growth; so far, raising interest rates has been out of the question. However, in less extreme times, bond investors have been concerned about inflation and any potential Fed action toward mitigating it. A side-by-side comparison of excerpts from the June 30 and May 3, 2005 texts regarding inflation (below) provide examples of Fed wording that investors have used to forecast future monetary policy decisions.

<b>May 3, 2005</b>	<b>June 30, 2005</b>
<i>Pressures on inflation have picked up in recent months and pricing power is more evident. Longer-term inflation expectations remain well contained.</i>	<i>Pressures on inflation have stayed elevated, but longer-term inflation expectations remain well contained.</i>

While both texts have language that is similar in nature, even a slight change in wording can be construed to indicate a change in policy or a shift in Fed thinking. Many bond market participants believed the June statement contained “softer” language regarding future inflationary pressures as compared to the May statement.

In an attempt to be more transparent in its policy-making, the Fed has recently reduced the period of time within which FOMC meeting minutes are released to the public from six weeks after each session to three weeks. Bond market participants will thoroughly examine the documents looking for any subtle (or not so subtle!) word changes from prior statements which would hint at the Fed’s opinion regarding the Fed Funds rate, inflation, or any other topics that investors believe will drive future Fed interest rate decisions.

## Public Comments Further Inform Investors

Public comments by either the Fed Chairman or other Fed officials (governors, bank presidents, etc.) can also influence the bond market. Foremost among speaking engagements are the Federal Reserve Board's semiannual reports on the economy and monetary policy to Congress, which take place in February and July. The semiannual report, formerly known as the Humphrey Hawkins Testimony Report after the Humphrey Hawkins Act, is given to Congress by the Federal Reserve Chairman to discuss the state of the economy and monetary policy. Financial market participants listen to the most powerful banker in the country speak about the nation's current economic conditions and future prospects. Similar to studying the FOMC statement, the bond market will look for clues in the Chairman's testimony especially as it relates to growth, inflation and possible changes to the Federal Funds rate. Bond market participants will not only scrutinize the Chairman's prepared remarks but also his responses to questions by members of Congress.

Federal Reserve officials may also speak to universities or business groups from time to time. The release of notes from these meetings helps to disseminate Fed thinking, which serves to lessen the impact on financial markets when the Fed does implement its policy. Comments from Fed officials who are FOMC voters count slightly more to bond investors as they more directly affect monetary policy decision-making. In addition, a Fed official's orientation is also taken into consideration. Fed officials can be considered "Hawks" (those more likely to raise rates), while other members are considered "Doves" (those more likely to decrease rates). Marketplace sentiment may suddenly shift if a "Hawk" or a "Dove" says something that goes against what the public considers their normal point of view. Therefore, it is not only important what is said, but who says it.

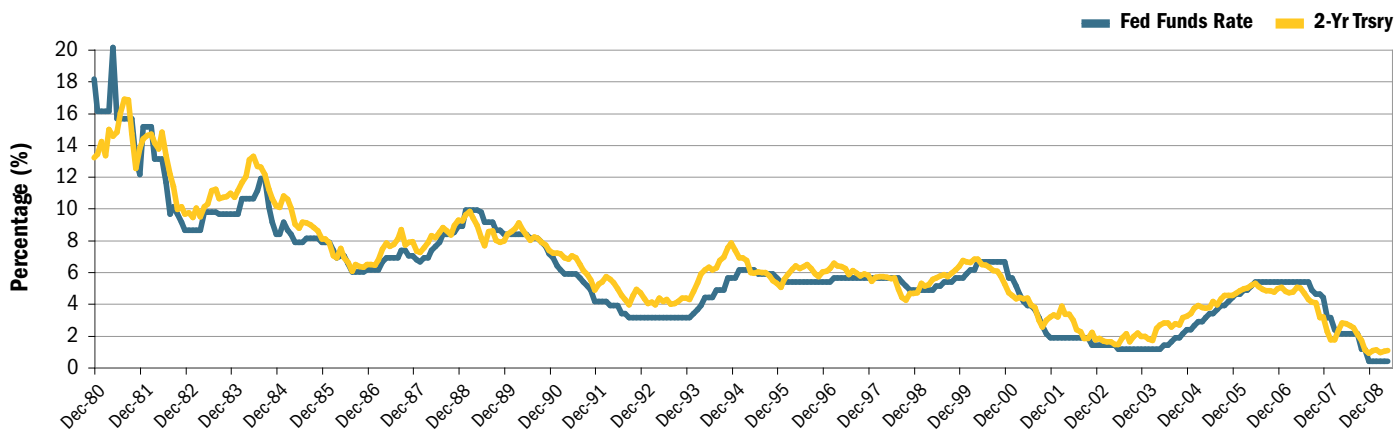
Shocks to the markets are caused when the public is "surprised" by an event or report. It is a well-known economic phenomenon that unexpected changes have had a more volatile effect on the public and investor actions compared to expected changes. Thus, the Federal Reserve has made an increasing effort over recent years to become a more transparent institution, partly to quell unnecessary volatility and partly so that investors will understand and be prepared for the determined policy path.

It is widely suspected that, in order to further promote transparency, the Federal Reserve uses "mouthpieces" as sounding boards to either inform or test markets. These purported mouthpieces are financial writers from such major news dissemination services like *Bloomberg* or *The Wall Street Journal*. Shortly after FOMC meetings, reports to Congress, or other public appearances, it is common for one or more of these journalists to write an article that offers their opinion about the Federal Reserve's intent. In this way, the Fed gets its message out to investors and possibly influences the market.

## Analysis in Practice: Effects of the Fed Funds Rate on Bond Yields

The bond market is concerned with the Fed Funds Rate because it affects short-term interest rates, which in turn, typically affect long-term interest rates. Of course, there are other factors that help drive Treasury interest rates such as supply/demand and the market's desire for the safety of government debt. The following graph illustrates how short-term bond yields (2-yr Treasury note) have moved with the Fed Funds rate over time. *Keep in mind that the following statistics may change considerably if different periods are used. Estimating a one time series model is a basic approach used to demonstrate general trends.*

### Short-Term Bond Yields Have Been Tightly Correlated with Fed Funds Rate Changes

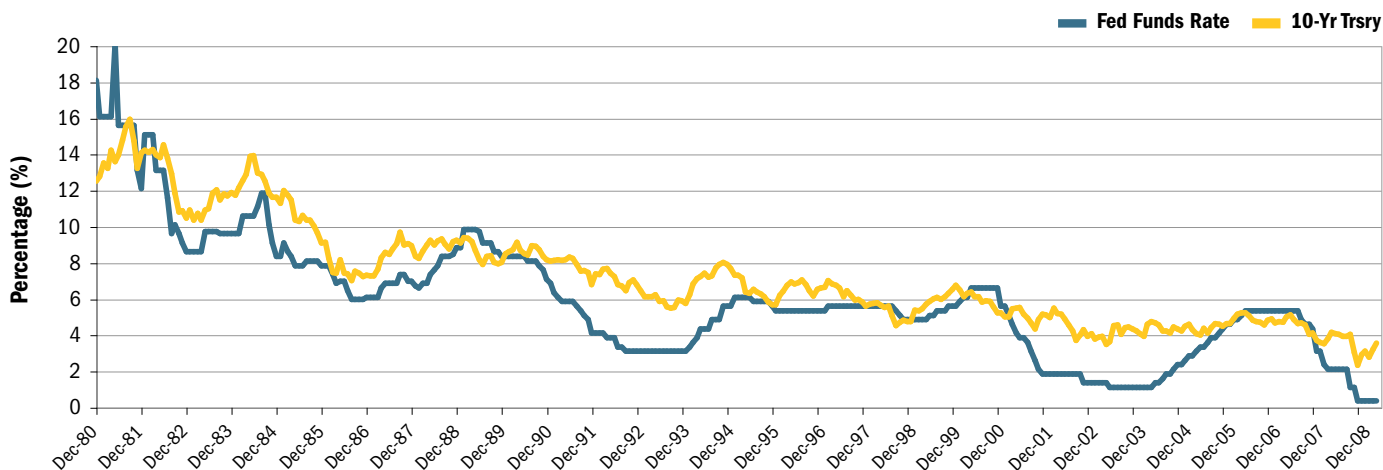


Source: Bloomberg. Last data point 5/31/09. The performance data quoted represents past performance, which is no guarantee of future results.

As you can see, the movement of the 2-year Treasury has been highly correlated with the Fed Funds rate. For the period, the R2 between these two factors is 0.96, which indicates a very strong correlation. There are times in which short-term rates will be above the Fed Fund rate and other times that it will be below. When the 2-year Treasury yield is above the Fed Funds rate investors are anticipating the Fed to raise rates in the future. Investors may sell securities in order to generate cash for investment at higher future rates, thus driving yields up (note that since the 2-year has a longer duration than the Fed Funds rate, the duration risk premium can account for the higher yield). In the case of a 2-year note yield below the Fed Funds rate, investors are expecting the Fed to lower rates in the future. Investors may buy securities to lock in current rates, thus driving yields lower. Related to this, is that in general, a positively sloped yield curve is considered “normal” since investors require more yield to tie their money up for longer periods, which are more subject to economic uncertainties and the ravages of inflation compared to short timeframes.

The process by which short-term rates affect long-term rates is much more complicated. Long-term rates are influenced by the rate of inflation. Investors want to maintain their real return (return after inflation), so if inflation expectations are low, long-term bond investors require a lower risk premium and yields tend to be lower in such an environment. Conversely, if inflation expectations are high, investors require a higher risk premium and interest rates/bond yields will likely rise or remain elevated relative to inflation. Demand from domestic and foreign investors will also affect long-term rates. But, how closely is the Fed Funds rate tied to long-term rates? The following graph shows that long-term rates have not been as closely correlated with the Fed Funds rate as have short-term rates, especially in more recent times.

#### 10-Year Treasury Yields Have Been Less Correlated to Rate Changes than the 2-Year Treasuries

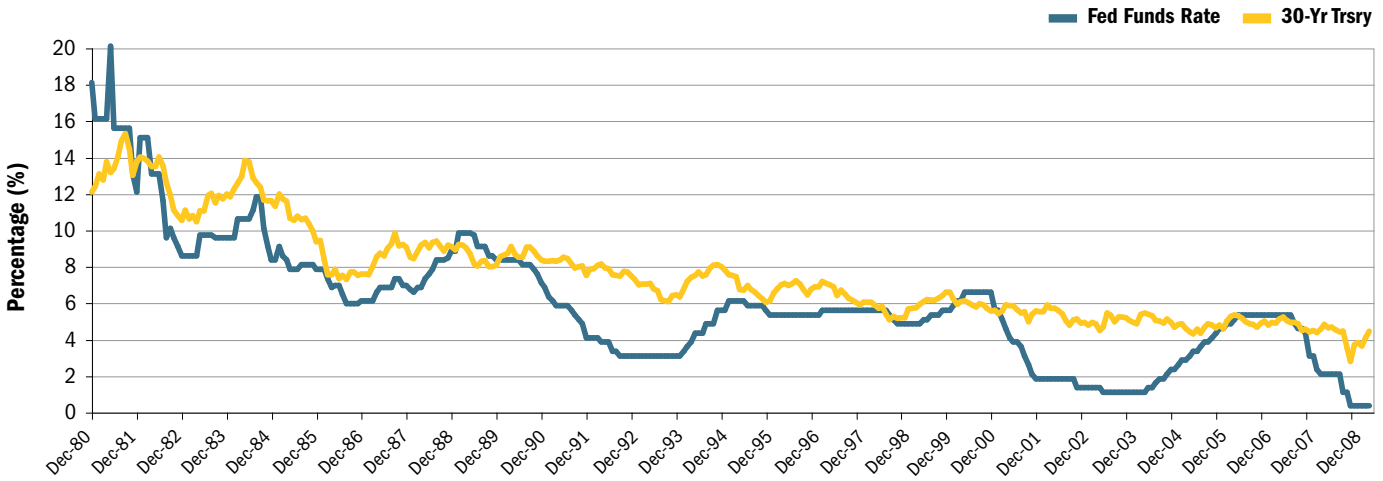


Source: Bloomberg. Last data point 5/31/09. The performance data quoted represents past performance, which is no guarantee of future results.

The correlation for the period at 0.90 is still strong, but not as strong as for the 2-year. The general trend for rates has been down over the past few decades after the inflation-fighting tactics by the Fed in the early 80s ended. The regression coefficient for the two metrics is 0.76 and is also a useful statistic, as it tells us that on average a 100 basis points change in the Fed Funds Rate (independent variable) has been associated with a 76 basis point change in the bond rate (dependent variable) in the same direction.

As we go further out on the yield curve, the correlation and regression coefficient decline. Against the 30-year, the R2 is 0.87, and the coefficient decreases to 0.67. Since the Fed Funds rate is a short-term rate, it makes sense that the 30-year Treasury, a long duration bond, would be less likely to move with it. The R2s are high, even for the longer-dated Treasuries, but remember, that correlation does not imply causation. The underpinnings for the movement in yields are multi-factored and not simply explained by the Fed Funds rate. Again, we’ve experienced a downward trend in rates for multiple decades, which would help explain the high correlations.

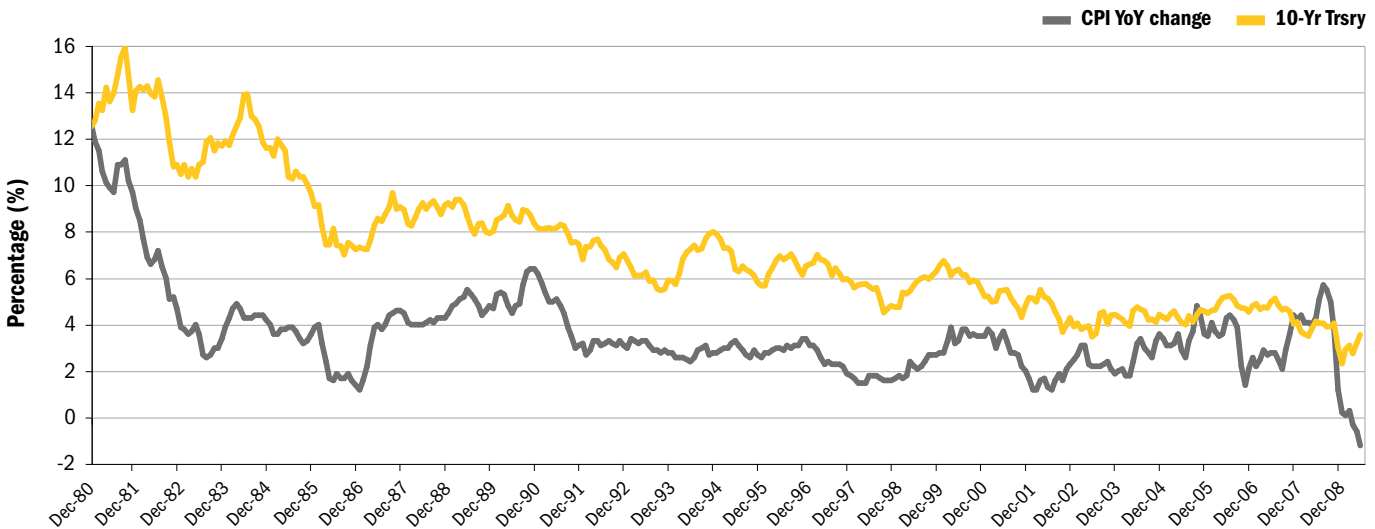
### 30-Year Treasury Yields Have Tracked Rate Changes, with Lower Correlations than Shorter-Term Bonds



Source: Bloomberg. Last data point 5/31/09. The performance data quoted represents past performance, which is no guarantee of future results.

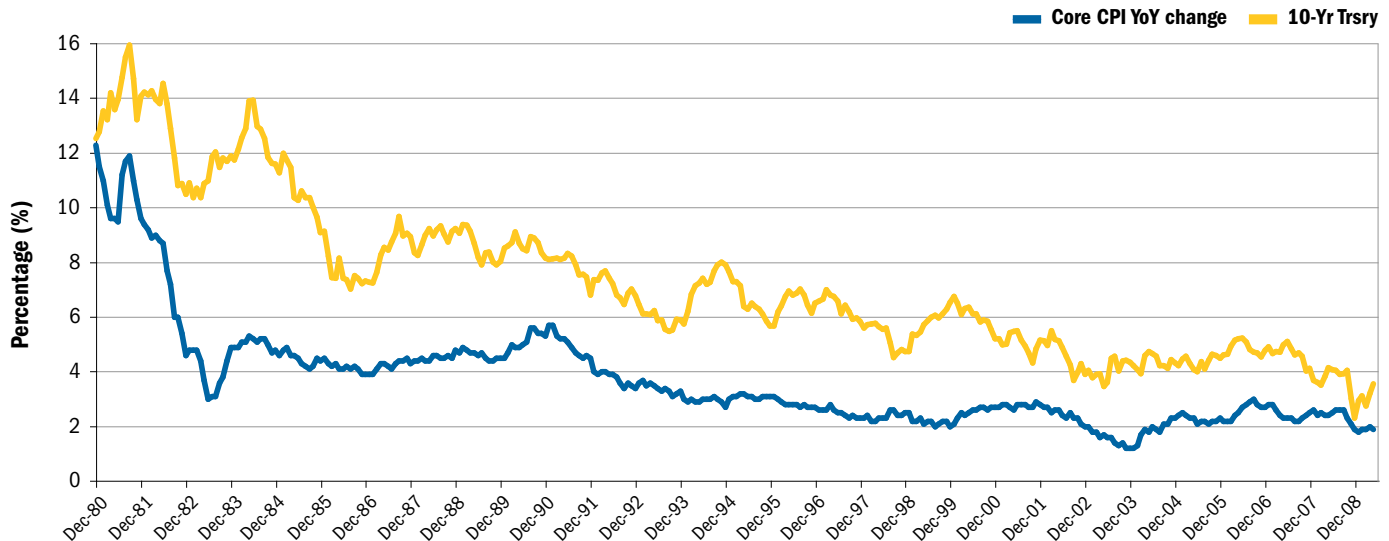
Regressing inflation, as measured by headline CPI against the 10-year Treasury, shows a correlation of 0.69. While this is not as strong as the correlation exhibited with the Fed Funds rate, the coefficient rises to 1.04, which means that for a 100 basis point move in CPI, we could expect approximately the same move in yields. This should be expected since bond investors are concerned about Real Returns (rate of return earned minus inflation). Bond investors, requiring a positive real return, will push yields higher in order to be compensated when inflation is high. Conversely, when inflation levels are low, investors will require a lower yield. Note that the expected level of inflation is at least as important, if not more important than the current level of inflation and is one of the main drivers of bond market. The graph below illustrates the movement of the 10-year Treasury versus movement of the year-over-year percentage change in headline CPI. For Core CPI, which strips away the volatile food and energy segments, the statistics are even higher (See next page). The correlation jumps to 0.86, and the coefficient spikes to 1.27, meaning that for a 100 basis point move in Core CPI, we'd expect a 127 basis point move in the 10-year Treasury's yield.

### 10-year Treasury Yields Have Responded to Changes in Headline CPI



Source: Bloomberg. Last data point 5/31/09. The performance data quoted represents past performance, which is no guarantee of future results.

## Core CPI Has Had a Stronger Influence on 10-Year Treasuries than Headline CPI



Source: Bloomberg. Last data point 5/31/09. The performance data quoted represents past performance, which is no guarantee of future results.

The following table provides a summary of how these variables are related.

	FFR & 2-Yr	FFR & 10-Yr	FFR & 30-Yr	10-Yr & CPI	10-Yr & Core CPI
<b>Correlation (R2)</b>	0.96	0.90	0.87	0.69	0.85
<b>Regression Coefficient</b>	0.91	0.76	0.67	1.04	1.27

- Correlation is the measure of how closely related two data series are. The range is +1 for perfect positive correlation to -1 for perfect negative correlation. A reading of zero indicates no correlation.
- The regression coefficient is the slope of the linear regression. It equals the change in Y (dependent variable) for each unit change in X (independent variable). In our example, the Fed Funds Rate and CPI are independent variables for their respective calculations, while Treasury rates are the dependent variables.

In sum, we've seen that the Fed Funds rate and the 2-year Treasury have exhibited very high correlation just shy of +1, a perfect positive correlation. The regression coefficient also tells us that we can expect almost a one-for-one change in the 2-year when the Fed Funds rate changes. While the 10- and 30-year rates have not been as strongly correlated with the funds rate as the 2-year, they have still shown very high correlations given that the overall trend for the past three decades has been one of lower rates. The coefficient, however, indicates less than a one-for-one movement. Concerning inflation, the 10-year moved almost lockstep with CPI with a 1.04 coefficient. The 10-year demonstrated an even higher correlation and movement per unit of Core CPI.

## Conclusion

Understanding the Federal Reserve's monetary policy is helpful in managing clients' fixed income portfolios. As a bond manager, Pioneer Investments is constantly scrutinizing Fed actions and releases to better grasp how economic policy might change future investment opportunities. We then take an active approach in positioning our portfolios accordingly. If you are interested in obtaining more information about the Federal Reserve, including FOMC statements, visit [www.federalreserve.gov](http://www.federalreserve.gov).



The views expressed in this piece are those of Pioneer, and are subject to change at any time. These views should not be relied upon as investment advice, as securities recommendations, or as an indication of trading intent on behalf of any Pioneer investment product.

Pioneer Investments is the trading name of Pioneer Investment Management, Inc. and Pioneer Institutional Asset Management, Inc., registered investment advisors.

Pioneer Investments  
60 State Street, Boston, Massachusetts 02109  
©2009 Pioneer Investments · [pioneerinvestments.com](http://pioneerinvestments.com)  
23277-00-0709

