

# Prospects and Risks in the Bond Market

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I'm pleased to be here today to discuss an issue dear to all of our hearts: Long-term interest rates and their recent behavior.

The gyrations of the bond market since the beginning of May have created considerable discussion. Some in the financial press and some traders ask whether the Fed sent confusing signals about prospects for monetary policy; others wonder instead whether the bond markets misunderstood and overreacted to Fed announcements.

Rather than discuss these issues—which have reached a “he-said, she-said” standoff—I would like to step away to review the basics of the bond market. I've often felt that longer-run fundamentals tend to get lost in a welter of short-run considerations that fade into oblivion quite quickly as a new set of short-run concerns dominate the news. I'll discuss the fundamental determinants of long-term interest rates, which I'll index by the benchmark yield on 10-year Treasury bonds.

Before proceeding, I want to emphasize that the views I express here are mine and do not necessarily reflect official positions of the Federal Reserve System. I thank my colleagues at the Federal Reserve Bank of St. Louis for their comments; Christopher J. Neely, Research officer at the Bank, provided special assistance. However, I retain full responsibility for errors.

## FUNDAMENTAL DETERMINANTS OF INTEREST RATES

The Federal Open Market Committee (FOMC) implements monetary policy by setting an intended, or target, federal funds rate, and then engaging in open-market transactions to keep

the actual fed funds rate close to the intended rate. This institutional fact has the unfortunate side effect of leading some to believe that the Federal Reserve has more control over interest rates than it in fact does.

Let's start the story at the beginning. The Fed has price stability and economic growth objectives. Price stability requires maintenance of low and stable inflation. Price stability contributes directly to economic growth; in addition, timely policy adjustments can help to reduce fluctuations in employment and output.

Put aside for now the fact that the FOMC implements policy by setting the intended federal funds rate, and concentrate instead on the objectives of policy. In recent years, success is almost absolute with respect to inflation and expected inflation, both of which are low and stable. Success is considerable, but incomplete, in terms of output and employment. I do not mean to imply that the Fed could have done more, but the economy's performance over the last few years has not been as robust as everyone wants. Unemployment increased as a consequence of the mild 2001 recession and has continued to rise since the recession ended in November 2001 because the pace of recovery has been modest.

I'd like to convince you that in practice the Fed has no latitude as to how to set the intended federal funds rate, except for matters of short-term timing, if it wants to achieve its objectives. Low and stable inflation, and output growth along its long-run growth path, imply a certain, though not constant, long-term interest rate. The Fed must deliver a path for the intended federal funds rate consistent with the desired outcomes for the economy in order to realize those inflation and output goals.

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Economists think of the benchmark 10-year Treasury rate as having three components: the real rate of interest, expected inflation, and a risk premium for unexpected inflation. I'll discuss the determinants of the real rate of interest last.

The expected inflation component is not difficult to understand. Inflation eats away the purchasing power of a bond; borrowers can pay off their debts with dollars of depreciated purchasing power. If expected inflation rises by 1 percentage point, then nominal interest rates will rise by 1 percentage point too, all else equal. By far the most important reason interest rates today are far below their levels in 1981 is that actual and expected inflation are much lower now.

No one knows exactly what inflation will be, so lenders must be compensated for the fact that coupon and principal payments will have uncertain purchasing power. Inflation uncertainty is the source of another component of nominal interest rates. The more volatile and unpredictable is inflation, the higher is this component of the nominal rate—the inflation risk premium. Today, inflation is expected to be fairly stable, so the inflation risk premium is probably small, certainly considerably less than in the late 1970s. It is very difficult to sort out inflation expectations from inflation uncertainty; I'll lump the two together and simply talk of inflation expectations.

I've mentioned that the large decline in interest rates after 1981 was due to a large decline in inflation expectations. If we examine interest rates over a period when inflation changed a lot, or across countries with very different inflation rates, we'll find that most of the variation of rates is due to variation of inflation. But when we examine rates over a period characterized by inflation stability, or across countries with similar inflation rates, then interest rate variation cannot be attributed to inflation. The observed variation over time, or differences across countries, reflects forces determining the real rate of interest.

The real rate depends most centrally on the expected productivity of physical capital. Investors can choose whether to hold bonds or physical capital, or equity claims to physical capital, in their portfolios. Firms can choose to finance cap-

ital spending by issuing bonds. If the real interest rate is too low relative to the expected return on new investment in plant and equipment, then there will be excess demand for funds to build physical capital and the real interest rate will be bid up. Conversely, if the real interest rate is too high relative to expected returns, then there will be an excess supply of funds and the real interest rate will be bid down. Through these opportunities for substituting capital for bonds, or vice versa, the real rate of return on bonds is linked to the real rate of return on capital.

A robust economy and high productivity means that businesses will seek to borrow to finance future production, which will bid up interest rates. Higher levels of economic activity mean higher interest rates, all else equal. The principal reason the 10-year bond rate is lower today than it was at its monthly peak in January 2000 is that the demand for funds to finance capital investment is much lower today than it was at the height of the previous economic boom.

We see this same economic force at work when comparing interest rates in the United States with those in Japan. Japan has been growing very slowly for a decade, going in and out of recession. The demand for funds is low because profitable investment opportunities are viewed as limited. In contrast, the U.S. situation today is viewed much more optimistically, even though not as optimistically as it was four years ago.

All of these components of interest rates are forward looking; they depend on expectations about the future. We can't directly observe these components of long-term interest rates, but we can estimate them.

Measuring expectations is inherently difficult, but our tools for estimating expected inflation have improved significantly in recent years. Primarily, we use survey expectations of inflation or the difference between yields on regular Treasury bonds and Treasury inflation-indexed securities (TIIS), which I'll call simply "indexed bonds" for short.

Indexed bonds, first issued by the Treasury in 1997, contain a provision that increases their principal and every semiannual interest payment

by the increase in the consumer price index from the date of issue. These bonds, therefore, completely protect the investor from the effects of inflation; the yield on the bonds is by definition a real yield. If we assume that the inflation risk premium is negligible, then the difference between the yield on a conventional bond and a TIPS bond measures the market's expectation of future inflation. For example, examining bonds maturing in approximately 10 years, yesterday the indexed bond had a yield of 2.38 percent while a conventional Treasury bond had a yield of 4.53 percent. These two bonds will turn out to have identical yields if the inflation rate between now and 2013 averages 2.15 percent, the difference between the two quoted yields. As a first approximation, we can say that these two asset markets are providing us with the information that investors expect that the inflation rate will average 2.15 percent over the next 10 years.

The expected rate of inflation depends both on what the Fed says and what it has done. Markets pay attention to what the Fed says it wants to do because it has built up a reservoir of credibility by providing low and stable inflation for some time. But words aren't enough. Ultimately, any central bank's policy actions must be consistent with its words or it will lose the public's trust. If the Fed doesn't maintain policies consistent with low inflation, inflation expectations will begin to rise. And if inflation expectations rise, long-term interest rates will also rise—holding all else constant.

So, yields on long-term Treasury bonds have an expected inflation component and a real component. The yields on other bonds, such as corporate bonds, contain another component: credit risk. The interest differential depends on the possibility that the borrower will default. Credit risk depends on the individual bond issuer and often changes over the course of the business cycle, increasing as business conditions deteriorate. The most dramatic example of this phenomenon is that the spread between yields on junk bonds and government bonds tends to widen during recessions and narrow during expansions. The

risks and falls of default risk are quite naturally linked to the state of the economy.

One final component of interest rates arises from the liquidity or illiquidity of the bond. Bonds that are actively traded in large volume are highly liquid. An investor can buy or sell substantial amounts with little or no impact on yield. Even within the Treasury market, we observe significant differences in liquidity of various issues. Trading tends to be concentrated in benchmark issues, such as the 10-year maturity. Bonds with 9 years to maturity and 11 years to maturity trade at a yield a few basis points higher than the 10-year bond.

## A REVIEW OF MAJOR INTEREST RATE DEVELOPMENTS

These fundamental concepts are what we need to understand interest rate developments in recent years. Using annual data, the peak year for the 10-year Treasury bond rate was 13.91 percent, in 1981. It's hard to know exactly what the real rate was at that time because unambiguous data are not available. However, the premium for inflation expectations and inflation uncertainty was surely quite large.

After 1982, inflation fell to the 4 percent range but interest rates remained quite high. The 10-year rate was above 8 percent every year in the 1980s, except for 1986, when it averaged 7.68 percent. As the economy grew after the mild recession of 1990-91, the bond rate actually fell slowly on average through the end of 1998. A long-term decline in bond rates during an economic expansion is a decidedly rare event, as rates typically rise during an expansion. Declining expected inflation and declining inflation risk explain this outcome. Based on survey data, expected CPI inflation declined from roughly 5 percent at the beginning of 1990 to a bit over 2 percent at the end of the decade. I suspect that declining inflation risk also contributed to the decline in bond rates, but no satisfactory series on inflation risk exists.

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The decline in rates in the second half of 1998 reflected concerns, in the markets and in the FOMC, about the effects of the Russian default in August and the severe problems faced by Long Term Capital Management, which broke into the open in September. By the end of the year, the economy shook off these concerns and the economic boom resumed in full force in 1999. The demand for capital was high, and handsome returns in the stock market led investors in that direction away from bonds. To keep inflation under control and temper the boom, the Fed raised the intended federal funds rate.

Using data on indexed bonds, first issued in 1997, we have a pretty good fix on real interest rates. As the economic boom intensified once the economy got past the disruption in the fall of 1998, real rates rose. The 10-year indexed bond yield peaked at about 4.4 percent in January 2000, but inflation expectations remained in the neighborhood of 2 percent. Accordingly, the 10-year nominal Treasury bond yield also peaked in January 2000, at about 6¾ percent.

As the economy softened over the course of 2000 and reached a business cycle peak in March 2001, bond rates began to fall. The Fed began to ease policy in January 2001. Interestingly, bond rates initially rose, as the market apparently believed that Fed easing would stimulate the economy fairly quickly and lead to a resumption in growth of credit demands. That was not to be; as we know now, the economy continued to drift, first in the mild recession that lasted from March to November of 2001 and then only modestly up in 2002.

On several occasions over the last three years, forecasts of more buoyant growth were disappointed. The combination of capital overhang from the investment boom of the late 1990s, shocks from major bankruptcies, the tragedy of 9/11, and corporate governance scandals held the economy back. When expected increases in credit demands did not materialize and with the disappointing performance of the stock market, investors bid bond rates down. Long-term inflation expectations may have drifted down a little

during this period, but most of the decline in the bond rate reflected a decline in the real rate of interest. By the middle of this year, the 10-year indexed bond yield, which had been about 4.4 percent in late 1999, was down to about 1.5 percent. That yield, by the way, has now rebounded to about 2.4 percent.

I think that the right interpretation of the rebound in the real rate of interest in recent weeks is that the market expects a resumption of economic growth, with accompanying resumption of stronger credit demands. I believe that the evidence for this interpretation is substantial, because we know from previous business cycles and from cross-country evidence that the real rate of interest tends to be higher in economies with higher growth rates.

## THE IMPORTANCE OF TRANSPARENCY

I've concentrated on longer-run fundamentals because I think that is the right place to look for explanations of significant changes in interest rates. The market is constantly seeking to understand the longer-run direction of the economy; however, trends are always easy to identify after the fact and difficult to read in real time.

On top of the longer-run trends in interest rates is an overlay of short-run noise. By "noise" I mean small day-to-day and week-to-week fluctuations that later turn out to reflect misperceptions, very temporary liquidity changes, and such things. If you look at a graph of quarterly average data, much of the noise disappears. If you look at a graph of daily data and go back to the daily financial press, you will see the news, rumors, and speculations that lie behind much of the noise. If you go back to the daily news, which I did at great length as an academic before I came to the Fed, you will likely be bored by most of what you read. Most of the accounts describe noise that has no value in understanding the fundamentals driving longer-run developments.

The stance of monetary policy is one of the fundamentals in the larger picture, because if the



Fed gets it wrong, then the economy will not grow along its potential growth path with low and stable inflation and interest rates will not settle at, or fluctuate around, the level appropriate to an economy growing at its full potential.

Because of the market's intense interest in monetary policy, the FOMC has a major communications challenge. I spoke in some detail on that topic in a speech two weeks ago in Philadelphia, and do not want to repeat that entire discussion here. The bottom line is that one of the Fed's jobs is to communicate as accurately as possible so the market can determine interest rates efficiently. That means that the Fed needs to do the best it can to convey the essential elements of policy clearly and not itself be a source of short-run noise in the market. To me, an essential ingredient of good Fed communications is to focus on longer-run fundamentals and on how the FOMC pursues its objectives by adjusting the stance of policy to the arrival of new information.

Even if the Fed were to communicate its objectives and methods perfectly, the future path of the federal funds rate would never be perfectly predictable because the FOMC must change the intended rate from time to time as new information arrives. Not to do so would create problems, such as the Great Inflation of the 1970s. That inflation was a consequence of policy adjustments that were too frequently too little and too late. In the end, those policy mistakes led to more uncertainty, because of the inflation, and larger interest rate changes than would have occurred if the Fed had been willing to act earlier and decisively. Given that the FOMC must respond in timely fashion to new information, and certainly has for at least 20 years, I'll make the claim that miscommunication accounts for only a trivial fraction of interest rate changes in recent years. Incidentally, "respond in timely fashion" does not necessarily imply frequent policy adjustments. In the more stable inflation environment we enjoy today, the Fed has far more freedom than it had in the 1970s to wait for information to accumulate.

Because the events that drive changes in the stance of policy are unpredictable, the intended federal funds rate cannot itself be predictable.

What ought to be predictable is the Fed's commitment to its policy goals and its response to events as they occur. Fed responses are not perfectly predictable today because no one inside or outside the Fed knows how to write an explicit recipe for conducting policy. However, there is ample evidence that policy is substantially predictable, as the market and the Fed most often do read the implications of arriving information the same way.

## CONCLUDING COMMENTS

Now I'll pull the analysis together. With regard to inflation expectations and inflation risk, prospects going forward are excellent. Actual and expected inflation have been quite stable in recent years, and there is every reason to anticipate that these attractive conditions will remain in force. The market appears to have great confidence in the Federal Reserve's commitment to price stability and its powers to maintain the inflation rate within the range of experience of recent years. Moreover, the stunning increase in productivity in the second quarter announced this morning and the strong case that handsome productivity increases will continue—even if not as stunning as the second quarter data—makes inflation control considerably easier than it otherwise would be. Although we must always be alert to inflation or deflation surprises coming out of the woodwork, there is, in my view, the prospect going forward that inflation will be benign and that the risks in this direction are as low as we have seen in the last 40 years.

With regard to prospects and risks on the real rate of interest, my message is that the risks are tied to risks with respect to economic growth. As I examine growth expectations of professional forecasters, such as the Blue Chip panel, my read is that the consensus outlook is for solid and balanced economic growth going forward. However, as I always emphasize when discussing the economic outlook, forecasts change over time, sometimes significantly, and at any given time there is a range of professional opinion on the outlook. Should we see a continuation of a sluggish recov-

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ery, then the prospects are that bond rates will fall somewhat from current levels. Should we see a gangbusters recovery, then the prospects are that rising credit markets will drive bond rates above current levels. In either case, the action will be primarily in the real rate of interest and not, I believe, in the inflation premium component of rates.