

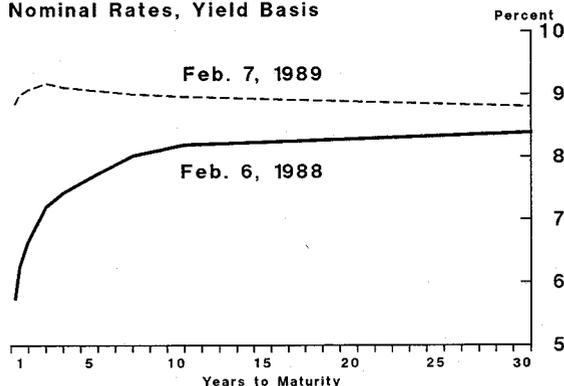
FRBSF WEEKLY LETTER

March 10, 1989

The Yield Curve and Recessions

Over the past year, short-term interest rates have risen sharply, while long-term interest rates have moved very little. As a result, the yield curve has flattened considerably. Chart 1 shows that in early February, the slope of the Treasury yield curve was only slightly positive out to maturities of two years, and it was negative beyond two years.

Chart 1
Treasury Yield Curve
Nominal Rates, Yield Basis



Some analysts think that the shape of today's yield curve indicates that a recession is likely in the near future. This view is based on the observation that the yield curve flattened or inverted prior to each of the last six recessions.

Is this reading of the "tea leaves" appropriate at this time? Maybe not. In the current environment of long-run disinflation, a flat yield curve does not necessarily have the same implications for the economy that it had in the past.

The yield curve

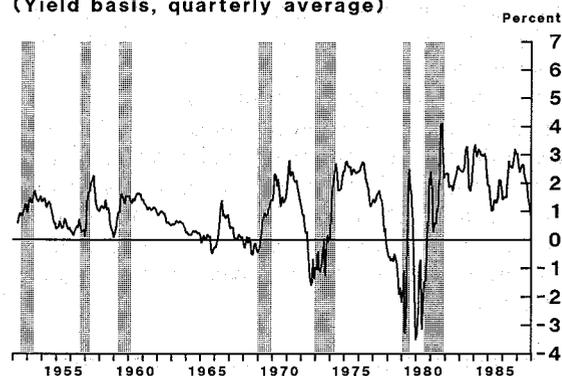
The yield curve depicts the term structure of interest rates, that is, the relationship between the yields on securities of comparable risk and their terms to maturity. Under the so-called "expectations" theory of the term structure of interest rates, the return currently available on a fixed-rate security that matures at the end of, say, 10 years should equal the expected return from investing in a consecutive series of short-term securities over the same period. Thus, if the market

expects short-term interest rates to be higher in the future, the yield on a 10-year Treasury note will be higher than that available on a three-month Treasury bill today, and the yield curve will slope upward. Similarly, if the market expects short-term rates to be lower in the future, the yield on the longer-term security will be lower than that on the T-bill, and the yield curve will slope downward (be inverted).

Empirical regularity

Chart 2 shows why the current shape of the yield curve is drawing attention. Before each of the last four recessions, the spread between the 10-year Treasury rate and the three-month Treasury rate turned negative, indicating that the yield curve was inverted. In the cases of the 1957 and 1960 recessions, the spread remained slightly positive, although it narrowed considerably. Prior to those two recessions, the yield curve was inverted for maturities beyond one or two years, as in early February 1989. The only time a recession did not follow an inversion of the yield curve was in the mid-1960s, and even then, real economic activity slowed.

Chart 2
Nominal Interest Rate Differential
10-year T-note less 3-month T-bill
(Yield basis, quarterly average)



Recession link

But why should the yield curve flatten and invert just prior to cyclical peaks in the economy? Historically, the flattening and inversion of the yield curve occurred when interest rates were rising rapidly. During these periods, it is logical that

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many observers would come to expect the high and rising level of interest rates to push the economy into a recession, which subsequently would cause interest rates to decline. And because they were expecting interest rates to be lower in the future, the yield curve would flatten or invert at these times, in keeping with the expectations theory of the term structure of interest rates.

In the past, market participants could expect interest rates to behave in this fashion around cyclical turning points for two reasons. First, recessions tended to slow economic activity and reduce the demand for credit, causing real, or inflation-adjusted, interest rates to fall from their cyclical peaks. Second, recessions also tended to slow the rate of inflation, causing the inflation premium in nominal interest rates to fall.

The inflationary environment of the 1970s and early 1980s can help to explain why the yield curve tended to invert *only* when recessions (or at least economic slowdowns) seemed imminent. During this period, the overall trend in nominal interest rates was upward, largely because investors were requiring ever higher premia to compensate for accelerating inflation. Recessions were the only thing that seemed even temporarily to slow the price spiral and the rise in nominal interest rates.

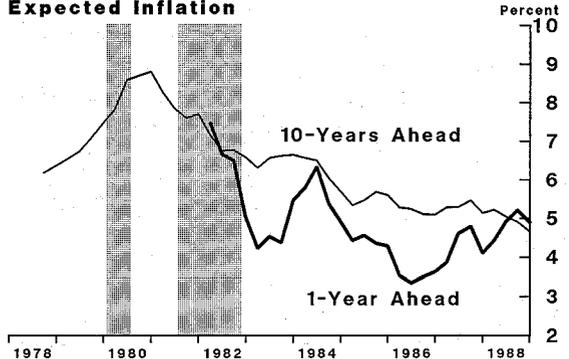
What about today?

Whether the current flattening of the yield curve is a harbinger of a recession depends on why the market might expect short-term interest rates to fall in the future. In the past, investors likely did not expect future rates to fall unless a recession intervened to dampen the inflationary spiral. But the disinflationary environment of the 1980s is very different from the past. In fact, much of the current rotation in the nominal yield curve is due to shifts in short-run and long-run inflation expectations that are not necessarily due to a significant change in the perceived probability of a recession.

One source of information on inflation expectations is a survey of 190 institutional investment decision makers, conducted by Richard Hoey and published by Drexel Burnham Lambert (referred to as the DBL survey hereafter). That survey provides consensus inflation expectations for periods of one, five, and ten years ahead.

Chart 3 plots quarterly averages of the survey results that were available in each quarter through December 1988, the last month for which survey results were available.

Chart 3
Expected Inflation



Source: Drexel, Burnham, Lambert

The Chart shows that inflation expectations for one year ahead rose noticeably in 1988, following a trend that began in the latter part of 1986. Overall, one-year ahead inflation expectations rose by more than 3/4 percentage point last year.

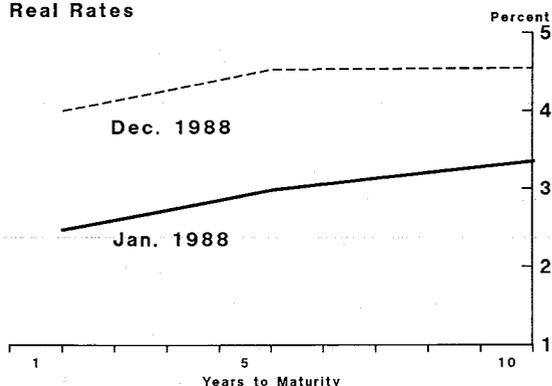
At the same time, however, the outlook for inflation over the longer run continued to *improve* in 1988, according to the DBL survey. On average, survey participants' expectations for inflation over a 10-year horizon fell by 1/2 percentage point.

The question, then, is what are the implications of these changes in inflation expectations? If the steady decline in longer-term expectations is due to a belief that a recession is imminent, then it seems likely that expectations of the future level of longer-term real interest rates ought to show a decline as well.

Using DBL survey data to represent the inflation premia in short-term and long-term nominal interest rates, it is possible to derive estimates of the real interest rates on Treasury securities with maturities of one, five, and ten years. In Chart 4, these estimates have been used to construct real yield curves. These yield curves show that, from January to December 1988, the real interest rate on 10-year securities *rose* by nearly as much as that on the one-year securities. Thus, the movement in real rates did not have much to do with the flattening of the nominal yield curve over the

past year. Instead, the shift in the yield curve, at least in the one-year to the 10-year range, mainly reflects changes in inflation expectations.

Chart 4
Treasury Yield Curve
Real Rates



In fact, in the current economic environment, a steady decline in long-run inflation expectations apart from a similar trend in the real rate is not an unreasonable proposition. Partly because of the shift in monetary policy that took place in the early 1980s, the U.S. has moved into an environment of lower inflation. It seems reasonable that the steady decline in expectations reflects financial decision makers' gradual acceptance of this new environment.

In a sense, then, the recent decline in inflation expectations is a lagged response to a shift in monetary policy in the early 1980s, and not necessarily indicative of a shift in attitudes concerning the likelihood of recession. That is, it is possible to explain the recent flattening of the yield curve without resorting to the argument

that decision makers expect lower inflation and lower interest rates to come as a result of a recession.

This argument seems even more reasonable when we see that decision makers' outlooks for inflation in the short run and in the long run are not very far apart. Nor are their long-run expectations far from actual inflation last year, which was 4½ percent, as measured by the GNP fixed-weight price index. Thus, it appears that decision makers are not expecting any major changes in the fundamental factors affecting inflation (such as the pace of economic activity) in the near future, even though they do expect a small, temporary rise in inflation this year.

Rethinking the link

In the past, a marked flattening or an inversion of the yield curve generally signaled an impending recession. This time around, however, the slope of the yield curve has flattened under conditions that certainly did not exist in the 1970s and early 1980s. What is different now is that inflation expectations have been declining for some time, apparently in (lagged) response to a policy shift that began in the early 1980s. Therefore, in the current economic environment, we cannot be sure that a flattening or an inversion of the yield curve has the same meaning as in the past. This observation does not tell us whether a recession is more or less likely now, only that we need to be cautious when we use the nominal yield curve as a leading indicator of peaks in the business cycle.

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