

BROOKINGS

Up Front

The Hutchins Center Explains: The yield curve – what it is, and why it matters

Michael Ng and David Wessel Wednesday, December 5, 2018

Editor's Note:

This explainer was originally published in April 2018. It was updated in December 2018 to reflect changes to the yield curve.

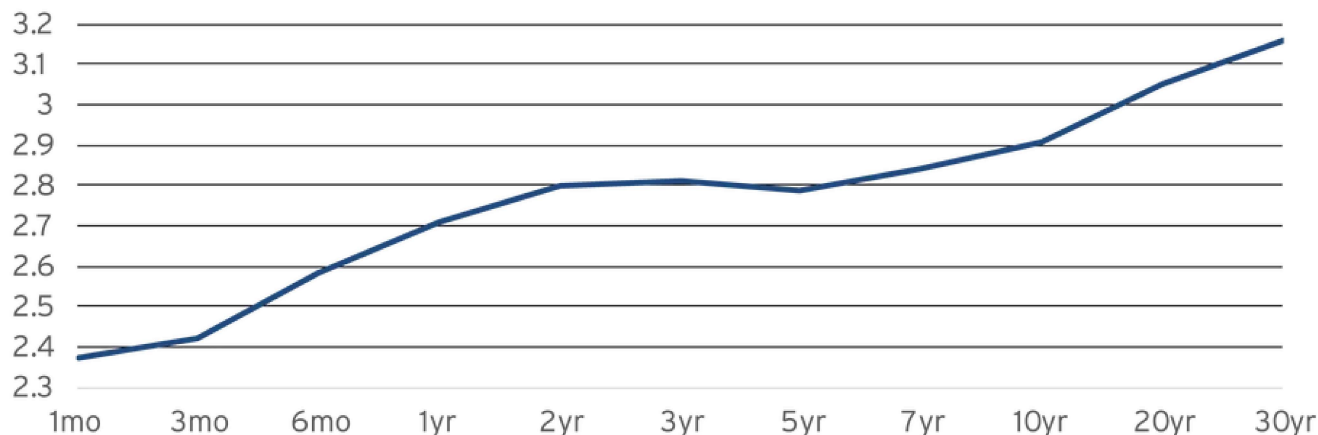
Financial markets sometimes offer clues to the future direction of the economy because they reflect the views of so many investors who are putting money behind their forecasts. One gauge that often gets attention is the yield curve. You can hear Federal Reserve officials talking about it. You can see it in financial wire-service headlines: “Flattening Yield Curve is Sending Message About Fed’s Rate Plans.” You can read about it in blogs: “What Bloomberg’s ‘Yield Curve Flattening’ Report Does Not Say” or “What the Flattening U.S. Yield Curve Means.” Here’s a primer on what the yield curve tells us – and what it doesn’t.

What is the yield curve?

The yield curve is a visual representation of how much it costs to borrow money for different periods of time; it shows interest rates on U.S. Treasury debt at different maturities at a given point in time.

As the chart below shows, the yield on 30-day Treasury notes was 2.37 percent on December 4, 2018, and the yield on 30-year Treasury bonds was 3.16 percent.

The Yield Curve



Source: Haver Analytics/US Treasury Department.



Why does the yield curve slope upwards?

Lenders and bond investors who commit to tying up their money for longer periods of time take on more risk because it's harder to forecast economic conditions – inflation, Federal Reserve policy, the global economy – over a decade than over the next week or month. The compensation that lenders and investors demand for making long-term loans is known as the term premium. With a positive term premium, the yield curve usually slopes upwards.

What else determines the slope of the yield curve?

Expectations for Fed policy

The Federal Reserve influences short-term interest rates across the economy by targeting the federal funds rate, the interest rate at which banks lend to each other overnight and a benchmark for other interest rates in the economy. Longer-term interest rates reflect, among other things, market expectations about how the Fed will move short-term rates in the future.

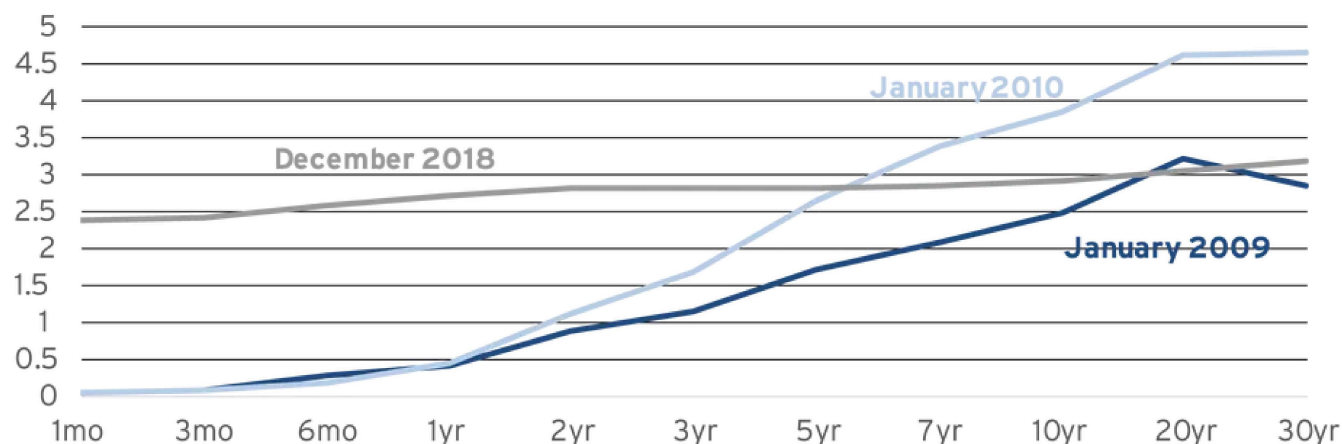
Expectations for inflation

Inflation erodes the value of any promise to pay a fixed sum in the future, including interest payments on a bond or loan. Investors and lenders demand compensation for this by building an “inflation premium” into the interest rate on a loan or bond.

The term premium and expectations for Fed policy change over time. As they change, so does the difference between short- and long-term rates. This is illustrated in the chart below, which draws the yield curve at different points in time. Notice how the yield curve has flattened significantly since the end of the Great Recession in 2009.

The Yield Curve

The Yield Curve is much flatter now than it was at the end of the Great Recession.



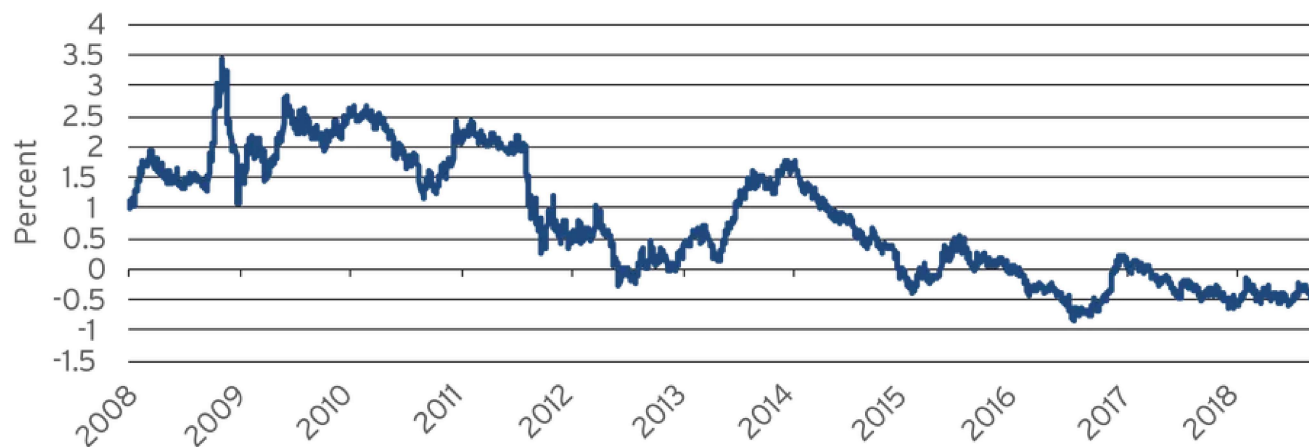
Source: Haver Analytics/US Treasury Department.

Why is the yield curve flatter?

The term premium and QE

The term premium has been quite low by historical standards in recent years. Estimates by the New York Fed show that the term premium on 10-year treasury bonds has declined since the end of the Great Recession, as shown in the chart below.

The Term Premium (10-year Treasury)



Source: Haver Analytics/Adrian et al. (2013)



At times, the term premium can be very small. When that occurs, investors are settling for a very low return for holding a longer-term bond or lending money for a longer period of time. In some instances, the term premium can even be negative; that is, investors aren't even getting fully compensated for expected inflation and the expected path of future Fed rate increases.

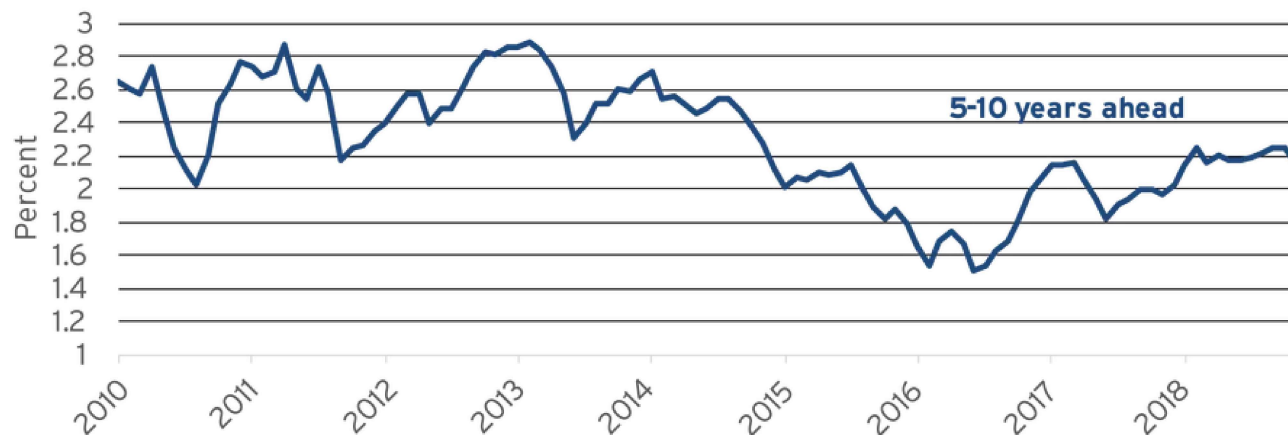
Much of the recent decline in term premiums is due to the Fed's purchases of trillions of dollars in long-term bonds known as quantitative easing (or QE), which was intended to drive down the term premium and the rate on long-term bonds. Research by Fed economists suggests that QE pushed down the term premium on 10-year Treasury bonds by a full percentage point. In October 2017 the Fed began unwinding its large balance sheet by allowing bonds it holds to mature. This likely will push the term premium back up over time. However, this process has been slow, and the overall size of the Fed's balance sheet remains quite large.

Low inflation

Another reason for a flat yield curve is that inflation has remained quite low and is expected to remain that way. The Fed's preferred measure of inflation, the core personal consumption expenditures (PCE) price index, rose 1.78 percent in October, measured year-

over-year. That's below the Fed's 2 percent inflation target. The bond market offers one important way to gauge investors' inflation expectations for the future. The chart below shows investor expectations for inflation five to 10 years in the future. Notice that despite the recent increase, investors now expect less inflation in the near-term than investors did back in the 2011-13 period.

Inflation Expectations Implied by Bond Prices



Source: Haver Analytics.

Note: Data uses constant maturity yields in per annum at a monthly frequency.



Fed rate hikes

The main reason the yield curve has flattened in recent years is because the Fed has been raising short-term interest rates. Increases in the Fed's target for short-term rates usually lead to an increase in longer-term rates — but not always — and lately, not as much as usual. The average response to a December survey of 23 broker-dealers estimated that Fed rate increases explain about two-thirds of the decline in the yield curve's slope since December 2015.

What is an inverted yield curve?

An inverted yield curve means the interest rate on long-term bonds is *lower* than the interest rate on short-term bonds. This is often seen as a bad sign for the economy. That's because long-term rates might go down — inverting the yield curve — if markets expect

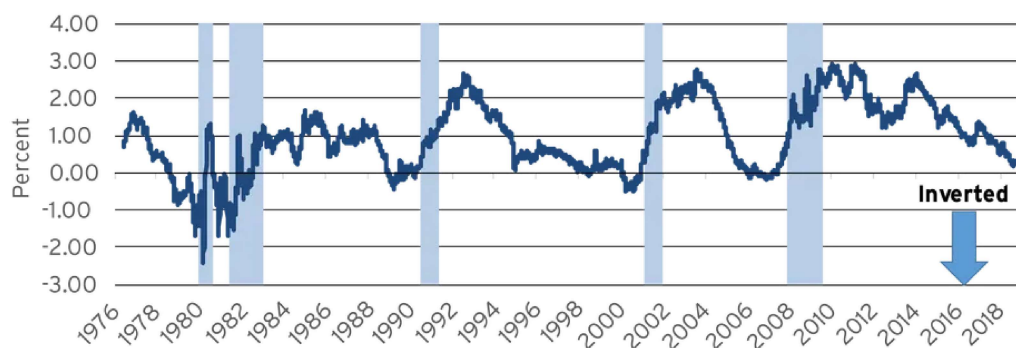
that the economy will deteriorate and that the Fed will cut short-term rates in the future. (Recall that one factor that determines the yield curve is market expectations for future Fed policy.) Alternatively, markets could be anticipating very low inflation or even deflation in the years ahead, also negative for the economy. But those aren't the only possibilities: An inverted yield curve could reflect a shrinking of the term premium.

Does an inverted yield curve mean there will be a recession soon?

Not necessarily. The chart below shows the slope of the yield curve since 1976, measured as the rate on 10-year Treasury debt minus the rate on 2-year Treasury debt. When the line dips below zero, interest rates on longer-term bonds are lower than shorter-term bonds, i.e. an 'inverted' yield curve. Notice that every time over this period that the yield curve has inverted a recession has followed.

The Slope of the Yield Curve (10 year - 2 year Treasury Yield)

Generally, an inverted yield curve can sometimes prove as an indicator of an impending recession.



Source: Haver Analytics/US Treasury Department.
Note: Shaded blue bars indicate NBER recession dates.

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The December 2017 Federal Open Market Committee (FOMC) minutes indicate that some committee members expressed concern that the flattening of the yield curve “could portend an economic slowdown, noting that inversions have preceded recessions over the past several decades, or that a protracted yield curve could adversely affect the financial conditions of banks....” (Banks, in general, profit more when long-term rates at which they lend are higher than short-term rates at which they borrow or pay on deposits.)

This time could be different, though, as other FOMC members argued at that same meeting. Another interpretation of the data using interest rates that are more forward looking argues that the yield curve isn't actually signaling an elevated risk of recession. In addition, some research from the Fed shows that an inverted yield curve does increase the probability of a recession occurring relative to any given point in time, but controlling for the low levels of interest rates overall this probability is lower. The New York Fed estimates that the probability of a recession in the next year based on the slope of the yield curve is only around 14 percent, compared to 40 percent right before the 2008 recession. Much of this relies on the case that with a very low term premium, the yield curve will naturally be flatter and that relatively small increases in short-term interest rates relative to long-term rates could lead to inversion. Former Fed Chair Janet Yellen, now our colleague at Brookings, explained in December 2017:

“[T]here is a strong correlation historically between yield curve inversions and recessions, but let me emphasize that correlation is not causation, and I think that there are good reasons to think that the relationship between the slope of the yield curve and the business cycle may have changed. And one reason for that is that long-term interest rates generally embody two factors. One is the expected average value of short rates over, say, 10 years, and the second piece of it is a so-called term premium that often reflects things like inflation—inflation risk. ...[R]ight now the term premium is estimated to be quite low, close to zero, and that means that the yield curve is likely to be flatter than it’s been in the past. And so it could more easily invert. If the Fed were to even move to a slightly restrictive policy stance, you could see an inversion with a zero term premium. So I think the fact the term premium is so low and the yield curve is generally flatter is an important factor to consider.”
