

Trouble with the Curve

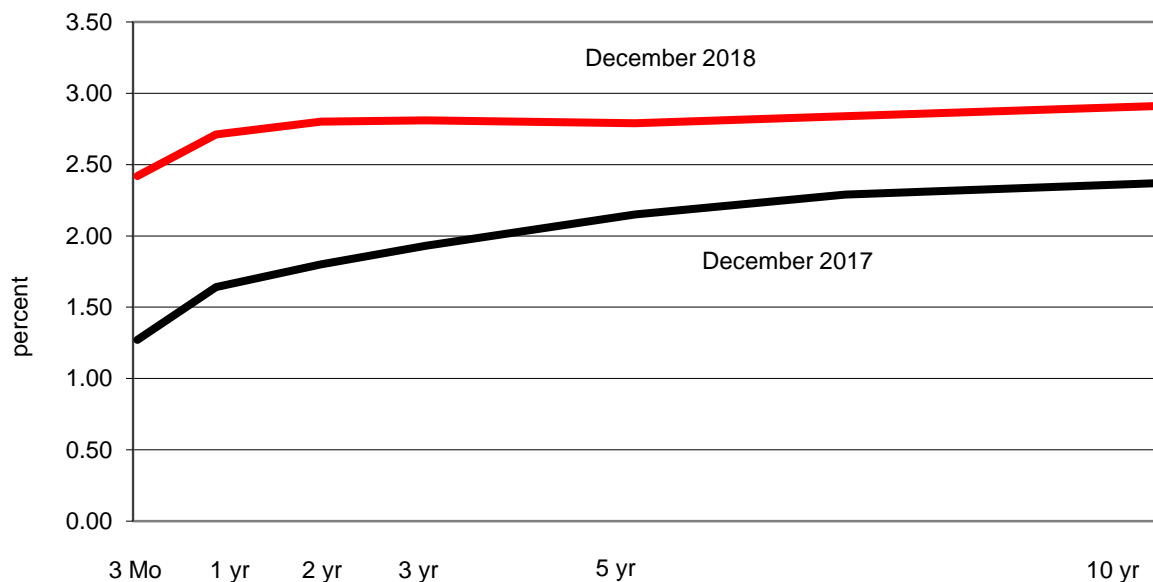


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The yield curve is a graph of interest rates (yields) on Treasury securities of different maturity dates (e.g., 3-month, 2-year, 10-year). Typically, the yield curve “slopes upward” which means longer-term interest rates are higher than shorter-term interest rates. Sometimes the yield curve inverts in which case shorter-term rates are higher than longer-term rates. Historically, an inverted yield curve, specifically one in which the 2-year interest rate is higher than the 10-year interest rate, has been a signal that a recession is on the horizon. An inverted yield curve is one of the most reliable recession predictors because the curve inverted before the recessions of 1970, 1973, 1980, 1982, 1990, 2001, and 2008 with these recessions beginning 6 to 18 months after the curve inverted.

As of this writing, the 2-year interest rate remains just below the 10-year rate. Still, as Chart 1 shows, the yield curve has gone from substantially upward sloping to more or less flat. In fact, the 2-year rate has recently risen above the 5-year rate, so the curve is inverted, though not with respect to the 2-year vs. 10-year rates, often noted as a recession signal.

Chart 1: Treasury Yield Curve – December 2018 vs. December 2017



Source: U.S. Department of the Treasury, data as of December 4, 2018

Why Does the Yield Curve Normally Slope Upward?

Before delving into why an inverted yield curve is a recession signal it is first important to understand why the yield curve normally slopes upward. In general, long-term rates (e.g. 10-year Treasury yields) are higher than short-term rates (2-year Treasury yields) because bond investors need to be compensated for locking up their money for a longer period of time.¹ True, a bondholder doesn't have to hold the bond until it matures but if the bond is sold early, there is the risk of a capital loss if bond prices fall. Thus, long-term bonds are less attractive either because of their lower liquidity or greater risk, both of which require them to provide a greater yield to compensate investors.

In addition to this "term premium" there is another factor which affects the relationship between short-term and long-term interest rates – expectations of future interest rates. Consider someone who wishes to make a 2-year bond investment. One option is to buy a 2-year bond. Another option is to buy a 1-year bond and then in one year buy another 1-year bond. The decision of which option to pursue will depend in part on expectations of the future interest rate of the second 1-year bond. If people expect interest rates to rise in the future so that the future 1-year rate will be much higher than the current 1-year rate, an investor who locks in their yield by buying a 2-year bond will need a higher interest rate to make that investment worthwhile. Thus, when interest rates are expected to rise, the yield curve becomes even more upward sloping.

What Causes the Yield Curve to Invert?

However, the yield curve can invert if people expect interest rates to fall in the future. In this case, someone might be willing to accept a lower rate on a 2-year bond instead of a 1-year bond because they can lock in today's rate for a longer period of time instead of reinvesting in the future when interest rates are expected to be lower. This then is the situation that produces an inverted yield curve – expectations that interest rates will fall in the future.

The expectation of lower future interest rates is often a signal of a future recession because interest rates tend to decline when the economy enters a downturn. In part this is because the Federal Reserve typically reduces the fed funds rate during recessions, which pushes down other interest rates, particularly on short-term securities. Furthermore, recessions are often accompanied by increased financial stress, drops in stock prices, and increases in corporate bond defaults. These events usually cause a "flight to safety" as investors sell riskier assets and buy safe Treasury securities causing interest rates on these securities to fall. For example, in late 2006, the 2-year yield was around 4.75 percent while the 10-year yield was only 4.60 percent. A year and a half later the economy was in recession and the 2-year and 10-year yields had fallen to around 2.0 percent and 3.5 percent, respectively.

¹ Technically, Treasury securities of maturities of 1 year or less are referred to as "bills," those of 2 years to 10 years are "notes" and those of more than 10 years are "bonds." For simplicity, we use the term "bonds" for all maturities.

Inverted Curve: Just a Signal or a Cause?

For now, we've talked about the inverted yield curve as a signal of a recession, but not necessarily a cause of a recession. But there are at least two reasons why an inverted yield curve might cause the economy to falter. The first is that the yield curve can invert if the Federal Reserve increases the fed funds rate too much. A higher fed funds rate will raise short-term rates more than long-term rates because long-term rates are influenced not just by the current fed funds rate but also by longer-term expectations of future fed funds rates. The Fed is currently raising interest rates so it is certainly possible that they will increase them too much.

Another reason why an inverted yield curve might cause a recession is that it can be harmful to bank profitability. Banks earn profits by borrowing money short-term (e.g., a 12-month CD) and lending it long-term (a 30-year mortgage). Usually, the bank lends at a higher rate than it borrows because long-term rates are higher than short-term rates. But when short-term rates are higher a bank could find itself paying more to get new deposits while earning less on its long-term loans. This can cause banks – and other financial intermediaries – to scale back their lending activity, slowing the economy. To this point, financial stocks have been hit particularly hard during the recent stock market decline.

The recent flattening of the yield curve could well be a move toward an inverted curve. Importantly, one should not limit the definition of an inverted yield curve to the relationship between 2-year and 10-year rates. If any part of the curve is inverted, it is an indication that investors expect interest rates to fall during that time period. Therefore, the fact that the 5-year rate is lower than the 2-year rate reflects expectations of falling interest rates in the future, which may be a valid signal of a future recession, regardless of the level of the 10-year rate.

Is This Time Different?

But before we surrender to the power of the curve, consider some other facts. First, while all recent recessions have followed an inverted curve, not all inverted curves have been followed by recessions. Throughout 1966 the yield curve was inverted but a recession didn't begin until 1970. And in 1998, the yield curve briefly inverted but the economy continued to grow strongly for almost three more years. So it is a good, but not perfect, predictor of a turn in the business cycle.

A second fact to consider is that one reason why the yield curve is so flat is because 10-year interest rates remain quite low, particularly given the current strength of the economy and gradual increases in the inflation rate. One reason why long-term U.S. Treasury rates remain low is that the bond market is a global market and "low" U.S. rates are much higher than rates on 10-year German bonds (0.27 percent) or Japanese bonds (0.06 percent). International investors have been buying U.S. Treasuries, keeping interest rates from increasing in the U.S. Perhaps then the inversion of the U.S. yield curve is saying more about the outlook for global interest rates and growth than about conditions in the U.S.

Our View

Nevertheless, our view – reflected in the forecasts we provide to the Philadelphia Federal Reserve – is that the economy will slow substantially in 2019 and 2020. Whether this slowdown results in a recession remains unclear, but in any case, an economy that grows only 0.5 percent is not much better than one that shrinks 0.5 percent. Hopefully, any future inversion of the yield curve will be one of those “false positives” as in 1998. But with the current expansion approaching a record 10-year length, it is probably best to be aware of the trouble with the curve.