

- **Background:** The yield curve—which measures the spread between the yields on short- and long-term maturity bonds—is often used to predict recessions.
- **Description:** We use past values of the slope of the yield curve and GDP growth to provide predictions of future GDP growth and the probability that the economy will fall into a recession over the next year.

## RECENT NUMBERS

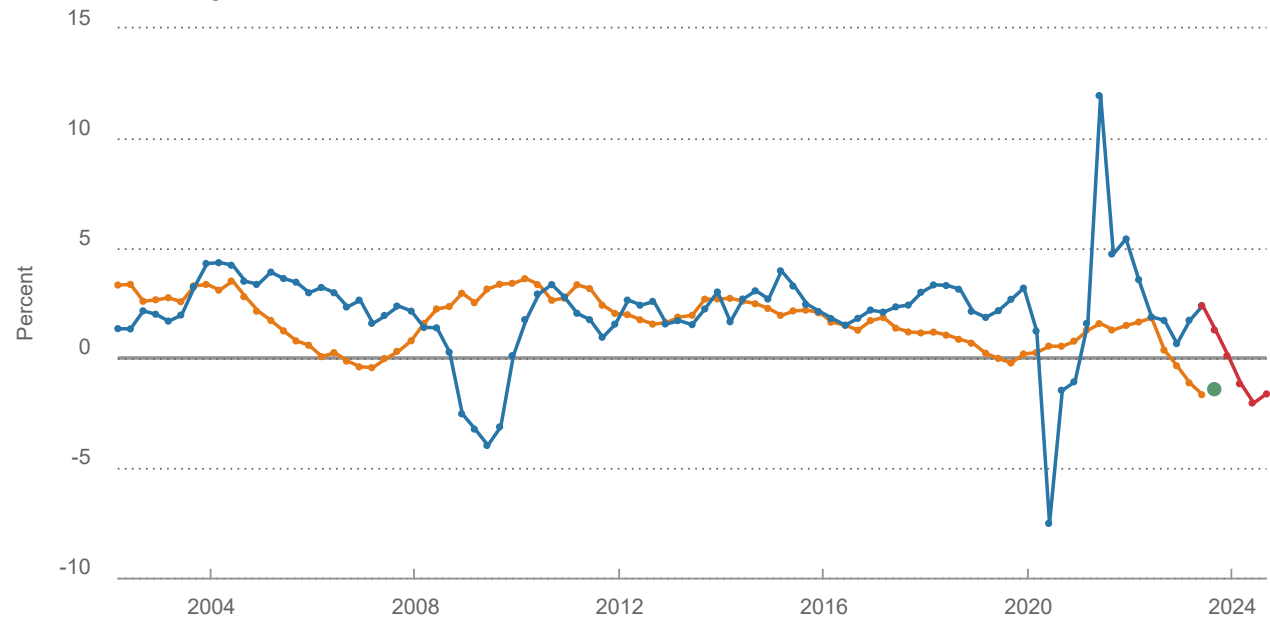
	September	August	July
3-month Treasury bill rate (percent)	5.56	5.58	5.49
10-year Treasury bond rate (percent)	4.39	4.27	3.81
Yield curve slope (basis points)	-117	-131	-168
Prediction for GDP growth (percent)	-1.6	-2.7	-2.9
Probability of recession in 1 year (percent)	67.6	70.6	75.3

### Yield-Curve-Predicted GDP Growth



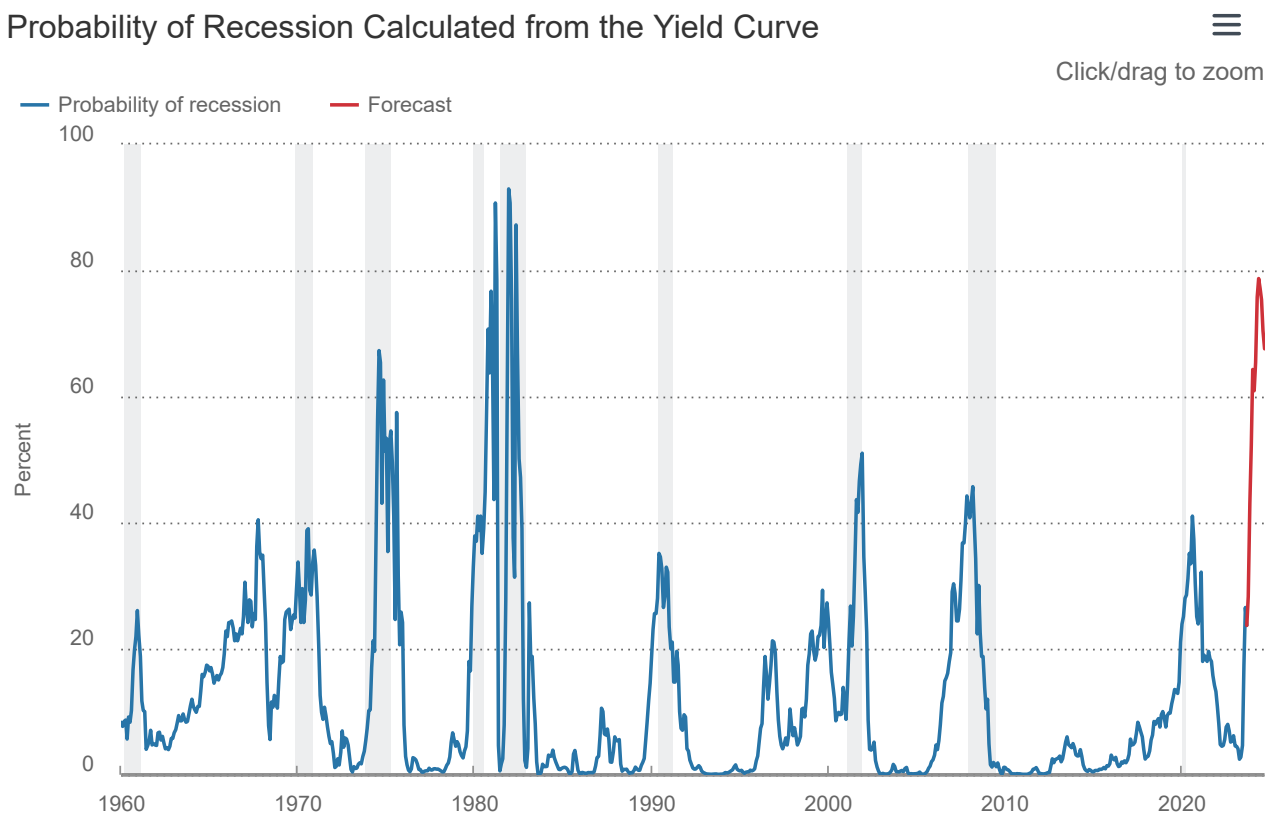
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- GDP growth (year-over-year)
- Incomplete quarterly average, 07/01/2023 to 09/22/2023
- 10-year minus 3-month yield spread
- Predicted GDP growth



Source: Bureau of Economic Analysis, Federal Reserve Board, Federal Reserve Bank of Cleveland, Haver Analytics

## Probability of Recession Calculated from the Yield Curve



Source: Federal Reserve Board, Federal Reserve Bank of Cleveland, Haver Analytics. Note: Shaded bars indicate recessions.

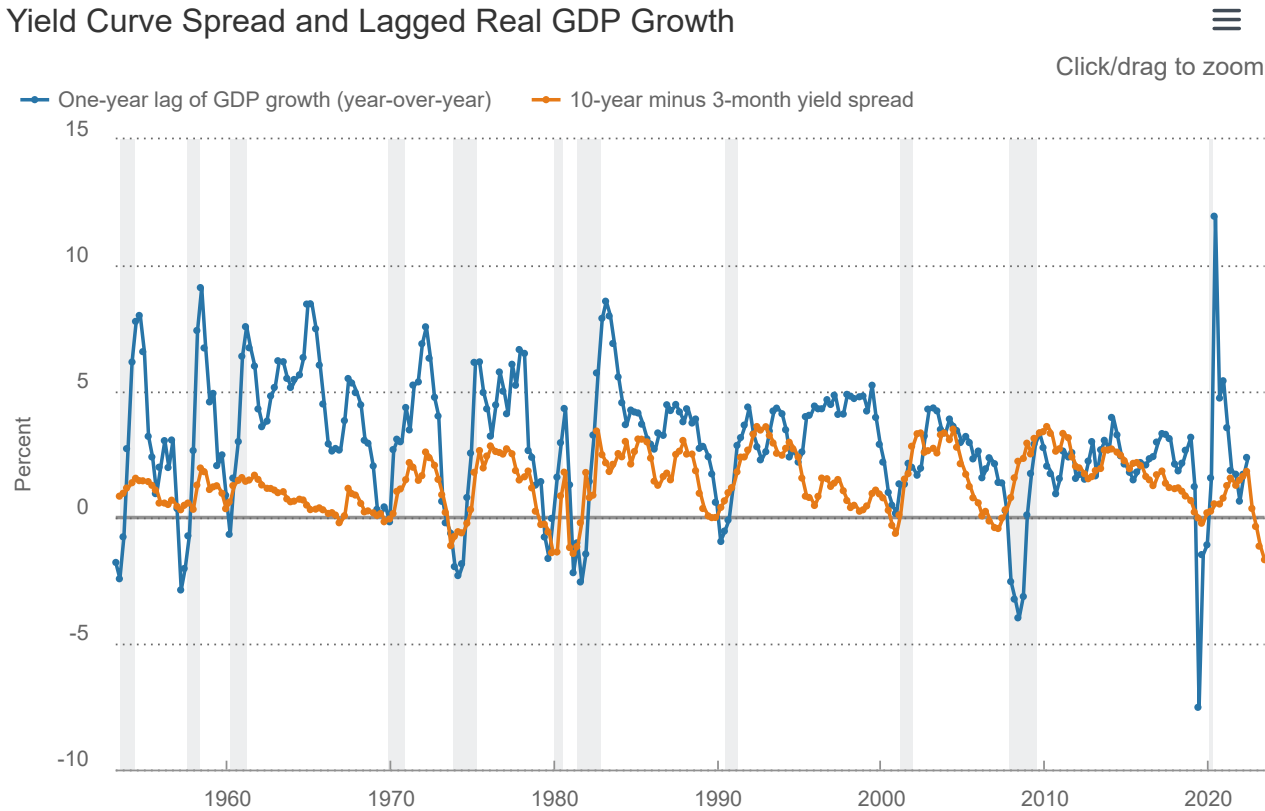
## Background

### The Yield Curve as a Predictor of Economic Growth

The slope of the yield curve—the difference between the yields on short- and long-term maturity bonds—has achieved some notoriety as a simple forecaster of economic growth. The rule of thumb is that an inverted yield curve (short rates above long rates) indicates a recession in about a year, and yield curve inversions have preceded each of the last eight recessions (as defined by the [NBER](#)). One of the recessions predicted by the yield curve was the most recent one: The yield curve inverted in May 2019, almost a year before the most recent recession started in March 2020. There have been two notable false positives: an inversion in late 1966 and a very flat curve in late 1998.

More generally, a flat curve indicates weak growth and, conversely, a steep curve indicates strong growth. One measure of slope, the spread between 10-year Treasury bonds and 3-month Treasury bills, bears out this relation, particularly when real GDP growth is lagged a year to line up growth with the spread that predicts it.

## Yield Curve Spread and Lagged Real GDP Growth

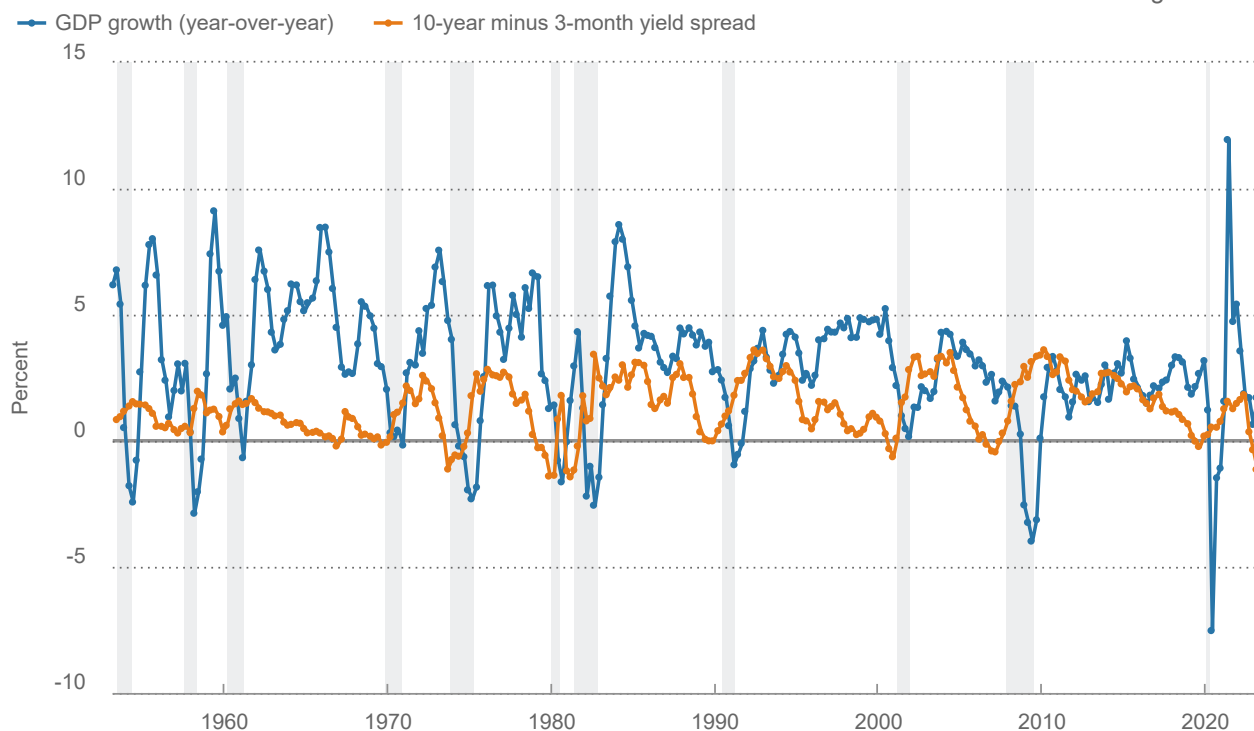


Source: Federal Reserve Board, Federal Reserve Bank of Cleveland, Haver Analytics. Note: Shaded bars indicate recessions.

## Yield Curve Spread and Real GDP Growth



Click/drag to zoom



Source: Federal Reserve Board, Federal Reserve Bank of Cleveland, Haver Analytics. Note: Shaded bars indicate recessions.

### Predicting GDP Growth

We use past values of the yield spread and GDP growth to project what real GDP will be in the future. We typically calculate and post the prediction for real GDP growth one year forward.

### Predicting the Probability of Recession

While we can use the yield curve to predict whether future GDP growth will be above or below average, it does not do so well in predicting an actual number, especially in the case of recessions. Alternatively, we can employ features of the yield curve to predict whether or not the economy will be in a recession at a given point in the future. Typically, we calculate and post the probability of recession one year forward.

Of course, it might not be advisable to take these numbers quite so literally, for two reasons. First, this probability is itself subject to error, as is the case with all statistical estimates. Second, other researchers have postulated that the underlying determinants of the yield spread today are materially different from the determinants that generated yield spreads during prior decades. (For a recent example, see "[Recession Probabilities](#).") Differences could arise from changes in international capital flows and inflation expectations, for example. The bottom line is that yield curves contain important information for business cycle analysis, but, like other indicators, should be interpreted with caution.