

# Fixed Income Strategy

IN-DEPTH ANALYSIS OF THE FIXED INCOME MARKETS

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## Power in the Yield Curve

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### Key takeaways

- » *In recent weeks, there has been increased focus on the yield curve from the Federal Reserve (Fed) and in the media.*
- » *Some market participants now are concerned that a near-term yield curve inversion could signal impending U.S. economic weakness ahead. The Treasury yield curve has been a powerful predictor of recession in past economic cycles.*

### What it may mean for investors

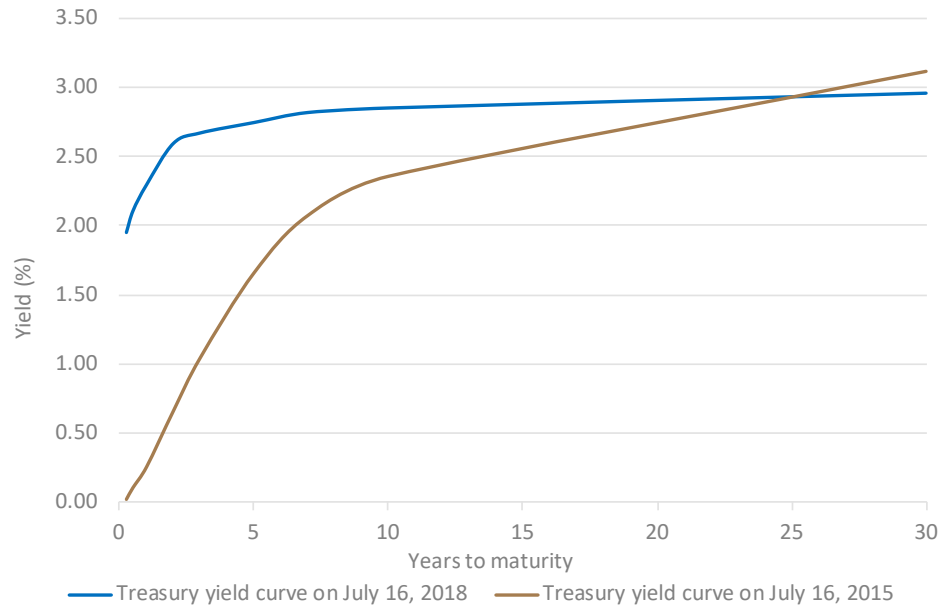
- » *We believe that the U.S. economy will remain healthy in the near term, and we expect the economic expansion to continue into 2019. Yet, we believe that the yield curve merits close monitoring.*

The yield curve is essentially the difference between shorter- and longer-term interest rates. While it is a simple concept that often is shown graphically, the yield curve captures investors' attention, because it has a story to tell. The yield curve has inverted (short-term interest rates moving above longer-term rates) before each of the past six recessions. Yield curve inversion is an important forecasting tool. Yet, in and of itself, it does not cause a recession. While the yield curve can help to diagnose a problem in the economy, it is not foolproof—as it does not pinpoint exact timing, or how fast conditions may change. It does not necessarily signal when investors should immediately reduce portfolio risk. In fact, equity markets sometimes can continue to perform quite well after a yield-curve inversion occurs. In this report, we explore the power of the Treasury yield curve to predict U.S. recessions, discuss what the yield curve means for investors' portfolios today, and outline what market participants should monitor going forward.

The Treasury yield curve has been flattening for more than three years. As this curve flattening continues, there is less breathing room for interest rates, and we face the possibility of yield curve inversion. Yield curve inversion can grab media headlines and becomes a focus for investors and Fed members alike. It is doing so today—as media headlines have highlighted the yield curve and Fed chair Jerome Powell recently discussed yield curve developments in his congressional comments.

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**Chart 1. Three years of curve flattening—U.S. Treasury yield curve in July 2018 and July 2015**



Sources: Bloomberg, Wells Fargo Investment Institute, July 16, 2018. Yields represent past performance. **Past performance is no guarantee of future results.** Yields fluctuate as market conditions change. A yield curve is a curve on a graph in which the yield of fixed-interest securities is plotted against the length of time they have to run to maturity.

## Yield curve inversion and history—predicting U.S. economic recessions

It is important to understand the ways in which yield curve inversion may be measured. The yield curve is composed of multiple points; some are far more important than others in offering a meaningful recessionary signal. Using just the Treasury yield curve, we looked at five different yield curve points and three different recessionary indicators. In this section, we explore each one and highlight which signals we believe are the most meaningful yield curve inversion signals for investors to watch today.

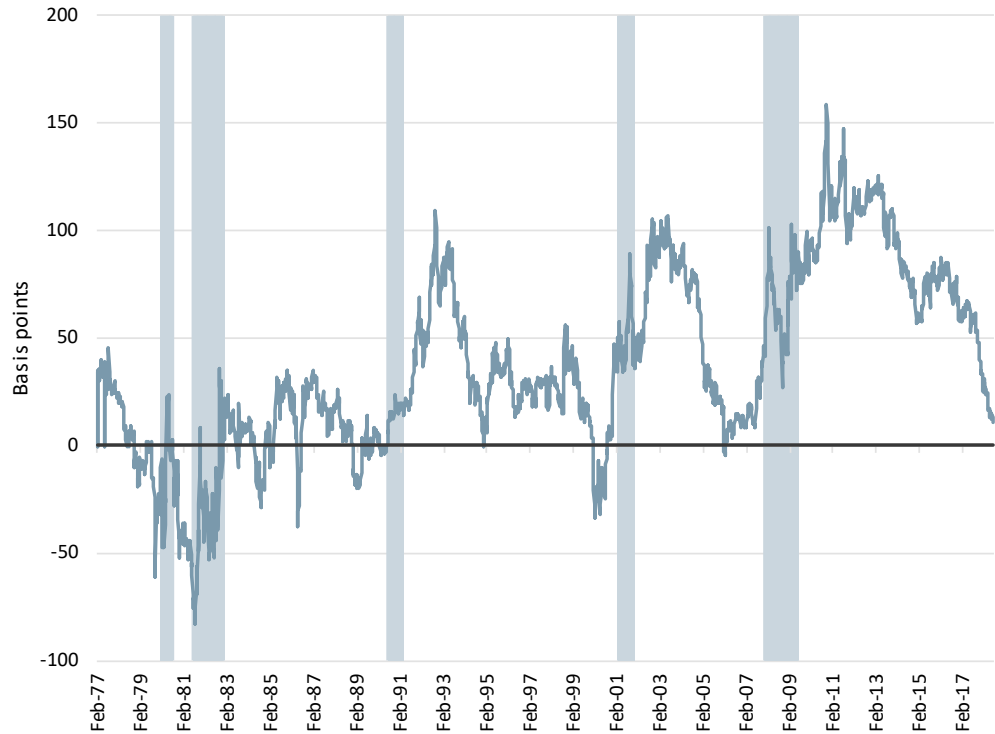
### What are the “best” measures of yield curve inversion?

As noted, we examined five key points on the Treasury yield curve. These included the 3-month, 1-year, 2-year, 7-year, 10-year, and 30-year maturities. While other Treasury maturities also could be examined, these selected points cover the entirety of the yield curve term structure and provide a lengthy historical data set. Using weekly data, we explored three yield curve indicators: a single week of curve inversion, four consecutive weeks of curve inversion, and a single week of at least 25 basis points of curve inversion.<sup>1</sup> For each indicator, we examined each of the past seven recessions for which data was available. The recessions are identified by the National Bureau of Economic Research, and they include: December 1969 to November 1970, November 1973 to March 1975, January 1980 to July 1980, July 1981 to November 1982, July 1990 to March 1991, March 2001 to November 2001, and December 2007 to June 2009.

<sup>1</sup> One hundred basis points equal 1%.

The yield curve inverted before each of the recessions studied. Yet, the indicators also provided a false negative for recession in the mid-1960s—when an inversion was followed by an economic slowdown, but not by an official recession. At that time, an official recession did not materialize until December 1969, which was more than three years after the initial inversion trigger.

**Chart 2. Thirty-year Treasury yield minus 10-year Treasury yield**



Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018. Shaded area represents timeframe of a U.S. economic recession. Yields represent past performance and fluctuate with market conditions. **Past performance is no guarantee of future results.** 100 basis points equals 1 percent.

**Table 1. Treasury yield curve inversion (30-year minus 10-year yield) and U.S. recessions**

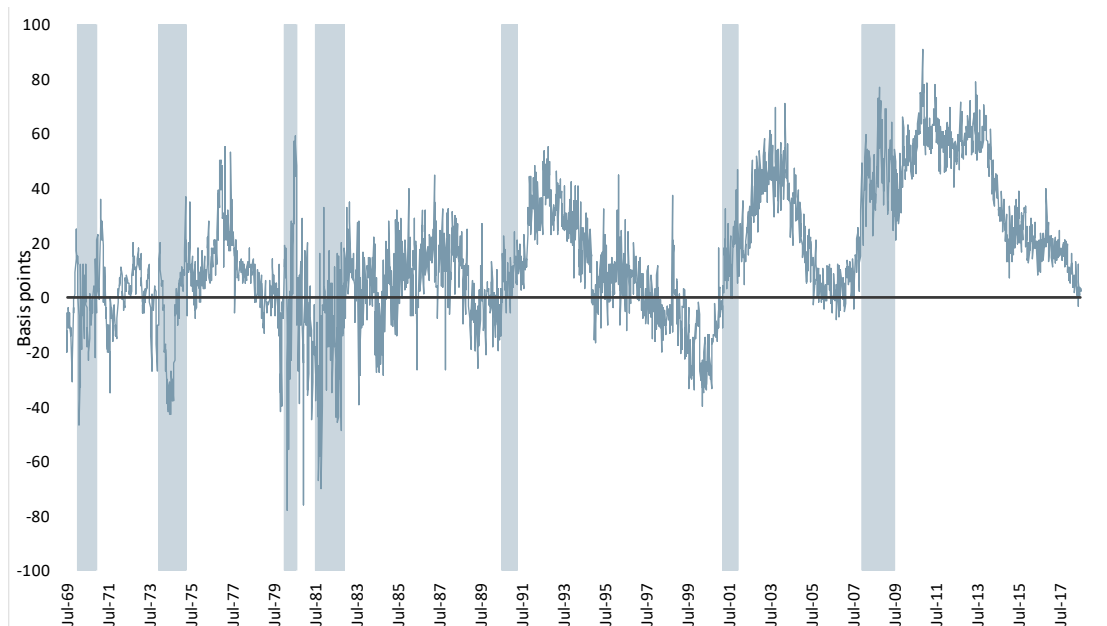
Indicator	Number of weeks before recession						
	Dec. 1969	Nov. 1973	Jan. 1980	Jul. 1981	Jul. 1990	Mar. 2001	Dec. 2007
One week of inversion	No data	No data	149	48	396	58	95
Four weeks of inversion	No data	No data	59	43	316	55	92
Inversion of 25 basis points	No data	No data	12	44	305	56	N/A

Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018.

Thirty year bonds did not become a staple of the Treasury issuance calendar until 1977. This limits the ability for market observers to analyze long-maturity yield curve inversion for early recessionary periods.

For any of the three indicators, we found that using the 30-year Treasury yield minus the 10-year Treasury yield provided an inconsistent recessionary signal. The signals turned negative as much as eight years before the July 1990 recession—and as few as three months before the January 1980 recession. While inversion in the long part of the Treasury yield curve may provide investors with information about the market’s long-term economic outlook, it is not a precise (or necessarily useful) tool for U.S. recession prediction.

**Chart 3. Ten-year Treasury yield minus 7-year Treasury yield**



Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018. Shaded area represents timeframe of a U.S. economic recession. Yields represent past performance and fluctuate with market conditions. **Past performance is no guarantee of future results.** 100 basis points equals 1 percent.

**Table 2. Treasury yield curve inversion (10-year minus 7-year yield) and U.S. recessions**

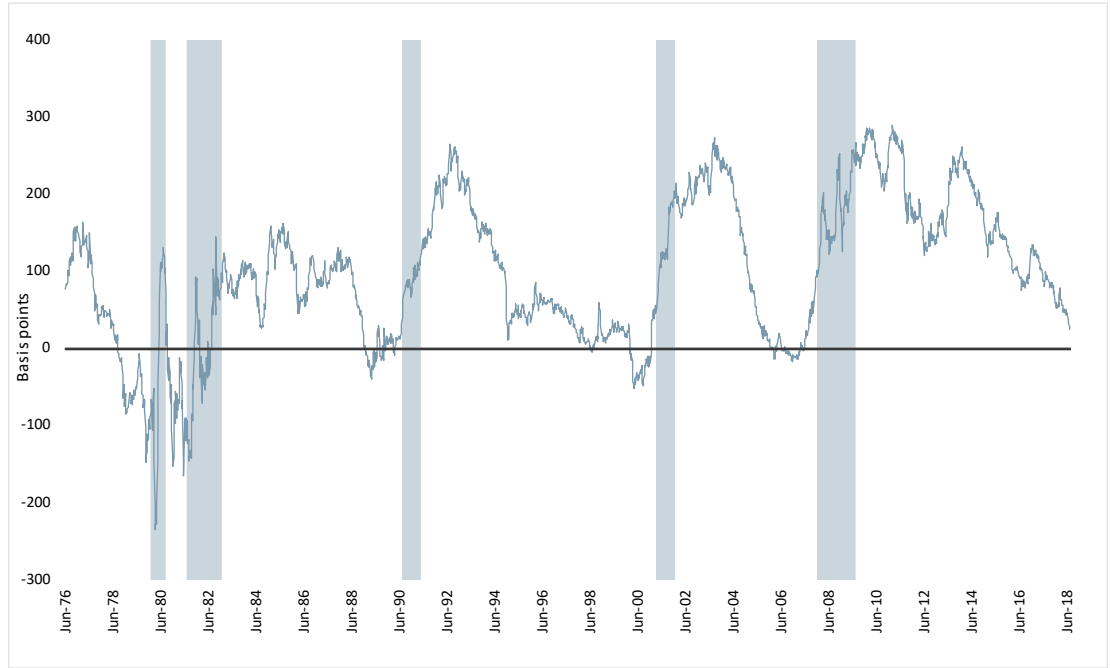
Indicator	Number of weeks before recession						
	Dec. 1969	Nov. 1973	Jan. 1980	Jul. 1981	Jul. 1990	Mar. 2001	Dec. 2007
One week of inversion	No data	134	70	45	369	327	121
Four weeks of inversion	No data	131	52	42	307	193	53
Inversion of 25 basis points	No data	N/A	9	3	360	81	N/A

Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018.

As of July 16, 2018, 10-year Treasury yields were only 3 basis points higher than 7-year Treasury yields. The financial media has picked up on the potential for the 10-to-7-year part of the yield curve to invert in the near term—and the headlines are making some investors cautious. In our analysis, we found yield curve inversion between these two Treasury maturities to be of little predictive value. In our view, investors should not be overly concerned if this portion of the yield curve does invert. The data we analyzed

showed that inversion of the yield curve between 7-year and 10-year Treasury securities is comparable to an inversion further out on the yield curve. That is, it often is not meaningful for U.S. recession prediction.

**Chart 4. Ten-year Treasury yield minus 2-year Treasury yield**



Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018. Shaded area represents timeframe of a U.S. economic recession. Yields represent past performance and fluctuate with market conditions. **Past performance is no guarantee of future results.** 100 basis points equals 1 percent.

**Table 3. Treasury yield curve inversion (10-year minus 2-year yield) and U.S. recessions**

Indicator	Number of weeks before recession						
	Dec. 1969	Nov. 1973	Jan. 1980	Jul. 1981	Jul. 1990	Mar. 2001	Dec. 2007
<b>One week of inversion</b>	No data	No data	72	42	81	142	101
<b>Four weeks of inversion</b>	No data	No data	69	39	75	139	93
<b>Inversion of 25 basis points</b>	No data	No data	62	41	69	50	31

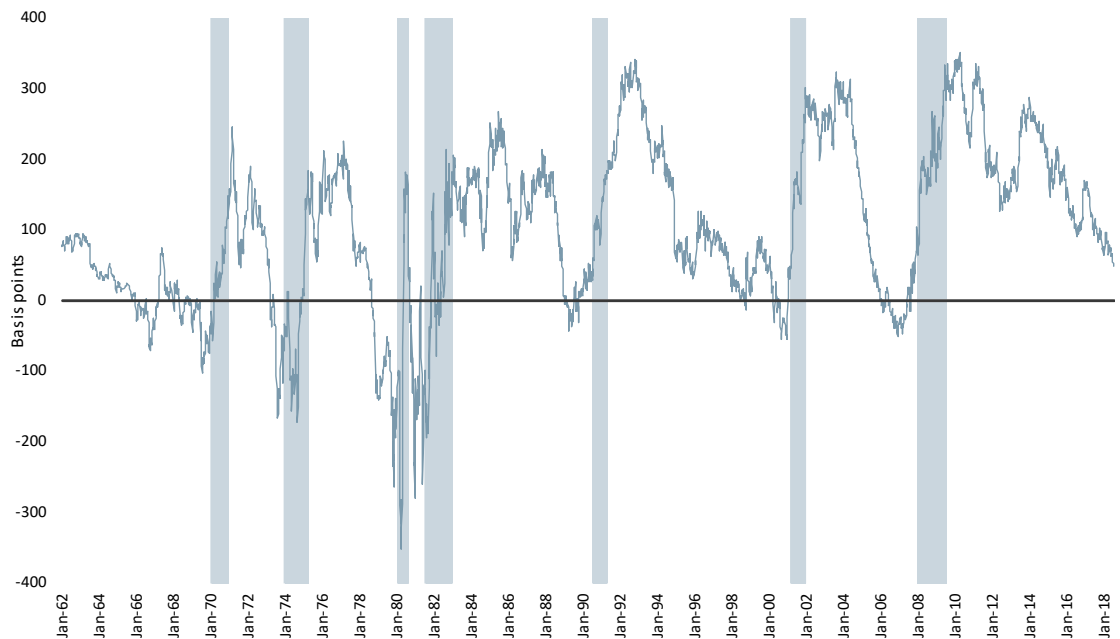
Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018.

Our data set for two-year Treasury yields begins in 1976, which limits our ability to analyze this data for pre-1970 recessions. This is a data point that we have been watching closely as the Treasury yield curve continues to flatten. As of July 16, 2018, the 10-year Treasury note offered 26 basis points of additional yield over 2-year Treasury securities. We expect the 10-to-2-year Treasury curve to remain positive over the near term, but if this portion of the Treasury yield curve were to invert, it may provide a more powerful message than inversion further out on the yield curve. Still, it is important to note that this indicator often turns negative well over a year before a U.S. recession strikes—and that it is most reliable when it inverts by at least 25 basis points.

The yield gap between the 10-year Treasury note and 2-year Treasury securities turned negative almost three years before the March 2001 recession. Not only did it turn negative, but it remained negative for four weeks. Using a negative 25-basis-point threshold as a trigger improved the forecast accuracy, but it also decreased the lead time of the indicator. The shortest amount of time between a 25-basis-point inversion in this indicator and a U.S. recession was 31 weeks (almost 8 months). That occurred before the Great Recession that began in December 2007.

The 10-year to 2-year yield curve is a useful indicator, but it is prone to giving a signal that may be too early for investors to meaningfully act. If we instead focus on a higher threshold (the 25-basis point-indicator), a magnitude of inversion that has occurred in every recession in which we have available data to analyze, this indicator proved more reliable.

**Chart 5. Ten-year Treasury yield minus 1-year Treasury yield**



Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018. Shaded area represents timeframe of a U.S. economic recession. Yields represent past performance and fluctuate with market conditions. **Past performance is no guarantee of future results.** 100 basis points equals 1 percent.

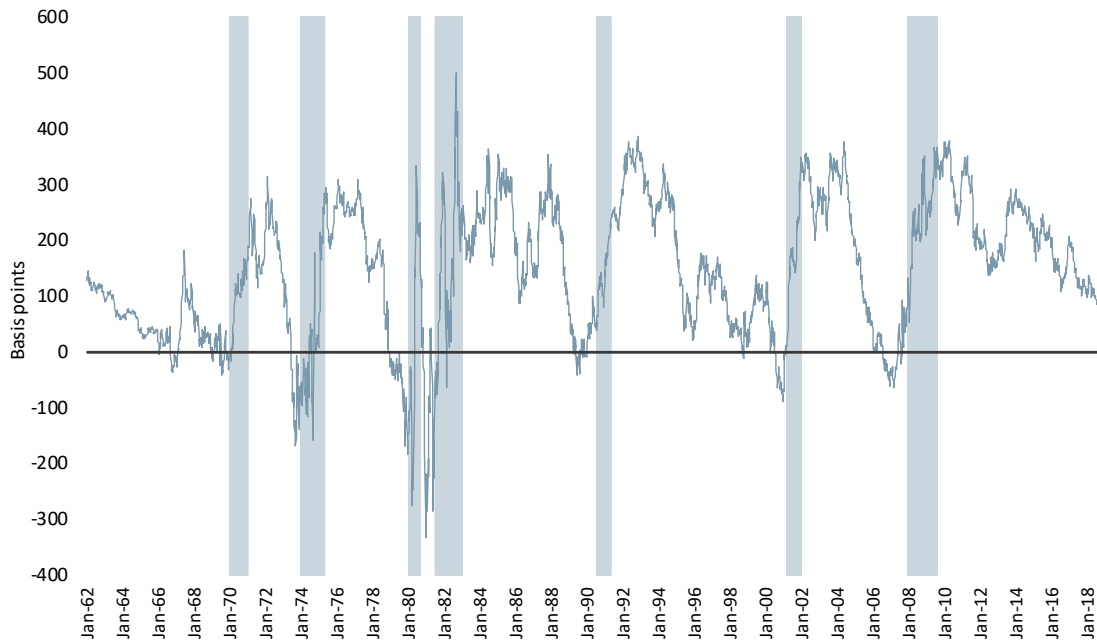
**Table 4. Treasury yield curve inversion (10-year minus 1-year yield) and U.S. recessions**

Indicator	Number of weeks before recession						
	Dec. 1969	Nov. 1973	Jan. 1980	Jul. 1981	Jul. 1990	Mar. 2001	Dec. 2007
<b>One week of inversion</b>	207	31	61	32	75	126	99
<b>Four weeks of inversion</b>	204	19	58	29	72	46	93
<b>Inversion of 25 basis points</b>	170	18	61	31	67	47	68

Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018.

Our analysis shows that a review of the yield gap between 10-year and 1-year Treasury securities improves on the ability to predict U.S. recessions (over what we see in data points further out on the yield curve). While 2.5 years before the March 2001 recession, this indicator did turn negative for one week, when we consider a four-week inversion trigger, we saw inversion between 19 and 93 weeks before each of the last six recessions with an average of 45 weeks, or just over 10 months before a U.S. recession officially started. Using a single 25-basis-point inversion as a trigger offered a similar outcome of predictability.

**Chart 6. Ten-year Treasury yield minus 3-month Treasury yield**



Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018. Shaded area represents timeframe of a U.S. economic recession. Yields represent past performance and fluctuate with market conditions. **Past performance is no guarantee of future results.** 100 basis points equals 1 percent.

**Table 5. Treasury yield curve inversion (10-year minus 3-month yield) and U.S. recessions**

Indicator	Number of weeks before recession						
	Dec. 1969	Nov. 1973	Jan. 1980	Jul. 1981	Jul. 1990	Mar. 2001	Dec. 2007
One week of inversion	203	22	57	35	58	129	98
Four weeks of inversion	166	19	54	32	55	31	69
Inversion of 25 basis points	167	20	54	34	56	30	68

Sources: Bloomberg, Wells Fargo Investment Institute, Federal Reserve Bank of St. Louis FRED database, July 16, 2018.

This indicator (10-year minus 3-month Treasury yields) showed a similar result as the 10-year minus 1-year indicator. Yet, the average of both the four negative weeks and 25-basis-points of magnitude indicators was about two months less than the 10-year minus 1-year indicator. Although this indicator is reliable, it provides a shorter lead time for investors to act.

## Inversion indicator conclusions

While a single point of yield curve inversion can be meaningful, it also can be unpredictable. Thus, we prefer either four consecutive weeks of curve inversion for a given indicator and/or at least 25 basis points of inversion before concluding that the yield curve has meaningfully inverted. Indicators that incorporated shorter maturities saw fewer false positives. Unfortunately, as we move to shorter maturities on the yield curve, the indicators also provide less lead time from when the indicator is triggered until the time U.S. recessionary conditions hit.

If we had to select just one yield curve indicator to predict an upcoming recession, we would favor the 10-year Treasury yield minus the 1-year Treasury yield. We would focus on four weeks of curve inversion as a trigger—as that indicator provides a bit more warning than using a 25 basis-point curve inversion threshold. Yet, either one is acceptable. We would note that the 10-year Treasury yield minus the 2-year yield does provide additional warning in many cases, but the potential for a false negative also is greater. The 10-to-2-year Treasury yield curve is worthy of attention, given its ability to provide additional warning, but we must be sure to confirm with other indicators.

In our view, simple yield curve flattening is not indicative of a pending recession. Instead, we believe that we must see inversion that is consistent with our highest conviction yield curve indicators.

## What does yield curve inversion mean for U.S. equity markets?

Now that we have identified our preferred yield curve inversion indicator, we will examine what it has meant for the equity market when we experienced this trigger. Specifically, we reviewed the total return performance of the S&P 500 Index both before and after changes in our preferred inversion trigger.

**Table 6. S&P 500 Index return in periods surrounding inversion of 10-year minus 1-year Treasury yield curve**

Date of inversion trigger	S&P 500 total return 12 months prior	S&P 500 total return 6 months prior	S&P 500 total return 6 months after	S&P 500 total return 12 months after
April 6, 1973	2.75%	1.10%	2.10%	-11.97%
September 15, 1978	13.37%	18.45%	-0.62%	10.31%
October 10, 1980	30.98%	28.93%	5.71%	-2.01%
March 10, 1989	15.15%	11.79%	21.06%	19.37%
April 7, 2000	14.21%	14.16%	-6.54%	-24.71%
February 23, 2006	9.44%	8.04%	1.50%	14.82%
<b>Average</b>	14.32%	13.75%	3.87%	0.97%
<b>Median</b>	13.79%	12.98%	1.80%	4.15%

Sources: Bloomberg, Wells Fargo Investment Institute, July 16, 2018.



**Table 7. Weeks from inversion trigger to S&P 500 Index peak**

Inversion trigger	S&P 500 peak post-inversion	Weeks from inversion trigger to S&P 500 peak
April 6, 1973	April 20, 1973	2
September 15, 1978	September 8, 1978	-1
October 10, 1980	November 28, 1980	7
March 10, 1989	July 13, 1990	70
April 7, 2000	September 1, 2000	21
February 24, 2006	October 12, 2007	85
<b>Average</b>		<b>31</b>

Sources: Bloomberg, Wells Fargo Investment Institute, July 16, 2018.

Clearly, past performance is not a guarantee of future results. Yet, we can draw some conclusions from the data in Tables 6 and 7. Historically, the S&P 500 Index has performed well in the months leading up to yield curve inversion. Post-inversion results are more mixed. While still remaining positive, the historical average S&P 500 Index return has declined following yield curve inversion (relative to the pre-inversion return). Still, we would point out that there are post-inversion periods in which we continued to experience strong S&P 500 Index performance. Over the past six recessions, the average peak in the S&P 500 Index occurred 31 months after we hit the inversion trigger. Market forces continue to change, and this time the market could react differently. Yet, history suggests there will be time for equity investors to react after the yield curve inverts.

### Is this time different?

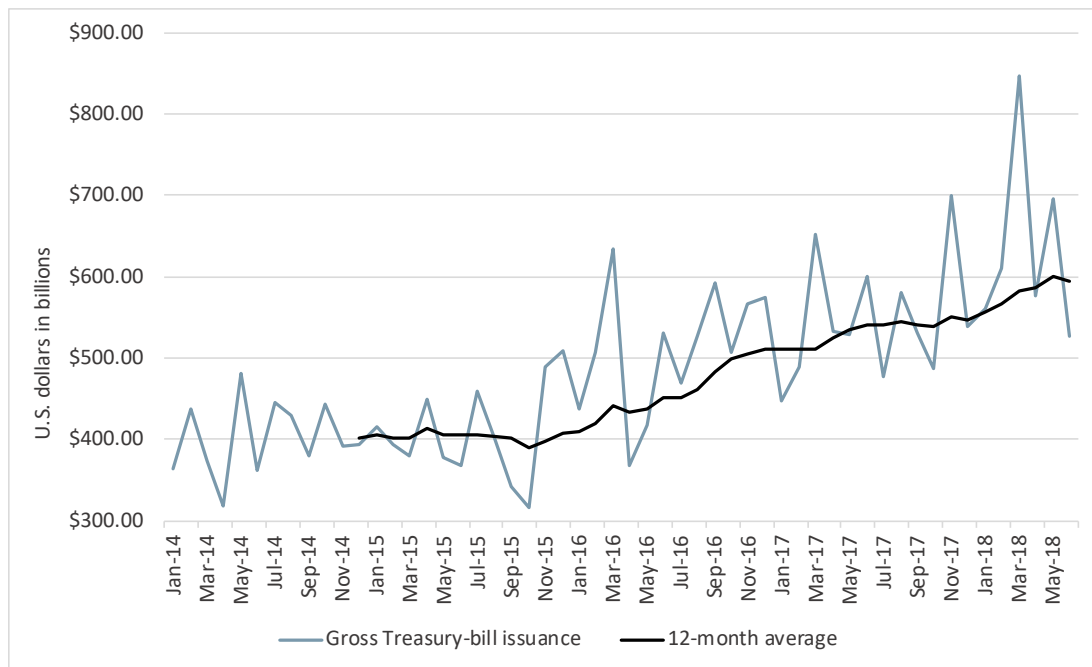
The monetary and fiscal response to the Great Recession of 2007-2009 was unprecedented, and it continues to influence financial markets to this day. An inflated Fed balance sheet, significant short-term debt issuance, and very low interest rates in the U.S. and global markets are notable factors. Could the yield curve indicator be different this time—proving to be less reliable than it has in each of the past six recessions?

Low interest rates often are highlighted as one of the primary factors that make this cycle different from the others that we have analyzed. It is true that rates are lower than at almost any other time when the U.S. economy was experiencing similar periods of very low unemployment and positive (and growing) economic expansion prospects. Since interest rates are so low, Fed rate increases may not slow the U.S. economy down as they have in the past—or so the argument goes. We do not concur with this view. In fact, we see this argument as mostly hope by those who believe this growth cycle can continue indefinitely in the face of increased short-term rates.

Another popular theory on why this time may be different is the high levels of U.S. Treasury issuance in short-term maturities. The Great Recession was met by significant fiscal spending to help cushion the economic blow for the U.S. economy. This spending significantly expanded the need to finance U.S. Treasury debt in the public markets.

Borrowing eventually stabilized, but earlier this year, the passage of tax-cut legislation led to a renewed need for federal debt issuance. Looking to keep overall costs down, the U.S. Treasury has chosen short-term debt markets for the bulk of this new debt. The theory is that the excess supply in short-term paper relative to longer-term maturities is leading to a supply/demand imbalance that is flattening the yield curve.

**Chart 7. Monthly issuance of U.S. Treasury bills**



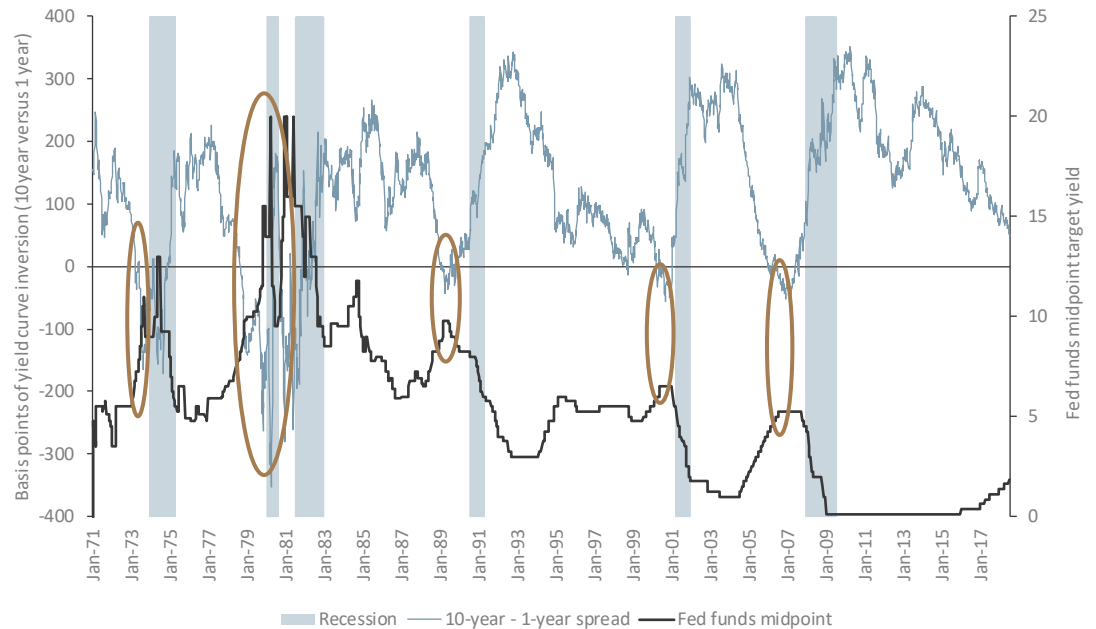
Source: SIFMA (Securities Industry and Financial Markets Association), July 16, 2018.

In a March 5, 2018, paper titled “Economic Forecasts with the Yield Curve,” San Francisco Fed researchers Michael Bauer and Thomas Mertens examined some of these arguments surrounding the predictive power of the yield curve. Their conclusion was: “While the hypotheses have some intuitive appeal, our analysis shows they are not substantiated by statistical analysis.” We do not recommend that investors assume this time will be different. Yield curve inversion has delivered a powerful message in recent cycles. In our view, it is a message that is unlikely to change through multiple cycles.

### It’s the Fed

Given the predictive power of the short end of the yield curve and the direct power that the Fed has over it, we can reasonably assume that the Fed has a significant part to play in yield curve inversion. There have been times when the Fed has had no choice but to continue to raise short-term interest rates, even if the yield curve inverted—as the damage of high inflation must be mitigated through slower growth, even if it inflicts a recession. While inflation is currently trending higher, we have reached the Fed’s inflation targets only recently, and most indicators suggest that a meaningful move above Fed inflation targets is very unlikely. Still, the Fed appears intent on continuing its current gradual path to higher short-term interest rates.

**Chart 7. The Fed helps to power the yield curve**



Sources: Bloomberg, Wells Fargo Investment Institute, July 16, 2018. Shaded area represents timeframe of a U.S. economic recession. Yields represent past performance and fluctuate with market conditions. **Past performance is no guarantee of future results.** 100 basis points equals 1 percent. The circles highlight the periods in which yield curve inversion was preceded by Fed rate hikes

The relationship between Fed tightening and curve inversion historically has been strong. The yield curve does not invert every time the Fed enters a monetary tightening cycle. Yet, history also shows that Fed tightening does appear to be a necessary component of curve inversion.

If the Fed continues to tighten, the yield curve is likely to continue to flatten. At some point, it is likely to invert. If this occurs without a corresponding increase in the inflation that the Fed is trying to quash, then we can say that if the curve does invert, the cause will be the Federal Open Market Committee’s (FOMC) action. If this time plays out like the past six in our study, any subsequent U.S. economic downturn would be the result of a monetary policy mistake. In our opinion, an escalation in the Fed’s path of rate hikes would increase the risk of a policy mistake—and if that did occur, it would show up in a flatter yield curve, or even an inverted one.

Some FOMC members appear concerned about possible yield curve inversion. For more than a year, St. Louis Fed president James Bullard has argued that the Fed should not aggressively increase rates so long as the U.S. economy remains in a low-growth, low-productivity, and low-inflation regime. Bullard’s view can be seen in the low “dot” in the FOMC economic projection report releases. Dallas Fed president Robert Kaplan and Atlanta Fed president Raphael Bostic also have expressed reservations about the flattening yield curve. In a May interview, Raphael Bostic stated that it was his job “to make sure that (curve inversion) doesn’t happen.”

Not all Fed officials seem to have the same concerns. They see curve flattening as a normal part of the monetary policy normalization process. In recent comments, Fed chair Jerome Powell stated that a flattening yield curve is worth watching, but that it is not a recession warning sign today.

In May, Fed governor Lael Brainard discussed the current low “term premium”<sup>2</sup> in the markets, by stating “A smaller term premium will make the yield curve flatter by lowering the long end of the curve. With the term premium today very low by historical standards, this may temper somewhat the conclusions that we can draw from a pattern that we have seen historically in periods with a higher term premium. With a very low term premium, any given amount of monetary policy tightening will lead to an inversion sooner, so that even a modest tightening that might not have led to an inversion in the past could do so today.” Essentially, Lael Brainard was arguing that this time *is* different.

### **Implications for investors**

We are skeptical that this time is different when it comes to yield curve inversion indicators. Such an assumption is a strong bet against history. It is not entirely clear exactly why an inverted yield curve has had such a strong ability to predict a recession, but the evidence clearly suggests that it does. A flattening yield curve likely impacts risk taking and slows lending, but it does not cause a recession (in and of itself). The Treasury yield curve has proven to be a meaningful indicator throughout history—a history that covers many different types of economic and market regimes. This time could be different, but the odds suggest that the yield curve will act the same in this cycle as it has in the past, and that it merits monitoring.

If investors want to select just one yield curve indicator to watch, we recommend the gap between the 10-year Treasury yield and the 1-year Treasury yield. If this indicator turns negative for at least four weeks or the curve inverts by more than 25 basis points, we believe that it would be an indication that a recession is likely within the next 18 months. Focusing on other indicators could provide an early warning, but acting too early could lead to missing out on potential late-cycle gains in risk assets. Yet acting too late could be a missed opportunity to pare tactical portfolio risk. The data suggest that investors have time to act once the yield curve does invert; we stress the important of patience and waiting for a conclusive signal before taking meaningful portfolio actions.

For now, the yield curve remains positively sloped and our interest-rate outlook suggests that a positive slope will remain well into 2019. That is, we believe that conditions still remain favorable for risk assets. Investors should be watchful, informed, and vigilant. Yet, they also can be reassured that the expansion could continue well into 2019—so says the yield curve.

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<sup>2</sup> The term premium in fixed-income markets reflects the higher yields often paid for longer-maturity securities to reflect greater uncertainty for longer-term periods than for shorter-term periods.

## Risks Considerations

Investments in fixed-income securities are subject to interest rate, credit/default, liquidity, inflation and other risks. Bond prices fluctuate inversely to changes in interest rates. Therefore, a general rise in interest rates can result in the decline in the bond's price. Credit risk is the risk that an issuer will default on payments of interest and principal. This risk is higher when investing in high yield bonds, also known as junk bonds, which have lower ratings and are subject to greater volatility. If sold prior to maturity, fixed income securities are subject to market risk. All fixed income investments may be worth less than their original cost upon redemption or maturity. Although Treasuries are considered free from credit risk they are subject to other types of risks. These risks include interest rate risk, which may cause the underlying value of the bond to fluctuate. Investing in foreign securities presents certain risks not associated with domestic investments, such as currency fluctuation, political and economic instability, and different accounting standards. This may result in greater share price volatility. These risks are heightened in emerging markets. Sovereign debt is generally a riskier investment when it comes from a developing country and tends to be a less risky investment when it comes from a developed country. The stability of the issuing government is an important factor to consider, when assessing the risk of investing in sovereign debt, and sovereign credit ratings help investors weigh this risk.

## Definitions

An index is unmanaged and not available for direct investment.

**S&P 500 Index** is a market capitalization-weighted index composed of 500 widely held common stocks that is generally considered representative of the US stock market.

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