

July 29, 2019

## The Yield Curve and Recession Risk: Is This Time Different?

*I do think you have to look at the yield curve...If the yield curve inverts as it has...and if it persists for some time, that's obviously something I would definitely take seriously.*

-Vice Chair Clarida

Inversions of the yield curve have been an excellent, indeed nearly faultless, predictor of recessions. That is why, as Clarida indicated in the quote above, he does (and presumably other policymakers should) pay careful attention to the current inversion—albeit a fairly small and recent one—in making decisions about monetary policy.

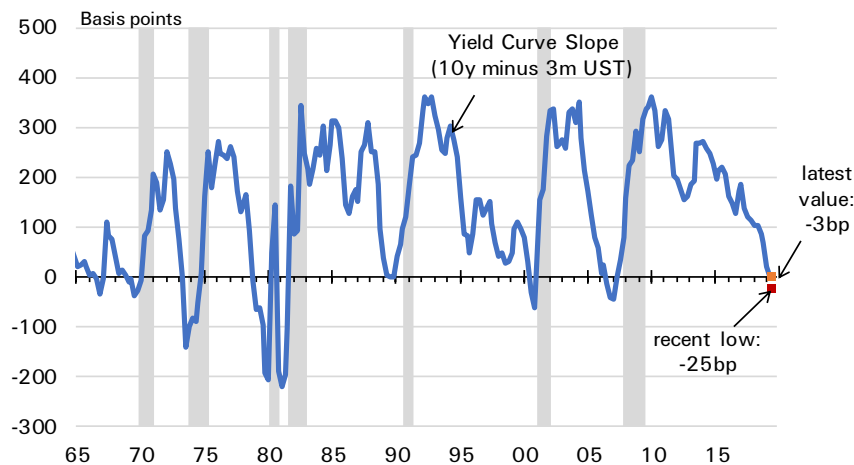
An inverted yield curve is a reliable predictor of recessions because it is a marker for an aggressive tightening cycle, which is appreciated to be at least a contributor to a recession, and often the dominant factor. However, some have said that “this time is different,” specifically that an inversion of the yield curve today is a less reliable predictor of recessions than in the past. Here we provide some evidence that supports that.

But, in the end, we conclude that an inversion of the yield curve, albeit adjusted to reflect these differences, remains a strong signal about the probability of a recession and should inform policy decisions.

### The Yield Curve and Recession Risk

In Figure 1 we show the yield curve slope—measured as the difference between the ten-year Treasury yield and three-month Treasury bill rate—on a quarterly basis, shaded for recessions. This figure confirms the predictive power of an inversion: An inversion almost always precedes recessions—one false positive.

**Figure 1. The Yield Curve and Recessions**



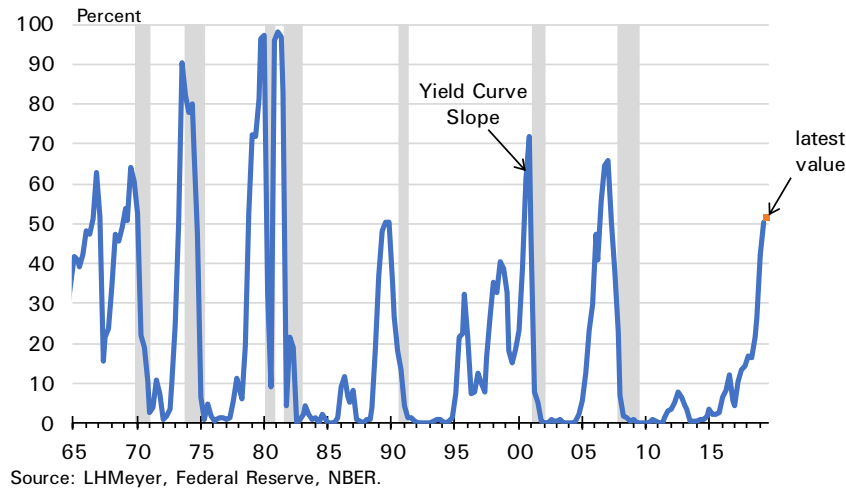
Source: LHMeyer, Federal Reserve, NBER.

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In Figure 2, we can see why Clarida may be paying close attention to the yield curve today. The yield curve has sharply narrowed in recent quarters. The inversion has been as large as -25 basis points at points recently, bringing the average slope in Q2 to zero, and it remains slightly inverted. In our initial probit regression, with the yield slope as the only independent variable, the estimated probability of a recession over the next year has increased sharply over recent quarters—from below 20% to about 50% in Q2.

**Figure 2. Estimated Probability of Recession Over the Next Year**



Still, such an estimated recession probability is lower than the probabilities estimated before the previous two recessions (both above 60%) and far below the estimated probabilities before the three recessions between the mid-70s and mid-80s (all above 80%).

On the other hand, the three further hikes in the funds rate that participants contemplated in December last year arguably would have pushed the probit-based probability to at least the 65% level, threatening a recession this year. If the yield curve narrowed, say, another 50 basis points, the estimated probability also would have increased to close to about 65%.

### Two Phases of the Narrowing in the Yield Curve

The flattening of the yield curve during tightening cycles is a well-established regularity, reflecting that short-term rates move more than long-term rates, in turn reflecting in part that long-term rates already incorporate expectations of further rate hikes and those are a relatively smaller part of the total period of expected short-term rates covered by the term of the security. This was the source of the narrowing of the yield curve slope from early 2017 through about December last year.

But that rise in the funds rate is not what inverted the yield curve recently. Rather, it was a decline in long-term rates relative to short-term rates that culminated in the inversion. That development appears to have reflected increasing pessimism in the markets about the economic outlook and expectations that, as a result, the FOMC would begin to ease, indeed by 100 basis points over the next year. And it highlights that policy tightening isn't always the dominant source of recession risk. But still, whatever the source of a yield curve inversion, historically an inversion has been a reliable signal of a recession over the next year.

### But This Time is Different

We identify two reasons why the yield curve may be a less reliable predictor of recessions today. First, the steady decline in the term premium means that it takes a much less aggressive tightening to invert the yield curve. Indeed, if the term premium were zero—and it has been averaging near zero or even lower for quite

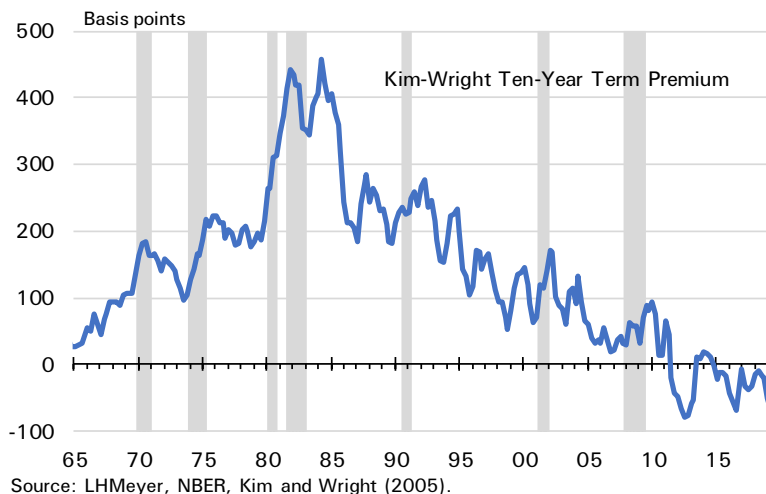
some time—the yield curve would be inverted about half the time. An inversion would therefore no longer as reliably identify a sufficiently aggressive tightening to precipitate a recession.

Second, an inversion of the yield curve has typically been accompanied by a move of monetary policy into restrictive territory. In this tightening cycle, the FOMC has stopped short of doing so.

### The Decline in the Term Premium

The term premium has, of course, generally been positive historically, accounting for the upward slope in the yield curve. The positive term premium reflects the compensation that investors have historically demanded for taking duration risk, principally inflation risk. As seen in Figure 3, the Kim-Wright measure of the term premium has declined over time from over 400 basis points in the period following the high and volatile inflation in the late 1970s to an average below 50 basis points before the last recession, when inflation had declined toward and then became more stable around the 2% objective. Since the recession, it's usually been negative. It last turned positive in late 2018, but has since declined sharply once again. It was estimated to be nearly -90 basis points at the end of Q2. The negative term premium implies that a yield curve inversion is an even less reliable signal than otherwise.

**Figure 3. The Long Decline in the Term Premium**



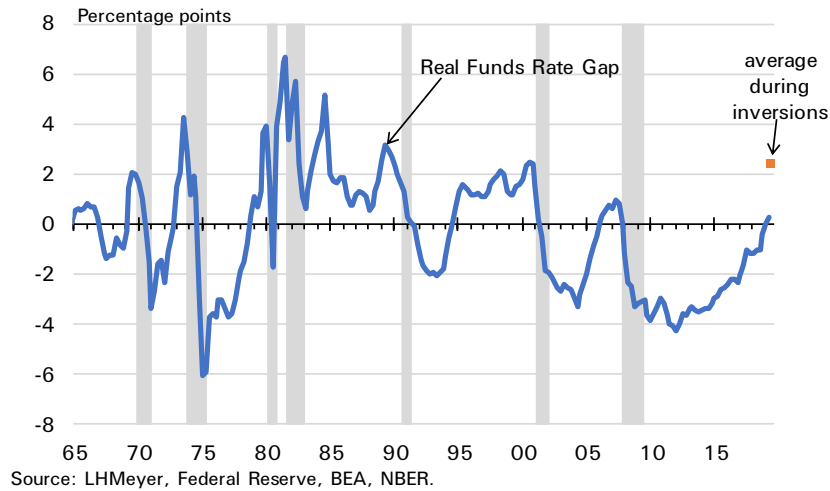
### The Rate Gap in This Tightening Cycle

Another way this time is different is that the FOMC has not moved into restrictive territory during the tightening cycle. The funds rate has been raised only to the bottom of the broad range of estimates of the neutral rate, taken as the range of estimates by FOMC participants.

We define the “rate gap” as the difference between the real funds rate, calculated by subtracting four-quarter core PCE inflation, and its estimated neutral level at a given time. In an earlier commentary, we showed that the rate gap is also an excellent predictor of recessions ([link](#)).

We show this in Figure 4, where we plot the path of the rate gap shaded for recessions. We will explain the meaning and significance of the dot below.

Figure 4. The Real Funds Rate Gap



We conclude that the rate gap, like the yield curve, is quite a good predictor of recessions. That shouldn't be surprising, because the logic of why that is the case is the same as for the yield curve. The marker for a funds rate tightening cycle that has been followed by a recession is, with respect to the yield curve slope, an inversion; or, with respect to the rate gap, a move of policy into restrictive territory.

#### Adjusting for the Term Premium and the Rate Gap

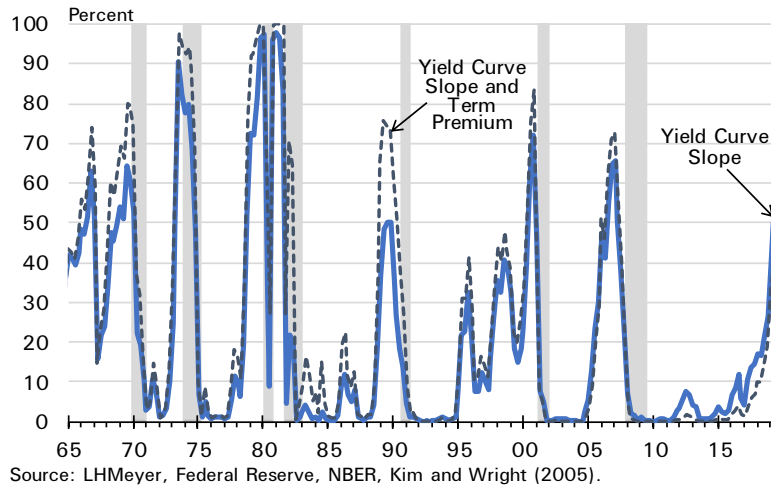
Here we use probit regressions to test the propositions that (1) a decline in the term premium has mitigated the recession risk implied by an inversion of the yield curve and (2) the idea that, because the FOMC has not moved into restrictive territory as the yield curve has inverted, the current inversion is associated with a lower probability of recession.

#### Adjusting for the Decline in the Term Premium

To test the first proposition, we first estimate a probit regression with both the yield curve slope and the Kim-Wright measure of the term premium. If the first proposition is supported by this regression, the term premium should enter significantly and with a negative sign. That is the case.

Next, we examine the importance of adjusting for the decline in the term premium by comparing the probability of recession implied by the yield curve slope accounting for the term premium and without doing so. We see in Figure 5 that, as expected, the estimated probability of recession from the probit regression that includes the term premium is lower than that without the term premium. Adjusting for the decline in the term premium reduces the estimated probability of recession from about 50% to about 40%.

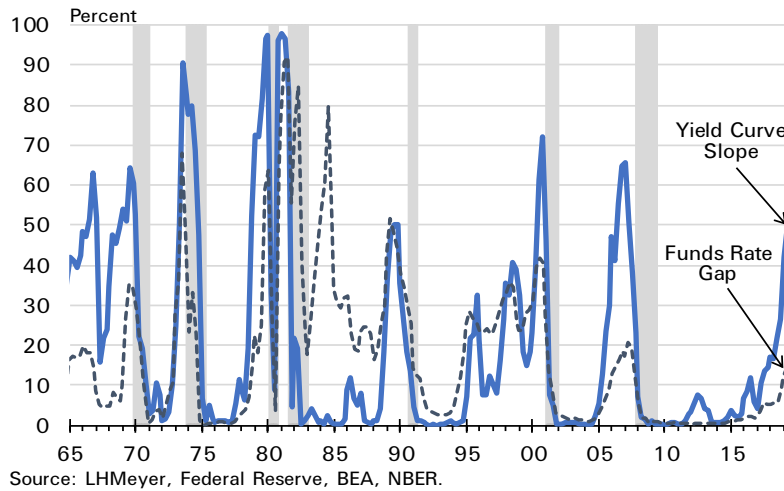
**Figure 5. The Role of the Term Premium**



Adjusting for the Rate Gap

The significance of the fact that the rate gap has not moved into restrictive territory in this tightening cycle is very clear in Figure 6, where we compare the estimated recession probabilities from probit models using either the yield curve slope or funds rate gap as an independent variable. The estimated probability based on the yield curve alone has shot up materially in recent quarters. The estimated probability with respect to the rate gap has remained low.

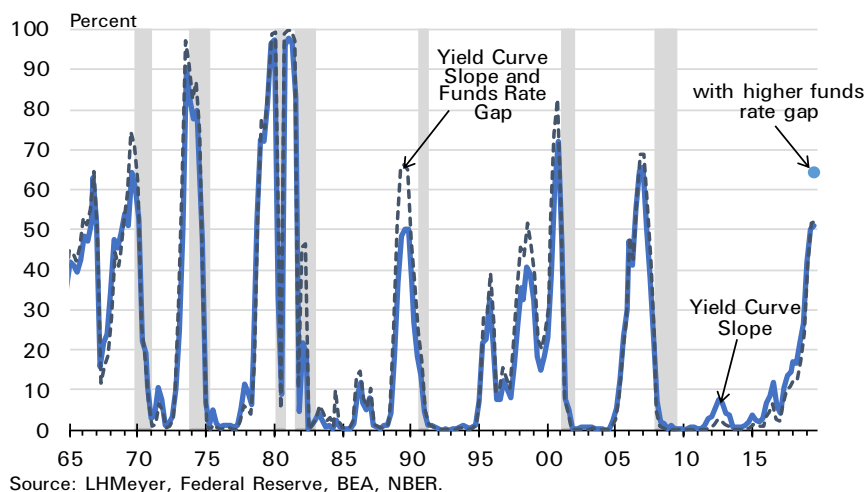
**Figure 6. Recession Probabilities Implied by the Yield Curve Slope and Rate Gap**



Assessing the Importance of the Rate Gap

In Figure 7, we compare the probability of recession from a probit model including just the yield curve slope and one that includes both the yield curve slope and the rate gap. The rate gap is zero today, so it does not reinforce the effect of the yield curve. But we now think that is the point: The rate gap usually does reinforce the effect of the inversion. This time it has not.

**Figure 7. The Importance of the Rate Gap**



To test that we compute the rate gap at the time of each inversion in the sample period. In all cases, including before the last recession, the rate gap was positive and the overall average was 239 basis points. Using that “normal” rate gap at inversion, the probability rises to about 65%, near a threshold consistent with signaling a recession—the higher dot shown in the previous chart.

To reinforce this point, consider what would have happened to the probability of recession if the FOMC had raised the funds rate by 75 basis points, in line with the December rate projections. The rate gap would have gone well into restrictive territory and, we suspect, in line with the historical regularity, that the yield curve would have inverted far more. We conservatively assume the yield curve slope would have fallen by an additional 25 basis points. Then the probability of recession would have increased to about 65%, near the threshold for a recession call.

### The Evolution of Recession Risk Implied by the Yield Curve

Here we speculate on how the yield curve and rate gap might evolve this year and what that will mean for these predicted recession probabilities. We assume that the FOMC will lower the funds rate by 50 basis points this year, to well into accommodative territory. We don’t assume that long-term rates will fall in this case, as markets already expect at least this much easing. The estimated probability of recession would fall to around 30%, further below the threshold for a recession call. In this case, the estimated probability of a recession over the next year, based on these models, has peaked and will recede going forward.

### The Bottom Line

- The yield curve has been a reliable predictor of recessions in the past.
- However, the recent inversion is not large enough to be a signal of a recession over the next year, based on our probit regressions.
- In addition, this time is different. One reason is that the term premium is much lower than it was before previous recessions, which means that there doesn’t have to be as severe a tightening cycle to invert the yield curve compared to the past.
- A second difference is that, unlike before past recessions, the FOMC has not gone into restrictive territory.
- Had the FOMC moved into restrictive territory as much as it did on average during previous inversions, the estimated probability of recession would have increased to about 65%, consistent with levels before some earlier recessions.
- Had the FOMC raised rates an additional three times, as was the median projection in December, our probit models would likely have signaled a recession over the next year.
- If the FOMC now lowers the funds rate, as it will surely do this week, the estimated probability of recessions has already peaked and will fall further below levels that preceded past recessions.

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