Yield Curve Inversion: Evaluation and Implications

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The recent inversion in the Treasury yield curve is drawing an enormous amount of attention in the global financial markets. The inverted spreads between short-term and long-term Treasuries are regarded as the most predictable indicator of a recession. The problem is that the recent inversion came amid when the U.S. economy is going through the longest expansion in history. Controversies are mounting over whether the inversion's predictability weakens or not. Some point to the inversion's weakening predictability in the post-crisis era, arguing that the recent inversion could not be a signal for an impending recession.

However, this yield curve inversion is worthy of attention because this is the first post-crisis inversion reflecting expectations for policy rate cuts. The escalating trade war between the U.S. and China and the resultant concerns about a potential slowdown appear to be behind the current long-short inversion. If the inverted yield curve prolongs further, this could be viewed as growing market concerns about a slowdown, which requires more caution by market participants as well as central banks.

The inverted yield curve in U.S. Treasury securities has been recently drawing massive attention in the global financial markets. An inverted yield curve - a phenomenon where the long-term interest rate becomes lower than the short-term interest rate - is one of the most accurate predictor, among other major financial market and economic indicators, for an economic recession. In the U.S., the long-short inversion occurred before every economic recession since 1960.

* All opinions expressed in this paper represent the author's personal views and thus should not be interpreted as Korea Capital Market Institute's official position.

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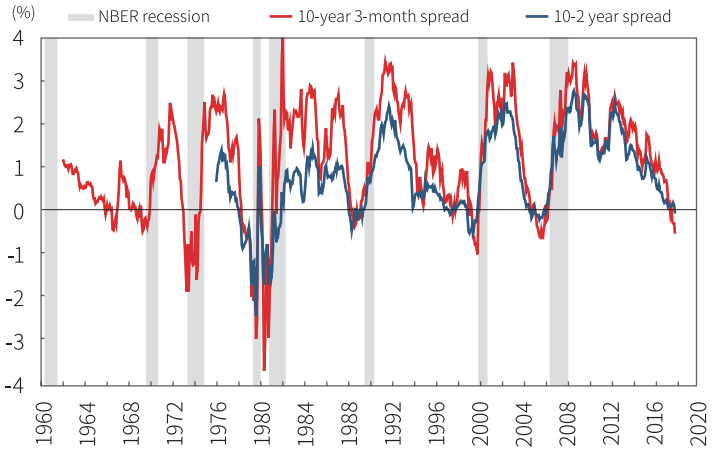
As the inversion hit all the major spreads including the 10-year and 2-year spread in August 2019 for the first time after 2007, concerns and controversies have been mounting over an impending recession in the U.S. whose economy is on a solid growth track. Under the circumstances, this article examines what's behind the recent long-short inversion and discusses the implications.

Yield curve inversion and economic cycles

Figure 1 shows economic cycles and Treasury spreads between 10-year and 3-month, and 10-year and 2-year, a widely-watched gauge. First of all, the U.S. experienced seven recessions after 1962, every one of which was preceded by a yield curve inversion. And except for one recession in the mid-1960s,[1] every inversion of the Treasury yield curve on 10-year and 3-month was followed by a recession after 5-month to 23-month.[2]

Figure 1. U.S. Treasury spreads and economic cycles



Note: 1) The data indicate the minimum of daily differences between 10-year and 3-year Treasury yields of each month between January 1962 and August 2019.
2) The gray shades indicate the recession defined by NBER.
Source: Bloomberg.

With each cycle of inversion exhibiting a similar pattern, the financial markets tend to focus on the 10-year and 2-year Treasury spread, whereas central banks' monitoring focuses on the 3-month and 10-year spread (Bauer and Mertens, 2018b). The yield curve on 3-month and 10-year, and on 2-month and 10-year inverted in March and August 2019, respectively.

1) GDP growth slowed after the 1966 inversion, but the economy did not dip into the recession.

2) According to Bauer and Mertens (2018a), a total of nine recessions after 1950 were preceded by the inverted yield curve on 10-yeear and 1-year Treasuries with the lag between 6-month and 24-month. In Gerald and Stuart (2018), the yield curve is found to be significant as a predictive indicator for a recession for a period between 1857 and 1913.

Interestingly, it's still not clear why a yield curve inversion predicts a recession. This causes controversies over the predictability of the recent yield curve inversion which came amid the longest expansion in U.S. history. The followings explore the mechanism of a yield curve inversion, and provides a recap of recent discussion.

Theory on interest rate determination says that a long-term interest rate is the sum of the term premium and the average of future short-term interest rates expected at present. The latter reflects market expectations for the path of future monetary policy, while the former means the reward for the risk arising from holding long-term securities instead of short-term ones. Although the term premium is determined by various factors, inflation risk is traditionally regarded as the most important determinant among others. More recently, however, inflation tends to head downward towards a stable level, which makes other factors – quantitative easing, appetite for safe assets, and other factors affecting supply and demand in the debt capital market – more significant.

According to the aforementioned rationale, there are two conceptual paths that could cause a yield curve inversion. Among others, expectations for a future economic slowdown and the subsequent fall in the policy rate could lower long-term interest rates, and in the end cause an inversion.[3] On the other hand, the yield curve may invert even without expectations for another policy rate cut if the term premium declines or dips below zero.

Some find that the yield curve inversion occurred because post-crisis quantitative easing by major central banks and population aging pushed up demand for longer-term Treasury securities, causing the term premium to tumble to negative territory (Haltom, Wissuchek and Wolman, 2018). It is argued that the term premium enfeebles the inversion's predictability for a recession as compared to the past, and therefore, that it's hard to see the recent inversion as a signal for an impending recession.[4] More recently, Bauer and Mertens (2018b) and Johansson and Meldrum (2018) show that the low term premium itself has no impact on the inversion's predictability for a recession. The yield curve inversion, they argue, is reflective of market reactions to the increased recession risk, regardless of whether the lower long-term interest rate results from either lower expectations for future short-term interest rates or the lower term premium.

3) This is because long-term interest rates reflect the future path of short term interest rate (i.e., policy rate), while the current short-term interest rates are determined by the monetary policy at present. Financial markets' focus on the spread between 10-year and 2-year Treasuries is because the 2-year Treasury rate among others is known to be the most sensitive to the current monetary policy.

4) Former Fed Chair Janet Yellen, Interview, FOX Business (August 14, 2019).

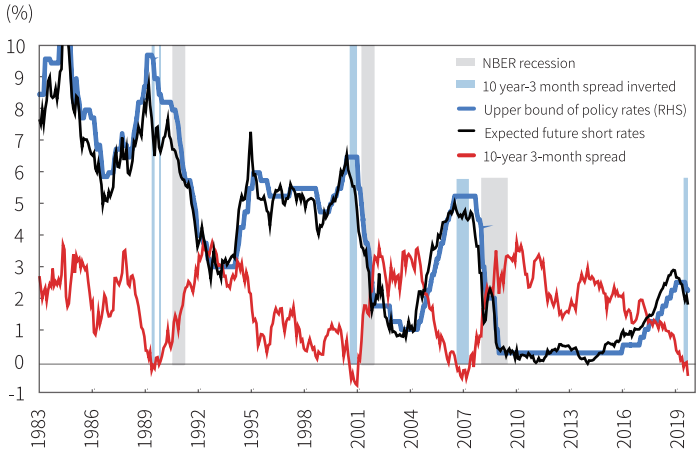
One of the reasons why the inversion's predictability for a recession is still uncertain could be that market's concerns about a recession not only affect the path of short-term interest rates, but also the term premium. A recession forecast usually boosts demand for long-term government bonds, in which case long-term interest rates fall via the term premium, not via the path of short-term interest rates. In particular, the 10-year U.S. Treasury security is one of the financial assets sought after the most by investors for hedging the risk of a global economic slowdown.[5] Although quantitative easing and other factors evidently help bring down the overall term premium level, it's still uncertain whether they are the direct cause to the inversion or not. It's worth noting that the correlation between the inverted yield curve and the recession could be effective only when the inversion occurs.

Review of the recent Treasury yield curve inversion

To recap, what's important in the correlation between a yield curve inversion and a recession is whether the market actually expects an economic slowdown and policy rate cuts. Figure 2 illustrates market expectations for future policy interest rates and the 3-month and 10-year Treasury spreads since 1983.

The three recessions analyzed occurred under the same context in four ways: 1) it was when the policy rate hike ended; 2) market expectations for a future policy rate cut caused an inversion; 3) the policy interest rate actually fell; and 4) it was then the economy actually dipped into a recession.

Figure 2. Yield curve inversion and expectations for monetary policy



Note: The data are as of the end of every month between January 1983 and August 2019.
Source: Adrian, Crump and Moench (2013), Bloomberg.

5) Harvey, C., 2019, The Yield Curve is Triggered. Does a Recession Loom on the Horizon? Duke Today.

This time, the spread between 3-month and 10-month Treasuries inverted in May 2019. This round of inversion seems to share the same context to that of the aforementioned periods: 1) the Fed stopped hiking the policy interest rate in December 2018; 2) the inversion occurred when the market began reflecting the cut in the policy interest rate in May; and 3) the policy interest rate actually fell in July. In a word, what happened so far appears to be a déjà vu of the past cycle, from expectations for the policy rate cut to an inversion and finally to the policy rate cut.

What's important here, however, is that the trigger of market expectations for the policy interest rate cut was the escalating trade conflict between the U.S. and China. When the two countries' trade war lingered to expand into to non-tariff areas in May, the market then began reflecting the cut in the policy interest rate.[6] In the end, it seems fair to conclude that the recent inversion reflects a possible economic slowdown triggered by the trade conflict between the U.S. and China. The yield curve on 10-year and 2-year Treasuries inverted in August 2019, and the deteriorating U.S.-China trade war is viewed as a major factor in play here.[7]

Closing and implications

Although some argue the declining term premium dampens the inversion's predictability for a recession, it's worth giving attention to the recent inversion given that the phenomenon is the first post-crisis incident reflecting the policy interest rate cut. On the other hand, the inversion of the yield curve on 10-year and 3-month Treasuries prolongs, whereas the 2- and 10-year spread inverted by a narrow margin in August for the first time. Rather than a strong signal for a recession, this seems to be the beginning of the market reflecting concerns about a potential slowdown.

More importantly, the yield curve inversion has a high correlation with a recession after a lag, but does not say much about the severity of a recession. Given that the main cause of the recent inversion lies in the deteriorating trade conflict between the U.S. and China, the recession could be mild or lagging for quite some time depending on how the trade dispute pans out in the future.

6) In general, federal funds futures are used to gauge market expectations for the future course of monetary policy. However, they reflect not only market expectations for the policy rate but also the forward term premium. This creates a bias as large as the term premium when using federal funds futures to measure market expectations for monetary policy (Piazzesi and Swanson, 2008). Indeed, federal funds futures have reflected the possibility of the policy rate cut since the beginning of 2019.

7) PIMCO, 2019, Yield Curve Inversion: Markets Are Correct to Price in Higher Recession Risk, PIMCO Blog.

For the time being, the 10-year and 2-year spread is expected to invert or revert back and forth. However, if the inversion prolongs as does the 10-year and 3-month spread, this could be regarded as growing market concerns about a recession. And this requires close monitoring and caution by market participants as well as central banks.

References

Adrian, T., Crump, R., Moench, E., 2013, Pricing term structure with linear regression, *Journal of Financial Economics* 110(1), 110-138.

Bauer, M.D., Mertens, T.M., 2018a, Economic forecasts with the yield curve, *FRB San Francisco Economic Letter* 2018-7.

Bauer, M.D., Mertens, T.M., 2018b, Information in the yield curve about future recessions, *FRB San Francisco Economic Letter* 2018-20.

Gerald, S., Stuart, R., 2018, The slope of the term structure and recession: The pre-Fed evidence, 1857-1913, CEPR Discussion Paper 13013.

Haltom, R., Wissuchek, E., Wolman, A.L., 2018, Have yield curve inversions become more likely? *FRB Richmond Economic Brief EB*18-12.

Johansson, P., Meldrum, A., 2018, Predicting recession probabilities using the slope of the yield curve, FEDS Notes.

Piazzesi, M., Swanson, E.T., 2008, Futures prices as risk-adjusted forecasts of monetary policy, *Journal of Monetary Economics* 55, 677-691.