

THE VIEW

Economic Research

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THE SHAPE OF THE U.S. YIELD CURVE: A CAUTIONARY TALE

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EXECUTIVE SUMMARY



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- In March 2019, the spread between the long and short end of the U.S. yield curve entered into negative territory, sparking concerns about an economic downturn ahead. For the past 60 years, each U.S. economic downturn has been preceded by a yield curve inversion. While some may argue that this time it is different, our calculations show that implied recession probabilities range between 43-60%, hinting towards a very likely economic correction in the near future. The timing is, however, unknown.
- Our long-term yields proprietary model shows that the current flat shape of the yield curve is likely to stay. Additionally, the current anchoring of the short end of the curve by the Federal Reserve at 2.5%, plus the implicit stickiness of the long end of the curve, fairly valued at 2.5%, hints at the possibility of further yield curve inversion. The warning signs derived from the current and future shape of the yield curve suggest that a U.S. economic downturn is probable. Investors need to look towards a downside risk-managing investment strategy.

43-60%

ESTIMATED RECESSION PROBABILITY IMPLIED BY THE U.S. YIELD CURVE

BEWARE OF THE YIELD CURVE

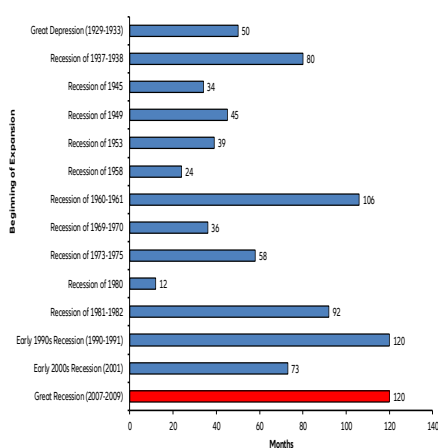
The U.S. economy has just matched the longest cycle ever recorded in modern times (Figure 1). In this context, market participants are increasingly watching for a turning point, focusing on the inversion of the U.S. yield curve (i.e. when long-term treasury yields are lower than short-term treasury yields) as an indicator of the future economic out-

look. For the past 60 years (earliest modern data point), an inversion of the yield curve heralded each economic downturn in the U.S. (Figure 2).

Through most of the current period of expansion, the yield curve has been on a flattening spree. As of the end of April 2019, the difference between

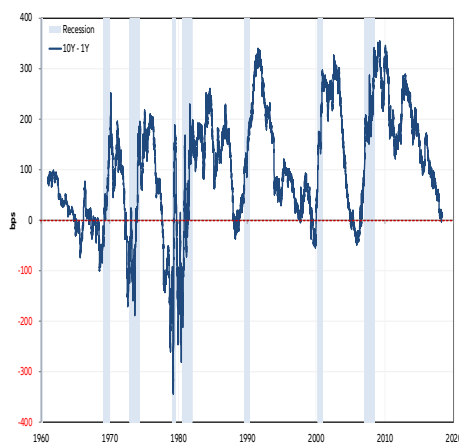
long-term and short-term U.S. Treasury yields (term spread) stood at only 13bps and, most importantly, the yield curve inverted for six days between March 22 and March 28 2019 (Figure 3).

Figure 1: United States economic cycles



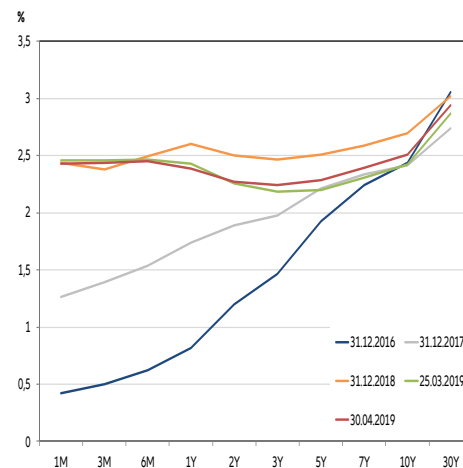
Sources: National Bureau of Economic Research

Figure 2: U.S. 10Y-1Y term spread



Sources: Bloomberg, Allianz Research

Figure 3: U.S. yield curve



Source: Bloomberg

Historically, pundits have always found reasons to downplay the significance of yield curve inversions (Table 1). This time is no different: An argument persists, suggesting that the relationship between the slope of the yield curve and the business cycle may have now changed due to unique current circumstances, including the unusually low risk premiums holding down interest rates. However, this paper empirically shows that one should take the short-lived yield curve inversion as a warning signal. An inverted yield curve can reflect lower future economic expectations and hint at a palpable conjunction of both reduced economic health and future growth. Secondly, it can also be a symptom of the Fed driving up shorter-term rates too high, which, in turn, could lead to a contraction in both lending and the economy.

To assess the reliability of the signal, we computed four logistic regressions based on four yield curve metrics as proxy variables for the term structure of the U.S. yield curve. We found that:

1. When using the 10-year treasury yield minus 2-year treasury yield, the probability of a recession at current term spread is 43%;
2. When using the 10-year treasury yield minus 3-month treasury yield, the probability of a recession at current term spread is 50%;
3. When using the Near Term Forward Spread² (18-month forward spot yield minus 3-month Treasury yield)³, the probability of a recession is 58%; and
4. When using the Fed Funds rate deviation from equilibrium, the probability of a recession is 60%.

Note that we could have used the 10-year treasury yield minus 1-year treasury yield as shown in Figure 2 as most metrics are yielding similar results. Also note that recession probability signaled by the three term spreads is consistent with former turning point levels⁴. This becomes more visible when one uses the Near Term Forward Spread metric alone (Figure 5). Last, though all indicators confirm the likelihood of a recession, timing it with precision (lapse between inversion and contraction for e.g.) is not statistically significant.

Table 1: Yield curve inversions: a summary

Period	Argument	Result
1989	The yield curve is artificially inverted because commercial banks are buying longer-term Treasuries instead of lending to real estate.	The U.S. economy suffered a brief recession from July 1990 to March 1991 because of rising interest rates and an oil price shock caused by Iraq's Invasion of Kuwait in 1990 and the subsequent first Gulf war.
2000	The yield curve is artificially inverted because the Clinton administration is running a budget surplus and no longer issuing long-maturity Treasuries.	The collapse of the dotcom bubble and the September 11 terrorist attacks caused a mild recession from March 2001 to November 2001.
2006	The yield curve is artificially inverted because a global savings glut is keeping longer-term bond yields pinned down.	The deflation housing bubble and subprime mortgage meltdown caused a global financial crisis and the worst recession since the Great Depression, lasting from December 2007 to June 2009.
2019	The yield curve is artificially inverted because of the Fed's market-distorting quantitative easing program, a jump in Treasury bill issuance and low global interest rates.	Unknown.

Source: *Financial Times*¹

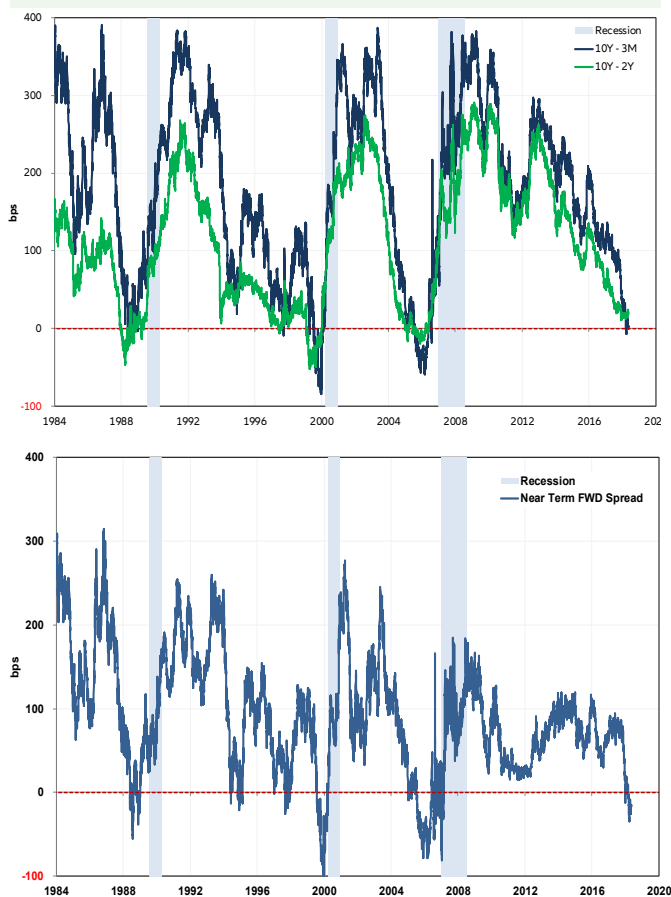
¹ Financial Times: Has the yield curve predicted the next U.S. downturn? Robin Wigglesworth and Joe Rennison, Apr. 3rd, 2019

² E. Engstrom and S. Sharpe. "(Don't Fear) The Yield Curve," FEDS Notes. Washington: Board of Governors of the Federal Reserve System, June 28, 2018, <https://doi.org/10.17016/2380-7172.2212>.

³ The near-term forward spread does appear to be a pretty good gauge of market expectations regarding monetary policy. Consequently, assuming market participants have some foresight, it is not all that surprising that negative readings for the near-term spread tend to precede (and thus can be used statistically to forecast) recessions

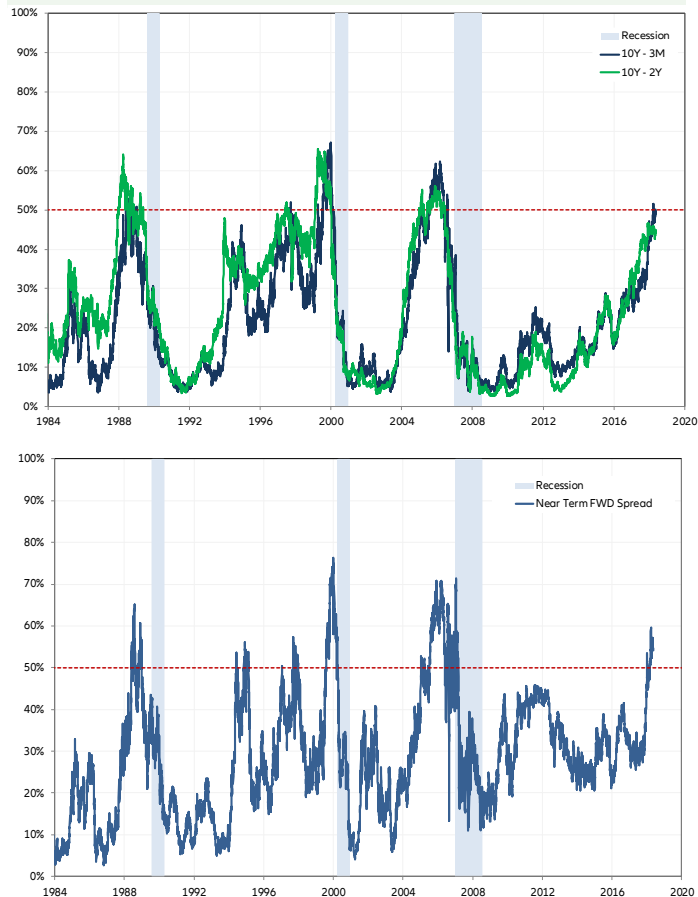
⁴ In contrast to the NY Fed indicator, the computed indicators show a much higher recession probability. Apart from minor methodological differences it is worth mentioning that the NY Fed indicator tends to peak at 35-45% levels hinting that a 40% recession probability for the Fed indicator may prove enough to predict future recessions. https://www.newyorkfed.org/research/capital_markets/ycfaq.html

Figure 4: U.S. term spreads



Sources: Bloomberg, Allianz Research

Figure 5: Recession probabilities based on Term Spreads



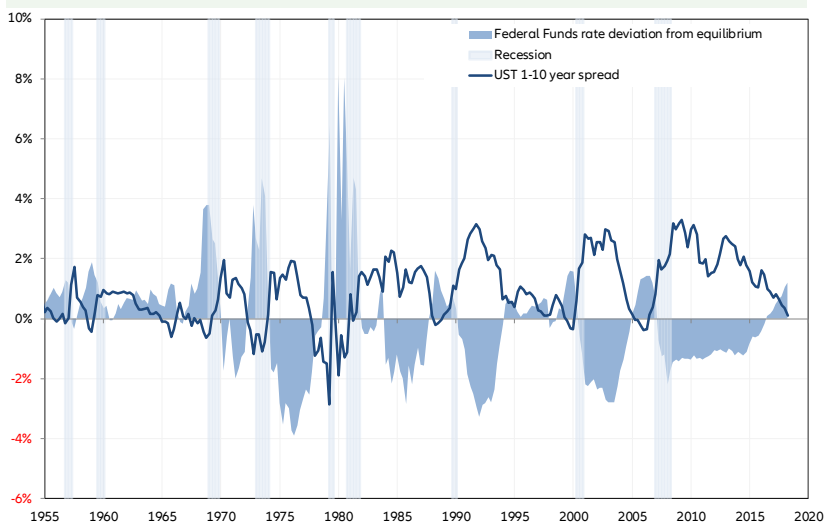
Sources: Bloomberg, Allianz Research

Figure 5 shows that the Near-Term Forward Spread generated two false signals (first in 1995, then in 1998). Looking at those two short-lived inversion periods, one can argue that the nature of those misleading signals was not only different, but completely unrelated to U.S. domestic matters. In 1995, the U.S. economy was confronted with the exogenous shock provoked by the Mex-

ican peso crisis. Moreover, at that point, the length of the U.S. expansion was only four years long. In the case of the 1998 inversion, a similar story holds. The (near) inversion was due to the exogenous shock provoked by the Russian financial crisis. While Brexit and the U.S.-China trade tensions might be compared to the 1995 or 1998 exogenous shocks, we consider that current

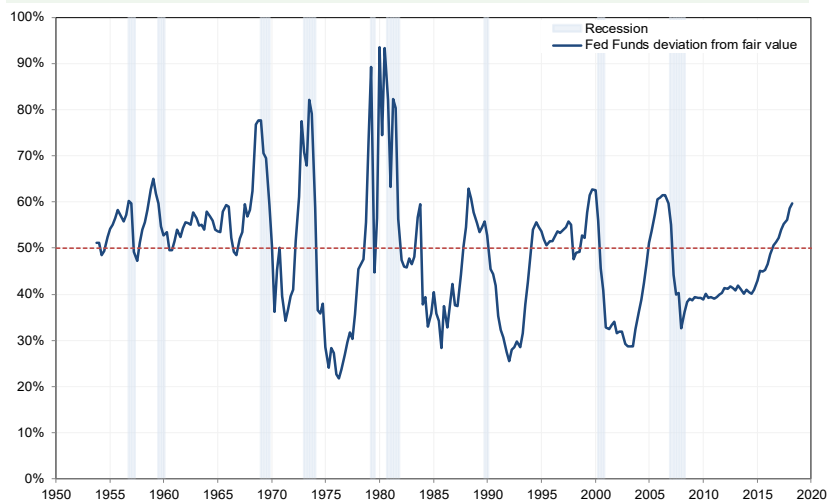
economic conditions (late-late cycle stage and most economic indicators point towards slower U.S. activity) are different from those prevailing at the time of these two erroneous signals.

Figure 6: Fed Funds deviation from equilibrium



Sources: Bloomberg, Allianz Research

Figure 7: Recession probabilities based on Fed Funds "fair value"



Sources: Bloomberg, Allianz Research

As for Fed Funds deviation (Figures 6 & 7), an inverse correlation between the deviation of the Federal Funds rate from its equilibrium (fair value) and the U.S. term spread is directly observable. This indicator strongly suggests that the U.S. tends to enter into economic downturn periods when the Fed raises policy

rates too high (i.e. when monetary conditions are too tight). By having a closer look at Figure 6, it seems plain that the Fed has overreacted to current economic conditions⁵ as much as it had in 1990, 1999 and 2007, before the last three recessions. It is worth mentioning that one of the most valuable ad-

vantages of Fed Funds is that the volatility of its estimate is far lower than that embedded in the other three variables used in this analysis, allowing for a clearer picture of what is ahead.

⁵The Fed Funds rate "fair value" is derived from the "theoretical" equilibrium between Fed Funds and trend nominal growth.

IS THIS SIGNAL GOING TO PERSIST?

To see how the shape of the yield curve is likely to develop, and whether it will continue implying that a recession is on the horizon, the behavior of the short and long end of the curve are analyzed separately. When it comes to the short

end of the curve, the latest Federal Reserve economic projections show the central tendency projections for 2019 at 2.4-2.6% and its long-run projected value at 2.5-3.0%, meaning that the short-end of the curve is believed to

remain anchored at around 2.5% in 2019 and 2020⁶. (See Table 2). Similarly, economists forecast the short end of the curve to remain at 2.50% for both 2019 and 2020 (Bloomberg).

Table 2: U.S. Federal Reserve economic projections

U.S. Federal Reserve Projections ⁷ (Mar 19)	2019	2020	2021	Longer run
Change in real GDP	1.9 – 2.2	1.8 - 2.0	1.7 - 2.0	1.8 - 2.0
- December projection	2.3 - 2.5	1.8 - 2.0	1.5 - 2.0	1.8 - 2.0
Fed funds rate	2.4 – 2.6	2.4 – 2.9	2.4 – 2.9	2.5 - 3.0
- December projection	2.6 - 3.1	2.9 - 3.4	2.6 - 3.1	2.5 - 3.0

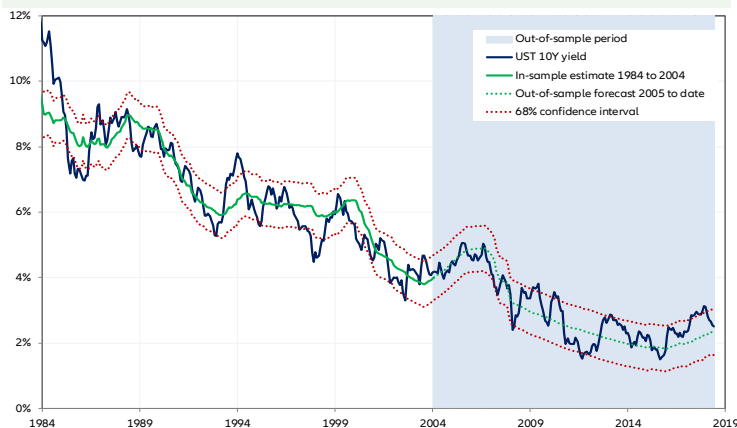
Source: U.S. Federal Reserve

Shifting to the long end of the curve (represented by the 10Y U.S. Treasury yield), a Bloomberg survey shows that most economists expect a mild pick-up in long-term yields, with 10Y Treasuries at 2.75% by the end of 2019 and at 2.87% by the end of 2020. However, according to the results of our proprietary model, the long end of the yield curve is close to its intrinsic fair value of ~2.5% (Figure 8). According to this model, the elasticity of the U.S. 10Y yield "fair value" is low, implying that the long end of the curve seems to be fairly sticky and is unlikely to move in either direction.

Taking both the short and long end of the curve projections into account, the US yield curve will likely remain flat at best in the near future. Building on this premise, another round of yield curve inversion is possible if the Fed turns out to be slow to ease its monetary policy.

Given the uncertainty generated by the yield curve inversion, a downside risk management strategy may be warranted to shield portfolios and perform during a likely downturn.

Figure 8: 10-year U.S. yield fair value



Sources: Bloomberg, Allianz Research

⁶ As a reference for the reader, the current market value is at 2.4%, with markets pricing in 0 hikes until 2020 and even a 20% probability of a rate cut in the January 2020 Fed's meeting.

⁷ The numbers displayed refer to the central tendency estimates which exclude the three highest and three lowest projections for each variable in each year.

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