The New Treatment of the Yield Spread in the TCB Composite Index of Leading Indicators

By

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The Conference Board added the difference between the 10-year Treasury note yield and the Federal funds rate to its composite index of leading economic indicators (LEI) in 1996 in a revision that also deleted two components of the LEI, the change in the index of sensitive materials prices and the change in manufacturers’ unfilled orders for durable goods. The November 1996 issue of Business Cycle Indicators (p.3) argued that this series “has become widely accepted as a forecasting variable that is related to the stance of monetary policy” and that “it clearly ranks above average as a leading indicator because it consistently turns in advance of the business cycle.” It referred to a chart showing that the yield spread “turned negative before the start of each of the last five recessions.”

The spread of the term structure of interest rates (long minus short rate) is inherently forward looking because it contains critical information about the market’s expectations of future interest rate movements and the perceived risk from holding bonds. When the Federal Reserve is expected to pursue a policy of increasing or decreasing the short rates, for example, this will alter temporarily the relative attractiveness of long vs. shorts bonds. The level of the short interest rates \( i_s \) and the spread \( s = i_L - i_s \) are thus linked by a relationship with predictive content. The two variables together contain most of what can be learned from the entire yield curve (which shows how the yields of bonds depend on time to maturity).\(^1\)

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Investors require higher yields to commit their money for longer periods. Hence the long bond yield usually exceeds the short bond yield, i.e., \( i_L > i_S \). (To abstract from risk differences, which can complicate matters considerably, the proper reference here is to yields on default-free bonds.) As long as the spread is positive, individuals and institutions – primarily banks – can make money borrowing short and lending long.

Occasionally, though, the yield curve inverts as \( i_S \) rises above \( i_L \) and the spread turns negative. This acts as a negative profit margin for the banks. It also suggests expectations that the short rates will fall, since the long rates are averages of current and future short rates. This is likely to happen when the bond market foresees a weakening economy, possibly a recession. The Fed may be raising the short interest rates to fight inflation, but investors and financial markets may increasingly fear that, partly as a result, the economy may slow.

These arguments help explain why the yield inversions occur mostly in late stages of business expansions and why they often signal economic downturns. Our first two charts provide the evidence. Chart 1 shows that the 10-year Treasury note yield \( (i_L) \) and the Federal funds rate \( (i_S) \) tend to move broadly together, both cyclically and over longer horizons. Their long trends were decidedly upward before 1981 when inflation was rising and downward in 1982-2004 when inflation was brought under control by strongly restrictive monetary policies and a string of serious business recessions. Shorter cyclical fluctuations are also evident in both \( i_S \) and \( i_L \). In the 1960’s, 1970’s, and early part of 1980’s – an era of prevailing inflation – the short rate rose much more than the long rate in expansions and fell much more in contractions and/or recoveries. Since the early 1980’s, after the defeat of high inflation, cyclical declines prevailed over rises in the long as well as the short rate but became particularly large in the latter.

Chart 2 shows that the spread (ten-year yield minus Federal funds) declines before each of the seven recessions, although its leads are long, and it also declines on
other occasions (see the extra turning points marked $x$). It was quite irregular particularly after 1980. The spread becomes negative after inverting but it also tends to increase again just before the recession. Its leads at peaks are very variable but mostly too long to be really useful; they average 21.8 months and exceed 20 in all but two cases. The leads at troughs are not so long but even more variable (they average 9.8 months, but the longest three are 10-21 months and there is one lag of six). This and its volatile behavior make $s_i = i^L_t - i^r_t$ a noisy leading indicator.

A closer look at Chart 2 suggests that business cycle contractions are preceded by the spread becoming negative (all six of the latest recessions were). To capture this we make the spread contribute positively (negatively) to LEI only when it is itself positive (negative), not when it rises (falls). Thus, we cumulate the spread month by month and use it in this form. As Chart 3 shows, this produces an indicator (call it $s^{c}_t$) that is much smoother than the raw yield spread. Also, in contrast to the highly volatile $s_t$ (Chart 2), the cumulative spread has only one extra movement instead of six (or two $x$’s instead of twelve). The leads of $s^{c}_t$ are more regular and persistent than those of the non-cumulative $s_t$: they average 14.3 and range from 8 to 21 months at peaks, and average 6.5 and range from 3 to 14 months at troughs.

All else equal, the shift to the use of the cumulative yield spread from its raw form in the LEI increases the trend in the index, shifting its levels considerably. However, the trend of the LEI is an artificial construct based on the combination of trending and trendless components. This observation and subsequent research led to The Conference Board’s decision to reinstitute the trend adjustment that was a part of the index methodology from the very beginning. Gad Levanon discusses the proposed trend adjustment in an accompanying article (available on our website at

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2 Other options considered but not adopted were to use other series for $i^L$ and $i^r$ and to drop the yield spread altogether. The rich literature on the term structure of interest rates uses a variety of short and long rates or yields but the basic characteristics of the spread remain much the same, as summarized above.
In order to compare the old index with the new index which uses the cumulative yield spread instead of the raw yield spread, it is necessary to adjust the trend of the old index with the same procedure (Chart 4). It can be seen that the timing of other specific cycle peaks and troughs in the two indexes are about identical.

In conclusion, the transition to using the cumulative yield spread is supported by both theoretical reasons and empirical evidence. Theory suggests that the yield curve should contribute negatively to the LEI when it inverts, not just when it is declining. The cumulative yield spread successfully captures this property. In practice, the cumulative yield spread is smoother and is a better leading indicator than its raw form.

Dropping $s_t$ means omitting a variable that many theorists and practitioners regard as very important and potentially useful.