

The Inverted Yield Curve: Historical Perspectives and Implications on Cash Portfolios

EXECUTIVE SUMMARY:

Compared to past periods, the yield curve inversion we are experiencing is quite benign. Therefore, there need not be profound concerns that an economic recession will automatically derive from this phenomenon.

After the Fed funds rate reaches its peak in the coming spring-summer timeframe, one can expect the shape of the yield curve to normalize and to become upwardly sloping once again.

Corporate bond yield spreads to Treasury yields may not suffer as a direct result of the inverted yield curve. In fact, overweighting corporate securities may be the right strategy in this difficult and tricky environment.

Finally, shortening portfolio duration may not always be the right strategy for maximizing cash portfolio returns with an inverted yield curve. When an inversion is relatively mild, one can expect that investing further out on the curve may provide higher return potential over shorter maturity targets.

We expect the current yield curve inversion to be mild, with opportunities for competitive returns for cash portfolios. Should the potential for a more severe yield curve inversion develop, we may adopt more defensive yield curve and sector selection strategies.

INTRODUCTION

When the yields of short-term Treasury notes rose above that of long-term securities last December, the financial markets buzzed with a discussion of the phenomenon of an “inverted yield curve” and the likelihood that it forecasts an economic recession. An inverted yield curve can be damaging to bond investors as it often means lower income potential for bonds with higher interest rate risk. Particularly exposed are corporate cash portfolios with buy-and-hold strategies that derive most, if not all, of their returns from the income component.

More recent economic and market data seem to suggest that the curve inversion may be with us for quite some time. How to interpret this unusual yield curve phenomenon and its investment implications is no doubt a very timely subject. In this report, we set out to examine previous interest cycles where the yield curve inverted itself, in hopes of learning

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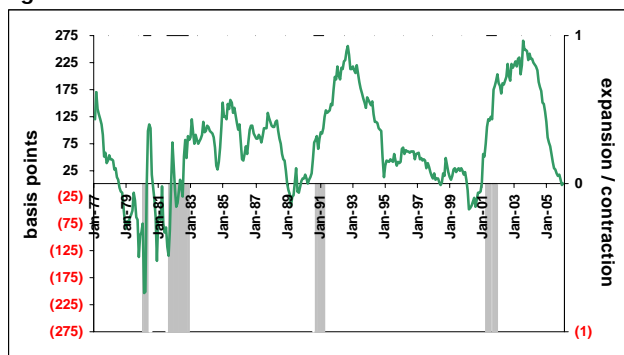
Table 1: Recent Inversions in the Treasury Yield Curve

Starting From	Number Months	Average Inversion	Maximum Inversion
Aug-78	21	-71	-202
Sep-80	13	-78	-142
Jan-82	4	-26	-42
Jun-82	1	-23	-23
Dec-88	6	-19	-40
Aug-89	2	-16	-17
Jun-98	1	-3	-3
Feb-00	10	-30	-48
Average	7	-33	-65
Dec-05	?	?	?

Source: Bloomberg data of yield differential between generic two and 10-year Treasury notes at month-ends in 1976 to 2005.

Compared to historical averages, the curve inversion we are experiencing is quite benign.

Figure 1: Yield Curve Inversions and Recessions



Source: Bloomberg data of Treasury yield spread history and NBER's peak-to-trough business cycle dates, a traditional measure of economic recessions.

While severe yield curve inversions often lead to recessions, mild ones may not.

what to expect in short and long-term interest rate movements for the remainder of the year.

REFLECTIONS FROM THE PAST

To gain a historical perspective, we will evaluate the yield relationships of benchmark Treasury notes available from Bloomberg over the last 30 years. Because controversy exists as to what constitutes an inverted yield curve, we consider the curve inverted when the yield differential between the two and 10-year Treasury notes becomes negative. For simplicity, we will focus on the month-end yield spreads of the two data series.

Historical Averages

As Table 1 indicates, the yield curve inverted **eight times**, for at least one month at a time, in the last 30 years. The average duration of an inversion was **seven months**, with an average negative spread of **0.33%**, or 33 basis points. The average maximum inversion was 65 basis points. Of course, wide dispersion exists in all categories. For example, the inversion beginning in August 1978 lasted 21 months, and the curve inverted by as much as 202 basis points. The mildest occurrence started June 1998, when the inversion lasted only one month with an inversion of three basis points.

The yield curve inversion we are experiencing since December 27th 2005 is now two months young and the negative spread has reached only 11 basis points. Compared to historical averages, it is no doubt quite benign.

Correlation with Economic Recessions

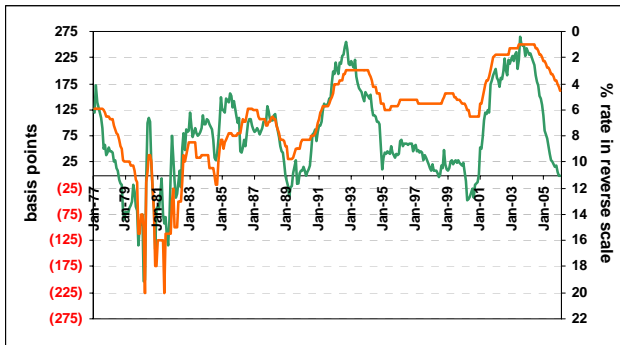
Inverted yield curves attract attention from the economic community not only because of their rare occurrence, but also due to their historical reliability as a leading indicator of recession. If the patterns from the past hold true today, one can expect a generally lower interest rate environment in the months ahead.

Figure 1 appears to indicate a strong correlation between yield curve inversions and recessions. Using business cycle data from the National Bureau of Economic Research, all four recessions in the US since 1980 occurred either while the yield curve was inverted, or within one year of an occurrence. *However, while severe yield curve inversions led to recessions, mild ones did not.* Of the eight observed historical occurrences, only four resulted in a recession.

The historical correlation may lead one to erroneously think that inverted yield curves *caused* recessions. In fact, the opposite is true. Negative yield spreads often signal the market's anticipation of an interest rate cut by the Federal Reserve because of an oncoming recession. So, to extend the thinking, if the curve inversion is not borne out of recession fears, the historical correlation may not inevitably lead to a recession.

Other research found that the correlation is a recent phenomenon¹. Between 1954 and 1966, the US economy had three recessions but no yield curve inversions. The curve inverted twice in the late 1960s, but with no recession following. Some economists, including former Fed chairman Alan Greenspan and the current chairman Ben Bernanke, have argued that an inverted yield curve may no longer be a strong

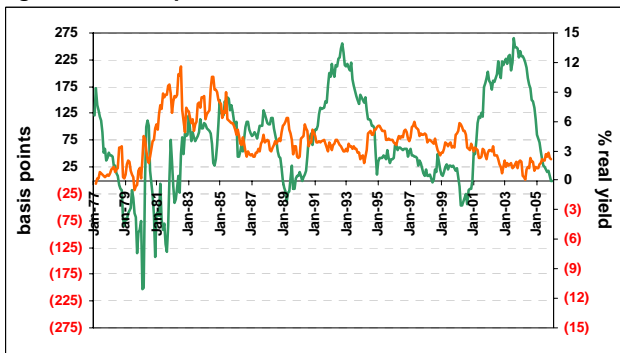
Figure 2: Yield Spread and the Fed Funds Rate



Source: Bloomberg data of Treasury yield spread history and the Federal Open Market Committee's Federal funds target rate history.

Yield curve inversions seem to correlate well with the peaking of the Fed funds rate. If history repeats itself, we can expect the yield curve become normal soon.

Figure 3: Yield Spread and Real Cost of Funds



Source: Bloomberg data of Treasury yield spread history and the Bureau of Economic Analysis on US GDP Personal Consumption Core Index (quarter-over-quarter, seasonally-adjusted).

There is no apparent correlation between the shape of the yield curve and the economy's real cost of borrowing.

Corporate bond yield spreads to Treasury may not suffer as a direct result of yield curve inversion.

recession indicator because of the global nature of today's bond market.

Correlation with the Fed Funds Rate

Another observation one can make involves the relationship of yield curve inversions to the Fed funds rate movement. As the Fed seems near the end of its higher interest rate campaign, bond investors can benefit from lessons on how the yield curve reacts to a shift in monetary policy.

Figure 2 studies the relationship between curve inversion and the Fed Funds target rate. (Note that the right scale indicates the Fed funds rate in reverse.) The relationship between the general direction of the Fed funds rate and the Treasury yield spread seems to be quite strong; that is, as the target overnight rate increases, the yield spread between the two and ten-year Treasury note yields tends to compress. Furthermore, the occurrence of a *yield curve inversion seems to correlate to the peaking of the short-term rate*. Our current interest rate environment may not be an exception.

In one of our previous studies, we found that in the last 30 years, the average length of a tightening cycle was 14 months with an average of 522 basis point increase in the Fed funds rate². If the futures market is correct in predicting a 5% rate by May 2006, it will have risen by 400 basis points in 23 months, the longest post-World War II tightening cycle.

If history repeats itself again, we can expect the yield curve to abandon its inverted shape and re-steepen soon after the Fed stops raising the short-term rate. If true, the outcome would mean a better environment for bond investors.

Correlation with Real Borrowing Costs

One of the arguments that inverted yield curves lead to recessions stems from the belief that substantial monetary tightening may inhibit economic growth due to increased borrowing costs. A further concern is that corporate bonds could become less desirable to investors due to higher corporate financing costs.

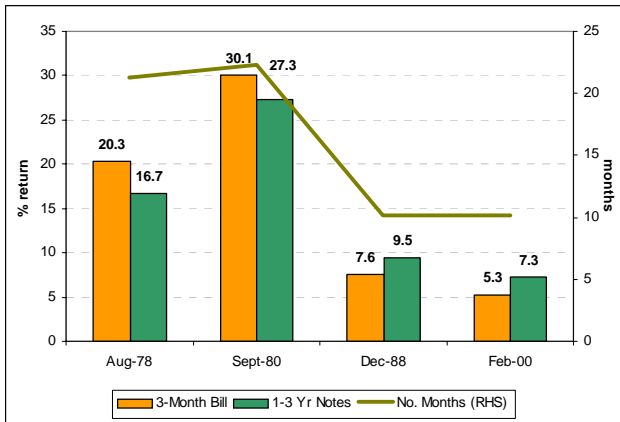
Figure 3 looks at the relationship of the shape of the yield curve to the yield of the five-year Treasury note. We choose the five-year note as a proxy of the economy's cost of funds. In other words, we assume that the aggregate cost of consumer and business borrowings, including mortgage financing and capital expenditure, closely resembles the yield of a bond maturing in five years³. We use the GDP Personal Consumption Price Index, a preferred inflationary measure by the Fed, to arrive at the cost of borrowing in real, or inflation-adjusted, terms.

As Figure 3 indicates, there is no apparent correlation between the shape of the yield curve and the real borrowing burden. As a matter of fact, real borrowing costs were in a steady decline since the recession that ended in 1982. During this period, the real yield ranged between 6.3% and 0.1%.

The current tightening cycle did not appear to greatly affect real borrowing costs, either, as the rate rose from 2.1% in March 2004 to

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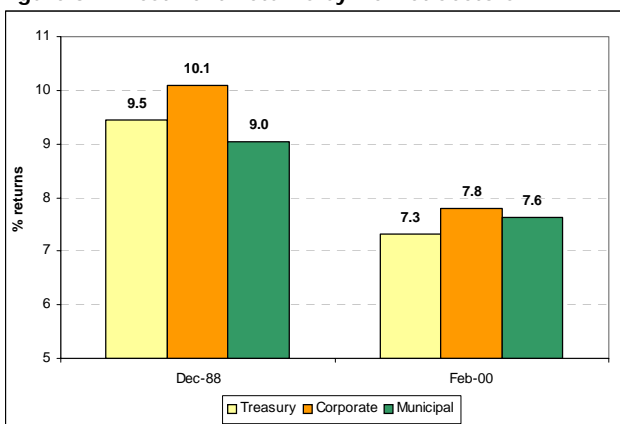
Figure 4: Returns in Inverted Yield Curve Environment



Source: Bloomberg data of historical total returns of the 3-month T-bill and the 1-3 year T-notes indices from Merrill Lynch Global Indices for the following periods: 8/78-5/80, 9/80-7/82, 12/88-10/89, and 2/00-12/00.

When an inversion is relatively mild, one may expect that investing further along the yield curve provides return advantage over shorter maturity targets.

Figure 5: Investment Returns by Market Sectors



Source: Bloomberg data of historical total returns of the 1-3 year T-notes, the 1-3 year corporate rated A-and-higher, and the 1-3 year large cap municipal indices from Merrill Lynch Global Indices for the following periods: 8/78-5/80, 9/80-7/82, 12/88-10/89, and 2/00-12/00. Municipal returns are represented as taxable-equivalent assuming a 35% combined tax rate.

Corporate bonds outperformed Treasury securities during mild yield curve inversion periods.

only 2.2% in January 2006. This information partially explains why recessionary concerns may be unwarranted. Corporate financing burdens, and by extension, corporate bond yield spreads to Treasury, may not suffer as a direct result of the monetary tightening or yield curve inversion.

CASH PORTFOLIO RETURNS WHEN YIELD CURVE INVERTS

It is often difficult for cash portfolios to invest further out on the yield curve when the shape of the curve is inverted as it often means taking on more interest rate risk for lower yield. However, shortening portfolio duration may be an overly simplistic investment approach as there are other contributors besides duration to cash portfolio returns.

We set out to collect empirical data on how the major groups of cash portfolio securities fared when the yield curve was inverted in the last 30 years. For ease of analysis, we combined some of the close-by inverted periods and ignored the periods when the curve was inverted only briefly. This left us with the following four periods to examine: August 1978 to May 1980, September 1980 to July 1982, December 1988 to October 1989, and February 2000 to December 2000.

Figure 4 shows that, for the 1978 and 1980 inversions, the Merrill Lynch 3-month Treasury bill index outperformed the 1-3 Year Treasury notes index. But during the 1988 and 2000 inversions, the 1-3 year Treasury index provided higher return. (Note that returns were positive for all periods of yield curve inversion.) We can also observe from the right hand scale that the length of time of the inversion may also affected the return differences.

Our choice of the 3-month T-bill and the 1-3 year T-note indices was made in order to approximate two extreme cases of maturity targets for a typical cash portfolio. One may infer from Figure 4 that *when the curve inversion is relatively mild, investing further along the curve may provide return advantage over shorter maturity targets.* On the other hand, if the curve is projected to invert for an extended period of time, it may be more prudent to stay with shorter portfolio duration.

In addition, we studied the return differential of different market sectors during the inverted yield curve environments. Due to availability of comparable historical index information, we will look at the results for the last two periods only.

In Figure 5, the high-grade (A-rated and higher) corporate index outperformed the Treasury index by **0.6%** in the earlier period and **0.5%** in the 2000 period. There seem to be two explanations to the outperformance of corporate securities; first, the extra yield spreads on corporate bonds provided higher coupon income than Treasury securities and second, the corporate yield curve is almost always positively sloping despite an inverted shape in the Treasury yield curve.

Figure 5 also shows that, on a taxable-equivalent basis, municipal bonds with similar maturity structures had mixed results in total returns when compared to Treasury and corporate securities during the last two periods.

We believe the current yield curve inversion to be mild and not recession-driven. There may be abundant opportunities for competitive returns for cash portfolios.

CONCLUSIONS

History rarely repeats itself in an identical fashion, but it often comes back in a different disguise. Our historical analysis of inverted yield curve behavior and its investment implications on cash portfolio performance sought to provide clues on how to protect a portfolio from the challenging interest rate environment. We found that,

Compared to historical averages, the curve inversion we are experiencing is quite benign. Therefore, there need not be profound concerns that an economic recession will automatically derive from this phenomenon.

As the Fed funds rate reaches its peak in the coming spring-summer timeframe, we can expect the shape of the yield curve to normalize and to become upwardly sloping again.

Corporate bond yield spreads to Treasury yields may not suffer as a direct result of yield curve inversion. In fact overweighting corporate securities may be the right strategy to combat the inverted yield curve environment.

Finally, shortening portfolio duration may not always be the right strategy for maximizing cash portfolio returns with an inverted yield curve. When an inversion is relatively mild, one can expect that investing further out along the yield curve provides return advantage over shorter maturity targets.

We leave the readers with our key thought regarding portfolio strategy going into 2006: if one expects the current yield curve inversion to be mild, there could be opportunities for competitive returns for cash portfolios. This has been and continues to be our belief. Should our assumptions shift to a belief in a more severe yield curve inversion, we will employ a more defensive yield curve and section selection strategy.

Endnotes:

1. David Wyss, *U.S. Economic Forecast: Inverted Logic*, Standard & Poor's, January 11th 2006.
2. CAG Newsletter: *As the Fed Moves from Predictable to Data Dependant, Is the End Near*, Capital Advisors Group, May 4th 2005.
3. Bill Gross, *A Gift That Should Keep on Giving*, PIMCO, January 2006.

**APPENDIX:
WEATHERING AN INVERTED CURVE ENVIRONMENT**

In November 2004, we published an article called “How to Weather a Rising Interest Rate Environment” in the Capital Advisor. We find that many of the suggestions are still valid in an inverted yield curve environment. It provides some of the portfolio strategies for a cash investor in the flat/inverted yield curve environment.

There are several portfolio management techniques available to help diminish the risk presented by the inverted yield curve. In fact, when managing portfolio duration, yield curve positioning and security selection properly, higher short-term rates can add value, particularly for short duration or held-to-maturity portfolios.

Duration Management

Though it is extremely difficult to predict with precision how quickly and to what extent interest rates will shift, we believe investors should resist moving all fixed income assets into an overnight fund for fear of losses. In overweighing your money market fund allocation, you are likely to substantially reduce portfolio yield as you give up the higher yields provided by some bonds with longer maturities. Moreover, you may have to reinvest at a lower yield in the future if the curve stays or becomes further inverted.

In our opinion, the key is to strike a logical balance between lowering duration to protect principal value and increasing duration to lock in the current yield potential to control reinvestment risk. You should assess your tolerance for potential unrealized market value losses and decide on a portfolio duration target. For example, a portfolio with six months of duration may stand to lose 0.5% of its value if that part of yield curve moves up by 100 basis points. Once the targeted duration is established, you may then select investments that take advantage of the yields further out on the curve based on a break-even analysis versus a short money market instrument. It is important to note that when an investor holds a security to maturity, unrealized losses are largely irrelevant as long as the repayment of principal is reasonably assured.

Yield Curve Positioning

When interest rates change, not all bonds behave the same. Market expectations may cause the shape of the yield curve to normalize, or become further inverted. An informed investor should be able to take advantage of the changing shape of the yield curve without changing the overall portfolio duration and its corresponding interest rate risk.

A well-managed short-duration portfolio should always have a certain portion of its portfolio in liquid funds for reinvestment as interest rate expectations change. Certain maturities along the curve may provide more incremental yield pick-up than bonds that are either shorter or longer. For example, substantial yield pickup exists today between overnight and six-month maturities even though the curve further out

is inverted. Properly allocating funds in anticipation of a shift in the curve can provide additional return potential.

Security Selection

The ability to select the appropriate mix of securities is another method to control interest rate volatility. Some well established bond investments are specifically designed to reduce interest rate risk. With a good understanding of their credit quality and relative yield attractiveness, an investor can add return without taking on additional interest rate risk. Examples of such investments include:

TIPS

A Treasury Inflation Protected Security, commonly referred to as "TIPS", is a U.S. Treasury issued bond that has its redemption value indexed for inflation based on the Consumer Price Index (CPI) readings. Since its redemption value will never fall below its face value, while earning a premium over inflation, TIPS may be a good weapon against higher interest rates.

Floating Rate Securities

A floating rate security (also referred to as floating rate note, or FRN) is an instrument whose coupon rises when the underlying reference rate (usually U.S. LIBOR or U.S. Treasury Bills) rises. They may provide additional yield opportunities relative to U.S. Treasury securities without taking on interest rate risk.

Corporate Bonds

Short duration corporate bonds of high credit quality typically provide incremental yield relative to U.S. Treasuries. This extra yield can help cushion the principal loss associated with higher interest rates.

Foreign Government Securities

U.S. dollar denominated, high-grade foreign government bonds, such as those issued by G-7 nations, may also provide interest rate protection, particularly when the markets view higher U.S. interest rates as being at least partly due to trade and fiscal deficits. In this scenario, yields of foreign government bonds should rise slower than U.S. securities.

Investors need to be cognizant of the risks associated with higher short-term interest rates. We believe that it is unwise to simply hide your cash in a money fund in this environment. A prudent, short-duration investment strategy can help to mitigate the risk of an inverted yield while allowing more flexibility to take advantage of improving yields.

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