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INVESTMENTS

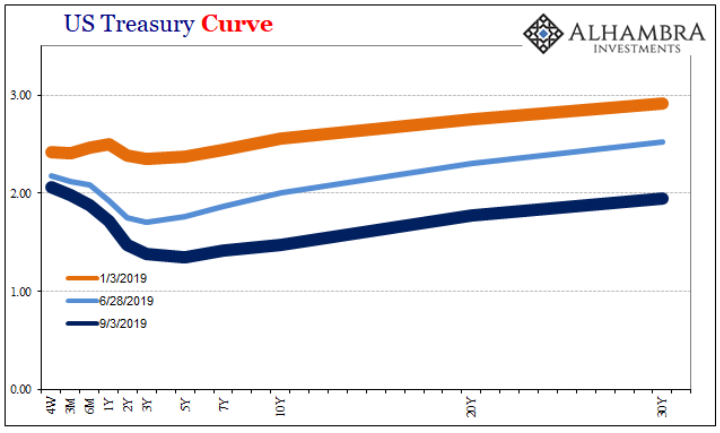
The Yield Curve

And What It Means

The Yield Curve Inverted! Recession is Coming!

There's been a lot of press recently about the inversion of the yield curve. Stock markets sold off recently when the yield of the 10-year Treasury note fell below the yield on the 2-year Treasury note. The press has emphasized the point – repeatedly and loudly – that this condition has preceded every modern recession. While that is technically true, it is also true that ***"Recession!"*** headlines are great link bait and good for media businesses. **But the mere inversion of the yield curve isn't sufficient, by itself, to warrant action by the long-term investor.**

Let's take a look at what a yield curve inversion really means for investors. The first thing to know is that there isn't just one yield curve. There are multiple ways of looking at and interpreting yield curves. **A yield curve is just a comparison of the rates available on different maturities of a particular type of debt instrument.** The yield curve you've seen so much about in the news is the Treasury yield curve and here's how it's changed this year:



As you can see, there are some shorter-term rates (the left-hand side of the dark blue line) that are higher than some of the longer-term rates (the right-hand side of dark blue line). That's what it means for the yield curve to be inverted. You might also notice that the curve isn't *completely* inverted. There are some shorter-term rates that are still lower than long term rates. For example, one widely watched comparison is between the 2-year Treasury note yield and the 10-year Treasury note yield. Recently, the 2-year rate rose above the 10-year rate. Because this is considered the standard recession indicator, it was this inversion that triggered the flood of articles about yield curves and recessions. Here's the 10-year yield minus the 2-year yield:

22-Aug	23-Aug	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	3-Sep	4-Sep
0.01	0.01	0.0	-0.04	-0.03	-0.03	0.0	0.0	0.04

The Dow sold off over 600 points the day the 10/2 curve first inverted but the selloff can't be entirely credited to the inversion. Rather the inversion itself was driven by other news. That was the same day the President said "We don't need China" and "ordered" US companies to find alternatives to manufacturing in China. He also announced new, higher tariffs on imports from China. **It was this trade war news, generally accepted as negative for US and global economic growth, that pulled the 10-year yield down below the 2-year.**

But anyone watching the market that day knows that the stock market selloff was fairly muted until the curve inverted. At that point the selling accelerated and at one point the Dow was down over 800 points. There seems little doubt that some investors – and I hesitate to call them that – were selling on the fear of recession, driven by the trade war and confirmed - they believed - by the yield curve inversion.

Yield Curves and Recession

But does an inverted yield curve really mean that recession is imminent? Does it mean recession is inevitable? And as you can see the curve only inverted for three days. Does the length of time the curve is inverted matter?

At first glance, it certainly appears that an inverted yield curve is good reason to worry. **After all, an inverted curve has preceded every recession since 1950. But that isn't the same as saying that all yield curve inversions precede recession.** Twice during that period, the yield curve inverted and righted itself with no recession until after the curve subsequently inverted again. The yield curve inverted from December 1965 to February 1967. The curve inverted again in December 1967 but recession still didn't start until December 1969, a full two years after the curve re-inverted and four years from the initial inversion.

In 1998, the curve briefly inverted for about a month from June to July. The curve inverted again in April 2000 and recession arrived in March 2001. These two inversions – 1965 and 1998 - over 30 years apart were quite different. The earlier inversion lasted 14 months while the 90s version lasted a mere month but recession was avoided in both instances. **The simple conclusion is that length of time the curve is inverted doesn't bear on whether the inversion leads to recession.**

Academic research on this point by Harvey Campbell of Duke University concluded that the inversion needed to last at least three months or it wasn't a reliable recession signal. But that research was limited to the four recessions from the 1960s to the 1980s. It was also based on the 10-year/3-month spread rather than the 10-year/2-year. That's important in the current case because the 10-year/3-month spread first inverted on March 22nd of this year, long before the recent 10/2 curve inversion. However, that spread has turned positive several times since then, most recently on July 23. Obviously, if you count from the first inversion, we have satisfied Campbell's 3-month requirement, but there is no indication that even he views this as a definitive recession signal, saying recently that his economic growth model "says growth will decrease in 2020 and perhaps 2021". *

There *are* two common factors for the inversions that didn't result in recession. In both cases the Fed cut interest rates rapidly and, despite that, stocks suffered a bear market. Both of those bear markets were fairly mild though; the 1966 bear market (February to October '66) saw an S&P 500 decline of 23.7% while the 1998 bear market lasted just 4 months and saw a market decline of 22%. Which brings us to the point of this exercise. The reason we want to, if possible, foresee the onset of an economic contraction is because we associate recessions with large stock market losses. Should we?

Bear Markets and Recession

Recession is not the only trigger for a bear market. Post WWII, there have been five bear markets (defined as a 20% drop in the S&P 500) with no yield curve inversion and no recession:

Stock Market Peak	Stock Market Trough	% Decline
May-11	Oct-11	-21%
Jul-98	Oct-98	-22%
Aug-87	Oct-87	-37%
Sep-76	Mar-78	-20%
Dec-61	Jun-62	-29%
	Average	-26%

There have also been numerous "near misses" where stocks have declined nearly 20% but managed to avoid the bear label. The most recent example was in

the 4th quarter last year. Using intraday levels, the S&P 500 fell 20.2% from peak to trough, but the loss was "only" 19.7% when using closing values. Most researchers use closing values and so few would call that a bear market. Does that matter? Not to us and probably not to most investors. No one can *feel* the difference between -19.7% and -20.2%. **What *is* important is that bear markets - or corrections where stocks fall less than 20% - not associated with recession are essentially random and impossible to predict.** They happen and you better have a strategic allocation plan that allows you to ride it out. Your chances of getting out before them and back in before the market goes back up are almost nil.

Bear markets come in all shapes and sizes. Since 1926, there have been at least eight**, ranging in length from six months to 2.8 years. The worst loss was the 83% loss in the Great Depression crash, while a few fell near the minimum of 20%. The average bear lasted 1.3 years and totaled a loss of 38%. Three of those bear markets started before the onset of recession and all except one ended before the end of the recession. The one that didn't was the dot com crash early this century, where the bear market didn't bottom until 10 months after the recession.

We are still left with the question of whether bear markets associated with recessions are worse than those that aren't. If they are, then predicting the onset of recession and making changes to our portfolio in advance would certainly seem worthwhile. **And, as it turns out, recession bear markets are worse than the non-recession variety:**

Recession	Max Stock Market Drawdown
1957	-21.47%
1970	-37.27%
1973	-49.93%
1981	-28.01%
1990	-20.36%
2001	-50.50%
2008	-57.69%
Average	-37.89%

Roughly 2/3s of bear markets were associated with recession and they were indeed worse, on average, than the ones that were not.

It seems logical then that if we can predict the onset of recession, we should be able to adjust our portfolios in advance and avoid some of the bear market pain. The yield curve is certainly an important indicator and it does provide advance warning (with the possibility of a false positive):

Recession Start	Recession End	Yield Curve
Aug-57	Apr-58	8
Apr-60	Feb-61	7
Dec-69	Nov-70	24
Nov-73	Mar-75	8
Jan-80	Jul-80	16
Jul-81	Nov-82	10
Jul-90	Mar-91	17
Mar-01	Nov-01	11
	Average	13

*Yield Curve Inversion Lead Time (3rd Column)

Issues with The Yield Curve

There are two problems that must still be addressed to make the yield curve useful as a recession indicator. First is the false positive issue. **Any successful tactical change to your portfolio requires two correct decisions, one to sell and one to buy.** If you make a sell decision based on a false positive from the yield curve, it will be that much more difficult to make the decision to correct your mistake. Second is the issue of timing. Do you sell when the curve first inverts? That would certainly be the easy choice and probably the correct one in the sterile, no stress environment of a research paper. But the psychological impact of selling too early is much harder to handle when real money and real goals are in play. In the last recession, the yield curve first inverted in February 2006 and the S&P 500 proceeded to gain another 25%, before peaking the very month the recession started in November of 2007. That's 21 months of being underinvested in stocks as they were making all-time highs. And you think you could just ignore that while your golf buddy brags about all the gains he's making?

The reality is that missing those last gains of a bull market really don't make that much difference unless you take an all-or-nothing approach to investing. If you reduce your equity allocation by, say, 10%, then the opportunity cost of selling in February of 2006 rather than November 2007 is just 2.5% total return. The psychological impact would be a lot greater though and could easily lead you to make a bigger mistake. How do you know when the signal was a false positive? What if you decide that this must be one of those times and buy back in right before recession hits?

Yield Curves and Recessions Outside the US

The yield curve is obviously a useful indicator but as the foregoing indicates, it isn't failsafe. **And there are reasons to doubt the validity of the signal at all, to wonder if the series of correct recession calls by the US yield curve is nothing more than a lucky streak.** Research on the yield curve in other countries*** provides a much more mixed picture. European countries do generally see their yield curves invert prior to recession but there are also many more false positives. And in Italy, for some reason, the curve doesn't tend to invert prior to recession. In emerging market economies yield curves have inverted 30 times since 2005 and recession only followed in 5 of those instances****.

And then there is the case of Japan. The Land of the Rising Sun has experienced five recessions since 1995 and not one of them was preceded by an inverted curve. Of course, inverting the yield curve when your central bank has its discount rate at zero – as Japan's was that entire time - is quite hard if not impossible. I know, I know, Japan is unique and we aren't Japan. They have an aging population, are hostile to immigration and their central bank has engaged in repeated rounds of Quantitative Easing. Hmm. Maybe we aren't that different after all. Something to consider anyway.

If predicting the onset of recession is useful, and the yield curve is helpful but not foolproof – and cognitive bias makes us all fools to some degree when it comes to money – is there some way to improve its efficacy as an investing tool? After all, making unnecessary changes to our portfolio is costly in more ways than one. The answer is yes, but it requires looking beyond the simple Treasury yield

curve and incorporating other indicators into the analysis.

Using Other Indicators

To justify a change in our strategic allocation plan, we want to see confirmation from other recession indicators. We use several to bolster our recession-watch effectiveness:

- **Credit Spreads**
- **Chicago Fed National Activity Index**
- **Leading Economic Indicators**

Credit spreads are the most important and timely of these indicators. Credit spreads refer to the difference between risk-free yields (Treasuries) and lower-rated bonds. We track a number of different spreads but the first warning generally comes from the spread between Treasuries and junk bonds. Recessions are generally preceded by a widening of the spread between Treasuries and riskier bonds.

The Chicago Fed National Activity Index is a weighted average of 85 existing monthly economic indicators. It is constructed to have an average value of zero and a standard deviation of one. A reading of zero indicates the economy is growing at trend, a positive reading above trend and negative below trend. Recession is generally imminent when the 3-month moving average of the CFNAI is -0.75. We also look at 6-month cumulative values.

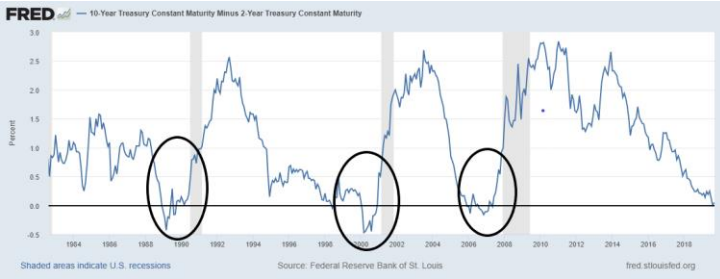
The Leading Economic Indicators are compiled by the Conference Board. We look at the leading, coincident, and lagging indicators. There are 10 leading indicators, 4 coincident, and 7 lagging. We look at the LEI and its rate of change as well as the ratio of leading to coincident and leading to lagging.

There is a tricky balance that must be struck between using only one recession indicator and multiple indicators. You want to use enough that you aren't relying on just one but limit it to ones with a proven correlation with future growth. We look at a very large amount of economic data but the list of indicators we use to make tactical changes to our portfolios is surprisingly short. There are others I haven't mentioned here, but in total we use well less than 10 individual indicators.

The yield curve represents investors' expectations for interest rates across time. Long term interest rates are really nothing more than a series of short-term rates, inflation expectations and a term premium (extra yield to compensate for the risk of buying a long-term bond). When long term rates are less than short term rates, that usually means that investors expect short term rates to fall. And short-term rates fall when economic growth is weak. That's why an inverted curve is associated with recession.

There is a wisdom of crowds and market expectations are remarkably correct most of the time. But investors are prone to mistakes and herding. The market was not right about dot com stocks at the turn of the century. The market was not right about real estate in 2006. Markets are not infallible because they consist of people who are not infallible. The yield curve works pretty well as a stand-alone indicator, certainly better than most things people watch. But it works a lot better when it is used in conjunction with other reliable indicators.

And one last thing should be considered when it comes to the yield curve. The inversion of parts of the Treasury yield curve is not the recession signal. Yes, after 2500 words on the subject, **it turns out that the inversion is not the important observation. Right before recession – about a year in the last three recessions - the yield curve hits its nadir and starts to steepen.**



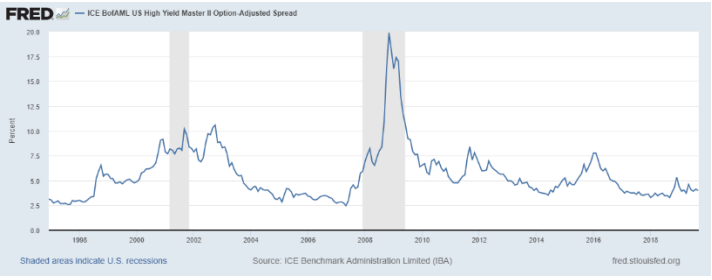
Gray vertical bars represent recessions.

That happens because the market starts to anticipate multiple rate cuts from the Federal Reserve and short-term rates fall faster than long term rates.

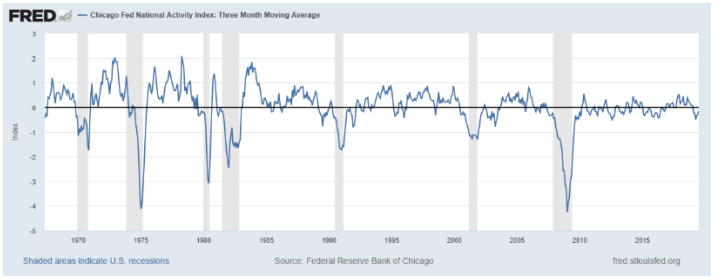
Current Conditions

The current yield curve configuration, where parts of the Treasury curve are inverted, does not warrant any tactical changes to your portfolio. The other indicators mentioned above are also not at levels or rates of change that indicate the need for a change.

Credit Spreads



The Chicago Fed National Activity Index



The Leading Economic Indicators

Strategy and Tactics

Adjusting your portfolio in anticipation of recession can be beneficial, but how exactly should one do that? Investing, contrary to the way it is presented in the popular press, is not an all-or-nothing proposition. If we could predict the onset of recession with 100% accuracy then I suppose it might make sense to sell all our stocks before it hits. But if we know how to predict recessions, it seems unlikely that no one else will have the same knowledge and they will be trying to act in advance of the recession too. To be successful, we would have to predict when the recession will begin and also when everyone else will act on this information.

This is what Keynes referred to as the beauty contest version of investing. **Successful investing isn't about predicting economic events like a recession, but rather predicting what other people will do in response, and when.** This is a very difficult game to play and one generally played only by speculators. If they anticipate what others anticipate others will do,

the profits can be enormous when they are right. They can also lose a lot when they are wrong. That's fine for the speculator, but not appropriate for your retirement funds. As an old mentor once told me, you don't gamble with the milk money.

As an investor, you need to understand the difference between strategy and tactics, two terms often confused. **Strategy is the long-term plan, the one that guides the overall endeavor. Tactics are the specifics about how you implement the plan and when you might deviate from it.** In investing, the strategic plan is usually an asset allocation plan. It describes how you will divide your funds between various asset classes such as stocks and bonds. This allocation can be based on a goal – aggressive for less important goals, more conservative for more important ones – or on circumstances such as age, risk tolerance and capacity. Once set, your strategic plan shouldn't change unless your original plan was flawed or your goal changes or your circumstances change from what you originally anticipated. Jumping from strategy to strategy is the absence of a strategy.

Investing tactics describe how you implement your strategic allocation. If your strategy calls for 60% of your funds to be invested in stocks, you still have to decide what kind of stocks. Large company or small company? US or International? Those are tactical decisions. Tactics will also, in extraordinary circumstances, dictate a short-term deviation from the strategic plan. An imminent recession would certainly qualify for a tactical shift in your portfolio.

If your strategic plan calls for 60% stocks and 40% bonds and multiple indicators are pointing to recession, you might move to 50% stocks and 50% bonds or 40% stocks and 60% bonds. What you shouldn't do is make a tactical change to 0% stocks and 100% bonds. Even with the best economic research, based on reams of historical data, there is the possibility you will be wrong. **Investing is about probabilities, not absolutes.**

If you make a successful tactical decision to reduce your equity holdings before recession, the job is only half done. You also have to decide when to raise your allocation back to your original strategic allocation. This is arguably more difficult than the selling side of the equation. Remember, bear markets usually end before the recession so you have to be a buyer when things look their bleakest. I'll save the details of that for another research paper, but suffice it to say that anticipating recovery isn't just the opposite of anticipating recession.

Most of your investing efforts should be spent on developing your strategic plan. A lot of attention gets paid to predicting the markets and the economy but most of it is just noise and shouldn't impact your strategy. Remember, Wall Street has a vested interest in getting you to *do* something. Brokers make money on activity not results.

In developing your strategic plan, assume that you will not be able to make any tactical changes before recession hits. Your plan needs to be one you can stick with if that happens.

Assume that the next bear market will be as bad as the last two and the stock market will fall 50%. If that happens what kind of loss will your portfolio experience? If 60% of your portfolio is in stocks and they fall 50% that translates to a 30% overall hit to your portfolio (assuming your bonds don't offset some of the loss). Take that a step further and translate it to dollars. For a $1 million portfolio that is a loss of $300,000. Can you absorb the emotional

impact of such a loss? Would you be able to resist selling at the bottom? Can you absorb that kind of loss and still meet your investing goals? Would it change your retirement date? How would that impact your life?

It is the tactical things that get talked and written about all the time. It's more interesting to talk about when the next recession will start than to discuss what asset classes should be included in your strategic asset allocation plan. Or how the correlation of those assets will impact the volatility of your portfolio. But the strategic plan is much more important than predicting the next recession. It isn't easy and there will always be uncertainties, but it isn't nearly as hard as predicting the future.

How We Can Help

Do you have a strategic investment plan? Are you wondering how recession will affect your portfolio? If you haven't reviewed your investment plan recently – or you don't have one – we think we can help.

Give us a call today at 1-888-777-0970 and we'd be happy to arrange for one of our investment professionals to discuss your situation with you – completely complementary. Let's start the conversation today.

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* https://today.duke.edu/2019/07/its-official-yield-curve-triggered-does-recession-loom-horizon

** There is no agreed upon definition of a bear market and it also depends on what stock market index you use. But there have been eight on which everyone agrees.

*** https://www.stlouisfed.org/on-the-economy/2019/august/yield-curve-inversions-predict-recessions-other-countries

**** https://www.bloomberg.com/news/articles/2017-08-09/don-t-trust-inverted-yield-curves-to-predict-emerging-market-gdp