

**The Next Recession:  
Will We See It Coming?**

by

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## The Next Recession: Will We See It Coming?

This morning, Keith Phillips and I consider whether we are likely to have advance warning of the end of the current expansion.

Recent experience makes it hard to be optimistic. According to the official record of the October, 1990 FOMC meeting, *“Many of the [FOMC] members observed that, insofar as could be judged on the basis of traditional indicators, the available data did not point to cumulating weakness and the onset of a recession.”*

The problem is that subsequent data revealed that economic activity had peaked back in July.

Now, it’s worth noting that the Fed was not alone in being slow to recognize the beginning of the downturn: surveys of private forecasters reveal that recession concerns only became widespread later in October, after the release of September employment data. Many economists doubt whether a recession would have developed at all, were it not for Iraq’s invasion of Kuwait.

One of the issues that we address this morning is whether our poor forecasting performance prior to the 1990 recession should be dismissed as a special case, or is representative of what we can expect in the future.

### ***Overview***

We begin our presentation with a review of some basic business-cycle facts.

Then we describe, in turn, three indexes that are supposed to signal the future direction of the economy. We evaluate their performance.

Finally, we look at what the leading indexes are telling us now.

### ***Some Basic Business-Cycle Facts***

A recession is a period of sustained, general decline in economic activity. Post-war recessions have ranged from 6 to 16 months in length, and averaged 11 months. Post-war expansions have ranged from 1 to nearly 9 years in length, and averaged just over 4 years.

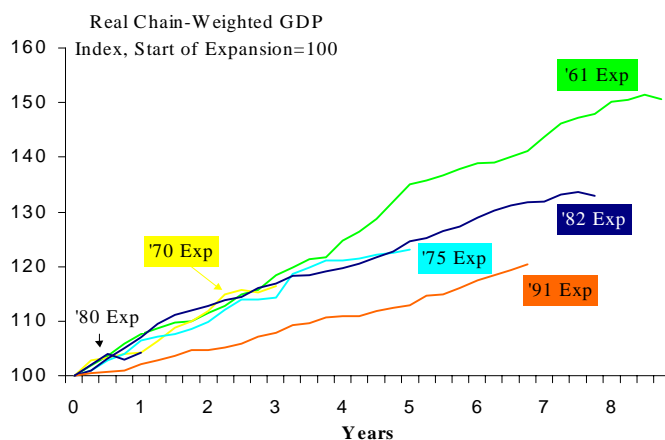
The starting and ending dates for expansions and recessions are set by a committee of economists affiliated with the National Bureau of Economic Research, or NBER. The NBER is a highly respected private organization that has been involved in business-cycle research for over 75 years. One of its prominent early members was former Fed Chairman Arthur Burns. In selecting dates for expansions and recessions, the NBER committee looks for clusters of turning points in output, income, sales, and employment.

The NBER has examined the cyclical timing of a large number of variables. These variables are classified as leading, coincident, or lagging at cyclical turning points, depending on whether they change direction before, at the same time as, or after output, income, sales, and employment. Some series have a different timing at business-cycle peaks than at business-cycle troughs. The unemployment rate, for example, is classified as a leading indicator at cyclical peaks, because it usually turns up before overall economic activity begins to decline. However, it is classified as a lagging indicator at troughs, because it typically doesn’t begin to fall until several months after output, employment, and sales begin to rise.

Obviously, leading indicators are of special interest to the economic forecaster.

There is a common perception that expansions die of old age—that the longer an expansion has run, the greater the risk that a recession is around the corner. If this perception is valid, then we have reason to worry, for, at seven years, the current expansion is now the third longest on record. As shown in Figure 1—which plots the level of real output during each of several recent expansions—only the 1960s and 1980s expansions have lasted longer. The figure also shows that, compared to other expansions, the current expansion has been unusually weak.

**Figure 1**  
**Is the current expansion getting long in the tooth?**



Fortunately, careful studies have shown that the common perception is false. Expansions don't die of old age, they die either because the economy becomes overheated—forcing the Fed to hit the brakes to prevent an acceleration of inflation—or because external shocks unexpectedly reduce the economy's productive capacity or cause a shortfall in demand. Currently, some economists are concerned about a shortfall of demand arising from the crisis in Asia. Others' fears center on the inflation threat from tight labor markets.

### ***The Conference Board's Leading Indicators***

As already noted, researchers have examined a large number of economic indicators, seeking those that reliably lead movements in the overall economy. Each month, economists at the Conference Board—a private corporation—take a weighted average of ten such series to obtain the composite leading index that we hear about in news reports. Responsibility for the index was privatized only two years ago. Previously, the index was compiled by the Commerce Department. The Conference Board index is the first of three leading indexes that we will be looking at this morning.

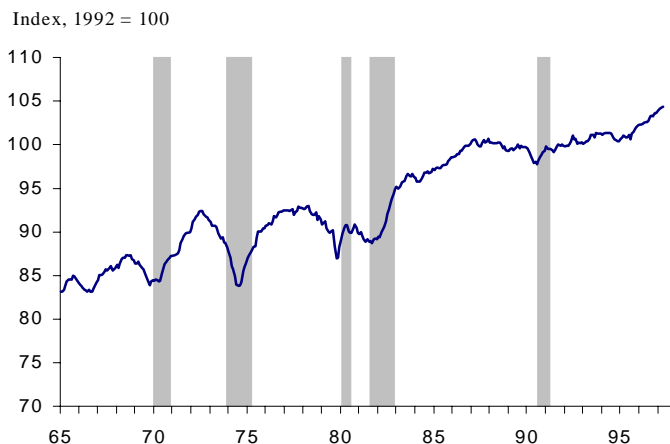
Two of the series included in the Conference Board index—stock prices and consumer expectations—are direct measures of people's confidence in the future health of the economy.

Two others give early signals of strength or weakness in the labor market. Four series measure new orders or reflect delivery delays that may indicate that sales are rising faster than production.

Also included in the leading index are two measures of household liquidity that tend to lead movements in spending: the M2 money supply adjusted for inflation, and the slope of the yield curve, measured by the difference between the 10-year Treasury bond and federal funds rates. Keith will talk more about the yield curve later in this presentation.

Plots of the Conference Board index suggest that it has done a good job of predicting recessions—shown here as shaded bands—and expansions. The average lead at the five cyclical peaks since the index was first released is over 8 months. The average lead at cyclical troughs is almost 4½ months.

**Figure 2**  
The Conference Board Index *appears*  
to have performed well ...



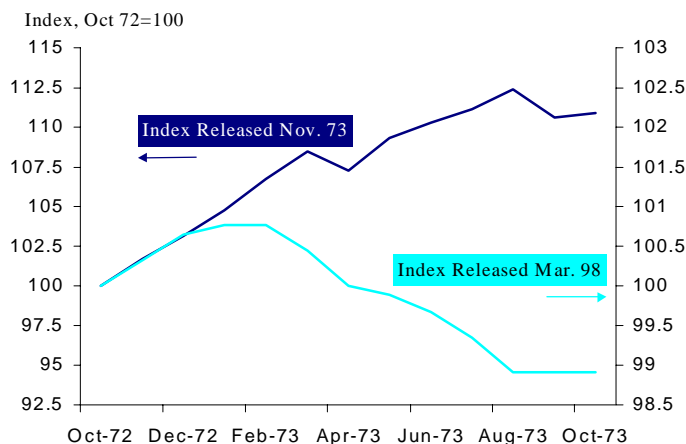
If there is a problem with the Conference Board index, this chart suggests that it is not that the index fails to give advance warning of turning points, but that the index occasionally predicts recessions that never materialize. Examples include 1966, 1984, and 1995. Indeed, it is sometimes said that the leading index has predicted 9 of the past 5 recessions!

The actual historical performance of the Conference Board index has been substantially worse than the previous slide suggests. The problem is that cyclical turning points in the Conference Board index that are obvious to us now—with the benefit of hindsight—were often not obvious to policymakers at the time.

Partly, the problem is simply that the leading index is published with over a 1-month delay. Partly, the problem is that it is difficult to distinguish short-term fluctuations in the index from major swings until several months have elapsed. After-the-fact revisions to the leading index are also an important contributor to the gap between the index's apparent success and its actual historical performance. While most revisions to the index are small and routine—reflecting the arrival of new, more complete information about the index's component series—some revisions reflect wholesale reformulations of the index itself.

A nice illustration of how looking at historical plots can exaggerate the usefulness of the leading index is given here. The line plotted toward the top of Figure 3 shows the leading index as it appeared in November 1973, at the start of the 1973-75 recession.

**Figure 3**  
 ... but revisions distort the index's forecasting record



The line peaks in August, only 3 months before the economy began to turn down. It is unlikely that any analyst would have felt comfortable predicting a recession on the basis of this information.

The lower line plots **revised** data for the Conference Board index over the same interval. The revised plot peaks fully 6 months earlier than the plot that was available to analysts back in 1973. If this plot had been available at the time, the fact that a recession was coming would have been obvious! The lesson is that if we want an **honest** record of a leading index's forecasting ability, we must limit ourselves to "real-time data"—that is, data available at the time the forecast would have been made.

### *Lessons from Real-Time Analysis*

A few years back, Ken Emery and I undertook just such an analysis of the real-time forecasting performance of the Conference Board's leading index. We found that because of the 1-month delay with which the index is released, the roundedness of cyclical peaks in the index, and the index's tendency to turn down when the economy is merely going to slow—not decline—the index can **not** be counted on to give advance warning of recessions. Indeed, a fully reliable recession signal has typically not been available until 3 months **after** a recession has begun. Similarly, a reliable recovery signal has typically not been available until 1 month after economic activity has begun to expand. In view of this weak performance, it is perhaps not surprising some economists have tried to develop alternatives to the Conference Board index.

Now I'll turn the presentation over to Keith Phillips, who will discuss two such alternatives, and review the signals we're currently receiving about the direction of the economy.

## *The Stock and Watson Leading Index*

In the late 1980s two economists from the NBER created an alternative U.S. leading index using much more rigorous statistical techniques to select and weight the leading index components. The authors picked 7 leading indicators for the index after a search over 250 candidate series.

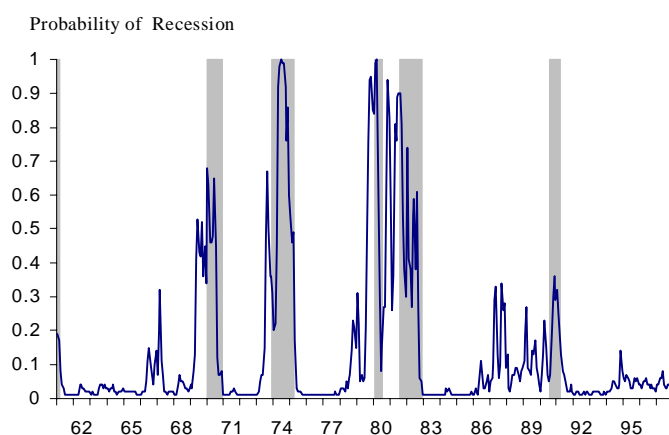
Many of the components of the Stock and Watson Experimental Index are similar to components of the Conference Board leading index. These include building permits, manufacturers unfilled orders for durable goods, part-time work due to slack conditions and the yield curve. Components which are quite different are an exchange rate measure, the 10-year T-bond rate and the interest rate spread between 6-month commercial paper and 6-month T-bills, which is often referred to as the quality spread. The largest weights in the index are given to changes in the quality spread and in the yield curve.

Stock and Watson, in an effort to be precise about the interpretation of movements in the leading index, use the changes in the index to create a probability of that the economy will be in a recession six months later.

### *S&W Index Jumps Prior to Recessions*

The new probability of recession index performed well over the period from 1961 to 1989. As shown in Figure 4, the four significant jumps in the index were all followed by recessions. Since this is the period to which the model was fit, however, it is not surprising that the index worked very well. As shown here, however, the Stock and Watson leading index did not give a clear signal of the 1990 recession. Also, as Evan mentioned earlier, the performance of an index can be distorted if the index is analyzed using revised data and not data that was actually available at the time.

**Figure 4**  
**Predictive power less evident**  
**in the early '90s**

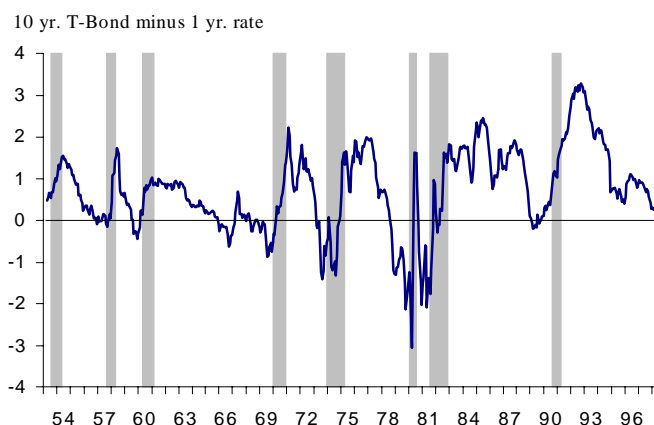


Because this index was first produced in 1989, it would be very difficult to do a real time evaluation on data prior to that time. The real time values of the index since 1989, however, have not fit the business cycle as well as shown here. But before I turn to the real time evaluation of the indexes, I would like to discuss one other measure that has been evaluated for its ability to lead recessions.

## *The Yield Curve Also Signals Recessions*

Recent research, much of it within the Federal Reserve System, has touted the power of the yield curve as a predictor of business cycle turns. As shown in Figure 5, the difference between the yield on the 10-year and 1-year treasury bonds has turned negative prior to every recession since the early 1950s. The index turned negative in the mid-60s, however, and was not followed by a recession. In one recent study, the researchers found that the yield curve was a better predictor of recessions at least two quarters in advance than a host of other indicators, including the S&W index and the CB Leading index.

**Figure 5**  
**A negative yield curve**  
**is a strong recession signal**



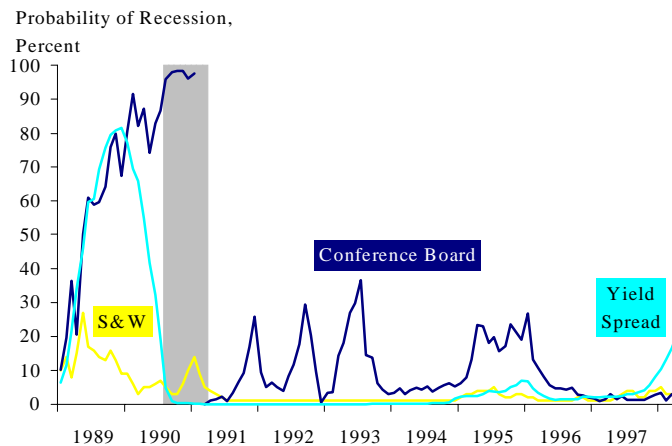
In a recent article in the Kansas City Fed Review, the author found strong predictive power from the yield curve spread but noted that it appears to make a difference if the yield curve declined due to rising short rates or falling long rates. The author noted that all U.S. recessions since 1955 (with the exception of 1990) were preceded by low spreads largely caused by increasing short rates and that two recent episodes of low spreads that were not followed by recession—that in 1986 and 1995—were caused by falling long rates. So in analyzing this important variable it is useful to distinguish if a low or negative spread is caused by rising short rates or falling long rates.

It is also important to note two advantages of the yield curve are that it is not subject to revision, which means that the movements shown in the chart were the actual movements at the time, and it is available daily and virtually instantaneously.

### ***A Real-Time Comparison***

To better compare the performance of the three leading indexes that we have discussed, we first calculate the probability of recession for both the Conference Board leading index and the yield curve based on how these indicators behaved near periods of past recessions. The probabilities are calculated using only data that would have been available to us had we calculated them each month during this period. The method that we used was developed by the statistician Salih Neftci. These real-time estimations are shown in Figure 6 plotted along with the real-time Stock and Watson probabilities of recession.

**Figure 6**  
**Leading Indexes have behaved**  
**differently in the '90s**



The probability of recession estimated with the Conference Board leading index and the yield curve jumped prior to the start of the 1990 recession, giving some advance warning of an impending downturn. The recession signals subsided prior to the start of the recession, however, and may have led analysts to expect that the likelihood of recession had eased. In July 1990, at the peak of the business cycle, the probability of recession was 19% based on changes in the yield curve and 74% based on changes in the Conference Board index.

The Stock and Watson index rose moderately for a brief moment in early 1989 but then declined, remaining at low levels throughout most of 1989 and 1990. Thus, while the Stock and Watson index performed well over the period for which it was estimated, its performance during the 1990 recession leaves an important question mark as to how this measure will perform over time.

Throughout the rest of the 1990's the probability of recession remained low for all three indexes. The Conference Board index experienced a much higher degree of volatility, generally reflecting a greater sensitivity to changes in the growth rate of the economy. Overall, then, the real-time analysis for the period since 1989 reveals that the three indicators often behave differently and it may be useful to monitor all three.

Finally, turning to the most recent months, the only indicator showing any signs of recession is the yield curve, although this signal is still very mild - about 21 percent using data from the first week in April. Also, the yield curve has flattened but the reduction is due to a drop in long rates which, in the past, has been less likely to signal recession than if the curve flattened due to rising short rates. The overall message of the indicators seems to be that continued expansion is likely this year. It is reassuring that this outlook is consistent with a consensus of private forecasters which is forecasting that Real GDP will grow 2.7 percent this year.

### ***Caveats to the Use of Leading Indexes***

We could stop here but it is important to consider some of the caveats to the use of leading indexes. The first caveat is that there have been only nine recessions in the post war period. So few observations to test over reduces the confidence in the results.

The second caveat is that the Conference Board index may place too great a weight on the manufacturing sector. Out of the ten indicators in the index, four are from the manufacturing sector. This emphasis on manufacturing may be particularly relevant to today because the recent rise in the value of the dollar may have an especially large impact on the manufacturing sector.

The third caveat is that it is very difficult to judge false signals. Evan mentioned earlier that the CB index has predicted 9 out of the last 5 recessions. A possible explanation is that policy makers have taken action to offset the emerging weakness, preventing a recession from developing. Something like this may have happened in 1984. After the Conference Board leading index peaked in March 1984, the Fed lowered the Fed Funds rate beginning in September, thereby orchestrating a soft landing that, had they not had early warning, may have turned into a recession.

### ***Will we see the next recession coming?***

The indicators in leading indexes typically measure expectations about, or orders for, future economic production. It is not surprising then that these indicators may change direction prior to changes in broader economic variables such as employment or RGDP. Research by Koenig and Emery suggests that to really know for sure a decline in the Conference Board's Leading Index is signaling recession, the signal has to be so strong or so prolonged that, on average, it occurs three months after the recession has started. While this may seem a very poor result, recessions, such as the one that occurred in 1990-1991, often aren't apparent at first and early warning signals, even if they occur at the beginning of the recession, are often of high value.

In response to criticism of the Conference Board's Leading Index, researchers have sought out better recession indicators. The Stock and Watson Index, while giving little warning of the 1990 recession, has a strong statistical foundation and may be a useful index in the future. The yield curve has had a good record in predicting recessions four quarters in advance and should be monitored closely. Even the yield curve, however, does not have a perfect record.

Finally, we may see the next recession coming, but if we do, then it is likely that it will not occur. In fact, we may be getting so good at seeing recessions coming that there are fewer that materialize. Since November 1982 we have experienced only eight months of recession - the fewest in history for a time period of this length. Several times over this period, such as in 1984, a decline in the Conference Board's leading index was followed by a drop in the Federal Funds rate and a slowing, rather than a decline in the overall economy.

At present, the yield curve is giving the strongest signal of an economic slowdown, but even it says that the odds of a recession during 1998 are no higher than 1 in 5.