



Dating the End of the Recession: Evaluating the Economic Indicators

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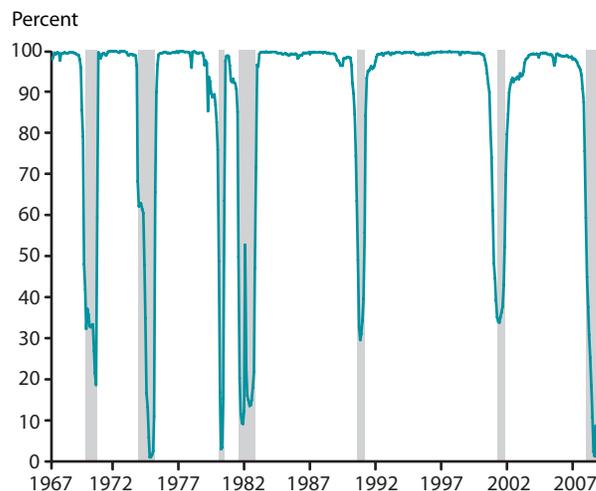
The current recession started in December 2007. Whenever it ends, it will likely have been the longest and deepest recession since World War II. But when will it end? Although it is extraordinarily difficult to forecast business cycle turning points, economists nonetheless focus on certain indicators that might signal when one business expansion ends and the next one begins. This commentary focuses on the latter by examining eight indicators (data series) with reasonably good track records of signaling a business cycle trough. Of these eight series, seven indicated a trough in economic activity either in late 2008 or early 2009. However, the one indicator that appears to stand out—the index of coincident indicators—has yet to signal a trough.

Dating business cycle troughs is conceptually similar to dating peaks. In both cases, the National Bureau of Economic Research (NBER) Business Cycle Dating Committee focuses on a few key data series to inform its decision. These include monthly series such as nonfarm payroll employment and real personal income less transfer payments and quarterly series such as real gross domestic product (GDP). One difficulty with dating peaks and troughs—and the main reason the NBER takes its time—is that the key variables are revised, often significantly. Waiting helps to minimize false alarms. To provide a quicker assessment of turning points, some economists have developed statistical models to replicate the NBER's more subjective methodology. Some of these models, which build on a method developed by Hamilton (1989), use data series favored by the NBER to estimate the probability of being in one of the two economic states—recession or expansion. One such model, developed by Chauvet and Piger (2009), uses four data series often used by the NBER¹: The chart shows that the model's probability of expansion (1 – the probability of recession) falls sharply at or near NBER-determined peaks and then begins to rise sharply at or near the NBER-determined troughs. This suggests that this method is highly accurate, with few if any false alarms.

A less-sophisticated method of dating troughs is to identify economic series with distinct business cycle characteristics. Here are eight:

- i. the Index of Coincident Indicators (ICI);
- ii. the Institute for Supply Management's Purchasing Managers Index (PMI);
- iii. the monthly average of weekly initial claims for state unemployment insurance benefits (CLAIMS);
- iv. the 3-month moving average of the Chicago Fed's National Activity Index (CFNAI);
- v. the 3-month moving average of the Aruoba-Diebold-Scotti Business Conditions Index (ADS)²;
- vi. the S&P 500 stock price index (SP500);
- vii. the yield on long-term Treasury securities (LTG); and
- viii. the 3-month moving average of retail automobile sales (domestic plus imported) (AUTOS).

Probability of Expansion (1 – Probability of Recession)



SOURCE: Jeremy Piger (www.uoregon.edu/~jpiger/us_recession_probs.htm).

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These indicators provide broad coverage of the domestic labor (CLAIMS), product (PMI and AUTOS), and financial markets (SP500 and LTG). Also, three indicators—ICI, ADS, and CFNAI—are composites of several economic series. (To examine the longest uninterrupted coverage possible, the analysis examines only periods since the February 1961 trough.)

The [table](#) lists each of the NBER trough months over this period and the trough month as measured by each indicator. The table also lists the mean, median, and standard deviation (SD) of the lead or lag difference (in months) between the NBER- and indicator-determined troughs of the seven recessions. The most desirable indicator for dating troughs before the NBER pronouncement will have the smallest means, medians, and SDs.

The calculations in the table suggest that some indicators are more promising than others. Five of the eight indicators—PMI, CLAIMS, CFNAI, ADS, and SP500—signal a rebound in economic activity before the recession officially ends. Of these five series, CLAIMS has both the smallest average and median difference, followed closely by CFNAI and SP500. This finding is consistent with a recent article by Gordon (2009), who argues that CLAIMS is a reliable indicator for predicting the end of a recession.

There is also considerable variation across indicators. For example, on average, the 3-month moving average of the ADS tends to reach a trough 3 months before the actual NBER trough, whereas LTG tends to reach a trough nearly 1.75 months after the NBER date. There is also considerable variation *within* indicators. For example, AUTOS appears to be the best indicator because its average is concurrent with the NBER trough, but its variation across episodes ranges from 11 months before the NBER trough to 8 months after. This variation is measured by the SD. The SD is also quite high for the two financial market variables (SP500 and LTG). It is also relatively high for the ADS. In the case of AUTOS, SP500, and LTG, the high SD also means that the

likelihood of a false alarm is larger for these series. Indeed, some subjectivity was used when dating troughs in these series around NBER troughs. The other indicators with smaller SDs tend to have better-defined troughs.³ Moreover, the ADS, PMI, and SP500 have relatively large SDs because of one or two outliers.

Analysts should consider watching the one indicator that stands out for its accuracy (smallest mean and median) and its consistency (smallest SD) across episodes: ICI. Its accuracy as a predictor of business cycle troughs is perhaps not surprising because the NBER regularly uses its components to date peaks and troughs. According to the latest data, PMI and LTG show that economic activity hit a trough in December 2008; CFNAI and ADS indicate the trough was in January 2009; CLAIMS, SP500, and AUTOS indicate March 2009.

However, the ICI has yet to reach a trough (data through April 2009). This evidence seems consistent with the view of most forecasters, who see the recession ending sometime during the third quarter of 2009. ■

Further Reading

Chauvet, Marcelle and Piger, Jeremy. “A Comparison of the Real-Time Performance of Business Cycle Dating Methods.” *Journal of Business & Economic Statistics*, 2008, 26, pp. 42-9.

Gordon, Robert J. “Green Shoot or Dead Twig: Can Unemployment Claims Predict the End of the American Recession?” *VOX*, May 1, 2009; www.sabainfo.ir/content/media/image/2009/05//15259_orig.doc.

Hamilton, James D. “A New Approach to the Economic Analysis of Nonstationary Time Series and the Business Cycle.” *Econometrica*, 1989, 57(2), pp. 357-84.

¹ This model uses the four series that comprise the monthly index of coincident indicators: nonfarm payroll employment, industrial production, real manufacturing and trade sales, and real personal income less transfer payments. Over time, these are the four key series, along with real GDP, regularly used by the NBER Dating Committee to date peaks and troughs.

² The ADS is updated and published by the Federal Reserve Bank of Philadelphia: www.phil.frb.org/research-and-data/real-time-center/business-conditions-index/.

³ This was particularly true for LTG in the 1970, 1990-91, and 2001 episodes; for AUTOS in the 1973-75, 1981-82, 1990-91, and 2001 episodes; and for SP500 in the 2001 episode.