Economic *SYNOPSES*

short essays and reports on the economic issues of the day

2010 ■ Number 21

Business Cycle Measures

Kristie M. Engemann, *Senior Research Associate*
Michael T. Owyang, *Research Officer and Economist*

At the time this essay was written, the National Bureau of Economic Research (NBER) had not yet announced the official end of the recession. Many economists, however, believe that it ended in mid-2009. We discuss two business cycle measures that provide some statistical evidence of a trough long before an NBER announcement, which could help policymakers decide when to exit quantitative easing.

The Philadelphia Fed publishes the Aruoba-Diebold-Scotti business conditions index (ADS index), which is constructed using data measured at mixed frequencies: gross domestic product (measured quarterly); employment, industrial production, personal income less transfer payments, and manufacturing and trade sales (measured monthly); and initial jobless claims (measured weekly). Ironically, the ADS index is a daily time series that contains no daily data—the authors of the index note in their published paper that including a daily interest rate spread (term spread, or the difference between the 10-year T-bond and 3-month T-bill yields) did not improve the index's performance. The index is revised whenever any series is updated.[1]

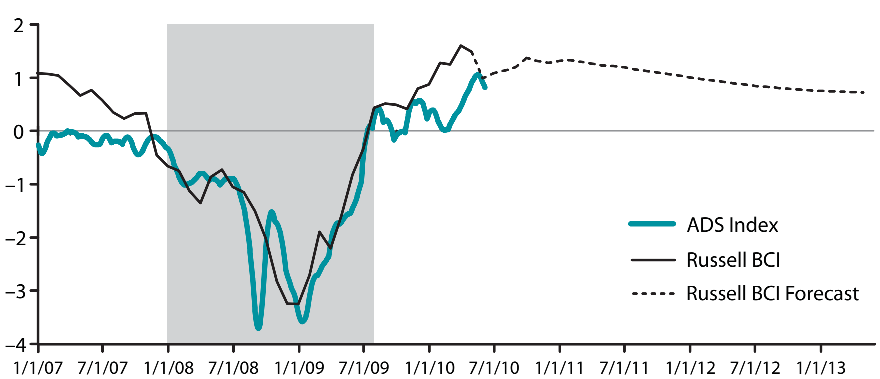
Economist Michael Dueker at Russell Investments introduced a business cycle index (Russell BCI) that is updated around the 15th of each month. Dueker uses both macroeconomic and financial data to assess the current state of the economy and make predictions for the upcoming three years. His estimation uses employment, inflation excluding food and energy, the term spread, the difference between Aaa and Baa corporate bond yields, and the difference between commercial paper and T-bill yields.[2]

The chart shows the ADS index vintage from June 17, 2010 (which includes values through June 12) and the Russell BCI vintage from June 2010 (which includes values through May). With the ADS index, values above zero indicate the degree to which business conditions are better than average, whereas the opposite holds true for values below zero. Russell BCI values are expressed as the number of standard deviations from zero; larger positive (negative) values indicate that conditions are farther from a business cycle peak (trough).

Business cycle measures can provide timely statistical evidence of turning points.

Both measures show August 2009 as the first full month with positive values since the recession began, which indicates that the recession ended last July. Even though the ADS index has dipped below zero briefly since then, the authors of the index still classify July 2009 as the trough. Since early February 2010, the ADS index has generally shown steady improvement in business conditions. Addi-

Business Cycle Measures



SOURCE: Philadelphia Fed (ADS index) and Michael Dueker at Russell Investments (Russell BCI and forecasts). The gray-shaded area indicates recession; the beginning is the official NBER date, and the end is the date indicated by the ADS index and the Russell BCI.

tionally, the Russell BCI forecasts show a slight decline in conditions with the release of June data but then fairly steady conditions through mid-2013.

Both the ADS index and Russell BCI had already pinpointed July 2009 as the end of the recession in vintages released in mid-September of 2009. Although the recession's end date is not official, these measures provide some idea about the overall state of the economy. ■

[1] For an introduction to the model, see Aruoba, S. Borağan; Diebold, Francis X. and Scotti, Chiara. "Real-Time Measurement of Business Conditions." *Journal of Business and Economic Statistics*, October 2009, *27*(4), pp. 417-27. Additional details on the ADS index were obtained from the Philadelphia Fed (www.philadelphiafed.org/research-and-data/real-time-center/business-conditions-index/).

[2] For an introduction to the model, see Dueker, Michael. "Dynamic Forecasts of Qualitative Variables: A Qual VAR Model of U.S. Recessions." *Journal of Business and Economic Statistics*, January 2005, *23*(1), pp. 96-104. Additional details on the Russell BCI were obtained from Russell Investments (www.russell.com/Helping-Advisors/Markets/BusinessCycleIndex.asp).