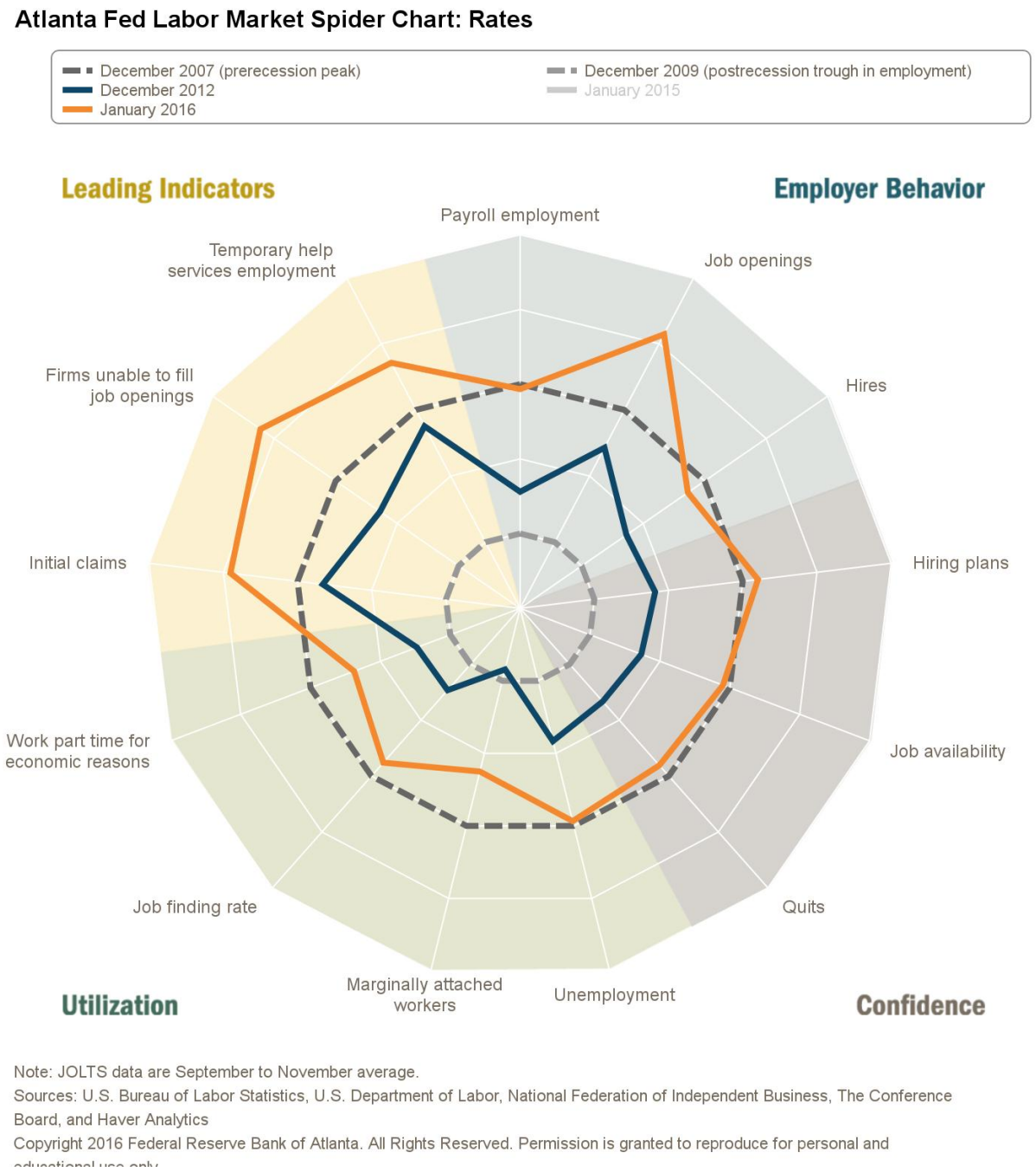
February 5, 2016

Introducing the Refined Labor Market Spider Chart

In January 2013, Atlanta Fed research director Dave Altig introduced the Atlanta Fed's labor market spider chart in a *macroblog* post.

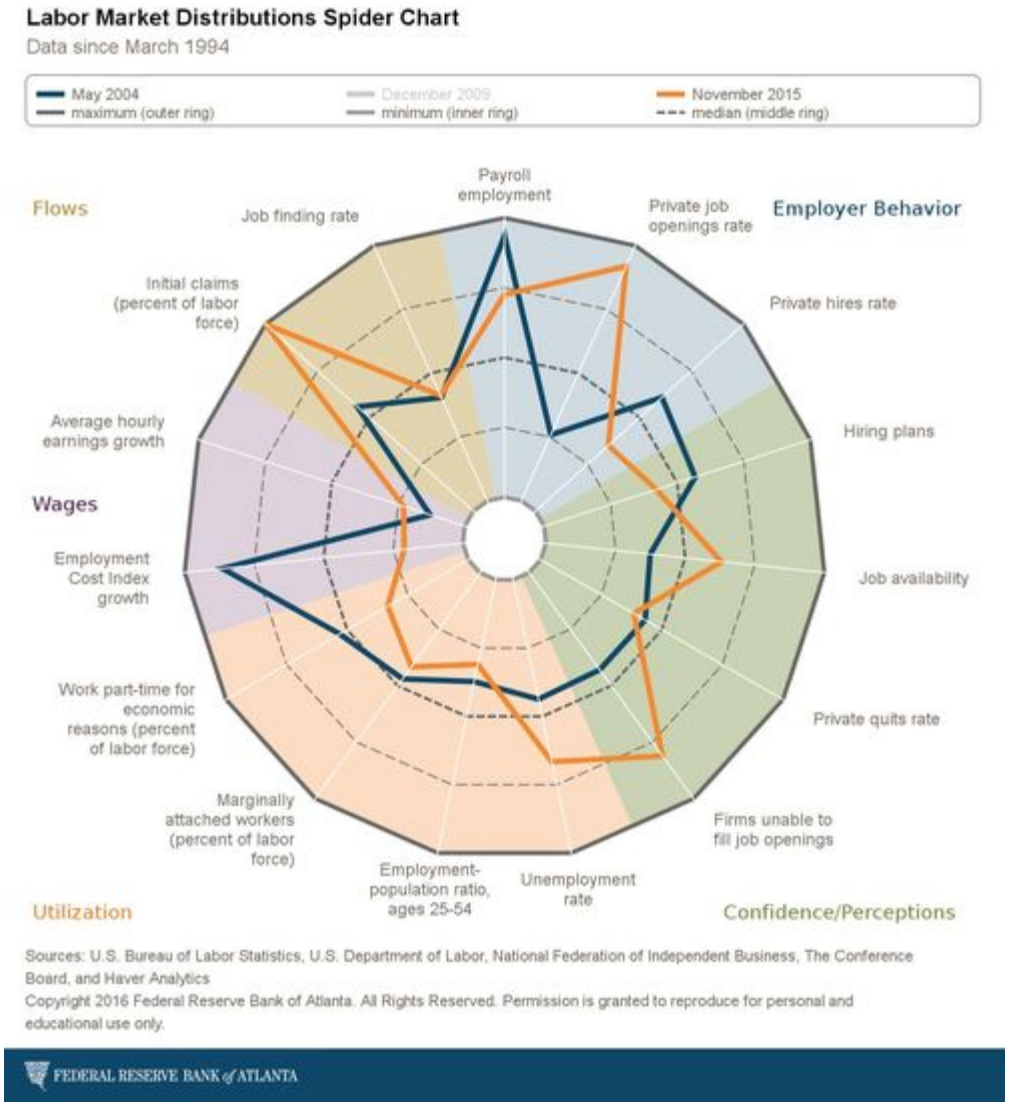
In a follow-up post that June, Atlanta Fed colleague Melinda Pitts and I introduced a dedicated page for the spider chart located at the Center for Human Capital Studies (CHCS) webpage. It shows the distribution of 13 labor market indicators relative to their readings just before the 2007–09 recession (December 2007) and the trough of the labor market following that recession (December 2009). The substantial improvement in the labor market during the past three years is quite evident in the spider chart below.



(enlarge)

As of December 2012, none of the indicators had yet reached their prerecession levels, and some had a long way to go. Now, many of these indicators are near their prerecession values—and some have blown by them.

To make the spider chart more relevant in an environment with considerably less labor market slack than three years ago, we are introducing a modified version, which you can see here. Below is an example of a chart I created using the menu-bars on the spider chart's web page:



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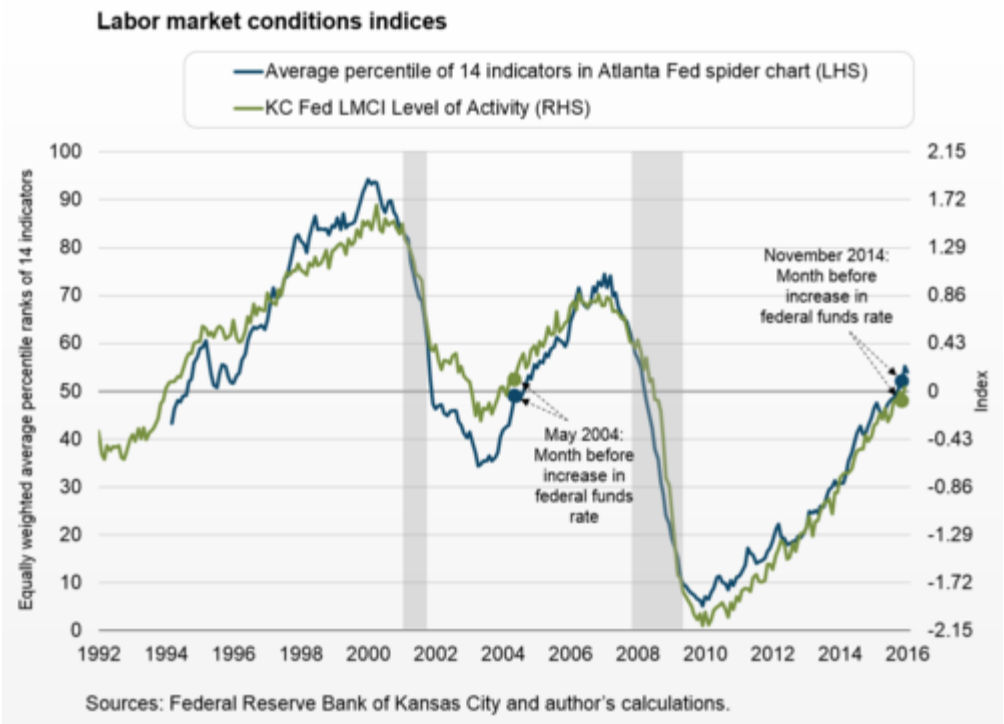
In this chart, I plot the May 2004 and November 2015 percentile ranks of labor market indicators relative to their distributions since March 1994. As with the previous spider chart, indicators such as the unemployment rate, where larger values indicate more labor market slack, have been multiplied by –1. The innermost and outermost rings represent the minimum and maximum values of the variables from March 1994 to January 2016. The three dashed gray rings in between are the 25th, 50th, and 75th percentiles of the distributions. For example, the November 2015 value of 12-month average hourly earnings growth (2.26 percent) is the 23rd percentile of its distribution. This means that 23 percent of the other monthly observations on hourly earnings growth since March 1994 are lower than it is.

I chose May 2004 and November 2015 because they had the last employment situation reports before "liftoffs" of the federal funds rate. November 2015 appears to be stronger than May 2004 for some indicators (job openings, unemployment rate, and initial claims) and weaker for others (hires rate, work part-time for economic reasons, and the 12-month growth rate of the Employment Cost Index).

The average percentile ranks of the variables for these two months are similar, as the chart below depicts:



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Also shown in the chart is the Kansas City Fed's Level of Activity Labor Market Conditions Indicator. It is a sum of 24 not equally weighted labor market indicators, standardized over the period from 1992 to the present. In spite of its methodological and source-data differences with the average percentile rank measure plotted above, it tracks quite closely, especially since 2004. However, as shown in the spider chart that I referred to above, there is quite a bit of variation within the indicators that may provide additional information to our analysis of the average trends.

We made a number of other changes to the spider chart to ensure it reflects current labor market issues. These changes are documented in the FAQs and "Indicators" sections of the new spider chart page. Of particular note, users can choose not only the

years for which they wish to track information, but also the period of reference that provides the basis of the spider chart. The payroll employment variable is now the three-month average change rather than a level. Temporary help services employment has been dropped, and two measures of 12-month compensation growth and the employment-population ratio (EPOP) for "prime-age workers" (25 to 54 years) have been added.

Some care should be taken when comparing recent labor market data values with those 10 or more years ago as structural changes in the labor market might imply that a "normal" value today is different than a "normal" value in, say, 2004. The variable choices for the refined spider chart were made to mitigate this problem to some extent. For example, we use the prime-age EPOP as a crude adjustment for population aging, putting downward pressure on the labor force participation rate and EPOP over the past 10 years (roughly 2 percentage points). This doesn't entirely resolve the comparability issue since, within the prime-age population, the self-reporting rate of illness or disability as a reason for not wanting a job has increased about 1.5 percentage points since 1998 (see the *macroblog* posts here and here and the CHCS Labor Force Participation Dynamics webpage). If this increase in disability reporting is partly structural—and a Brookings study by Fed economist Stephanie Aaronson and others concludes it is—some of the decline in the prime-age EPOP since the late 1990s may not be a result of a weaker labor market per se.

Other variables in the spider chart may have had structural changes as well. For example, a study by San Francisco Fed economists Rob Valleta and Catherine van der List concludes that structural factors explain just under half of the rise in the share of workers employed part-time for economic reasons over the 2006 to 2013 period.

To partially account for structural changes in trends, we allow the user to select one of 11 time periods over which the distributions are calculated. The default period is March 1994 to present, which is what was used in the example above, but users can choose a window as short as five years where, presumably, structural changes are less important. A trade-off with using a short window is that a "normal" value may not produce a result close to the median. For example, the median unemployment rate is 5.6 percent since March 1994 and 7.3 percent since February 2011. The latter value is much farther away from the most recent estimates of the natural rate of unemployment from the Congressional Budget Office and the Survey of Professional Forecasters (both 5.0 percent).

In our June 2013 *macroblog* post introducing the spider chart, we wrote that we would reevaluate our tools and determine a more appropriate way to monitor the labor market when "the labor market has turned a corner into expansion." The new spider chart is our response to the stronger labor market. We hope users find the tool useful.

By Pat Higgins, senior economist in the Atlanta Fed's research department

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