

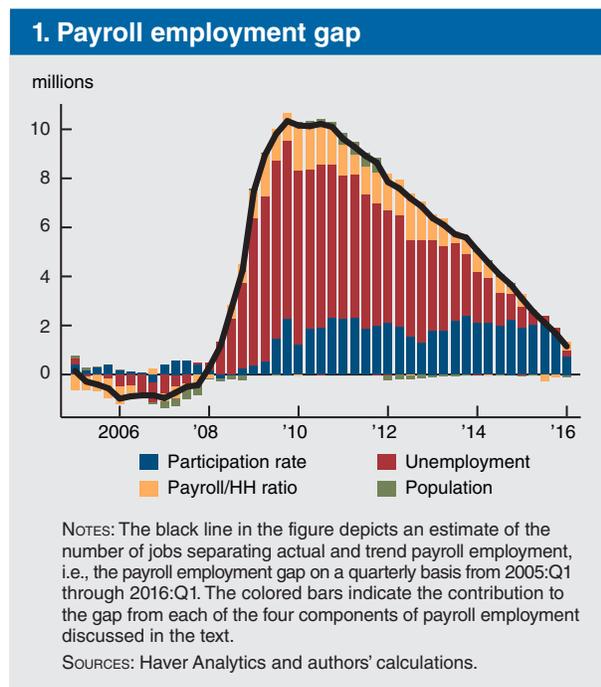
Chicago Fed Letter

Is there still slack in the labor market?

by Daniel Aaronson, vice president and director of microeconomic research, Scott A. Brave, policy economist, and David Kelley, senior associate economist

Based on recent population and labor force projections, we estimate that payroll employment remained about one million jobs below its trend as of April 2016. Given an average pace of roughly 200,000 jobs added per month so far this year, this implies that labor market slack is likely to persist until late 2016. Considerable uncertainty surrounds this estimate, however, especially with respect to labor force trends. An alternative calculation that assumes a steeper decline in trend labor force participation driven by shifting demographics suggests that slack could persist for up to an additional year.

While labor market conditions have improved substantially in the past few years, the lack of sustained upward pressure on wages suggests that some slack may still remain. Using population projections from the U.S. Census Bureau (Census) and labor force projections from the Congressional Budget



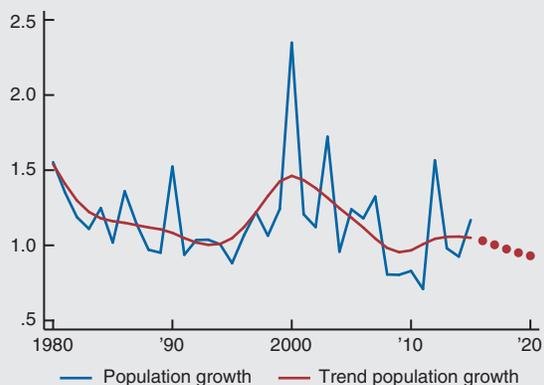
Office (CBO), we estimate that payroll employment remains about 1 million jobs below its trend (figure 1). In order to continue to close this gap, employment must increase faster than its underlying trend. By our estimates, gains of more than roughly 50,000 jobs per month in 2016 will cause labor markets to tighten on average. This implies that if employment continues to grow at an average pace of roughly 200,000 jobs per month, as it has so far this year, some labor market slack is likely to persist into late 2016.

In this *Chicago Fed Letter*, we detail how we arrive at our estimates of trend employment growth. We estimate that trend employment growth will increase through the end of the decade, rising to nearly 70,000 by 2020. Considerable uncertainty surrounds this jobs per month estimate, especially with respect to labor force trends. For instance, according to our calculations made based on the labor force participation trend

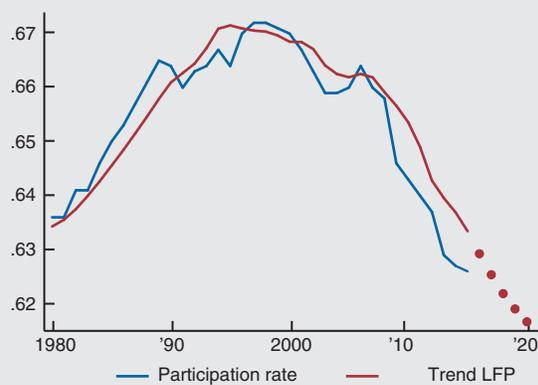
and natural rate of unemployment described in research by Aaronson et al.,¹ instead of the CBO's estimates of these series, trend employment growth would be closer to 50,000 jobs per month through the end of the decade.² Both projections are largely driven by shifting demographics in the labor force due to the ongoing retirement of the baby boomer generation.

2. Four components of trend employment growth

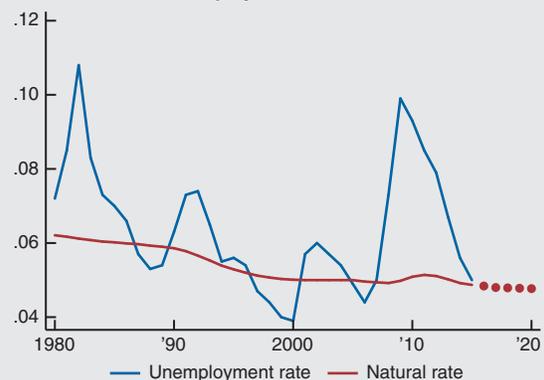
A. Population growth



B. Labor force participation rate



C. Natural rate of unemployment



D. Ratio of payroll to household survey employment



NOTES: The figure displays the recent history and projections for the four components of trend payroll employment growth discussed in the text. Each chart includes an estimate of the historical trend (red line), the historical data used to calculate the trend (blue line), and projections for the trend (red dots). The lower right panel also shows the ratio of adjusted payroll to household survey employment (green line) used to construct the trend ratio of payroll to household employment. See note 8 for variable definitions.

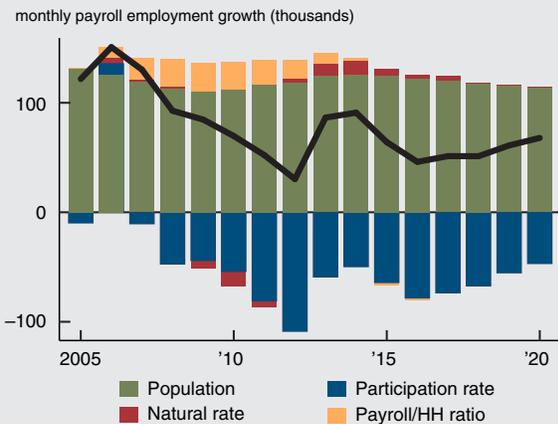
SOURCES: Haver Analytics and authors' calculations.

Measuring trend employment

As previously discussed in research by Aaronson and Brave,³ our estimate of trend payroll employment is the product of four component trends, shown separately in figure 2: population growth, the labor force participation rate, the natural rate of unemployment, and the ratio of payroll to household survey employment.⁴

- To obtain trend population, we append Census projections onto historical data for the civilian noninstitutional population aged 16 and over. The resulting series is then smoothed to obtain trend population growth (figure 2, panel A).⁵
- For the trend labor force participation rate (figure 2, panel B), we use the potential labor force from the CBO's *Budget and Economic Outlook* divided by our estimate of trend population.⁶
- Our estimate of the natural rate of unemployment (figure 2, panel C) is also from the CBO. The product of one minus the natural rate of unemployment and the previous two measures produces an estimate of trend employment as reported in the household survey of employment.
- Due to conceptual differences, household employment is generally somewhat higher than payroll employment.⁷ To move from this measure to an estimate of trend payroll employment, we multiply by the trend of the ratio between these two surveys. In estimating the trend of this ratio (figure 2, panel D), we make use of the "payroll concept-adjusted" household employment

3. Trend payroll employment growth



NOTES: The black line in the figure depicts an estimate of the annual average monthly change in trend payroll employment from 2005 through 2020. The colored bars indicate the contribution to trend employment growth from each of the four components discussed in the text. Estimates prior to and including 2015 are based on historical data, while estimates beyond 2015 are based on projections.

SOURCES: Haver Analytics and authors' calculations.

series produced by the U.S. Bureau of Labor Statistics (BLS) in order to first remove some transitory differences between the surveys.⁸

Labor market slack can be measured by the distance between trend and actual payroll employment, i.e., the employment gap. Figure 1 plots the employment gap since 2005. The solid black line indicates the size of the gap, while the colored bars in the figure show the contribution to the gap from each of the four components discussed above. At the peak of the Great Recession, employment was roughly 10 million jobs below trend. As of April 2016, it had recovered to a shortfall of around one million jobs, indicating that some slack still remains in labor markets. However, if job gains were to continue at an average pace of 200,000 jobs per month like they have so far in 2016, this shortfall would be closed later this year.

Closing the employment gap requires that employment increase faster than its underlying trend. Figure 3 plots our estimate of the annual average monthly change in trend payroll employment from 2005 through 2020. The solid black line corresponds to the month-to-month change in trend payroll employment. The colored bars indicate the contribution to this measure from each of the four components described previously.

In 2015, we estimate that trend employment increased at an average rate of about 60,000 jobs per month. Trend employment growth is expected to fall to around 50,000 jobs per month in 2016, with the slightly worse outlook driven by a larger decline in trend labor force participation in 2016 than in 2015 (the impact of changes in participation on employment growth is represented by the blue bars). However, we expect the pace of trend employment growth to pick up modestly over the remainder of this decade, even though trend population growth is expected to slow (green bars) as the slower decline in trend participation mitigates the decline in population growth. On balance, these forces should lead trend employment growth to rise to about 70,000 jobs per month by 2020.

Alternative estimates

It is important to keep in mind that these estimates come with considerable uncertainty. For example, the Census projects trend population growth to fall from roughly 1.0% in 2015 to 0.9% in 2020. If instead population were to continue to grow at its average rate over the past ten years, trend payroll employment growth would be higher by about 5,000 jobs per month in 2016 and 20,000 jobs per month by the end of the decade. Likewise, if trend labor force participation were to decline by an additional 0.1% annually, trend employment growth would be slower by roughly 20,000 jobs per month for the remainder of the decade. Finally, if the trend ratio of payroll to household employment continues growing at its average rate over the past five years as opposed to our baseline projection of no change, trend payroll employment will grow by an additional 10,000 jobs per month through the end of the decade.

These scenarios illustrate the sensitivity of our estimates to reasonable variations in the underlying assumptions. The range of plausible estimates covered in this exercise emphasizes that there is considerable uncertainty regarding future employment growth, depending on how the size of the population and working behavior evolve. Still, it is difficult to construct plausible hypothetical

scenarios under which trend employment growth matches the 150,000 jobs per month estimate that is often cited as the conventional wisdom.⁹

In fact, risks to the downside may potentially be greater. For instance, if instead we use the alternative measures for the natural rate of unemployment and trend labor force participation rate described in Aaronson et al. (2014 and 2015), trend employment growth would currently be higher, at around 70,000 jobs per month.¹⁰ However, shifting demographics would continue to exert downward pressure on the trend participation rate, leading trend employment growth to fall to around 50,000 jobs per month by the end of the decade.

The resulting measure of trend employment using our own estimates of trend labor force participation and the natural rate of unemployment is generally similar to that shown in figure 1, but has differed substantially in recent years. Both measures indicate a peak employment shortfall of roughly 10 million jobs, but our alternative measure implies the current pace of 200,000 job additions per month doesn't eliminate the employment shortfall until the second half of 2017.

Conclusion

We draw several conclusions from this exercise. First, it is likely that some slack remains in labor markets, leading to diminished wage and price pressure in the interim until employment again reaches its trend level. However, those gaps should be closed soon. Second, labor force attachment trends are now the primary source of this employment gap. Given this result, it has been especially comforting news that some of the gap has been closed by the 0.4 percentage point increase in the labor force participation rate since September 2015. Finally, the pace of employment growth needed to close this gap is considerably lower than the conventional wisdom would suggest and is lower than what it would have been only ten years ago. Taken together, these findings suggest that trend output growth is also likely to be on the low side of its history.

¹ Daniel Aaronson, Luoqia Hu, Arian Seifoddini, and Daniel G. Sullivan, 2014, "Declining labor force participation and its implications for unemployment and employment growth," *Economic Perspectives*, Federal Reserve Bank of Chicago, Vol. 38, Fourth Quarter, pp. 100–138, <https://chicagofed.org/publications/economic-perspectives/2014/4q-aaronson-et-al>; and Daniel Aaronson, Luoqia Hu, Arian Seifoddini, and Daniel G. Sullivan, 2015, "Changing labor force composition and the natural rate of unemployment," *Chicago Fed Letter*, Federal Reserve Bank of Chicago, No. 338, <https://chicagofed.org/publications/chicago-fed-letter/2015/338>.

² Alternative estimates of the payroll employment gap, trend employment growth, and its sources based on the labor force participation trend and natural rate of unemployment in Aaronson et al. (2014 and 2015) can be found in the web appendix to this article, <https://www.chicagofed.org/~media/publications/chicago-fed-letter/2016/cfl359-appendix-pdf.pdf>.

³ Daniel Aaronson and Scott Brave, 2013, "Estimating the trend in employment growth," *Chicago Fed Letter*, Federal Reserve Bank of Chicago, No. 312, July, <https://www.chicagofed.org/publications/chicago-fed-letter/2013/july-312>.

⁴ Trend employment is taken as the product of these four components, namely,

$$\text{employment} = \text{population} \times \text{participation rate} \times (1 - \text{natural rate}) \times \frac{\text{payroll}}{\text{household}}.$$

⁵ In particular, the smoothed population series uses the Hodrick–Prescott (HP) filter.

⁶ See <https://www.cbo.gov/publication/51129>.

⁷ See Mary Bowler and Teresa L. Morisi, 2006, "Understanding the employment measures from the CPS and CES survey," *Monthly Labor Review*, U.S. Bureau of Labor Statistics, February, pp. 23–38.

⁸ The payroll-to-household ratio can be decomposed into $\frac{\text{payroll}}{\text{HH}} = \frac{\text{payroll}}{\text{HH}^a} \times \frac{\text{HH}^a}{\text{HH}}$, where HH^a is the payroll concept-adjusted measure. We take the trend value of the first ratio to be one under the assumption that the adjusted household employment series approximates the payroll employment series well. The second ratio is then smoothed using the HP filter to produce the final trend payroll–household employment ratio. In our projections, we then hold this trend value fixed at its last estimated value.

⁹ Josh Zumbrun, 2016, "The new magic number for monthly job growth: 145,000," *Wall Street Journal*, April 7, <http://blogs.wsj.com/economics/2016/04/07/the-new-magic-number-for-monthly-job-growth-145000/>.

¹⁰This model estimates the effects of changes in the demographic and educational composition of the working-age population and thus accounts for many important long-run trends, such as the retirement of baby boomers, the increase in labor force participation of retirement-age workers, the decline in participation of prime-age men, changes in the labor force participation of women, and changes in educational attainment.

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ISSN 0895-0164