

FRBSF Economic Letter

2017-08 | March 27, 2017 | Research from the Federal Reserve Bank of San Francisco

Measuring Labor Utilization: The Non-Employment Index

Marianna Kudlyak

The elevated number of non-employed people who are out of the labor force has raised some concerns about how well the headline unemployment rate measures available labor. An alternative measure of labor utilization, the Non-Employment Index, accounts for all non-employed individuals, distinguishing between groups like short-term versus long-term unemployed, discouraged workers, retirees, and disabled individuals, and adjusting for how likely each is to transition to employment. Current data show the index is very close to its value in 2005–06, the period near the peak of the previous economic expansion.

Since the 2007–09 recession, the U.S. unemployment rate has declined from a high of 10.0% to 4.7% in February 2017. During the same period, the share of the population that reported not working and not actively looking for work grew from 35% to 37%, continuing its increase since 2000. Many of those who are out of the labor force are retired, disabled, or in school and have low probability of transitioning to work. However, the probability is not zero, and this group constitutes a large majority of all the non-employed. In fact, on average, every month more than twice as many individuals transition to employment from outside of the labor force than do from unemployment (Kudlyak and Lange 2014). The increase in the number of individuals joining the workforce from this group and the possibility that they represent an additional source of labor availability have raised questions about the accuracy of the unemployment rate as a gauge of underutilized labor resources.

In this *Letter*, I describe the Non-Employment Index (NEI) developed by Hornstein, Kudlyak, and Lange (2014), available at https://www.richmondfed.org/research/national_economy/non_employment_index. The index is an alternative measure of resource underutilization in the labor market that takes into account the different job finding rates of all non-employed individuals, not just the active job seekers who are counted as officially unemployed. Similar to the unemployment rate, the NEI increases during recessions and falls during recoveries. In 2016 and the beginning of 2017, the NEI has been hovering very close to its level in 2005–06, a year before the most recent business cycle peak. Consequently, this broader measure of labor resources tells a story similar to the unemployment rate—that the U.S. labor market has returned to full health.

Differing employment probabilities among the non-employed

The primary source of labor force statistics for the U.S. population is the Current Population Survey, jointly sponsored by the U.S. Census Bureau and the Bureau of Labor Statistics (BLS). Every month the survey compiles information on the shares of employed, unemployed, and those out of the labor force (OLF) in the civilian non-institutionalized population. Individuals who report actively looking for a job or are laid off and waiting to return to work are classified as unemployed; the rest of the non-employed are counted as OLF.

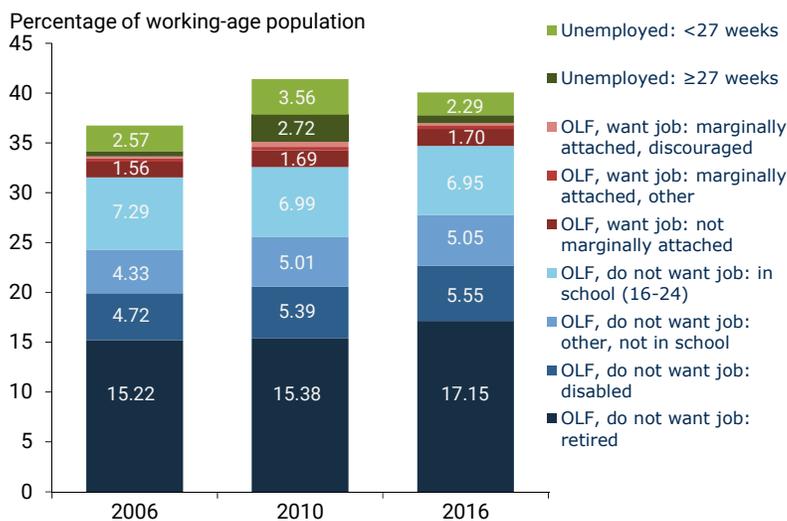
In the survey, people who are out of the labor force are asked a sequence of questions designed to determine their labor force attachment—that is, their interest in obtaining a job at some point. Specifically, non-employed individuals who are not actively looking for work are asked whether they currently want a job. If someone indicates wanting a job, the person is asked about the main reason for not looking for work and about search behavior in the past 12 months.

Based on the responses to these questions, OLF individuals can be classified into seven categories. Two are considered marginally attached, referring to non-employed individuals who want a job, are available for work, and have looked for a job sometime in the prior 12 months, but were not counted as unemployed because they had not searched for work in the four weeks preceding the survey. Among the marginally attached are discouraged individuals, who are not looking for work because they believe there are no jobs available or none for which they would qualify. The “other” marginally attached workers give a non-economic reason for not looking for work. A third group that reports wanting a job are not marginally attached, meaning they have not looked for work in the past 12 months. The remaining four categories from the survey broadly cover those who respond that they do not want a job, including retirees, disabled individuals, those in school, and others.

Different groups of the non-employed have vastly different likelihood of transitioning into employment. For example, people who want jobs have 13–14.5% probability of employment, while retired or disabled individuals have less than 2% probability of becoming employed. The unemployed are also a heterogeneous group. The short-term unemployed are twice as likely to enter the workforce as the long-term unemployed, who in turn are twice as likely as people who are out of the labor force but want a job.

Figure 1 shows the population shares of each of the nine groups in 2006, the previous business cycle peak; 2010, the highest unemployment rate in recent years; and 2016, the most current year available. Comparing 2006 and 2016, the population share of unemployed is almost unchanged but the composition has shifted somewhat, with short-term unemployed dropping from 2.57% in 2006 to 2.29% in 2016, and long-term unemployed growing from 0.55% to 0.80%. The out-of-labor-force share has grown over the decade, with more retired (15.22% versus 17.15%) and more disabled (4.72 versus 5.55%) in the population. This leads to the question of how the labor markets in these periods compare in terms of available labor resources.

Figure 1
Population shares of non-employed groups



Note: Annual average of monthly shares of groups in civilian noninstitutionalized population age 16 and older. Data not shown: marginally attached discouraged and other, respectively, 0.16 and 0.36 (2006); 0.49 and 0.35 (2010); 0.22 and 0.37 (2016).
Source: Author’s calculations using CPS data.

Since the standard unemployment rate is based only on the unemployed groups, it takes into account only about one-tenth of all non-employed individuals—albeit those with high employment transition rates. The BLS

routinely constructs alternative measures but adds only select groups of the non-employed—for example, discouraged or marginally attached—and does not recognize differences in employment transition rates. This approach ignores the potentially important information reflected in the changing shares of the unemployed and different OLF groups in total non-employment.

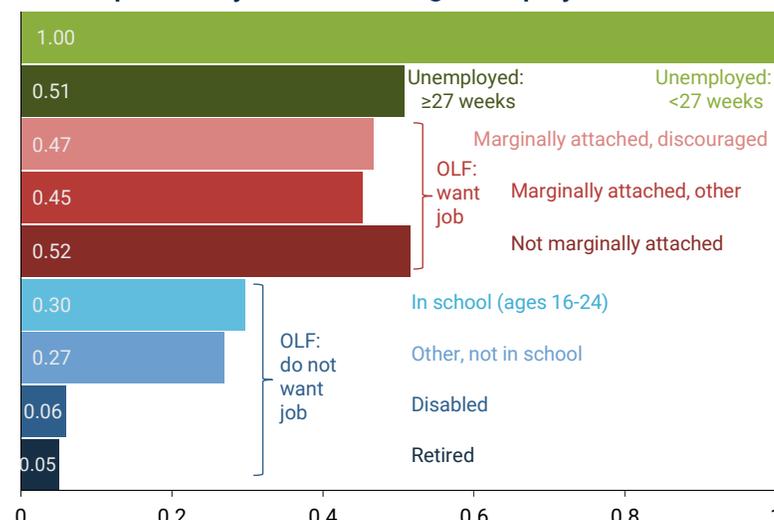
The Non-Employment Index

Motivated by these observations, Hornstein, Kudlyak, and Lange (2014) have developed a broader measure of labor market resource underutilization, the Non-Employment Index (NEI). The index reflects the weighted sum of all the non-employed categories; the weights are designed to account for each group’s employment transition probability, averaged over 1994–2016. The numerical weight for each group in the index is the ratio of the group’s employment transition probability to that of the short-term unemployed. The short-term unemployed group has the highest likelihood of moving into the workforce, and so its weight in the index is set as the baseline of 1.00 (Figure 2).

Changes in the NEI are driven by the changes in the population shares of different groups of the non-employed, while the group weights are kept constant. Using the averages of the transition rates over the entire period to calculate the weights ensures that the variation in the index is not driven by cyclical changes in relative transition rates. The NEI thus provides a measure of the entire potential employment pool that is currently non-employed.

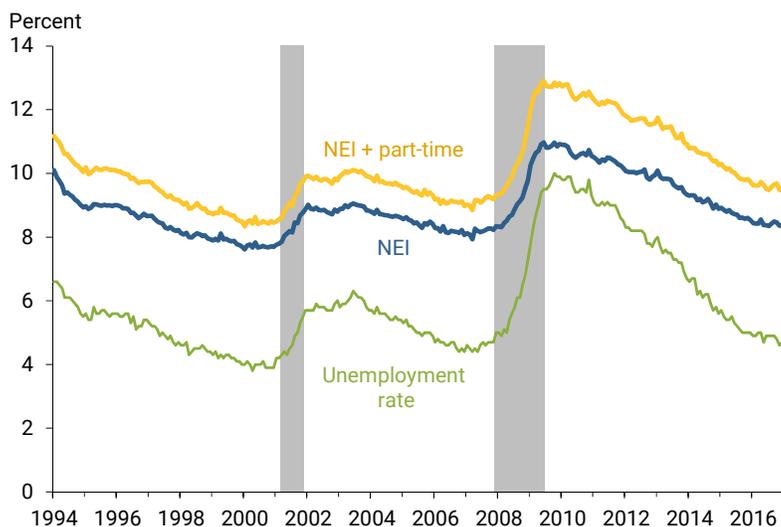
Figure 3 shows the NEI (blue line) alongside the official unemployment rate (green line). While the two use different baselines and are not directly comparable at any point in time, comparing their behavior over time can yield some insights. The NEI increased from its low of 7.9% before the most recent recession in March 2007 to its recession peak of 11.0% in September 2009, and has been

Figure 2
Relative probability of transitioning to employment



Note: Groups’ average employment transition probabilities over 1994–2016 relative to the employment transition probability of short-term unemployed. Source: Author’s calculation using CPS basic monthly files, 1994–2016.

Figure 3
Non-Employment Index (NEI) and the unemployment rate



Note: NEI and NEI+part-time are seasonally adjusted monthly series. Source: BLS and FRB Richmond.

decreasing since then. As of February 2017, the most recent reading, the NEI is at 8.2%, where it has hovered over the past year. In the previous recovery from the 2001 recession, the NEI reached 8.4% in 2005, a year before the cyclical peak.

Hornstein, Kudlyak, and Lange also construct a version of the index that takes into account individuals who report working part-time for economic reasons. This group consists of employees who want to work full-time but either have had their hours reduced or have not been able to find full-time jobs. The group represents a potential addition to labor underutilization (Valletta, Bengali, and van der List 2015). Hornstein, Kudlyak, and Lange use a weight of 0.5 for part-timers, calculated as the product of (1) the transition rate to full-time employment relative to the baseline employment transition rate and (2) the “underutilization rate” based on average weekly hours of full-time relative to part-time work. Similar to the unemployment rate, NEI+part-time in Figure 3 (yellow line) indicates that the labor market is operating at levels of resource utilization observed in the previous economic peak, 2005–06.

Non-Employment Index and the unemployment rate

To compare the relationship between the NEI and unemployment rate over time, Figure 4 plots the relationship between the monthly unemployment rate on the vertical axis, and the NEI on the horizontal axis for each month from January 1994 to February 2017. The black line is the estimated linear trend of this relationship for the sample period before the 2007–09

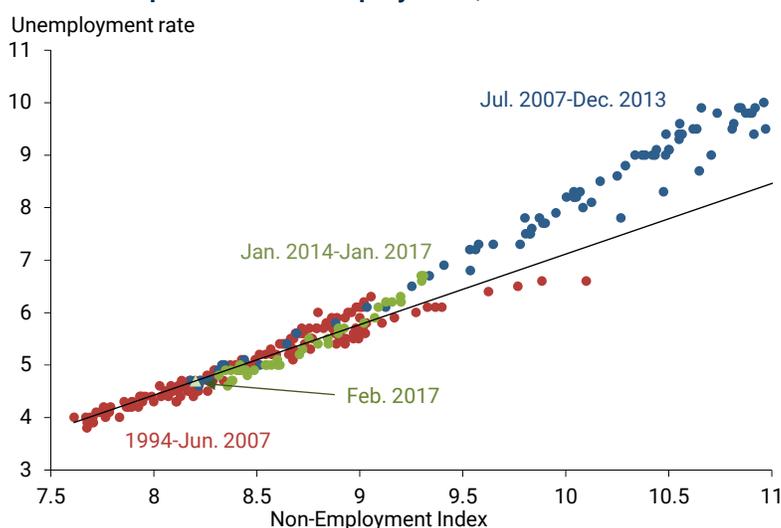
recession, from January 1994 to June 2007, represented by the red dots. For the post-2007 period, we distinguish between the months from July 2007 to December 2013 (blue dots), and the most recent period, from January 2014 through 2017 (green dots).

The red dots are closely clustered around the black line, implying that during that period there was a close relationship between the unemployment rate and the NEI. However, from 2007 to 2013 there is a break in the relationship, shown by the blue dots: For each value of the NEI, the actual unemployment rate is higher than the value predicted by their earlier

relationship. That is, the unemployment rate signals more resource underutilization for any level of NEI than would have been predicted by their earlier relationship.

The break in the relationship between the unemployment rate and the NEI is in part due to the exceptionally large increase of long-term unemployment following the 2007–09 recession. Since the NEI down-weights long-term unemployment significantly relative to short-term unemployment, it reflects a smaller increase than the total unemployment rate after the recession. The remaining portion of the break is because the increase in

Figure 4
Relationship of NEI to unemployment, 1994–2016



Source: BLS and FRB Richmond.

unemployment was disproportionately larger than the increase in the weighted OLF groups, which are counted in the NEI, during that period.

The monthly data since 2013 show that the unemployment rate and the NEI have returned to their pre-2007 linear relationship (green dots). Thus, the NEI appears to align with the assessment of the current labor market as given by the standard unemployment rate.

Conclusion

The Non-Employment Index provides an alternative measure of resource utilization in the labor market that takes into account all of the non-employed, not only those actively looking for work. Importantly, the index acknowledges that not all non-employed people are the same—different groups have different probabilities of transitioning to employment and make up different shares of the working-age population. The NEI suggests that the increase in underutilized labor resources during the 2007–09 recession may have been smaller than the boost in unemployment as estimated by the BLS. This difference arose because the NEI down-weights the long-term unemployed, whose population share increased substantially but who typically are less likely to move back into jobs, and because the NEI accounts not only for the unemployed but also for those out of the labor force. However, after the recession, the measures returned to their pre-2007 relationship.

This broader measure of resource utilization currently gives the same picture as the standard unemployment rate regarding underutilized worker resources. In other words, the NEI and the unemployment rate both indicate that the labor market today is close to the level observed at the end of 2005–06, near the peak of the previous economic expansion.

Marianna Kudlyak is a senior economist in the Economic Research Department of the Federal Reserve Bank of San Francisco.

References

- Hornstein, Andreas, Marianna Kudlyak, and Fabian Lange. 2015. “Measuring Resource Utilization in the Labor Market.” FRB Richmond *Economic Quarterly* 2015:Q1. https://www.richmondfed.org/publications/research/economic_quarterly/2014/q1/hornstein
- Kudlyak, Marianna, and Fabian Lange. 2014. “Measuring Heterogeneity in Job Finding Rates Among the Non-Employed Using Labor Force Status Histories.” FRB Richmond Working Paper 14-18. https://www.richmondfed.org/publications/research/working_papers/2014/wp_14-18
- Valletta, Robert G., Leila Bengali, and Catherine van der List. 2015. “Cyclical and Market Determinants of Involuntary Part-Time Employment.” FRB San Francisco Working Paper 2015-19. <http://www.frbsf.org/economic-research/publications/working-papers/wp2015-19.pdf>

Opinions expressed in *FRBSF Economic Letter* do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco or of the Board of Governors of the Federal Reserve System. This publication is edited by Anita Todd. Permission to reprint portions of articles or whole articles must be obtained in writing. Please send editorial comments and requests for reprint permission to Research.Library.sf@sf.frb.org

Recent issues of *FRBSF Economic Letter* are available at
<http://www.frbsf.org/economic-research/publications/economic-letter/>

| | | |
|---------|-----------------------------------|---|
| 2017-07 | Barnichon / Mesters | How Tight Is the U.S. Labor Market? http://www.frbsf.org/economic-research/publications/economic-letter/2017/march/how-tight-is-labor-market/ |
| 2017-06 | Neumark / Burn / Button | Age Discrimination and Hiring of Older Workers http://www.frbsf.org/economic-research/publications/economic-letter/2017/february/age-discrimination-and-hiring-older-workers/ |
| 2017-05 | Williams | Three Questions on R-star http://www.frbsf.org/economic-research/publications/economic-letter/2017/february/three-questions-on-r-star-natural-rate-of-interest/ |
| 2017-04 | Byrne / Fernald / Reinsdorf | Does Growing Mismeasurement Explain Disappointing Growth? http://www.frbsf.org/economic-research/publications/economic-letter/2017/february/does-growing-mismeasurement-explain-disappointing-productivity/ |
| 2017-03 | Christensen / Lopez / Shultz | Do All New Treasuries Trade at a Premium? http://www.frbsf.org/economic-research/publications/economic-letter/2017/february/do-all-new-treasuries-have-on-the-run-premium/ |
| 2017-02 | Williams | Looking Back, Looking Ahead http://www.frbsf.org/economic-research/publications/economic-letter/2017/january/looking-back-looking-ahead-economic-outlook-speech/ |
| 2017-01 | Li | How Does Business Dynamism Link to Productivity Growth? http://www.frbsf.org/economic-research/publications/economic-letter/2017/january/business-dynamism-link-to-productivity-growth/ |
| 2016-37 | Nechio / Wilson | How Important Is Information from FOMC Minutes? http://www.frbsf.org/economic-research/publications/economic-letter/2016/december/impact-of-fomc-minutes-on-bonds/ |
| 2016-36 | Bauer / Rudebusch | Why Are Long-Term Interest Rates So Low? http://www.frbsf.org/economic-research/publications/economic-letter/2016/december/why-are-long-term-interest-rates-so-low/ |
| 2016-35 | Andreasen / Christensen | TIPS Liquidity and the Outlook for Inflation http://www.frbsf.org/economic-research/publications/economic-letter/2016/november/tips-liquidity-and-the-outlook-for-inflation/ |
| 2016-34 | Bosler / Petrosky- Nadeau | Job-to-Job Transitions in an Evolving Labor Market http://www.frbsf.org/economic-research/publications/economic-letter/2016/november/job-to-job-transitions-in-evolving-labor-market/ |
| 2016-33 | Nechio / Rudebusch | Has the Fed Fallen behind the Curve This Year? http://www.frbsf.org/economic-research/publications/economic-letter/2016/november/has-fed-fallen-behind-curve-this-year/ |
| 2016-32 | Bidder / Mahedy / Valletta | Trend Job Growth: Where's Normal? http://www.frbsf.org/economic-research/publications/economic-letter/2016/october/trend-job-growth-where-is-normal/ |
| 2016-31 | Lansing / Markiewicz | Consequences of Rising Income Inequality http://www.frbsf.org/economic-research/publications/economic-letter/2016/october/welfare-consequences-of-income-inequality/ |