Where Have All the Workers Gone?

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Abstract

The labor force participation rate in the U.S. has declined since 2007 primarily because of population aging and ongoing trends that preceded the recession. The participation rate has evolved differently, and for different reasons, across demographic groups. A rise in school enrollment has largely offset declining participation for young workers since the 1990s. Participation in the labor force has been declining for prime age men for decades, and about half of prime age men who are not in the labor force (NLF) may have a serious health condition that is a barrier to work. Nearly half of prime age NLF men take pain medication on a daily basis, and in nearly two-thirds of cases they take prescription pain medication. The labor force participation rate has stopped rising for cohorts of women born after 1960. Prime age men who are out of the labor force report that they experience notably low levels of emotional well-being throughout their days and that they derive relatively little meaning from their daily activities. Employed and NLF women, by contrast, report similar levels of subjective well-being. Over the past decade retirements have increased by about the same amount as aggregate labor force participation has declined. Continued population aging is expected to reduce the labor force participation rate by 0.2 to 0.3 percentage point per year over the next decade. A meaningful rise in labor force participation will require a reversal in the secular trends affecting various demographic groups, and perhaps immigration reform.

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I. Introduction

The labor force participation rate in the United States peaked at 67.3 percent in early 2000, and has declined at a more or less continuous pace since then, reaching a near 40-year low of 62.4 percent in September 2015 (see Figure 1). Although the participation rate has shown some signs of stabilizing and possibly rebounding since the end of 2015, evidence on labor market flows – in particular, the continued decline in the rate of transition of those who are out of the labor force back into the labor force – suggests that this is likely to be a short-lived phenomenon. This paper examines cyclical movements and secular trends in labor force participation, with a goal of highlighting the broad types of policy interventions that might be effective at raising participation among particular demographic groups.

The paper is organized as follows. The next section summarizes evidence on trends in labor force participation overall and by various demographic groups. Careful attention is devoted to adjusting labor force and population data for the introduction of the 2000 and 2010 population controls in 2003 and 2012, respectively. The introduction of new population controls (i.e., sample weights) in the Current Population Survey (CPS) causes discrete jumps in labor force and population that are more appropriately distributed throughout earlier years and months. The main finding of this analysis is that the labor force participation rate has historically only displayed, at most, a moderate procyclical pattern. Shifting demographic shares, mainly an increase in older workers, can account for 80 percent of the decline in the participation rate since the last business cycle peak under a simple decomposition, although secular trends for some groups are also important.

The following section discusses and evaluates the recent rise in the participation rate. Because most of the movement in the participation rate in the last decade reflects secular trends

and shifting population shares, Section IV examines trends in the participation rate separately for young workers, prime age men, and women, as well as the retirement rate. The role of physical and mental health limitations, which could pose a barrier to employment for half of prime age men who are not in the labor force (NLF), is highlighted and explored. Survey evidence indicates that almost half of prime age NLF men take pain medication on a daily basis, and that as a group prime age men who are out of the labor force spend over half of their time feeling some pain. A follow up survey finds that 40 percent of NLF prime age men report that pain prevents them from working on a full-time job for which they are qualified, and that nearly two thirds of the men who take pain medication report taking prescription medication. It is also shown that generational increases in labor force participation that have historically raised women's labor force participation over time have come to an end, and the U.S. can no longer count on succeeding cohorts of women to participate in the labor market at higher levels than the cohorts they are replacing. The section also documents that an increase in the retirement rate after 2007 accounts for virtually all of the decline in participation since then, suggesting the persistence of labor force exits.

Section V presents evidence on the subjective well-being of employed workers, unemployed workers, and those who are out of the labor force, by demographic group. Two measures of subjective well-being are used: an evaluative measure of life in general and a measure of reported emotional experience throughout the day. Young workers who are not participating in the labor force seem remarkably content with their lives, and report relatively high levels of affect during their daily routines. Prime age men who are out of the labor force, however, report less happiness and more sadness during their days than do unemployed men, although they evaluate their lives in general more highly than unemployed men. Prime age and

older women who are out of the labor force report emotional well-being and life evaluations in general that are about on par with employed women the same age, suggesting a degree of contentment that may make it unlikely to see many in this group rejoin the labor force.

The conclusion highlights the role of physical, mental and emotional health challenges as a barrier to work for many prime age men who are out of the labor force. In particular, the findings presented here suggest that disabilities and daily pain are perceived by many prime age men who are out of the labor force as a barrier to regular employment. Since – apart from the unemployed – this is the group that exhibits the lowest levels of emotional well-being and life evaluation, there are potentially large gains to be had by identifying and implementing successful interventions to help NLF prime age men lead more productive and fulfilling lives.

II. Trends in Participation

Figure 1 shows the seasonally adjusted labor force participation rate as published by BLS. In addition, the graph shows alternative estimates of the participation rate using labor force and population data that were smoothed to adjust for the introduction of the 2000 and 2010 decennial Census population controls in the Current Population Survey in 2003 and 2012, respectively. The population controls introduced in 2012, for example, caused an abrupt 0.3 percentage point drop in the labor force participation rate from December 2011 to January 2012, largely because the population of older individuals exceeded the figure that had been assumed in intercensal years.[2] This population adjustment undoubtedly occurred more gradually over the preceding decade than in just one month. In addition, smaller level shifts occur in January of

[2] In addition, the population of 16-24 year olds exceeded the previously assumed figure, and the labor force participation rate of 16-24 year olds was lower when estimated with the new population controls as compared to the older controls. If the 2010 population controls were applied in December 2011, the labor force participation rate overall would have been 0.3 percentage point lower that month, and the participation rate of 16-24 year olds would have been 0.5 percentage point lower. See http://www.bls.gov/cps/cps12adj.pdf.

each year when intercensal population adjustments are introduced, which more appropriately should be distributed over previous months. Following the procedures used in the BLS labor force research series, we adjust labor force and population data for the various age and sex groups to smooth out the effects of level-shifts caused by the discrete introduction of new Census and intercensal population controls by distributing these shifts over preceding months in the period 1990-2015.[3] Compared to the published series, the adjusted series indicates that the labor force participation rate rose a bit less in the 1990s recovery, declined a bit more in the 2001-07 recovery, and fell a bit less in the current recovery, but overall the trends are similar. Henceforth, we focus on the adjusted labor force data.

The aggregate labor force participation rate series masks several disparate trends for subgroups. Figure 2 shows the participation rate separately for men age 25 and older, women age 25 and older, and young people age 16-24. The appendix figures show participation rate trends further disaggregated by age and sex. As is well known, the participation rate for adult men has been on a downward trajectory since the BLS began collecting labor force data in 1948. This trend was a bit steeper since the Great Recession, but the decline in participation of prime age men in the labor force is not a new development and was not sharper after the Great Recession than it was before it (see Figures A4-A6).[4] Workers age 55 and older are the only age group that has shown a notable rise in participation over the last two decades, albeit from a low base for the 65+ group, and the long-running rise in participation for 55-64 year old women seems to have come to an end after the Great Recession.

[3] We closely follow the procedures outlined in http://www.bls.gov/cps/documentation.htm#pop to make these adjustments.

[4] Charles, Notowodigdo and Hurst (2016) provide evidence that the housing boom in the pre-recession period masked an even greater fall in the labor force participation of less educated prime age men from 2000 to 2006 due to the collapse of manufacturing.

The aggregate participation rate rose in the half century following World War II because women increasingly joined the labor force. Beginning in the late 1990s, however, the labor force participation rate of women age 25 and over unexpectedly reached a decade-long plateau, and since 2007 women's labor force participation has edged down almost in parallel with men's. The plateau and then decline in women's labor force participation is responsible for the downward trajectory of the aggregate U.S. labor force participation rate. Although age, cohort and time effects cannot be separately identified, we later show that this appears more consistent with cohort developments than time effects.

Lastly, younger workers have exhibited episodic declines in labor force participation since the end of the 1970s. After falling sharply toward the end of the Great Recession, the participation rate for younger individuals has stabilized since then. The labor force participation rate of young workers probably responds more to the state of the business cycle than that of older workers because school is an alternative to work for many young workers in the short run.

A. Decomposing the Decline in the Participation Rate

At an annual frequency, after adjustments are made for the effects of changing population controls, the labor force participation rate reached a peak in 1997 (see Figure 3). From 1997 to 2016, the aggregate participation rate fell by 4.2 percentage points, with most (2.8 points) of the decline occurring after 2007. Several studies have shown that shifting demographics, mainly toward an older population, are responsible for around half of the decline in labor force participation.[5]

To see the effects of shifting demographics, write the aggregate labor force participation rate in year t, denoted ℓ_t, as:

[5] See CEA (2014) for an excellent survey of the literature.

(1) $\ell_t = \sum_i \ell_{it} \left(\frac{p_{it}}{\sum_i p_{it}}\right) = \sum \ell_{it} w_{it}$

where ℓ_{it} is the participation rate for group i, p_{it} is the size of the population of group i in year t, and $w_{it}$is the population share of group i.

The change between year t-k and year t can be written as:

(2) $\Delta\ell = \sum \Delta\ell_{it} w_{it-k} + \sum \Delta w_i \ell_{it}$ *and* $\Delta\ell = \sum \Delta\ell_{it} w_{it} + \sum \Delta w_i \ell_{it-k}$,

or a component due to the change in rates within groups (weighted by starting or ending period population shares), and a component due to changes in population shares (weighted by ending or staring period participation rates).

Table 1 reports the labor force participation rate and population shares for 16 age-by-sex groups.[6] There are notable declines in the participation rate for young workers, both male and female. The population shares have also shifted over time: the share of the population age 55 and over rose from 26.3 percent to 35.1 percent from 1997 to 2016, while the share age 25 to 54 fell from 57.5 percent to 49.7 percent. In general, the population has shifted toward groups with lower participation rates. If we assign the population shares in 2016 to the participation rates for each of the 16 groups in 1997, the resulting labor force participation rate is 63.7 percent, or 3.4 percentage points lower than it actually was in 1997, all else being equal. Since the labor force participation rate fell by 4.2 percentage points from 1997 to 2016, this calculation implies that 81 percent of the decline could simply have been a result of the shift in population shares.

Using the decompositions in equation (2), the shift in participation rates within groups account for 19 percent or 39 percent of the decline in labor force participation from 1997 to 2016, depending on whether 1997 or 2016 population shares are used to weight changes in each

[6] We use annual data because seasonally adjusted smoothed population controls are not available for each group. Data for 2016 are the average of the first eight months of the year. In earlier years, the average of the first eight months of the year was close to the annual average, so no adjustment is made for seasonality.

group's participation rate. Clearly, the changing age distribution of the population has had a major influence on the labor force participation rate. However, the decline in the participation rate of young workers, especially young men, is also quantitatively important. Regardless of which set of population shares are used as weights, the decline in participation of young men (age 16-24) from 1997 to 2016 accounts for almost one quarter of the decline in the overall participation rate, or about triple their current share of the population.

A limitation of these decompositions is that there is no counterfactual comparison and no other factors considered apart from demographics. Furthermore, changing population shares could affect participation of different groups. These calculations are just accounting identities that highlight the potential magnitudes of various shifts in population groups and participation rates.

B. Time-Series Models of Labor Force Participation

Table 2 provides estimates of some descriptive time-series regression models to predict the labor force participation rate to explore the cyclicality of the participation rate using annual data. The first panel (columns 1-4) utilizes full period of data available (1948-2016), while the second panel (columns 5-8) is restricted to the years 1997-2016. The key explanatory variables are the annual unemployment rate and a time trend. Tests of interactions between the unemployment rate and a recession indicator, and between the unemployment rate and an indicator of whether the rate was rising or falling that year, did not indicate an asymmetric business cycle response. Because a Dickey-Fuller test for a unit root in the participation rate

cannot reject the hypothesis of a unit root, Table 3 contains the corresponding estimates in annual first differences.[7]

Both the levels and first-differences regressions find evidence of a modest cyclical pattern in the participation rate which is statistically significant in most of the first-difference models. The model in column 2 of Table 3, for example, indicates that a massive 5 percentage point rise in the unemployment rate is associated with only a 0.4 percentage point decline in participation. Hall (2016), by contrast, concludes that "participation is not at all cyclical." I suspect the evidence of modest cyclicality found here results because Table 3 uses first differences of annual data while Hall uses first differences of noisier quarterly data. Nevertheless, there is hardly evidence of a strong cyclical pattern in the annual data.

The trend term in Table 2 indicates about a 0.2 to 0.25 percentage point per year decline in the participation rate after 1997. The indicator variable for the years 2007-16 do not provide much evidence that labor force participation was unusually low in this period, conditional on the trend and unemployment rate in the 1997-2016 sample.

C. Continuation of Past Trends?

As mentioned, the decline in the participation rate was faster in the last decade than in the preceding one. We next examine the extent to which the 2.8 percentage point decline in the labor force participation since the start of the Great Recession represents a continuation of past trends that were already in motion, combined with shifts in population shares, or a new development. Specifically, for each of the 16 groups in Table 1 we estimated a linear trend from

[7] Gustavsson and Österholm (2012) also find strong evidence of a unit root for the aggregate participation rate and for various subgroups, allowing for a time trend.

1997 to 2006 by OLS.[8] We then extrapolate from that trend over the next decade. The appendix figures show the trends for each subgroup, and the green line in Figure 3 aggregates across the group specific trends using fixed 2007 population shares for each year. The red line uses the actual population shares each year to weight the group's predicted participation rate to derive an aggregate rate.[9] The difference between the red and the green lines highlights the importance of shifting population shares.

Overall, applying the annual population shares to the 1997-2006 trends for each group leads to a forecast that the labor force participation rate would have fallen by 2.2 points from 2007 to 2016. The 0.6 percentage point shortfall between the actual decline and predicted decline could be the result of the Great Recession or changes in trends that might have occurred for other reasons. The group with biggest negative residual compared with the previous decade's trend is 55-64 year old women, who were predicted to experience an 8 percentage point rise in their participation rate but actually experienced no change from 2007 to 2016 (see Table 1 and Appendix Figure A-15). Younger workers saw a slower downward trend in the 2007-16 period than in the preceding decade. In general, there was a form of mean reversion, with the groups with the sharpest downward (or upward) trends from 1997-2006 experiencing more moderate downward (or upward) trends in the ensuing decade. Mathematically, the flat trend for 55-64 year old women as opposed to the predicted upward trend accounts for the entirety of the 0.6 percentage point undershooting of the aggregate participation rate. But Figure 3 makes clear that

[8] Although Tables 2 and 3 suggest a quadratic trend fits the aggregate data better than a linear one, in 7 of the 16 subgroups the quadratic term is insignificant in the period 1997-2016, and a linear trend does not do much injustice for describing the data for the other groups. Over such a short period, the linear extrapolation could be thought of as a first-order approximation to a more complicated trend.

[9] Formally, the predicted participation rate is the weighted sum of each group's predicted participation rate based on the linear trend for that group, where the weights are the group's actual share of the population in the year: $\hat{\ell}_t = \sum \hat{\ell}_{it} w_{it}$, where $\hat{\ell}_{it}$ is based on an extrapolation from the OLS estimated linear trend.

the lion's share of the decline in labor force participation since the start of the Great Recession is consistent with a continuation of past trends and shifting population shares.

D. Demographic Shifts over the Next Decade

To project how demographic shifts in the next decade are likely to influence labor force participation, we first combine the Census Bureau's population projections from 2015 to 2025 with the group-specific labor force participation rates in 2016 shown in Table 1.[10] This exercise indicates that, at each group's current labor force participation rate, anticipated demographic shifts will reduce labor force participation rate by 2.3 percentage points over the next decade.[11] If we carry out this exercise over the following decade (from 2025 to 2035), the participation rate is anticipated to fall by another 1.2 points from demographic shifts alone.

Of course, labor force participation rates for each group need not remain constant. As mentioned, labor force participation has been falling for young workers and rising for older workers (especially men) in recent years. If we combine the population projections with the demographic groups' linear trends extrapolated over the next decade instead of their 2016 labor force participation rates, then the participation rate is projected to fall by 2.7 points between 2015 and 2025, as the projected rise in labor force participation of older workers is offset by the fact that older workers still have a much lower participation rate than younger workers, and by a downward trajectory for younger workers' labor force participation that is projected out into the future.[12] Participation rate trends could change dramatically for some of the groups, but these

[10] Because the Census Bureau's published population projections are for age 15-19, we collapsed the bottom two age categories in Table 1. The 16-19 year old labor force participation rate in 2016 was assigned to the 15-19 year old group. This was done consistently for 2015 and 2025, so the figures cited in the text should not be skewed by this slight incongruence.

[11] Aaronson, et al. (2014) reach a similar conclusion.

[12] If the participation rate of male and female workers under age 35 were to stabilize at their 2015 rates, then this calculation would indicate that the overall rate would decline by only 0.4 percentage point over the next decade.

projections give an indication of the likely magnitude of the drag on participation to expect from demographic shifts in the future.

III. How Much of a Cyclical Recovery Should Be Expected?

A key question for economic policymakers is the extent to which labor force participation can recover from its two-decade long decline. As emphasized so far, most of the decline in the participation rate since 2007 is the (anticipated) result of an aging population *and* group-specific participation trends that were in motion before the Great Recession.[13] These trends could strengthen or reverse, but an aging workforce is likely to put downward pressure on labor force participation for the next two decades. To the extent there was a cyclical negative shock to participation, however, one might expect some recovery in the near term.

The 0.6 percentage point rise in the (seasonally adjusted) participation rate from September 2015 to March 2016 gave some hope that a cyclical recovery might be taking place. Three considerations lead me to suspect that there will be only a limited and short-lived cyclical recovery in participation, however. First, the cyclical component of the decline in labor force participation from the Great Recession was probably modest in the first place, likely in the range of 0.4 to 1.0 percentage point. (The bottom of this range is based on Table 3 and the 5 percentage point rise in the unemployment rate during the recession; the top is from the maximum gap between the change in the participation rate and the change in the predicted rate since 2007 based on Figure 3.) Second, the seasonally adjusted labor force participation rate edged down 0.2 percentage point from March to August 2016, suggesting that the cyclical

[13] CEA (2007; Table 1-2 and Box 1-2), for example, predicted a 0.2 to 0.3 percentage point annual decline in the labor force participation rate from 2007 to 2012 because of the aging of the baby boom cohort. See also Aaronson, et al. (2006).

recovery may already be over, which would not be surprising if the magnitude of the cyclical decline was toward the bottom end of the aforementioned range.

Third, and most importantly, throughout the recovery there has been *no* rise in the rate of transition of those who are out of the labor force joining the labor force. Figure 4 shows that the likelihood of transitioning into the labor force from out of the labor force edged down throughout the recovery, including in late 2015 and early 2016 when the participation rate retraced 0.6 percentage point. Thus, the idea that many labor force dropouts are returning the labor market is unsupported by the data. Instead, the labor force participation rate rose in late 2015 and early 2016 because unemployed workers stayed unemployed longer, especially long-term unemployed workers (see Figure 5).[14] More generally, Figure 4 shows no historical tendency for transitions from out of the labor force into the labor force to behave cyclically. And looking at the two different ways in which workers can participate in the labor force shows that transitions from out of the labor force to unemployment tend to be countercyclical, which should put to rest any concern that the unemployment rate may rise because of a wave of discouraged labor force dropouts returning to unemployment to search for a job. Instead, the tendency for the labor force withdrawal rate of the long-term unemployed to move procyclically (see Figure 5 and Krueger, Cho and Cramer, 2014) could lead to further downward movement in the labor force participation rate and unemployment rate.

Given the pre-existing downward trend in participation for most demographic groups and the aging of the U.S. population, stabilization in the labor force participation rate for a time may represent the best one could expect for a cyclical recovery. Indeed, Figure 4 highlights the challenges for raising labor force participation as nonparticipants are increasingly a group with a

[14] For completeness, I note that there was no decline in the rate of transition from employment to out of the labor force at the end of 2015 and beginning of 2016, which is the other flow that could have accounted for the rise in labor force participation.

lower likelihood of moving into the labor force. The next section focuses on reversing the secular trends toward nonparticipation for key groups.

IV. Secular Trends for Specific Groups

A. Young Workers

Young people have exhibited the largest decline in labor force participation in the past two decades. This is to a considerable extent offset by their increased school enrollment, however. Figure 6 displays trends in the nonparticipation rate separately for young men and young women (age 16-24). The share of young workers who were neither employed nor looking for a job increased significantly from 1994 to 2016. In 1994, 29.7 percent of young men were not participating in the labor force, and in 2016 this figure was 43.0 percent. Nonparticipation in the labor force also rose for young women. However, if we remove individuals who were enrolled in school in the survey reference week, the story is quite different. The bottom two lines in Figure 6 show the percent of men and women in this age group who were idle, defined as neither enrolled in school nor participating in the labor force. Young men still display an upward trend, but the share who were idle only rose from 7.3 percent to 8.9 percent from 2004 to 2016, while the trend for women is downward (from 15.8 percent to 12.1 percent).

A rise in school enrollment has therefore helped to offset much of the decline in participation. Given the significant increase in the monetary return to education that began in the early 1980s, this development could be viewed as a delayed and overdue reaction to economic incentives.

Working Age Young Men (21-30)

Aguiar, et al. (2016) highlight the rise in non-work and non-school time by young men age 21-30, especially those with less than a college education. The share of noncollege educated young men who did not work at all over the entire year rose from 10 percent in 1994 to more than 20 percent in 2015. They propose the intriguing hypothesis that the improvement in video game technology raised the utility from leisure for young men, contributing to a downward shift in labor supply and a more elastic response to wages.[15] While Aguiar and his coauthors are clear to point out that demand-side factors may also have contributed to the decline in work hours of young men, and that their estimates of the shift in the labor supply curve due to changes in leisure technology for video and computer games only account for 20 to 45 percent of the observed decline in market work hours of less educated young men, their hypothesis has generated keen interest. Here we briefly examine their video game hypothesis by comparing the self-reported emotional experience during video game playing, television watching, and all activities, as well as more standard labor force, school enrollment and time use data.

Preliminarily, we note that the CPS data indicate that from October 1994 to October 2014, the labor force participation rate of men age 21-30 fell by 7.6 points, from 89.9 percent to 82.3 percent, and this was partially offset by an increase in school enrollment. Idleness (neither enrolled in school, employed, nor looking for work) rose by 3.5 percentage points over this period.

Table 4 reports the amount of time that 21-30 year old men spent engaged in various activities per week in 2004-07, 2008-11, and 2012-15. Market work hours declined by 3.1 hours per week (9 percent) from 2004-07 to 2012-15. An increase in time devoted to education (1.3

[15] Technically, their time use measure pertains to all game playing. We follow their precedent of referring to the game playing activity in the ATUS as video game playing, as the increase in time devoted to this activity most likely is overwhelmingly the result of video game playing.

hours), playing games (1.7 hours), and computers (0.6 hours) over this period more than offset the decline in time spent working. If we limit the sample to young men who were out of the labor force (not shown), time spent on education increased by an impressive 5.3 hours, or 38 percent. Time devoted to education activities did not increase for NLF young men with a high school education or less, but conditioning on low education would downwardly bias any increase in school enrollment in this age group over time. Time spent playing video games by NLF young men rose from 3.6 hours per week in 2004-07 to 6.7 hours per week 2012-15, while time spent watching television fell from 23.7 to 21.7 hours over this period. As Aguiar, et al. conclude, video gaming is clearly drawing more attention from this group over time.

The 2010, 2012, and 2013 ATUS's included a supplement on subjective well-being modeled on the Princeton Affect and Time Survey (see Krueger, et al., 2009). Specifically, for three randomly selected episodes of each day, respondents were asked to report on a scale from 0 to 6, where a 0 means they did not experience the feeling at all and a 6 means the feeling was very strong, how happy, sad, tired, and stressed they felt at that time. In addition, they were asked how much pain, if any, they felt at that time, and how meaningful they considered what they were doing. Since television is a leisure activity that is probably a close substitute for video games, we explore the self-reported emotional experience during time spent playing video games, watching TV, and during all activities for young men.

If video game technology did indeed improve to make engaging in the activity more enjoyable, one would expect to see better emotional states (e.g., higher rating of happiness) during time spent playing video games than during time spent watching TV. Moreover, with three observations per person, it is possible to control for individual fixed effects and compare young men's reported experiences as they engage in different activities throughout the day.

Table 5 shows estimates of fixed effects regressions of the various affect measures on a dummy indicating time spent playing games, watching television, and using a computer. The omitted group is all other activities. To increase the sample size, the sample consists of males age 16 to 35. The results show some evidence that episodes that involve game playing are associated with greater happiness, less sadness and less fatigue than episodes of TV watching, although stress is higher during game playing. Game playing also appears to be a more pleasant experience than using the computer for this group. Game playing, however, is not reported as a particularly meaningful activity by participants; indeed, it is reported as less meaningful than other activities.

The ATUS also reveals that game playing is a social activity. A little over half the time that young men play video games they report that they were with someone while engaging in the activity, most commonly a friend. Furthermore, during 70 percent of the time that they were playing games they report they were interacting with someone (presumably online when they were not present). As a whole, these findings suggest that it is possible that, as Aguiar, et al. argue, improvements in video games have improved the enjoyment young men derive from leisure in a consequential way.

B. Prime Age Men

Although the participation rate of prime age men has trended down in the U.S. and other economically advanced countries for many decades, by international standards the participation rate of prime age men in the U.S. is notably low. Italy was the only O.E.C.D. country that had a lower labor force participation rate of prime age men than the U.S. in 2015. Because prime age men have the highest labor force participation rate of any demographic group, and have traditionally been the main breadwinner for their families, much attention has been devoted to

the decline in labor force participation of prime age men in the U.S.[16] Evidence in Juhn, Murphy and Topel (1991, 2002) suggests that the secular decline in real wages of less skilled men is a major contributor to the secular decline in their participation rate. CEA (2016) reaches a similar conclusion, as the decline in labor force participation has been steeper for less educated prime-age men.

Here we highlight a significant supply-side barrier to the employment prospects of prime age men: namely, health-related problems.[17] Table 6 reports the distribution of men and women reporting their health as excellent, very good, good, fair or poor based on the 2010, 2012 and 2013 American Time Use Survey Well-being Supplement (ATUS-WB).[18] Forty-three percent of prime age men who are out of the labor force reported their health as fair or poor, compared with just 12 percent of employed men and 16 percent of unemployed men. Women who are out of the labor force are also more likely to report being in only fair or poor health compared with employed women, but the gap is smaller: 31 percent versus 11 percent. Thus, health appears to be a more significant issue for prime age men's participation in the labor force than for prime age women's, and we focus on documenting the nature, and probing the veracity, of their health-related problems in this section. While it is certainly possible that extended joblessness and despair induced by weak labor demand could have caused or exacerbated many of the physical, emotional and mental health-related problems that currently afflict many prime age men who are out of the labor force, the evidence in this section nonetheless suggests that these problems are a

[16] Eberstadt (2016), for example, calls the increase in jobless men who are not looking for work "America's invisible crisis."

[17] Coglianese (2016) finds that about half of the decline in prime age male labor force participation is due to permanent exits, and that only 20 to 30 percent of the decline is due to reduced labor demand, suggesting a major role for supply side factors.

[18] The exact question was: "Would you say your health in general is excellent, very good, good, fair or poor?" Self-reported subjective health questions have been found to correlate reasonably well with objective health outcomes in the past.

substantial barrier to work that would have to be addressed to significantly reverse their downward trend in participation.

Beginning in 2008, the BLS has regularly included a series of six functional disability questions in the monthly CPS. For example, the survey asks, "Is anyone [in the household] blind or does anyone have serious difficulty seeing even when wearing glasses?"[19] Pooling all of the data from 2008-2016, results of these questions are reported in Table 7 by labor force status for prime age men. At least one disability was reported for 34 percent of prime age men who are out of the labor force, and this figure rises to 42 percent for the subset of men age 40 to 54.[20] Perhaps surprisingly, white prime age men were more likely to report having at least one of the six conditions (35.8 percent) than were prime age African American (32.3 percent) or Hispanic (29.3 percent) men. At least one disability condition was reported for 40 percent of nonparticipating prime age men with a high school education or less. The most commonly reported disabilities were "difficulty walking or climbing stairs" and "difficulty concentrating, remembering, or making decisions"; about half reported multiple disabilities. Only 2.6 percent of employed men and 5.8 percent of unemployed men in this age group reported a disability.

Figure 7a shows the probability of being out of the labor force conditional on having a disability each year from 2008 to 2016. The probability of being out of the labor force conditional on having a disability has trended up over the last eight years, which suggests that

[19] One could question whether this measure results in an underestimate or overestimate of the "true" disability rate. On the one hand, the list is restricted to just six conditions (for example, speech and language disorders are omitted). In addition, there could be a stigma attached to reporting physical, emotional and mental health conditions for household members. On the other hand, a disability could be self-reported because it is a more socially acceptable reason for joblessness than the alternative.

[20] A natural question is whether an increase in the number of disabled military veterans returning to civilian life has contributed to the decline in the participation rate. The short answer is that this does not appear to be the case. The share of out-of-the-labor-force prime-age men who are veterans has declined, from 11.4 percent in 2008 to 9.7 percent in 2016. Moreover, the proportion of prime age men who are veterans has trended down over the last two decades as the large cohort of Vietnam-era veterans has aged out of the prime-age category. Nevertheless, about 40 percent of veterans who are out of the labor force report a significant disability, so any strategy to assist veterans to return to the labor force would need to address disability issues.

the improvement in the job market over this period is not drawing disabled individuals back to work. Pooling all of the data together from 2008 to 2016, Figure 7b shows the probability of being out of the labor force for each of the six conditions, and for those who indicate having any of the six conditions and the subset with multiple conditions. Those who have difficulty dressing, running errands, walking or concentrating have a much lower participation rate than those who are blind or have difficulty seeing or hearing.

Prevalence of Pain and Pain Medication

For randomly selected episodes of the day, the ATUS-WB module asked respondents, "From 0 to 6, where a 0 means you did not feel any pain at all and a 6 means you were in severe pain, how much pain did you feel during this time if any?" The first row of Table 8 reports the average pain rating by labor force status (weighted by episode duration), and the second row reports the fraction of time respondents reported with a pain rating above 0, indicating the presence of some pain. The results indicate that individuals who are out of the labor force report experiencing a greater prevalence and intensity of pain in their daily lives. As a group, workers who are out of the labor force report feeling pain during about half of their time. And for those who report a disability, the prevalence and intensity of pain are higher – disabled prime age men who are out of the labor force report spending 71 percent of their time in some pain and an average pain rating of 2.8 throughout the survey day.

Comparing the daily pain ratings of employed and NLF men who report a disability indicates that the average pain rating is 88 percent higher for those who are out of the labor force. Moreover, in five of the six disability categories, reported pain is more prevalent and more intense for those who are out of the labor force than for those who are employed. These

results suggest that the disabilities reported for prime age men who are out of the labor force are more severe than those reported for employed men, on average.

The ATUS-WB also asked respondents, "Did you take any pain medication yesterday, such as Aspirin, Ibuprofen or prescription pain medication?" Fully 44 percent of prime age men who were out of the labor force acknowledged taking pain medication on the previous day, although this encompasses a wide range of medications.[21] This rate was more than double that of employed and unemployed men.[22] And if we limit the comparison to men who report a disability, those who were out of the labor force were more likely to report having taken pain medication (58 percent) than were those who were employed (32 percent), again suggesting the disabilities are more severe, on average, for those who are out of the labor force.

To better understand the role of pain in the life of prime age men who are neither working nor looking for work, we conducted a short survey of 571 nonworking men using an internet panel provided by Survey Sampling Inc.[23] The survey was conducted with Qualtrics software over the period September 30-October 2, 2016. Although the results are still preliminary, the initial findings only serve to underscore the role of pain in the lives of nonworking men. In this survey, 47 percent of NLF prime age men responded that they took pain medication on the previous day, slightly higher than in the ATUS sample. Nearly two-thirds of those who took pain medication reported that they took prescription pain medication (in 36 percent of these cases, the men reported that they also took over-the-counter pain medication).

[21] The high rate of utilization of pain medication is possibly related to Case and Deaton's (2016) finding of a rise in mortality for middle age whites due to accidental drug poisonings from 1999 to 2013.
[22] The gap was not as great for prime age women: 25.7 percent of employed women reported taking pain medication on the reference day compared with 34.7 percent of out-of-the-labor-force women.
[23] We screened for men age 25-54 who did not work in the previous week, were not absent from a job, and did not search for a job in the previous week. Because the BLS definition of out of the labor force requires that individuals did not search for a job in the past four weeks, our definition is a bit less restrictive. Weights were developed to match the 2016 CPS ASEC by age group (25-40, 41-54), race and Hispanic ethnicity. Weighed percentages are reported in the text.

Forty percent of this sample of prime age men responded "Yes" when asked directly, "Does pain prevent you from working on a full-time job for which you are qualified?"

Two-thirds of the men in this sample reported that they had a disability, which is about double the rate in the CPS for NLF prime age men. The higher disability rate partly resulted because respondents could write "Other" in addition to the BLS's six conditions, and 16 percent filled out other.[24] It is also possible that men who are drawn to participate in Internet surveys are more likely to suffer a disability, or that the CPS understates the number of prime age men with a disability.

Barriers to Employment

The BLS included supplemental questions in the May 2012 CPS on barriers to employment for people with one of the six physical, emotional or mental disability conditions listed previously. According to this survey, 56 percent of employed workers with a disability reported that their disability caused difficulty in completing their work duties, and 28 percent said that the difficulty was moderate or severe (BLS 2013). Overwhelmingly, nonworking men with a disability responded that their disability was a barrier to employment. They also cited lack of education and training (14.6 percent), lack of transportation (11.5 percent) and the need for special features at the job (9.9 percent) as barriers to work.

One would be remiss to not discuss the potential role of Social Security Disability Insurance (DI) in the decline in labor force participation of prime age men, as it is one of the few government income support programs available to this group. A few observations are in order. First, CEA (2014) reports that the fraction of prime age men on DI rose from 1 to 3 percent

[24] Common write-in responses for those who marked "other" included: anxiety disorder; back pain; cancer; chronic pain; epilepsy; heart condition; and sleep disorder.

between 1967 and 2014, while the labor force participation rate of this group fell by 7.5 percentage points, which suggests that DI could at most account for a quarter of the decline in participation, and estimates of the causal effect of DI suggest that the availability of benefits is responsible for even less of the decline in participation. Three quarters of prime age men who are out of the labor force do not receive DI. Second, the evidence reported here on the high incidence of pain experienced by the disabled, especially those who are out of the labor force, suggests that physical and mental health ailments are a barrier to participating in many activities.[25] Third, around one third of those who had a disability and were not in the labor force did not receive any financial assistance according to BLS (2013). Lastly, although one needs to be cautious in interpreting self-assessments of causality, 93 percent of people with a disability who were out of the labor force and received assistance from DI, workers' compensation insurance, or another program responded "no" to the following question in the May 2012 CPS supplement: "Some financial assistance programs include limitations on the amount of work you can do. Did this program cause you to work less than you would otherwise?"

C. Women

As mentioned, the aggregate labor force participation in the U.S. stopped rising after 2000 because the participation rate of women stopped rising. Starting in 2007 the participation rate began to fall for women overall, although the rate had already been declining for younger women over the previous decade. America's relative standing among economically advanced countries in terms of the participation rate of women also slipped. A particularly interesting comparison is with Canada. The participation rate of women in Canada was roughly equal to that in the U.S. in the late 1990s, but it continued to grow for another decade in Canada while it

[25] See Krueger and Stone (2008) on the relationship between pain and time use.

plateaued and then declined in the U.S. For prime age women, from 1997 to 2015 the participation rate rose from 76 percent to 81 percent in Canada while it fell from 77 percent to 74 percent in the U.S. Drolet, et al. (2016) find that participation rate of women in the U.S. declined at all education levels since the 1990s, but it declined more for women with a high school education or less, especially those age 25-44. In Canada, by contrast, the participation rate rose for all education groups.

Blau and Kahn (2013) conclude that "the expansion of 'family-friendly' policies, including parental leave and part-time work entitlements," explains 29 percent of the decrease in women's labor force participation in the U.S. relative to other O.E.C.D. countries.[26] Given that the biggest gap between women's labor force participation in Canada and the U.S. opened up among less educated women of childbearing age, who are unlikely to receive paid maternity leave and other family benefits, it is plausible that family leave policies, along with the rise in the education-income gradient in the U.S., account for a significant share of the rising gap in participation between women in the U.S. and Canada as well.[27]

There is also evidence that generational shifts, which drew increasing numbers of women into the workforce, have come to an end in the U.S.[28] This implies that historic gains in women's labor force participation that came about by the entry of new birth cohorts and exit of older ones will no longer lead to rising participation. Figure 8 displays the labor force participation rate of five cohorts of women based on ten year-of-birth intervals over the lifecycle from age 16 to age 79 using data from the 1962 through 2016 ASEC. The age displayed along the horizontal axis refers to the age of the middle birth year of the cohort. So the 1941 birth

[26] Dahl, et al. (2016), however, find that the extension of maternity benefits from 18 to 35 weeks in Norway had little effect on labor force participation.
[27] Moffitt (2012) highlights the puzzling fact that the employment rate declined for unmarried women without children, and for higher educated women as well.
[28] See Juhn and Potter (2006) for an early discussion of this issue.

cohort includes women born from 1937 to 1946, the 1951 cohort includes women born 1947 to 1956, and so on. The cross cohort pattern makes clear that at all ages women in the 1951 cohort were more likely to participate in the labor force than were women who were born a decade earlier when they were the same age. The increase in participation across succeeding cohorts was particularly evident for women age 21-45. But the cohort lifecycle profiles essentially stopped rising after the 1961 cohort, and women born in the five years surrounding 1981 were actually less likely to work at a given age than were women born a decade earlier. And while it is impossible to separate out calendar time, age and birth year effects, these generational developments are unlikely to represent time effects because they have been occurring over several years, and because participation is not very sensitive to the business cyclical.

The cohort pattern in Figure 8 also helps explain another anomaly: Why it is that women age 55 to 64 exhibited the biggest break from trend over the last decade, as shown in Appendix Figure A15. The answer appears to be that as women born in the late 1940s and early 1950s aged out of the 55-64 year old bracket, they were replaced by a succeeding generation of women who had about the same level of participation as the 1947-56 birth cohort when they were both in their late 40s and early 50s. An implication of this pattern is that a continuation of the sharp rise in participation over recent decades for women age 65 and over evident in Figure A16 is likely in jeopardy, as the 1950s birth cohort gives way to the 1960's birth cohort that had roughly the same labor force participation rate in midlife.

The finding that the cohort participation profiles stopped rising for younger women age 21 to 40, who are much more likely to be engaged in raising a family, highlights the potential for workplace flexibility and family friendly policies to raise participation in the future. Clearly, the

U.S. can no longer rely on the past tendency of succeeding generations of women to enter the labor force at earlier ages to lift the aggregate participation rate in the future.

D. Retirees

As emphasized in Section II, a major reason for the decline in labor force participation after 2007 is that the large baby boom cohort started to reach retirement age, as had long been expected. Those born in 1946, at the beginning of the baby boom, would have qualified for Social Security retirement benefits starting in 2008.

Further evidence of the profound effect of retirements on the U.S. workforce is in Figure 9, which shows the percentage of individuals age 16 and older who are classified as retired in the CPS.[29] The share of the 16+ population that was retired hovered around 15 percent from 1994 to 2007, and then rose from 15.4 percent to 18.0 percent from 2007 to 2016. The 2.6 percentage point rise in the retirement rate over this period almost exactly matches the 2.8 percentage point drop in the labor force participation rate. By gender, the retirement rate increased by 2.4 percentage points for men and 2.7 percentage points for women since 2007. Since retirements tend to be permanent exits from the labor force, and the main reason for the decline in labor force participation over the past decade is the increasing number of retirements due to the aging of the baby boom generation, this is another reason to expect relatively little cyclical recovery in labor force participation in the near term.

V. Subjective Well-Being

This section evaluates the self-reported subjective well-being (SWB) of various demographic groups by labor force status. A comparison of SWB across labor force groups is of

[29] This is based on the EMPSTAT variable in the IPUMS data.

interest for two reasons. First, low levels of SWB can point to social problems for particular groups and potentially large welfare gains from successful interventions. Second, if a group that is out of the labor force exhibits a high degree of SWB it is probably unlikely that they are severely discontent with their situation, and eager to change labor force status. Of course, SWB is difficult to measure and compare across individuals, so the usual caveats when using SWB measures apply.

Two types of measures of SWB are available from the ATUS-WB module. The first is the Cantril Ladder, a self-anchoring scale which asks respondents to evaluate their life in general, and was included in the 2012 and 2013 waves of the survey.[30] The exact question wording was:

> Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you.
>
> If the top step is 10 and the bottom step is 0, on which step of the ladder do you feel you personally stand at the present time?

The second measure is the affective rating of randomly selected episodes of the day. This includes ratings of happiness, sadness, stress, pain, meaningfulness and tiredness on a 0 to 6 scale. We compute the duration-weighted average of these affect measures as well as the U-index. The U-index is defined here as the percent of time in which the rating of sadness or stress exceeds the rating of happiness. Kahneman and Krueger (2006) emphasize that the U-index is robust if respondents interpret the scales differently, as long as they apply the same monotonic transformation to positive and negative emotions.

The measures are summarized in Tables 9a-9d for men and 10a-10d for women. The second to last row of the tables reports the mean Cantril ladder rating for each group. Figures

[30] See Deaton and Kahneman (2010) for a comparison of the correlates of the Cantril ladder and daily emotional well-being. They find that the Cantril ladder is more strongly correlated with education and income, while daily emotional well-being is more closely correlated with loneliness and health.

10a-10d further show cumulative distributions of the Cantril ladder for each group, where the horizontal axis is arrayed in reverse numerical order (from 10 to 1) so that distributions that lie above lower ones totally dominate in terms of the ladder of life.

A few findings are noteworthy. First, young men and women who are out of the labor force seem remarkably content with their lives. As a group, young people who are not participating in the labor force report that their lives are on a higher step of the Cantril ladder of the best possible life than do similarly aged individuals who are employed. On a moment-to-moment basis, there are only small and typically statistically insignificant differences in the duration-weighted average reported emotions across the employed, unemployed and out of the labor force youth. The only statistically significant difference related to sadness: unemployed youth reported being sadder over the course of the day than the employed or NLF youth.

Second, unlike youth, prime age men who are employed are considerably more satisfied with their lives in general than are men who are out of the labor force or unemployed. Prime age men who are out of the labor force report themselves between employed men and unemployed men on the Cantril ladder of life, but closer to the unemployed men. The emotional experiences over the course of the day, however, indicate that NLF men are less happy, more sad, and more stressed than unemployed men, reversing the ranking from the Cantril ladder. Moreover, the U-index (which measures unpleasant time but omits pain) is considerably higher for NLF men than for unemployed men. This reversal suggests that there may be more adaptation in terms of overall quality of life expectations for NLF men than there is in terms of their moment-to-moment experience. In other words, prime age men who are out of the labor force, who often have a significant disability, may have lowered their views of the best possible life they could expect, and reported their step on the Cantril ladder in relation to this compressed ladder, while

their reporting of emotional experience was not recalibrated with respect to expectations. If this is the case, then the low subjective well-being of prime age NLF men should be an even bigger social concern based on the emotional data than on the ladder of life data.[31]

One factor that likely contributes to the low level of emotional well-being of NLF prime age men is the relatively high amount of time they spend alone. Prime age NLF men spend nearly 30 percent of their time alone, compared with 18 percent for employed prime age men, 17 percent for prime age employed women, and 19 percent for prime age NLF men. Deaton and Kahneman (2010) found that alone time correlated more strongly with daily emotional well-being, while income and education correlated more strongly with evaluative well-being.

Third, unlike men, the SWB of prime age women who are out of the labor force is closer to that of employed women than it is of unemployed women. In fact, the U-index is lower for prime age NLF women than for employed prime age women. NLF women report higher levels of happiness and sadness but less stress than employed women. Unlike men, women who are out of the labor force report deriving considerable meaning from their activities. These results do not paint a picture where women who are out of the labor force, as a group, are discontent with their lives or daily routines, and therefore eager to return to work.

Lastly, women age 55-70 appear to be similar to prime age women in that the NLF group reports about equal contentment with their lives as a whole and daily emotional experiences as employed women. Unemployed 55-70 year old women, however, appear quite unhappy and dissatisfied with their lives. Men in the 55-70 year old group who are unemployed also appear to be quite dissatisfied and unhappy with their lives compared with employed men the same age, while NLF men appear midway between employed and unemployed men in terms

[31] For the sample of 21-30 year old men who were out of the labor force we found that the Cantril ladder was closer to employed men than to unemployed men, but the U-index indicated that they had much lower emotional experience than employed and unemployed men.

of the Cantril ladder. Men who are out of the labor force express relatively low levels of meaning in their daily activities, but their U-index indicates less time spent in an unpleasant state than employed or unemployed men.

VI. Conclusion

The decline in labor force participation in the U.S. over the past two decades is a macroeconomic and social concern. Along with several other studies, this study finds that declining labor force participation since 2007 is mainly a result of an aging population and ongoing trends that preceded the Great Recession, such as increased school enrollment.

Given ongoing downward pressure on labor force participation from an expected wave of retirements among members of the baby boom generation, and the fact that labor force participation is not particularly cyclical, a reversal in the slide in participation will require a change in secular trends affecting various demographic groups, and perhaps a major reform in immigration policy. There are a few demographic groups that may be more susceptible to a rise in labor force participation than others. First, older workers may increasingly delay retirement, bolstering their rise in labor force participation that has occurred over the past two decades. This trend may not continue for older women, however, as a cross cohort analysis shows that labor force participation stopped rising for cohorts that are about to enter their late 50s and 60s.

Second, labor force participation of women age 25 to 44 has been edging down for two decades, unlike their counterparts in Canada. More generous leave time and workplace flexibility provided by private company policies and supported by government policies could possibly help reverse this trend. Corporate and government policies that promote equal pay and the advancement of working women to supervisory and managerial positions may also facilitate such a reversal.

Third, addressing the decades-long slide in labor force participation by prime age men should be a national priority. This group expresses low levels of SWB and reports finding relatively little meaning in their daily activities. Because nearly half of this group reported being in poor health, it may be possible for expanded health insurance coverage under the Affordable Care Act to positively affect the health of prime age men going forward. The finding that nearly half of NLF prime age men take pain medication on a daily basis and that 40 percent report that pain prevents them from accepting a job suggests that pain management interventions could potentially be helpful. And while researchers may debate whether a deterioration in physical, mental and emotional health has led to the rise in the share of NLF prime age men, it is clear that many men in this group consider health and the incidence of pain to be a major barrier to work.

Lastly, several studies have found that the rise in inequality in the U.S. is linked to the decline in labor force participation . Policies that raise after-tax wages for low-wage workers, such as an increase in the minimum wage or expansion of the Earned Income Tax Credit, would also likely help raise labor force participation.

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Table 1: Labor Force Participation Rate and Population Shares for Selected Demographic Groups

Current Population Survey Data With Smoothed Population Controls

	Labor Force Participation Rate (%)			Share of Population (%)		
	1997	**2007**	**2016**	**1997**	**2007**	**2016**
Total	67.1	65.6	62.8	100.0	99.9	100.0
Men						
16-17 Years	41.3	28.7	23.7	2.0	2.1	1.8
18-19 Years	63.9	55.2	49.9	1.9	1.8	1.6
20-24 Years	82.5	78.5	73.3	4.3	4.5	4.3
25-34 Years	92.9	92.2	88.9	9.6	8.2	8.5
35-44 Years	92.5	92.2	90.6	10.7	8.8	7.7
45-54 Years	89.4	88.2	86.2	8.0	9.1	8.2
55-64 Years	67.6	69.6	70.1	5.1	6.8	7.8
65 Years & Over	17.1	20.5	24.1	6.6	6.9	8.4
Women						
16-17 Years	41.0	30.7	25.1	1.9	2.0	1.8
18-19 Years	61.2	53.7	49.3	1.8	1.7	1.5
20-24 Years	72.6	70.0	68.1	4.3	4.4	4.3
25-34 Years	76.0	74.4	74.1	9.9	8.5	8.7
35-44 Years	77.7	75.5	74.4	10.9	9.2	8.0
45-54 Years	76.0	76.0	73.7	8.4	9.6	8.6
55-64 Years	50.9	58.3	58.4	5.5	7.4	8.5
65 Years & Over	8.6	12.6	15.5	9.1	9.1	10.4

Notes: Data have been adjusted to account for the effects of the annual population control adjustments to the Current Population Survey; see text for further details. Source: Bureau of Labor Statistics; author's calculations.

Table 2: Time-Series Regression Models of the Labor Force Participation Rate in Levels

	Dependent Variable: Labor Force Participation Rate							
	1948 to 2016				1997 to 2016			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	58.601	57.205	57.078	57.068	67.526	67.270	67.673	67.522
	(1.121)***	(1.196)***	(0.806)***	(0.816)***	(0.316)***	(0.167)***	(0.491)***	(0.178)***
Unemployment Rate	0.009	-0.147	0.113	0.109	-0.008	-0.086	-0.027	-0.126
	(0.209)	(0.161)	(0.104)	(0.150)	(0.049)	(0.025)***	(0.055)	(0.031)***
Time	0.122	0.319	0.169	0.172	-0.242	-0.026	-0.260	-0.045
	(0.023)***	(0.074)***	(0.015)***	(0.078)**	(0.026)***	(0.039)	(0.048)***	(0.025)*
Time Squared / 1000		-2.828		-0.057		-10.738		-11.443
		(1.051)***		(1.340)		(2.180)***		(1.516)***
Indicator Variable for 2007 to 2016			-4.601	-4.547			0.282	0.513
			(1.086)***	(1.926)**			(0.504)	(0.148)***
Adjusted R-Squared	0.665	0.772	0.852	0.850	0.925	0.970	0.922	0.976
Number of Observations	69	69	69	69	20	20	20	20

Notes: Newey-West standard errors with 3 years of lags shown in parentheses. Data for 1990 to 2015 have been adjusted to account for the effects of the annual population control adjustments to the Current Population Survey. See text for more details. Source: Bureau of Labor Statistics; National Bureau of Economics Research; author's calculations. Levels of significance: *** = 0.01, ** = 0.05, * = 0.10.

Table 3: Time-Series Regression Models of the Labor Force Participation Rate in Annual First Differences

	Dependent Variable: Change in Labor Force Participation Rate							
	1949 to 2016				1997 to 2016			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.251	-0.099	0.165	-0.107	0.000	0.149	-0.012	0.132
	(0.115)**	(0.125)	(0.109)	(0.133)	(0.090)	(0.096)	(0.112)	(0.085)
Change in Unemployment Rate	-0.082	-0.085	-0.076	-0.086	-0.104	-0.072	-1.000	-0.060
	(0.032)**	(0.026)***	(0.028)***	(0.028)***	(0.027)***	(0.040)*	(0.041)**	(0.051)
Time	-0.006	0.025	-0.001	0.026	-0.020	-0.071	-0.016	-0.065
	(0.003)**	(0.008)***	(0.003)	(0.009)***	(0.010)*	(0.043)	(0.021)	(0.040)
Time Squared / 1000		-0.436		-0.456		2.737		2.892
		(0.108)***		(0.152)***		(2.369)		(2.453)
Indicator Variable for 2007 to 2016			-0.365	0.036			-0.052	-0.108
			(0.143)**	(0.154)			(0.218)	(0.208)
Adjusted R-Squared	0.142	0.343	0.227	0.333	0.197	0.234	0.149	0.194
Number of Observations	68	68	68	68	20	20	20	20

Notes: Newey-West standard errors with 3 years of lags shown in parentheses. Data for 1990 to 2015 have been adjusted to account for the effects of the annual population control adjustments to the Current Population Survey. See text for more details. Source: Bureau of Labor Statistics; National Bureau of Economics Research; author's calculations. Levels of significance: *** = 0.01, ** = 0.05, * = 0.10.

Table 4: Time Spent on Activities - Men Age 21-30

	Time Use, Hours Per Week			
Activity	**2004-2007**	**2008-2011**	**2012-2015**	**Change from 04-07 to 12-15**
Sleeping	60.62	60.54	61.40	0.78
Work (incl. commuting)	34.02	33.02	30.89	-3.13
Watching TV	17.20	16.71	16.99	-0.21
Eating and Drinking	7.42	7.48	7.39	-0.03
Grooming	3.91	4.07	4.05	0.14
Socializing	4.66	4.71	5.16	0.50
Food/Drink Preparation	1.13	1.42	1.64	0.51
Cleaning	1.41	1.57	1.37	-0.05
Reading	0.85	0.74	0.95	0.10
Shopping	2.04	1.85	1.79	-0.25
Laundry	0.40	0.45	0.56	0.16
Relaxing/Thinking	1.44	1.38	1.51	0.07
Gardening	0.67	0.72	0.74	0.08
Child Care	2.25	2.39	1.95	-0.30
Education	3.35	3.79	4.66	1.32
Adult Care	0.78	0.67	0.63	-0.14
Computer Use	1.25	1.56	1.86	0.60
Playing Games	2.05	3.28	3.72	1.67
N	*2,705*	*2,638*	*2,308*	

Notes: Table shows average number of hours per week spent on each activity. Sample is ATUS data, 2003-2015. Weighted using final ATUS person weights. Averages include people who report no time spent on an activity. N is total number of respondents.

Table 5: Regressions of Various Affect Measures on Activity Dummies and Person Fixed Effects, Men Age 16-35

	Dependent Variable:					
Explanatory Variable:	**Happy**	**Sad**	**Stress**	**Tired**	**Pain**	**Meaning**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Constant	4.168	0.523	1.540	2.208	0.582	4.209
	(0.021)***	(0.017)***	(0.023)***	(0.024)***	(0.013)***	(0.027)***
Gaming Dummy	0.567	-0.215	-0.235	-0.022	0.014	-0.860
	(0.104)***	(0.109)**	(0.123)*	(0.209)	(0.052)	(0.231)***
TV Dummy	0.085	-0.100	-0.627	0.359	-0.052	-0.921
	(0.070)	(0.064)	(0.086)***	(0.084)***	(0.047)	(0.095)***
Computer Dummy	-0.413	0.016	-0.321	0.218	-0.252	-1.112
	(0.154)***	(0.078)	(0.152)**	(0.181)	(0.120)**	(0.225)***
Person Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	12,603	12,618	12,621	12,618	12,621	12,594
p-value: Gaming = TV	0.000	0.297	0.005	0.075	0.255	0.809
p-value: Gaming = Computer	0.000	0.067	0.651	0.365	0.030	0.421

Notes: Sample is ATUS-WB module. Bottom two rows provide test of equality of of Gaming Dummy and TV Dummy, and Gaming Dummy and Computer Dummy. Levels of significance: *** = 0.01, ** = 0.05, * = 0.10.

Table 6: Self Reported Health Status, Prime Age Workers

	Employed	*Unemployed*	*Not in LF*
Men			
Excellent (%)	20.0	19.5	12.3
Very Good (%)	36.3	29.2	20.6
Good (%)	31.9	35.1	24.4
Fair (%)	10.7	13.9	25.4
Poor (%)	1.2	2.3	17.3
N	*7,277*	*468*	*683*
Women			
Excellent (%)	20.9	16.3	16.6
Very Good (%)	37.0	25.6	24.0
Good (%)	30.9	36.3	28.0
Fair (%)	10.0	18.1	19.3
Poor (%)	1.1	3.7	12.1
N	*7,453*	*637*	*2,265*

Notes: Sample is ATUS Well-being module, prime age (25-54) individuals, pooling years 2010, 2012 and 2013. Weighted using the well being module final weights. N is total number of respondents in each group.

Table 7: Disability Rate - Prime Age Men by Labor Force Status

	Employed	*Unemployed*	*Not in LF*
Difficulty dressing or bathing (%)	0.2	0.4	7.5
Deaf or difficulty hearing (%)	0.9	1.4	4.0
Blind or difficulty seeing (%)	0.4	0.9	4.0
Difficulty doing errands such as shopping (%)	0.3	0.9	15.0
Difficulty walking or climbing stairs (%)	0.8	2.1	20.0
Difficulty concentrating, remembering, or making decisions (%)	0.7	2.4	16.3
Any disability (%)	2.6	5.8	34.0
Multiple disabilities (%)	0.5	1.4	17.7
N	*1,965,782*	*137,952*	*253,853*

Notes: Data from monthly CPS surveys June 2008-August 2016, prime age (25-54) men only. Cells show the percentage of men in each labor force category with the condition listed in the row. Specific disabilities are not mutually exclusive. N is total number of survey respondents for each group.

Table 8: Prevalence of Pain and Pain Medication, By Labor Force Status

	Employed	*Unemployed*	*Not in LF*
All Prime Age Men			
Average Pain Rating (0-6)	0.76	0.81	1.97
Time Spent with Pain > 0	29.6%	26.3%	51.6%
Took Pain Medication Yesterday	20.2%	18.9%	43.5%
N	*7,277*	*468*	*683*
Disabled Prime Age Men			
Average Pain Rating (0-6)	1.49	1.25	2.81
Time Spent with Pain > 0	52.3%	42.1%	70.9%
Took Pain Medication Yesterday	32.4%	12.4%	57.7%
N	*191*	*25*	*276*

Notes: Sample is ATUS Well-being module respondents, prime age (25-54) men, pooling years 2010, 2012, and 2013. Weighted using the final well being activity weights. N is number of respondents.

Table 9a: Subjective Well-Being - Men, All Ages

	All	*Employed*	*Unemployed*	*Not in LF*	*p-value*
Happy	4.24	4.24	4.24	4.23	0.992
Tired	2.13	2.19	1.86	2.06	0.000
Stressed	1.39	1.48	1.38	1.16	0.000
Sad	0.60	0.54	0.68	0.71	0.000
Pain	0.88	0.74	0.86	1.24	0.000
Meaningful	4.18	4.25	4.05	4.04	0.000
U-Index	0.13	0.13	0.13	0.12	0.320
Cantril Ladder	7.03	7.10	6.29	7.01	0.000
N	*45,524*	*30,531*	*2,875*	*12,118*	

Notes: Sample is ATUS Well-being module, pooling years 2010, 2012, and 2013. Affects and U-index weighted using Well-being supplement final activity weights. Cantril ladder was asked in 2012 and 2013, and was weighted using Well-being supplement final person weights. N is total number of activities (3 per respondent) for each group. p-value is from an F-test that the means of the three labor force statuses are equal.

Table 9b: Subjective Well-Being - Men, Age 16-24

	All	*Employed*	*Unemployed*	*Not in LF*	*p-value*
Happy	4.23	4.25	4.30	4.16	0.570
Tired	2.24	2.23	2.23	2.27	0.935
Stressed	1.19	1.24	1.18	1.12	0.492
Sad	0.42	0.39	0.59	0.38	0.087
Pain	0.46	0.44	0.58	0.43	0.303
Meaningful	3.75	3.85	3.69	3.60	0.155
U-Index	0.11	0.12	0.09	0.10	0.314
Cantril Ladder	7.06	6.94	6.81	7.36	0.028
N	*4,723*	*2,294*	*842*	*1,587*	

Notes: Sample is ATUS Well-being module, pooling years 2010, 2012, and 2013. Affects and U-index weighted using Well-being supplement final activity weights. Cantril ladder was asked in 2012 and 2013, and was weighted using Well-being supplement final person weights. N is total number of activities (3 per respondent) for each group. p-value is from an F-test that the means of the three labor force statuses are equal.

Table 9c: Subjective Well-Being - Men, Prime Age

	All	*Employed*	*Unemployed*	*Not in LF*	*p-value*
Happy	4.18	4.20	4.25	3.95	0.010
Tired	2.23	2.25	1.51	2.52	0.000
Stressed	1.59	1.57	1.56	1.81	0.038
Sad	0.62	0.55	0.74	1.15	0.000
Pain	0.87	0.76	0.82	1.92	0.000
Meaningful	4.24	4.27	4.23	3.92	0.002
U-Index	0.15	0.14	0.17	0.22	0.002
Cantril Ladder	6.87	7.03	5.69	6.08	0.000
N	*25,079*	*21,661*	*1,393*	*2,025*	

Notes: Sample is ATUS Well-being module, pooling years 2010, 2012, and 2013. Affects and U-index weighted using Well-being supplement final activity weights. Cantril ladder was asked in 2012 and 2013, and was weighted using Well-being supplement final person weights. N is total number of activities (3 per respondent) for each group. p-value is from an F-test that the means of the three labor force statuses are equal.

Table 9d: Subjective Well-Being - Men, Age 55-70

	All	*Employed*	*Unemployed*	*Not in LF*	*p-value*
Happy	4.31	4.36	4.06	4.27	0.086
Tired	1.95	1.99	1.78	1.92	0.373
Stressed	1.27	1.37	1.38	1.12	0.002
Sad	0.70	0.60	0.81	0.83	0.001
Pain	1.19	0.85	1.81	1.60	0.000
Meaningful	4.41	4.50	4.57	4.26	0.001
U-Index	0.11	0.12	0.14	0.10	0.348
Cantril Ladder	6.84	6.98	5.55	6.19	0.000
N	*10,796*	*5,812*	*538*	*4,446*	

Notes: Sample is ATUS Well-being module, pooling years 2010, 2012, and 2013. Affects and U-index weighted using Well-being supplement final activity weights. Cantril ladder was asked in 2012 and 2013, and was weighted using Well-being supplement final person weights. N is total number of activities (3 per respondent) for each group. p-value is from an F-test that the means of the three labor force statuses are equal.

Table 10a: Subjective Well-Being - Women, All Ages

	All	*Employed*	*Unemployed*	*Not in LF*	*p-value*
Happy	4.38	4.31	4.35	4.47	0.000
Tired	2.43	2.52	2.25	2.33	0.000
Stressed	1.54	1.67	1.60	1.34	0.000
Sad	0.66	0.59	0.78	0.74	0.000
Pain	1.03	0.82	1.00	1.34	0.000
Meaningful	4.40	4.37	4.38	4.43	0.261
U-Index	0.15	0.16	0.16	0.13	0.000
Cantril Ladder	7.23	7.23	6.54	7.33	0.000
N	*57,272*	*31,684*	*3,181*	*22,407*	

Notes: Sample is ATUS Well-being module, pooling years 2010, 2012, and 2013. Affects and U-index weighted using Well-being supplement final activity weights. Cantril ladder was asked in 2012 and 2013, and was weighted using Well-being supplement final person weights. N is total number of activities (3 per respondent) for each group. p-value is from an F-test that the means of the three labor force statuses are equal.

Table 10b: Subjective Well-Being - Women, Age 16-24

	All	*Employed*	*Unemployed*	*Not in LF*	*p-value*
Happy	4.37	4.29	4.52	4.40	0.211
Tired	2.63	2.80	2.28	2.57	0.017
Stressed	1.48	1.50	1.52	1.45	0.897
Sad	0.45	0.38	0.63	0.47	0.047
Pain	0.62	0.56	0.91	0.55	0.255
Meaningful	3.97	3.88	4.17	4.00	0.271
U-Index	0.13	0.14	0.13	0.13	0.876
Cantril Ladder	7.06	6.97	6.92	7.29	0.116
N	*4,672*	*2,283*	*780*	*1,609*	

Notes: Sample is ATUS Well-being module, pooling years 2010, 2012, and 2013. Affects and U-index weighted using Well-being supplement final activity weights. Cantril ladder was asked in 2012 and 2013, and was weighted using Well-being supplement final person weights. N is total number of activities (3 per respondent) for each group. p-value is from an F-test that the means of the three labor force statuses are equal.

Table 10c: Subjective Well-Being - Women, Prime Age

	All	*Employed*	*Unemployed*	*Not in LF*	*p-value*
Happy	4.31	4.28	4.30	4.40	0.037
Tired	2.57	2.58	2.32	2.60	0.028
Stressed	1.72	1.77	1.69	1.57	0.001
Sad	0.66	0.60	0.85	0.78	0.000
Pain	0.98	0.83	1.05	1.43	0.000
Meaningful	4.43	4.40	4.64	4.49	0.007
U-Index	0.16	0.17	0.17	0.14	0.028
Cantril Ladder	7.13	7.24	6.23	7.03	0.000
N	*30,825*	*22,192*	*1,897*	*6,736*	

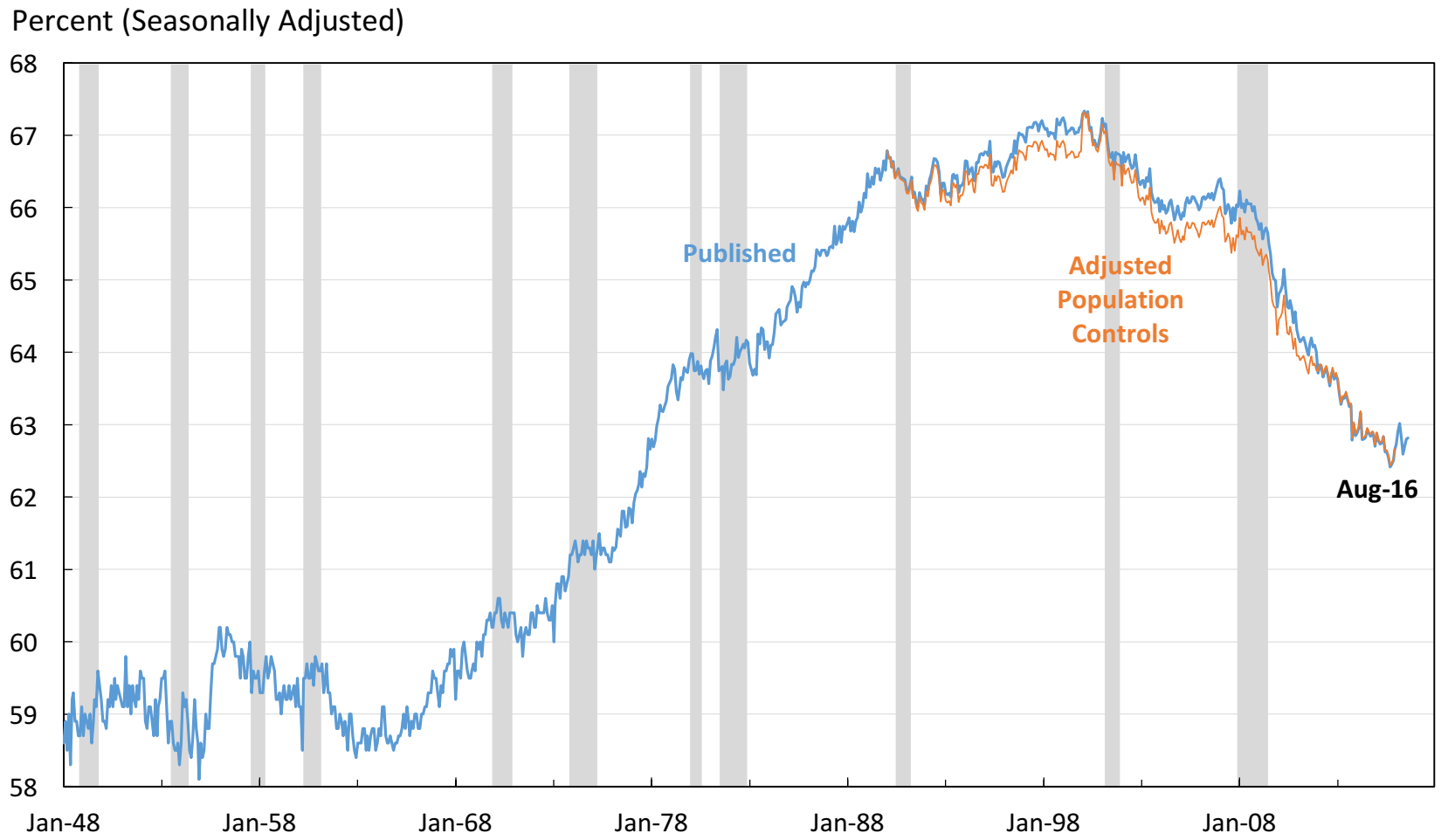
Notes: Sample is ATUS Well-being module, pooling years 2010, 2012, and 2013. Affects and U-index weighted using Well-being supplement final activity weights. Cantril ladder was asked in 2012 and 2013, and was weighted using Well-being supplement final person weights. N is total number of activities (3 per respondent) for each group. p-value is from an F-test that the means of the three labor force statuses are equal.

Table 10d: Subjective Well-Being - Women, Age 55-70

	All	*Employed*	*Unemployed*	*Not in LF*	*p-value*
Happy	4.44	4.45	3.75	4.46	0.003
Tired	2.19	2.15	1.53	2.26	0.000
Stressed	1.42	1.49	1.62	1.34	0.067
Sad	0.79	0.68	1.06	0.88	0.001
Pain	1.36	0.95	1.13	1.76	0.000
Meaningful	4.61	4.70	4.15	4.54	0.004
U-Index	0.14	0.15	0.23	0.13	0.019
Cantril Ladder	7.16	7.20	6.20	7.35	0.017
N	*13,370*	*6,486*	*422*	*6,462*	

Notes: Sample is ATUS Well-being module, pooling years 2010, 2012, and 2013. Affects and U-index weighted using Well-being supplement final activity weights. Cantril ladder was asked in 2012 and 2013, and was weighted using Well-being supplement final person weights. N is total number of activities (3 per respondent) for each group. p-value is from an F-test that the means of the three labor force statuses are equal.

Figure 1: Labor Force Participation Rate

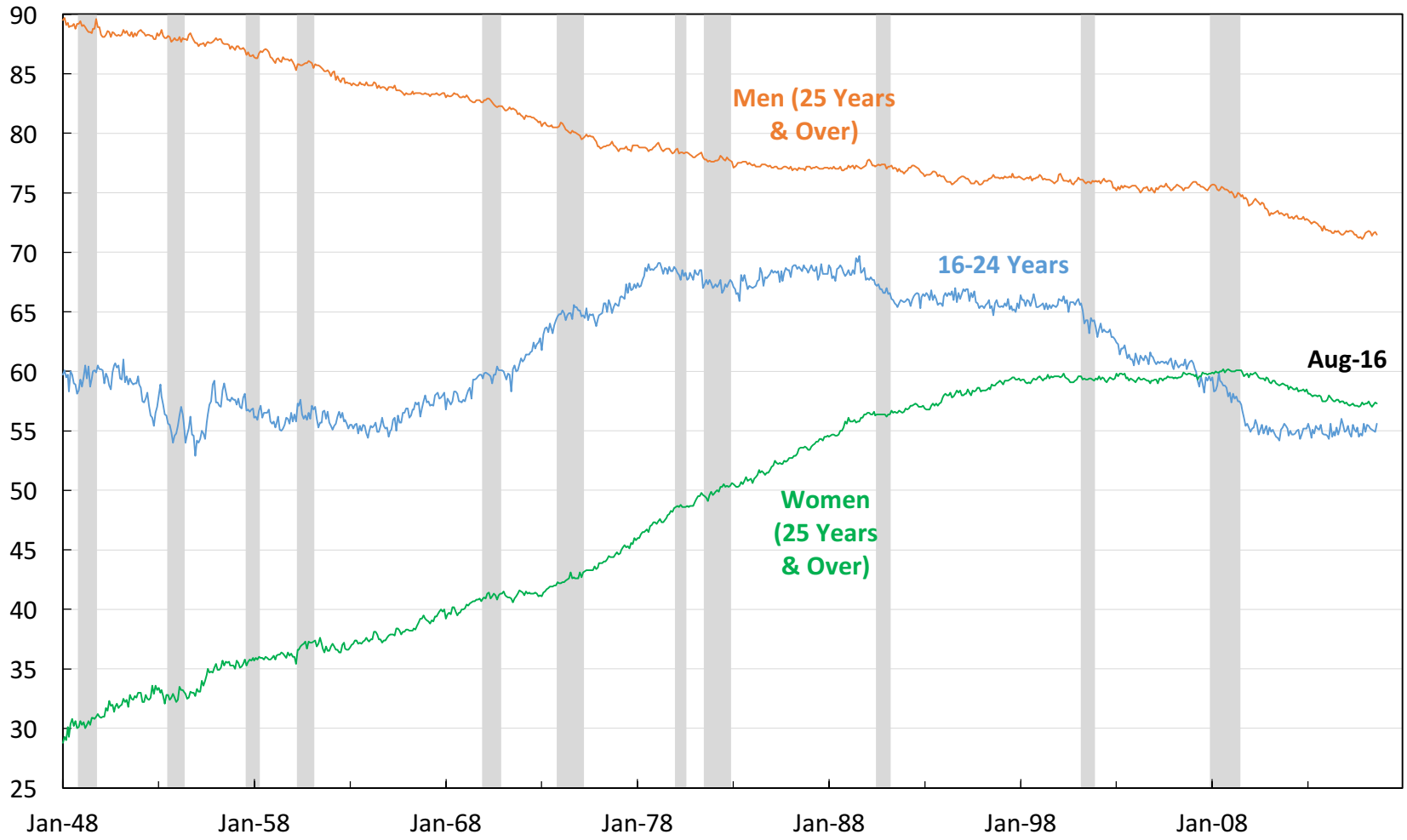


Notes: Data for January 1990 to December 2015 have been adjusted to account for the effects of the annual population control adjustments to the Current Population Survey. Shading denotes recession.

Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure 2: Labor Force Participation Rates by Age & Gender

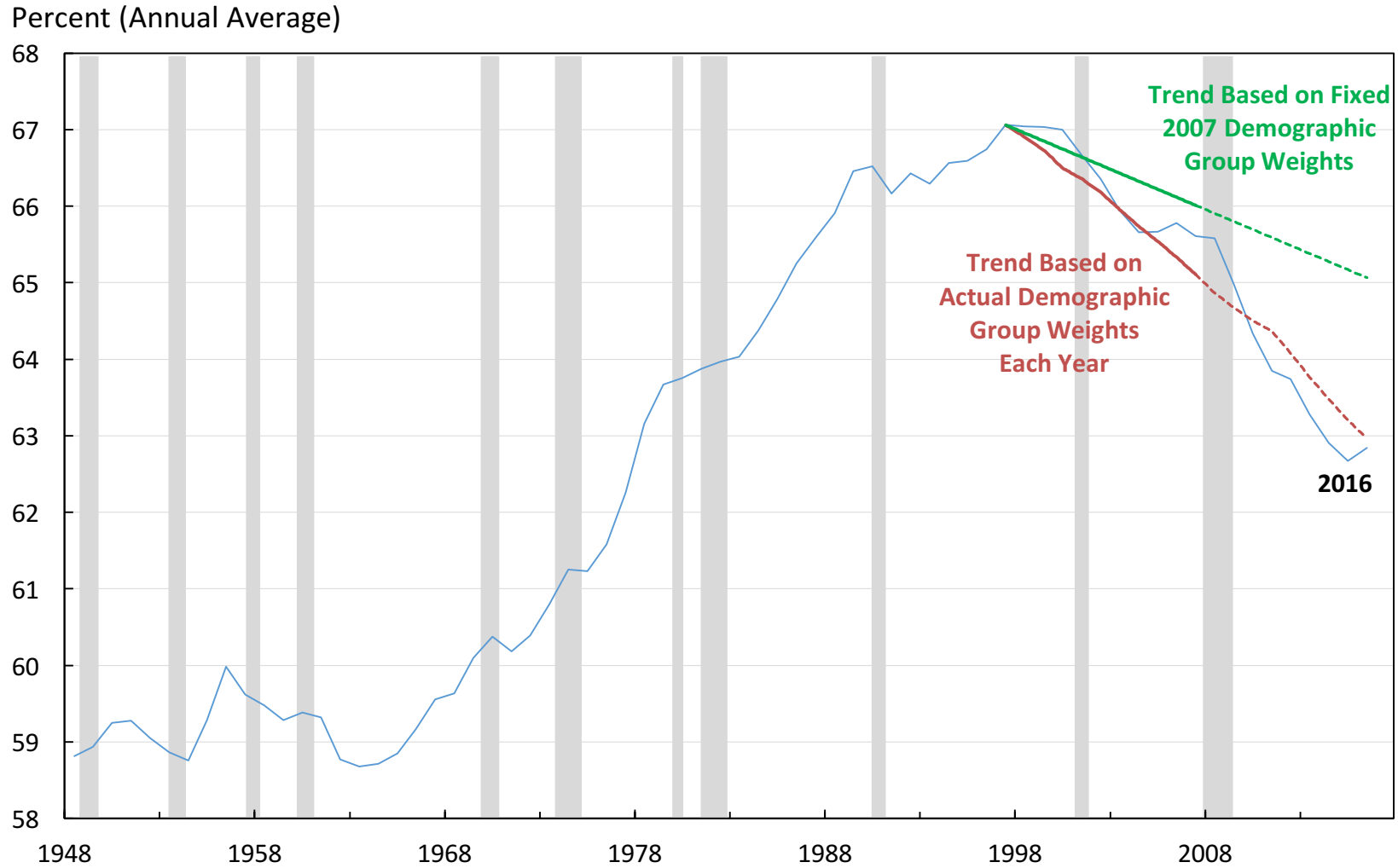
Percent (Seasonally Adjusted)



Notes: Shading denotes recession.

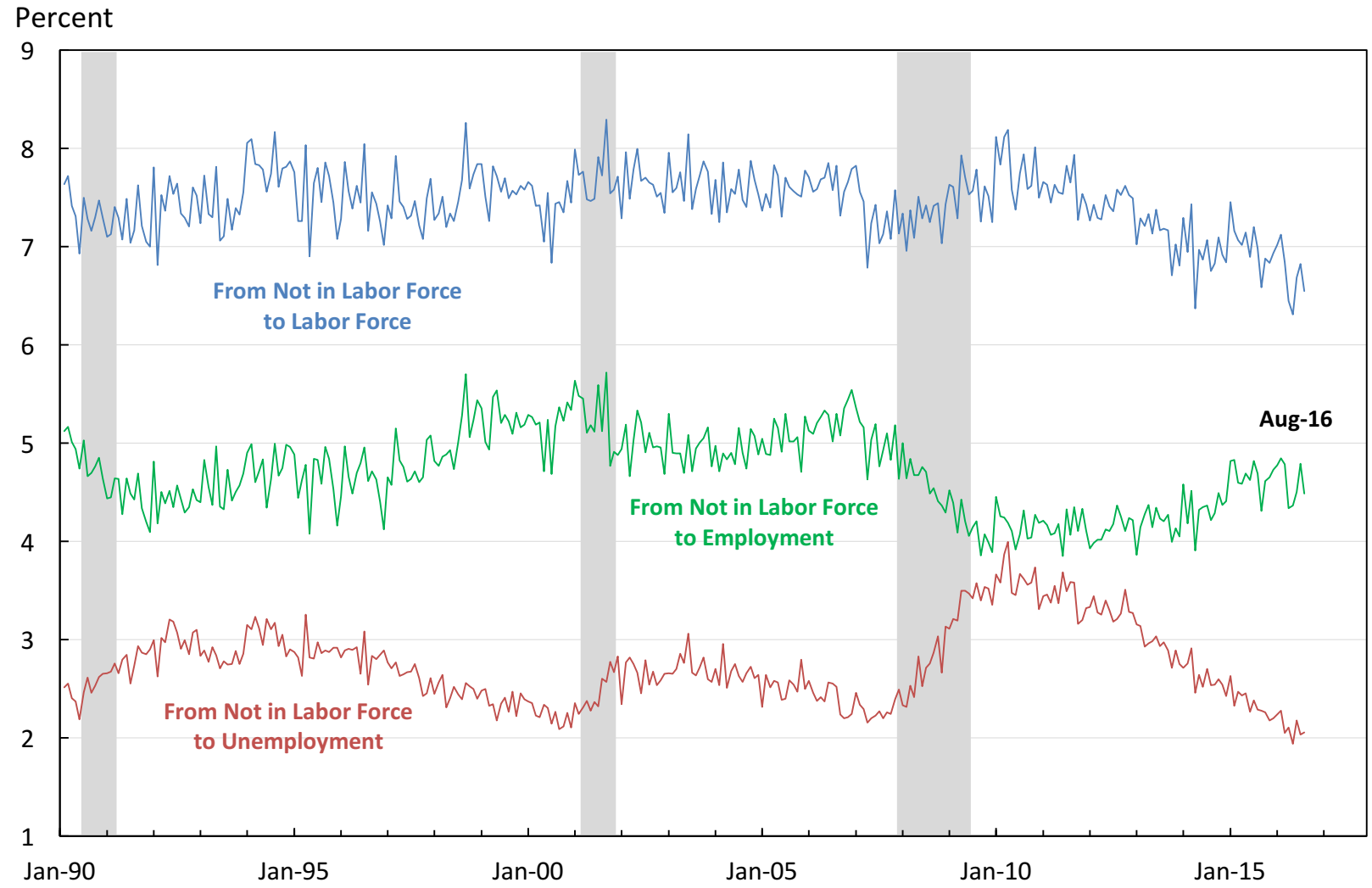
Source: Bureau of Labor Statistics; National Bureau of Economic Research.

Figure 3: Labor Force Participation Rate, Projected and Actual



Notes: Data for 1990 to 2015 have been adjusted to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure 4: Transition Rate From Not in Labor Force

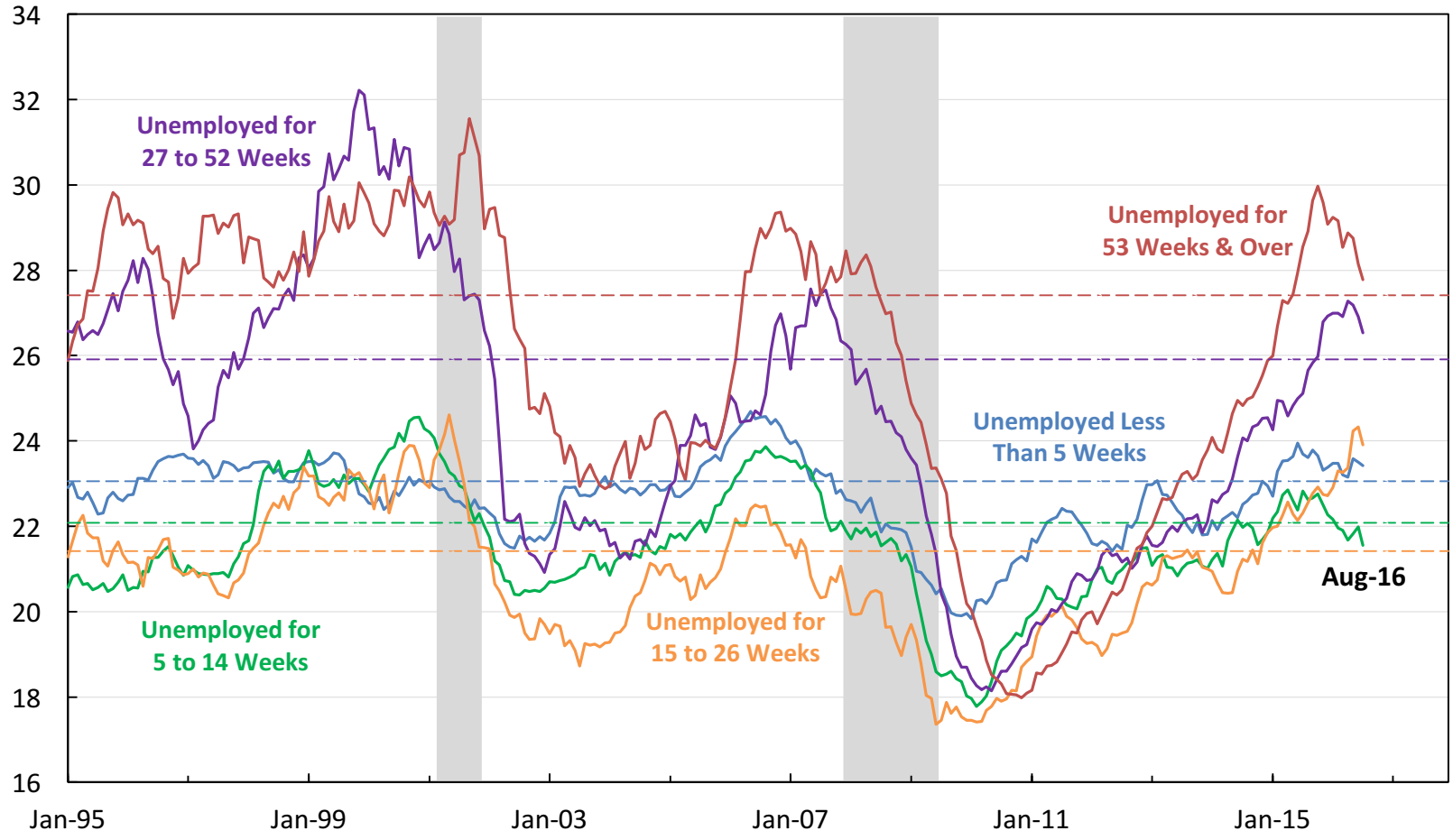


Notes: Shading denotes recession.

Source: Bureau of Labor Statistics; National Bureau of Economic Research.

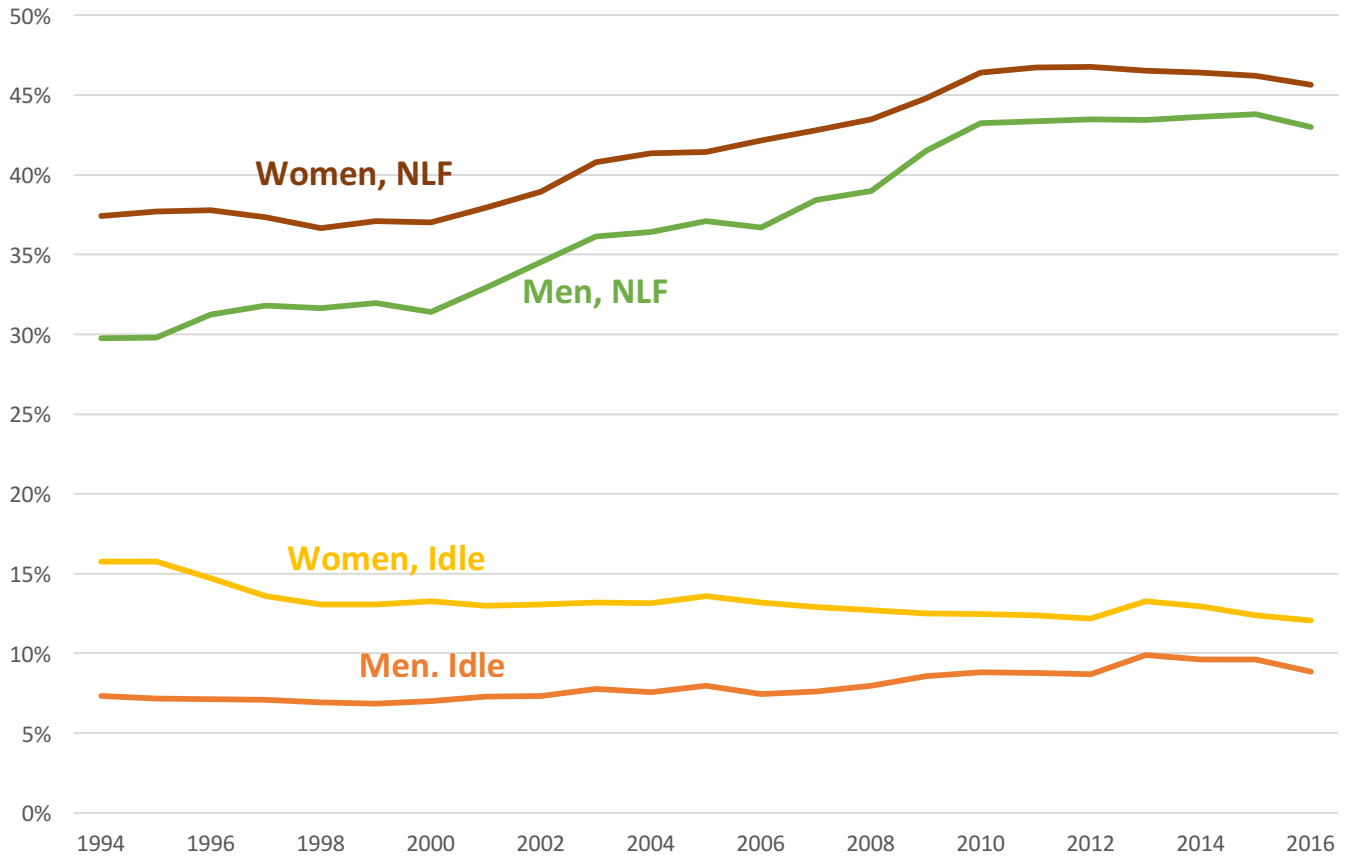
Figure 5: Monthly Probability of Transitioning From Unemployment to Out of the Labor Force by Duration of Unemployment

Percent (Not Seasonally Adjusted, 12-Month Moving Average)



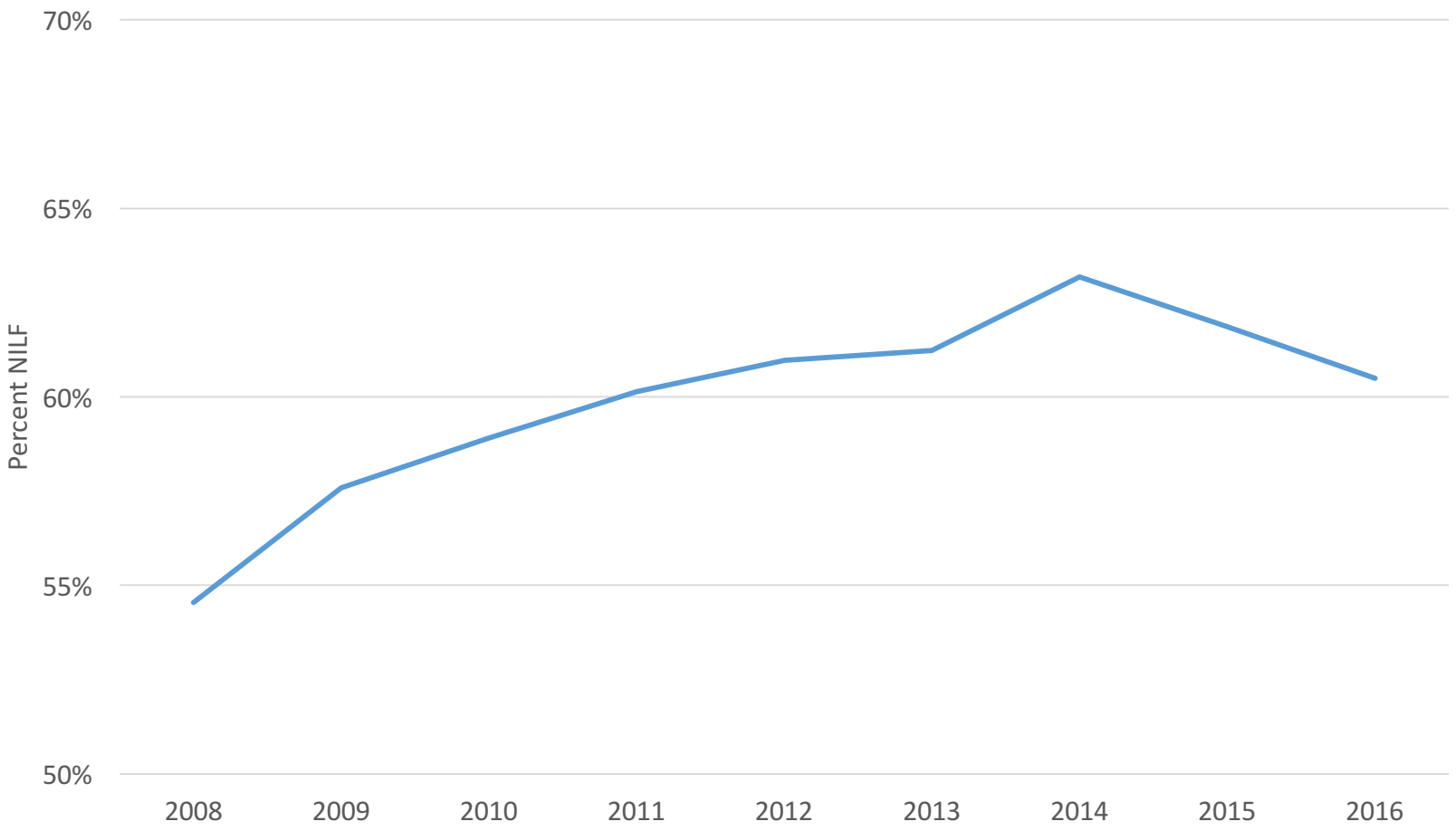
Notes: Dashed lines represent 1995-2007 averages. Shading denotes recession.
Source: Bureau of Labor Statistics; National Bureau of Economic Research.

Figure 6: Percent Not in the Labor Force (NLF) and Idle, Age 16-24



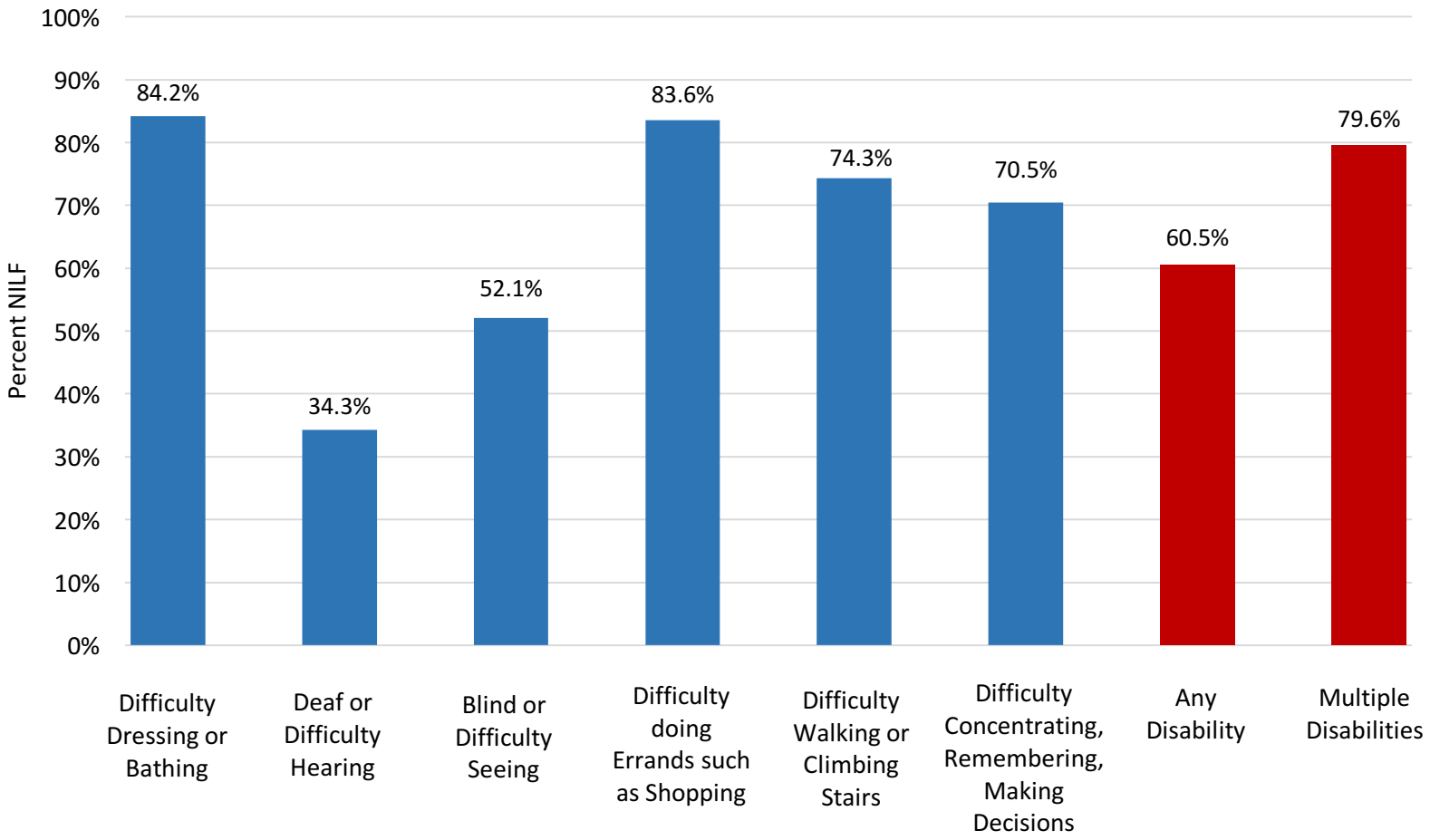
Notes: Data from ASEC, 1994 through 2016. People are classified as "Idle" if they were neither enrolled in school nor participating in the labor force. Ages 16-24 only. See text for more details.

Figure 7a: Probabilty of Being Out of the Labor Force Conditional on Having any Disability, Prime Age Men



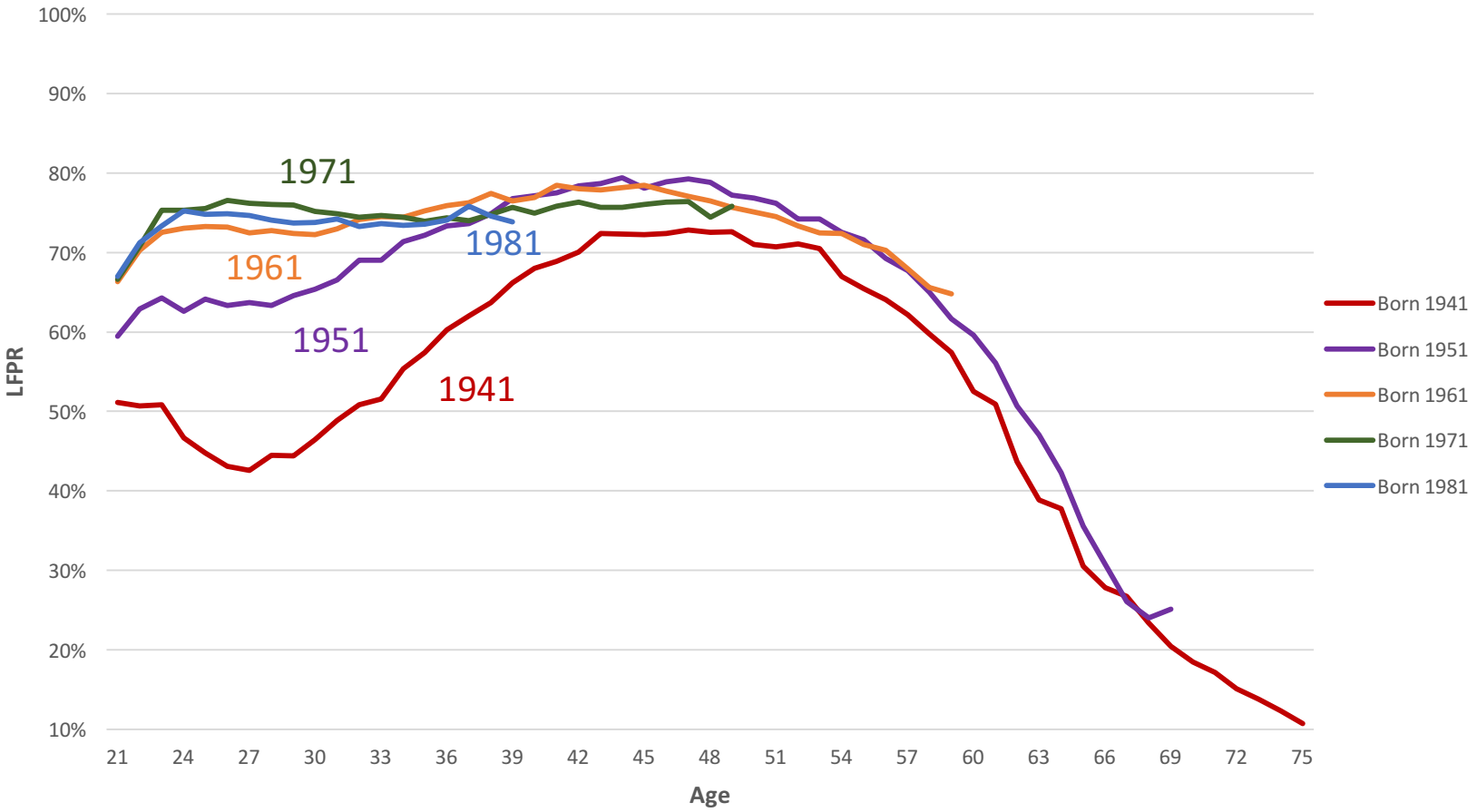
Notes: Data from monthly CPS, June 2008 through August 2016.

Figure 7b: Probability of Being Out of the Labor Force by Type of Disability, Prime Age Men



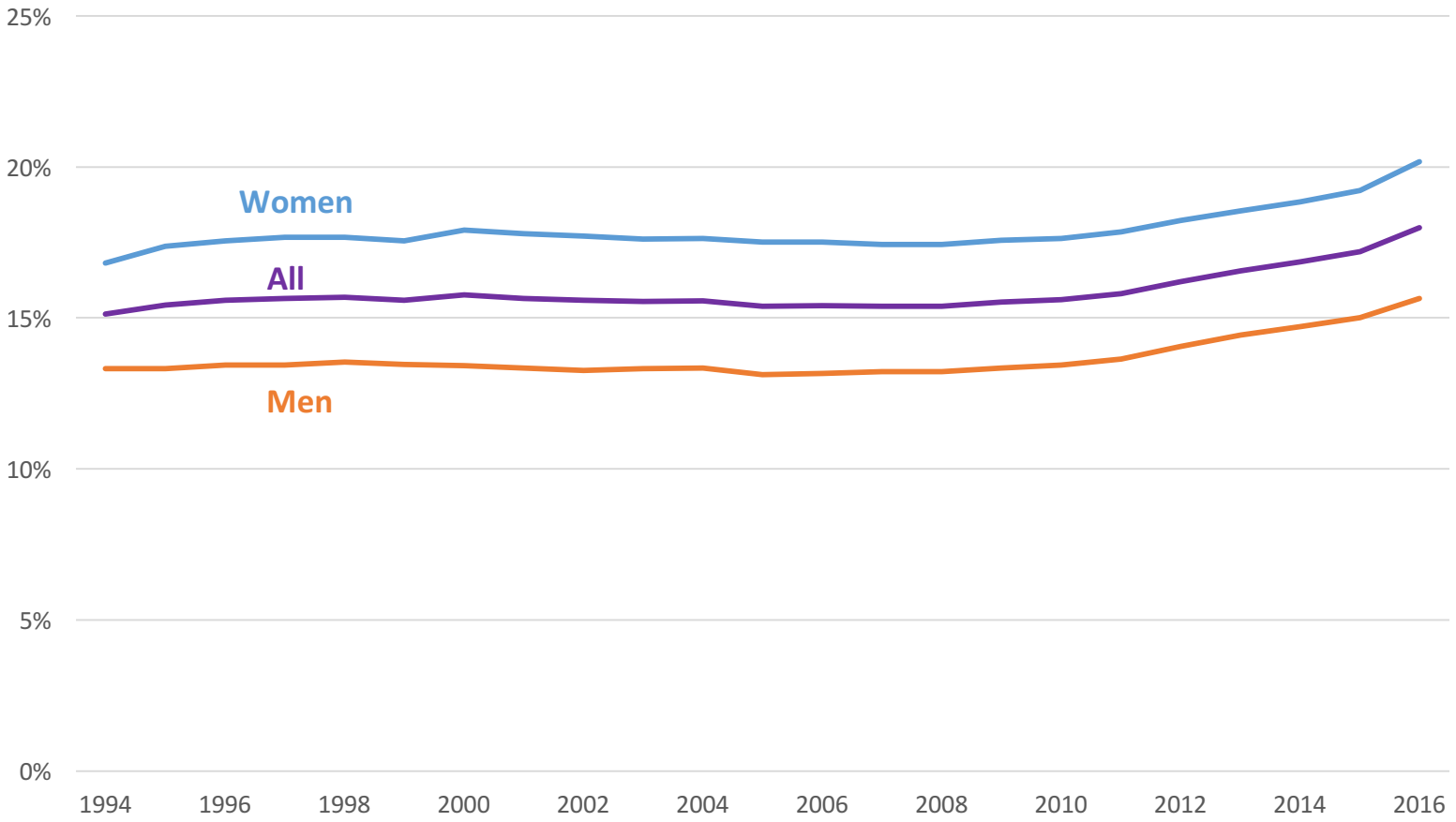
Notes: Data from monthly CPS, June 2008 through August 2016.

Figure 8: Labor Force Participation Rate for Women, by Age and Birth Year



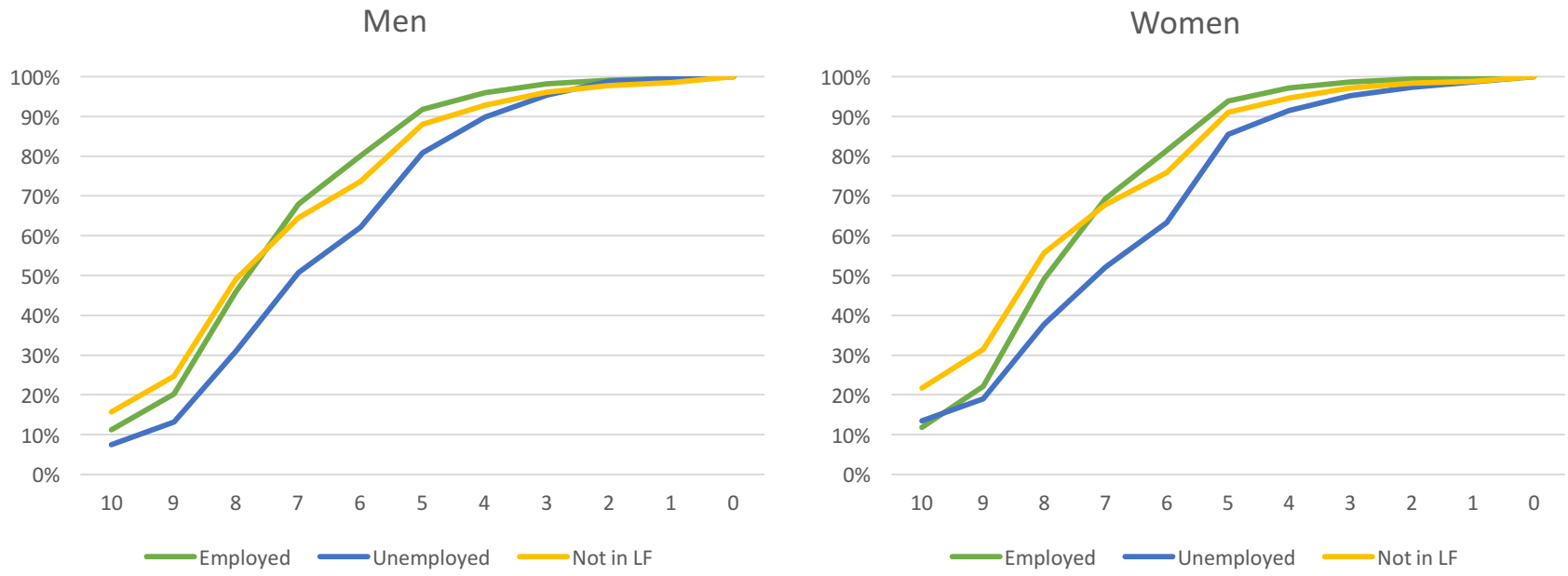
Notes: Data from ASEC, 1962-2016. Figure show the labor force participation rate of five cohorts of women based on ten year-of-birth intervals over the lifecycle from age 16 to age 79. The age displayed along the horizontal axis refers to the age of the middle birth year of the cohort.

Figure 9: Percentage of People Retired, Age 16+



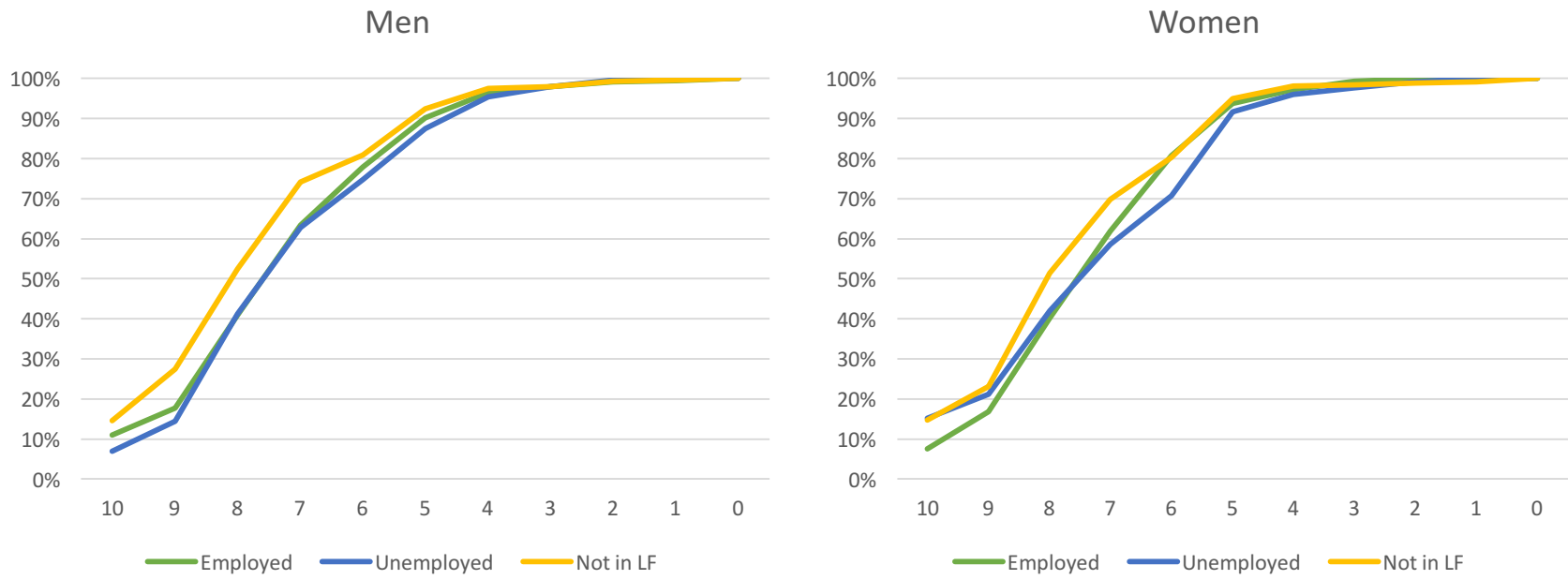
Notes: Data from monthly CPS. 2016 includes Jan-Aug. Retirement status determined by EMPSTAT variable in the IPUMS data.

Figure 10a: Cantril Ladder, All Ages



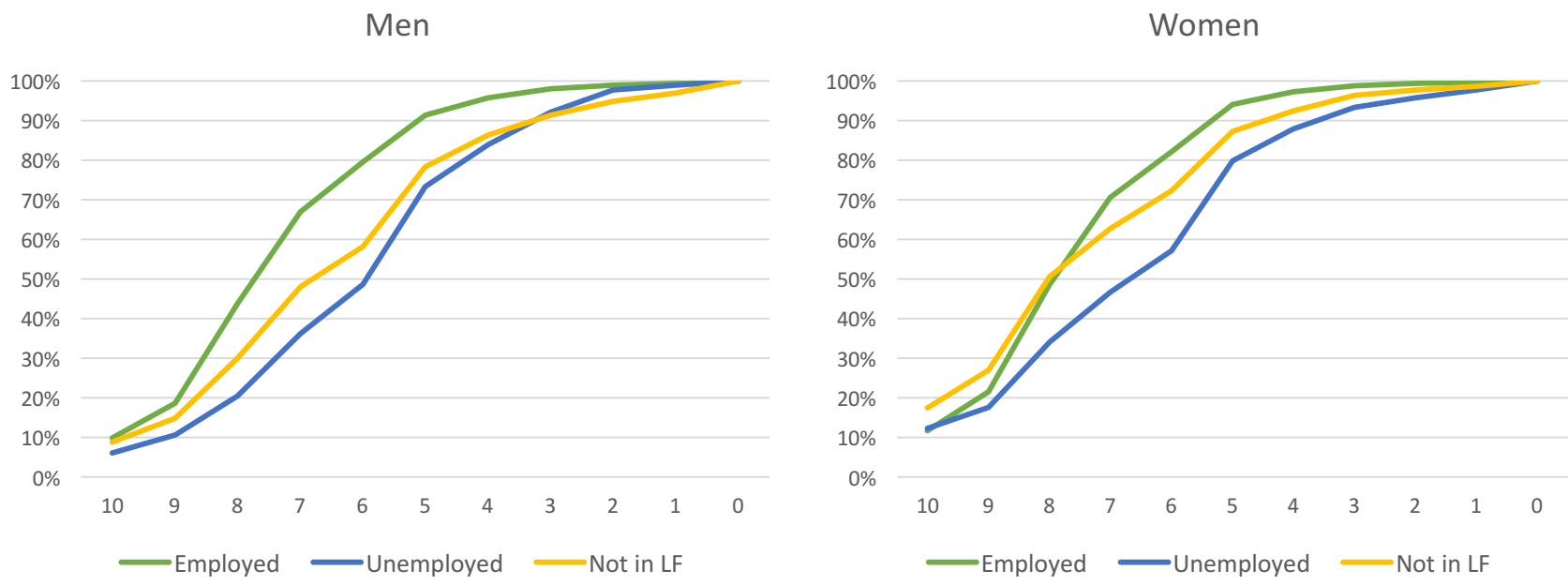
Notes: Sample is ATUS Well being module, pooling years 2012 and 2013.

Figure 10b: Cantril Ladder, Age 16-24



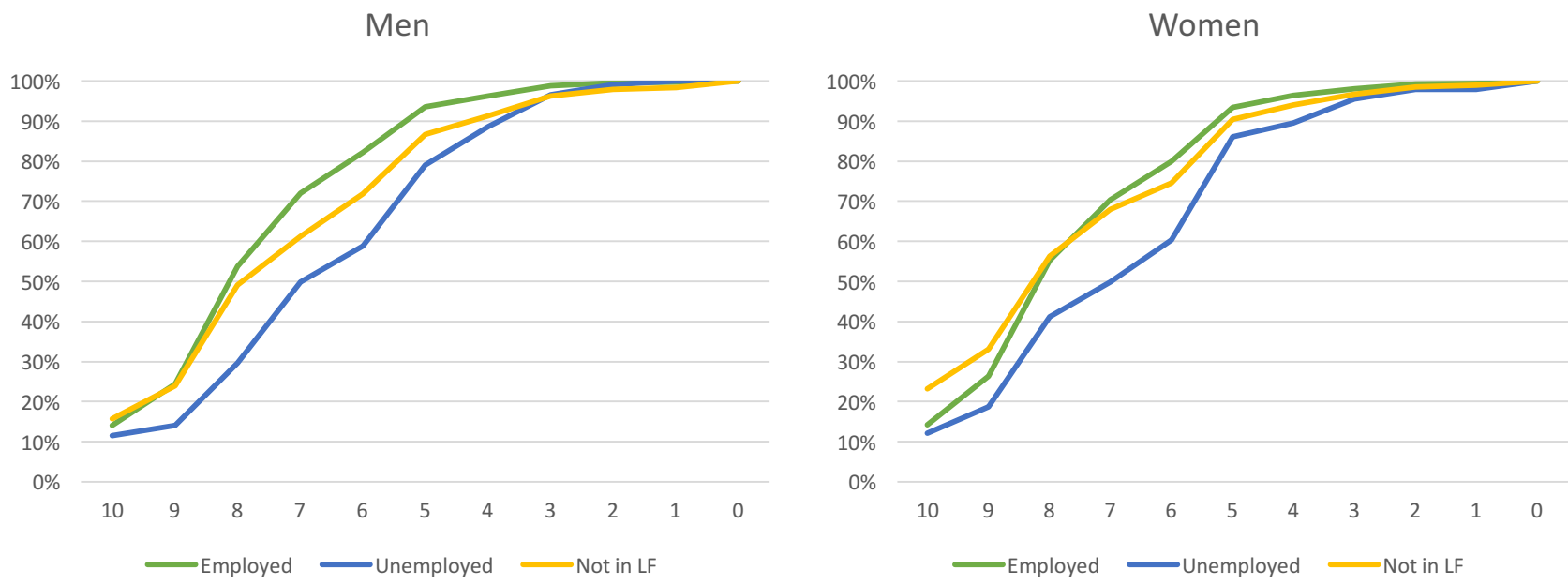
Notes: Sample is ATUS Well being module, pooling years 2012 and 2013.

Figure 10c: Cantril Ladder, Age 25-54



Notes: Sample is ATUS Well being module, pooling years 2012 and 2013.

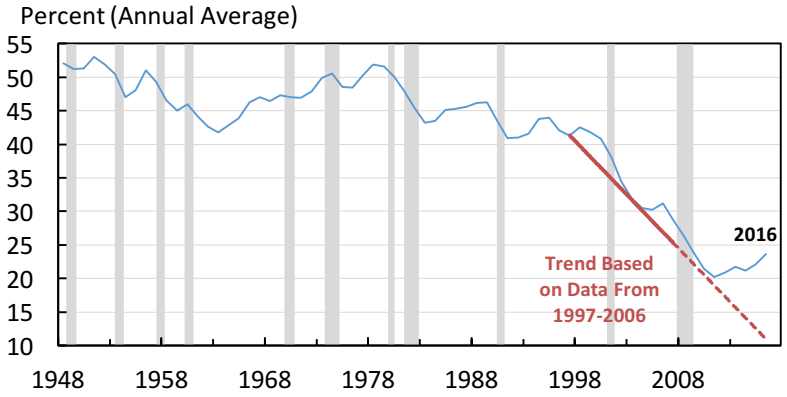
Figure 10d: Cantril Ladder, Age 55-70



Notes: Sample is ATUS Well being module, pooling years 2012 and 2013.

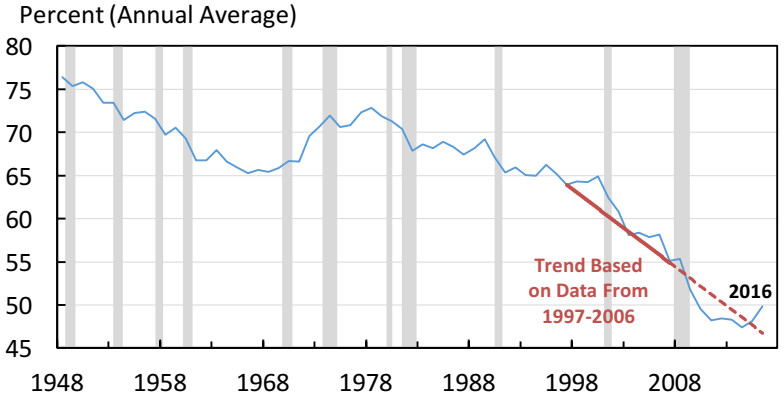
Appendix Figures

Figure A1: Labor Force Participation Rate: 16-17 Years, Men



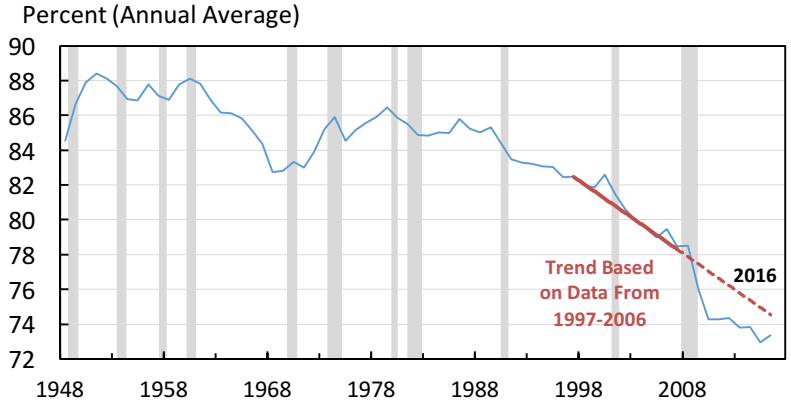
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A2: Labor Force Participation Rate: 18-19 Years, Men



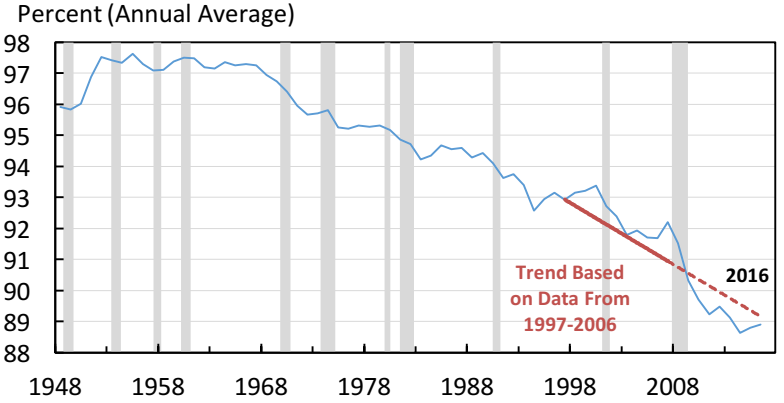
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A3: Labor Force Participation Rate: 20-24 Years, Men



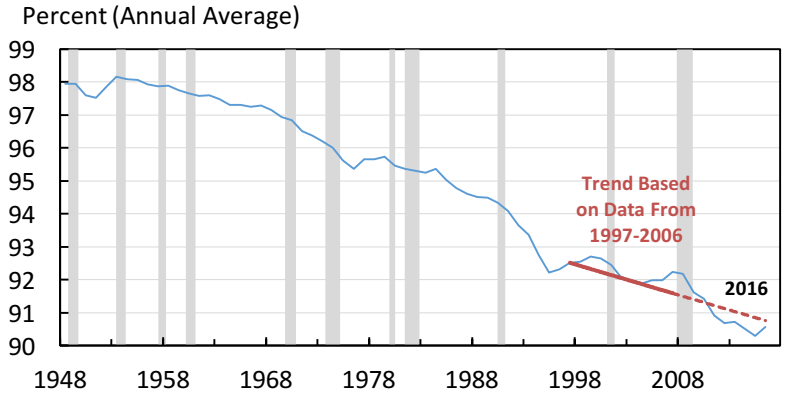
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A4: Labor Force Participation Rate: 25-34 Years, Men



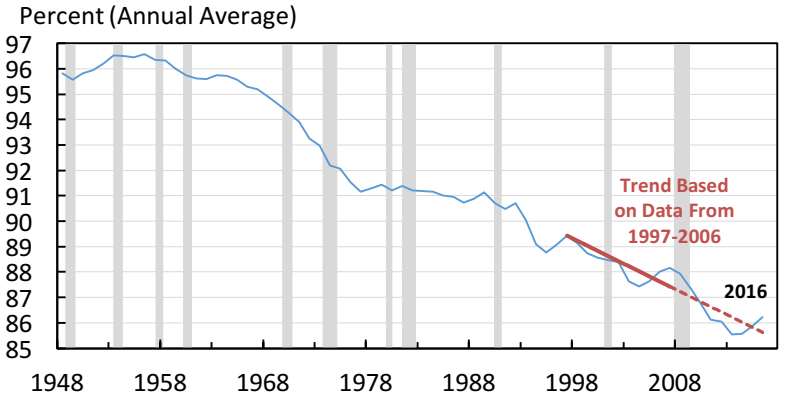
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A5: Labor Force Participation Rate: 35-44 Years, Men



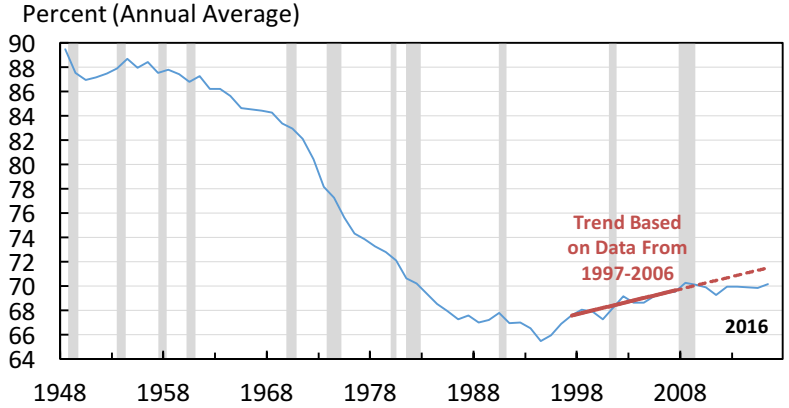
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A6: Labor Force Participation Rate: 45-54 Years, Men



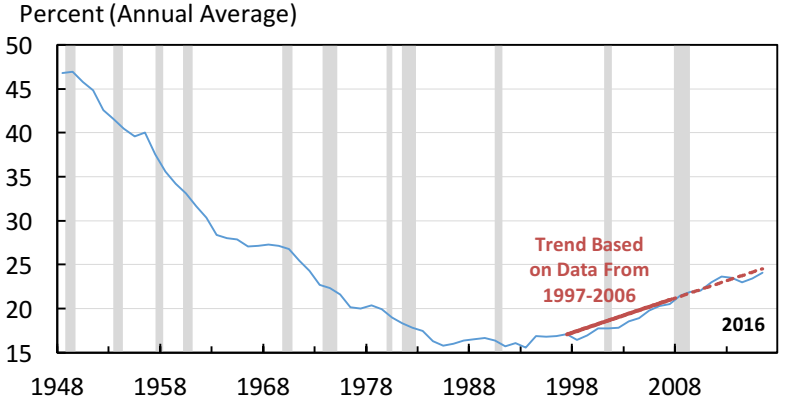
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A7: Labor Force Participation Rate: 55-64 Years, Men



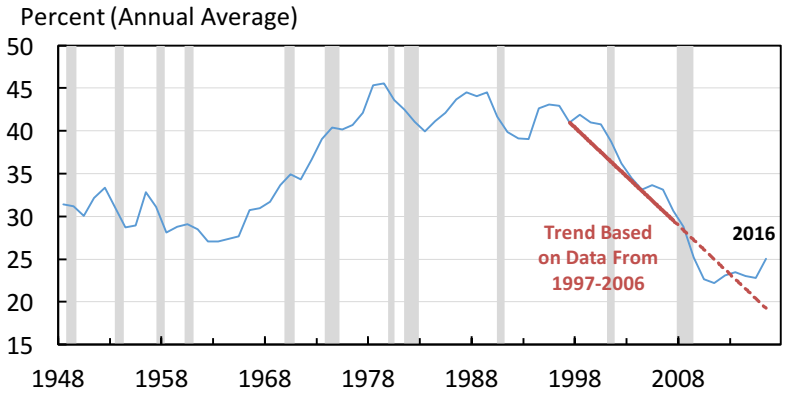
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A8: Labor Force Participation Rate: 65+ Years, Men



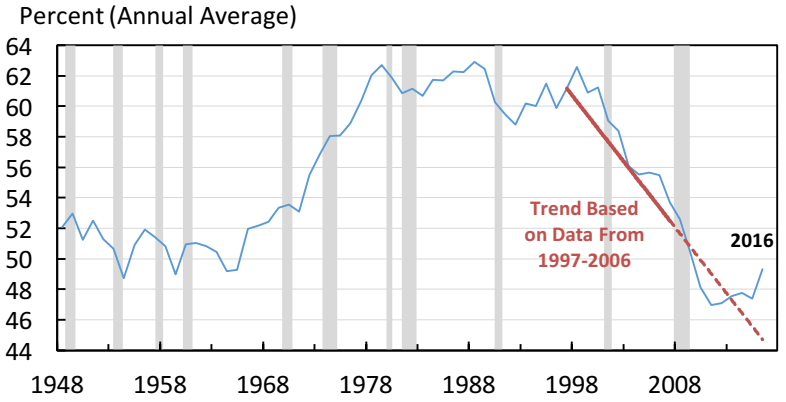
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A9: Labor Force Participation Rate: 16-17 Years, Women



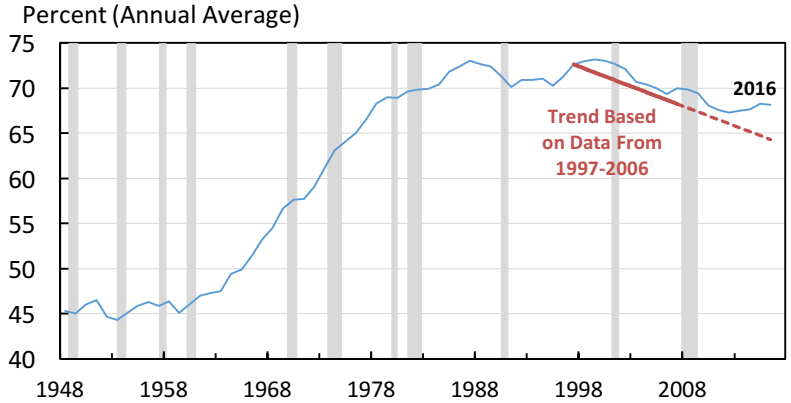
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A10: Labor Force Participation Rate: 18-19 Years, Women



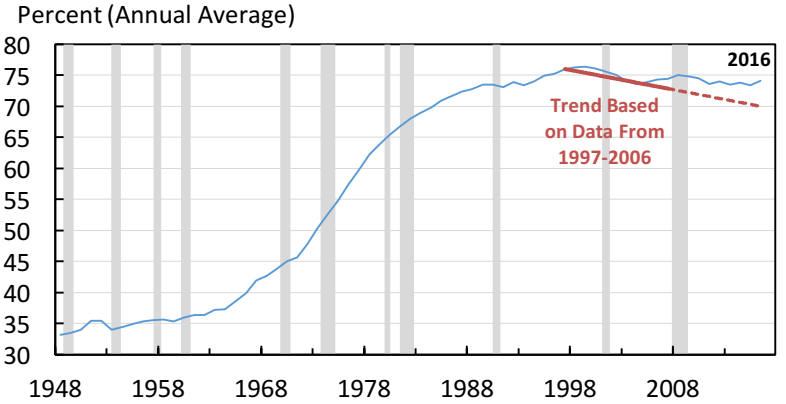
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A11: Labor Force Participation Rate: 20-24 Years, Women



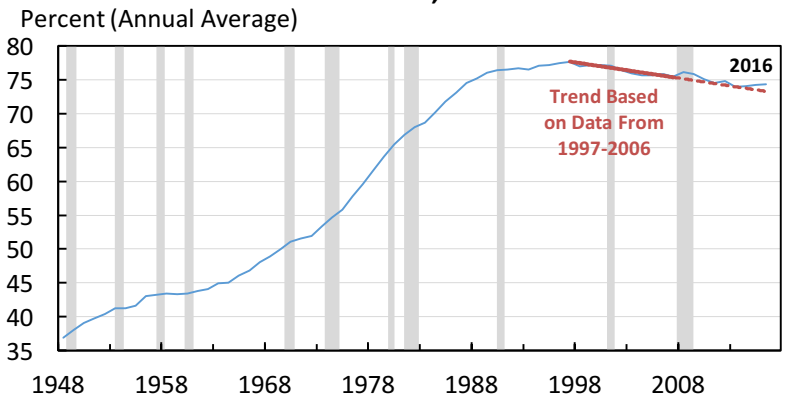
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A12: Labor Force Participation Rate: 25-34 Years, Women



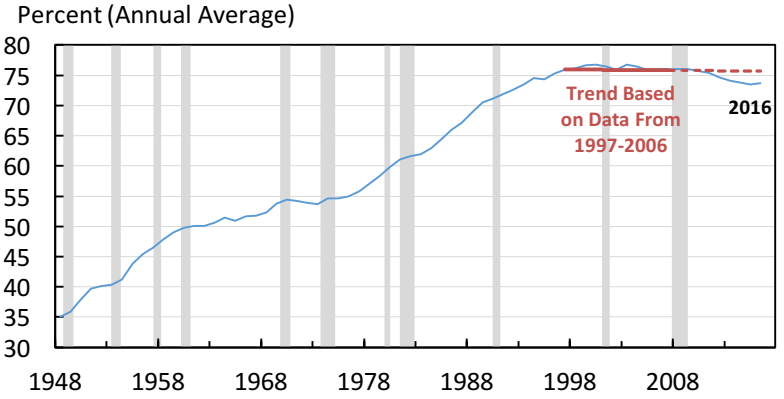
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A13: Labor Force Participation Rate: 35-44 Years, Women



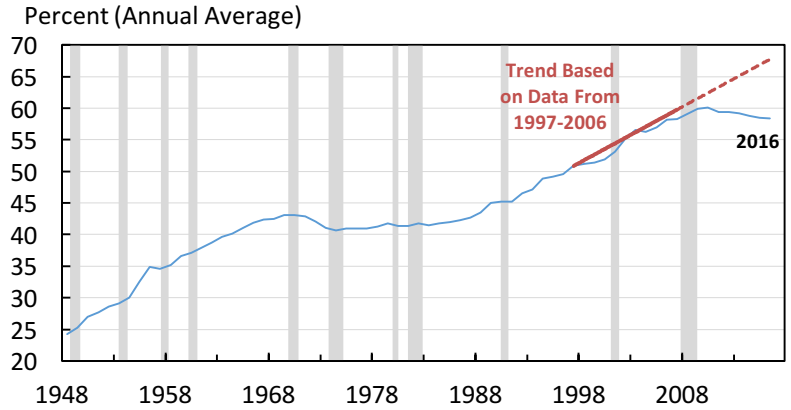
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A14: Labor Force Participation Rate: 45-54 Years, Women



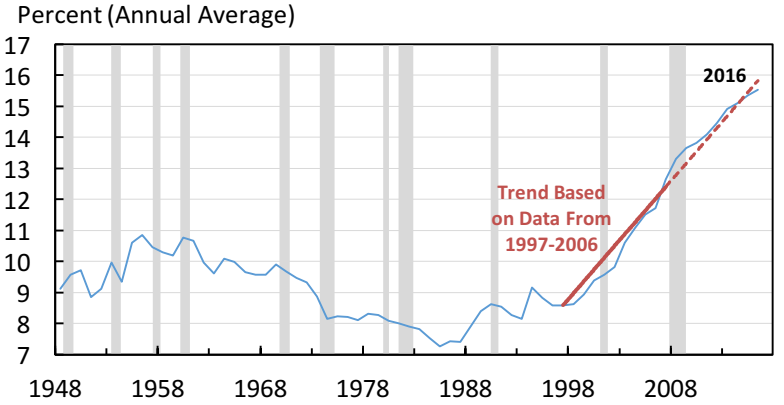
Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A15: Labor Force Participation Rate: 55-64 Years, Women



Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.

Figure A16: Labor Force Participation Rate: 65+ Years, Women



Notes: Data for 1990 to 2015 have been revised to account for the effects of the annual population control adjustments to the Current Population Survey. 2016 represents the average of data from January through August. Shading denotes recession. Solid line is OLS trend fitted to 1997-2006 data.
Source: Bureau of Labor Statistics; National Bureau of Economic Research; author's calculations.