

# Is the official unemployment rate misleading?

## A look at labor market statistics over the business cycle

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### Introduction and summary

In recent years, both economists and the popular press have asked whether the measured unemployment rate is “too low.” In particular, observers question whether current unemployment rates accurately reflect labor market weakness. By some conventional measures, the most recent recession was relatively mild. The official unemployment rate rose to a high of 6.3 percent in June 2003, which is low by historical standards (see figure 1), and real gross domestic product (GDP) declined by only 0.5 percent, compared with a 1.3 percent decline in the 1990–91 recession and an average decline of 1.1 percent during previous recessions from 1960 to 1981. At the same time, others have argued that this latest recession was not as mild for labor markets as suggested by the maximum unemployment rate level. Most point to the fact that based on payroll employment numbers, there were 1.8 percent fewer jobs in January 2004 than in March 2001. At the extreme, Austin Goolsbee suggests that

... the unemployment rate has been low only because government programs, especially Social Security disability, have effectively been buying people off the unemployment rolls and reclassifying them as ‘not in the labor force.’ In other words, the government has cooked the books. ...<sup>1</sup>

In this article, I focus on whether the current unemployment rate accurately reflects labor market strength, particularly when compared with the 1990–91 recession. There are many reasons to believe that unemployment rates may not be comparable over time. Fortunately, although the unemployment rate and jobs growth are the headline numbers of the monthly Bureau of Labor Statistics (BLS) *Employment Situation* release, the release provides many other statistics that one can use to put the unemployment rate into a broader context,

as well as to measure labor market strength in ways that may be more comparable over time. In particular, data on employment-to-population rates and those not in the labor force are useful for considering the relative strength of the labor market over time.

Currently, there is evidence that the official unemployment level may be lower than in earlier periods, in part due to factors affecting the labor force rather than factors affecting labor market strength. However, other evidence on labor market strength does not support the argument that the current labor market is weaker than that following the 1990–91 economic recession. Indeed, along several dimensions, the current period of economic recovery reflects stronger labor markets than in several previous recovery periods: Employment to population rates are high; the percentage of workers not in the labor force who say they want a job has not increased; and real hourly and weekly earnings are higher relative to levels at the peak of the business cycle in 2001.

Below, I begin by discussing why many believe that the official unemployment rate may not accurately affect labor market strength, how the official unemployment rate is measured, and what factors affect its measurement. Next, I consider how the most recent economic recession and recovery period compares with past recession and recovery periods when I look at alternative measures of labor market strength.

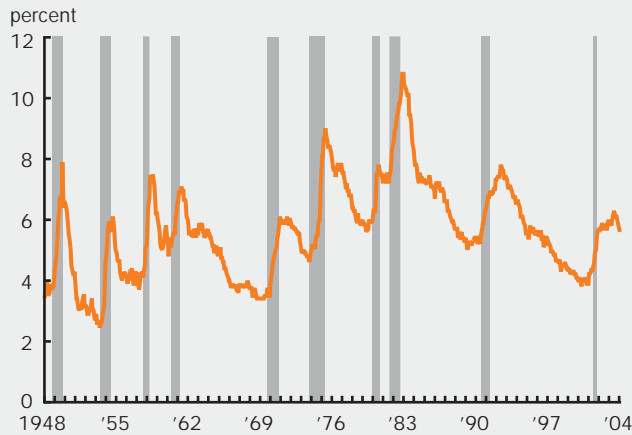
### Measuring unemployment

Figure 1 displays the seasonally adjusted, “official” monthly unemployment rates from the BLS from

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FIGURE 1

**Monthly unemployment rate, persons 16 and over, seasonally adjusted, January 1948–January 2004**



Note: NBER dated recessions are shaded in gray.  
 Source: Bureau of Labor Statistics, Historical data for the "A" tables of the *Employment Situation News Release*.

January 1948 through January 2004. Areas shaded in gray represent periods of economic recession as dated by the National Bureau of Economic Research (NBER), and a list of the monthly peak and trough dates can be found in table 1.<sup>2</sup> Following the 1991 recession, the unemployment rate peaked at 7.8 percent. Following the 2001 recession, the unemployment rate peaked at only 6.3 percent. Both recessions have been characterized as relatively mild. In fact, 6.3 percent unemployment is relatively low compared with maximum unemployment rates reached following other periods of economic recession over the past 40 years (7.1 percent in May 1961, 6.1 percent in December 1970, 9.0 percent in May 1975, 7.8 percent in July 1980, and 10.8 percent in November 1982).

**Why some suggest measured unemployment is too low**

In spite of the lower unemployment rates reached following the most recent economic recession, there has been little sign of recovery in the labor markets as measured by increases in payroll employment in the BLS *Establishment Survey* or the number of people who report being employed in the *Current Population Survey*.<sup>3</sup> In fact, many have compared the 2001 recovery with the so-called jobless recovery of 1991. Figure 2 provides a comparison of relative payroll employment numbers around the maximum payroll employment levels of 1990 and 2001, as well as the average relative employment numbers for the previous peak employment dates from 1960 through 1981. The peak employment levels are defined as the maximum level of employment

reached between NBER business cycle trough dates. Figure 3 provides a similar comparison using the household employment numbers adjusted for breaks in the series due to changes in population estimates.<sup>4</sup> In each figure, the maximum employment level corresponds to period 0, labeled "peak," and the level of employment is normalized to equal 1 at the maximum employment level of each business cycle. Relative employment levels below 1 occur in months when the total number of jobs or people employed is less than the maximum level of employment associated with each business cycle. Similarly, relative employment levels above 1 occur in months when the total number of jobs or people employed exceeds the level of employment at peak employment. Thus, at period 0 the normalized level of employment equals 1 in all series. A value of 1.02 indicates that employment in that

month is 2 percent above the maximum level reached in the relevant business cycle. Data for months to the right of the peak date are an indicator of the extent to which the economic recessions hurt labor markets.

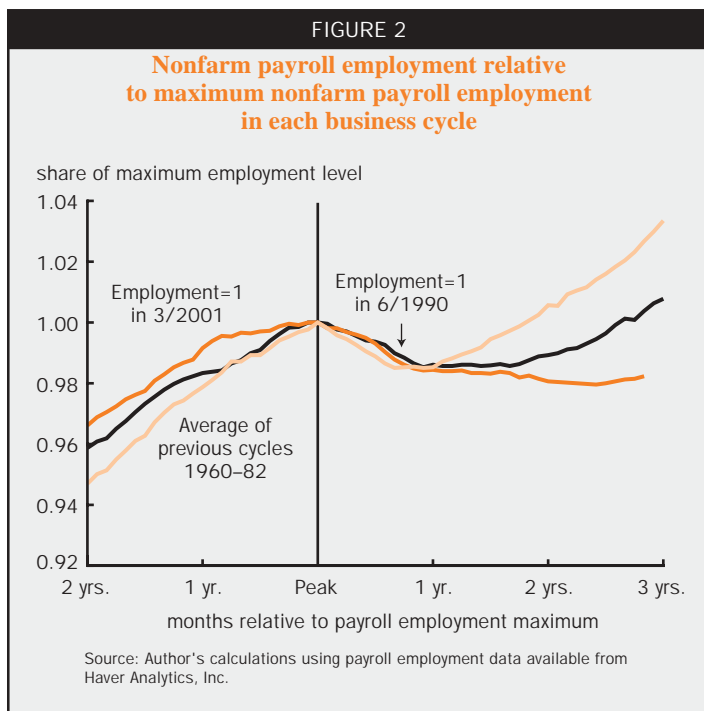
Both employment series tell very similar stories in terms of ranking the recessions by job loss. In the eight months following peak employment levels, employment is down by a somewhat larger percentage in the average recession than in the two most recent recessions, but, generally speaking, the periods look quite similar. One year after the employment peak, the series begin to diverge. Two years after the maximum employment dates, the average economic recovery has increased employment levels above the previous

TABLE 1

**NBER business cycle peaks and troughs, 1948–2003**

| Peaks         | Troughs       |
|---------------|---------------|
| November 1948 | October 1949  |
| July 1953     | May 1954      |
| August 1957   | April 1958    |
| April 1960    | February 1961 |
| December 1969 | November 1970 |
| November 1973 | March 1975    |
| January 1980  | July 1980     |
| July 1981     | November 1982 |
| July 1990     | March 1991    |
| March 2001    | November 2001 |

Source: National Bureau of Economic Research (NBER), [www.nber.org/cycles/cyclesmain.html](http://www.nber.org/cycles/cyclesmain.html).



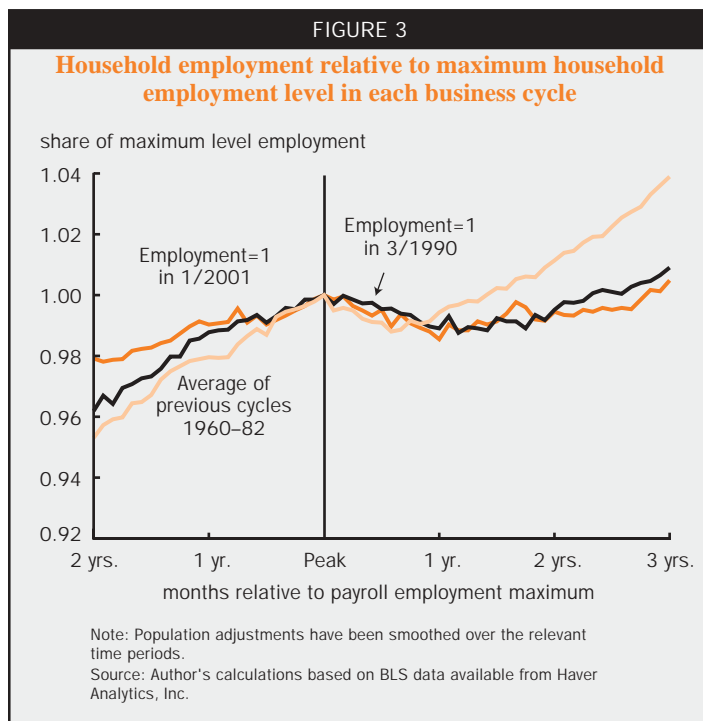
maximum. In contrast, payroll employment in June 1992 is 1.1 percent below peak payroll employment in June 1990, and payroll employment in March 2003 is 2 percent below employment in March 2001. The share of maximum employment levels is slightly higher in the household employment data for both the 1990–91 and 2001–02 business cycles, but as described in Aaronson et al. (2004), the series measuring the level of household employment may overstate employment growth since 2000 due to overestimates of population growth. Even with the possible overstatement, relative household employment levels are still below relative employment levels three years after peak employment in the average and post 1990–91 recession recovery periods. These series suggest that the current recovery period is weaker than both the average and the post 1990–91 recovery periods. Because the increase in unemployment rates has remained low relative to previous economic recessions and recovery periods, while growth in employment is also low, many question whether the unemployment rate accurately reflects weakness in the labor market.

**Factors contributing to declines in measured unemployment rates**

During the 1990s people were concerned about very low unemployment rates because this can lead to increases in the rate of inflation. As labor markets tighten, that is, unemployment rates fall below the non-accelerating inflation rate of unemployment (NAIRU),<sup>5</sup> wages increase faster than productivity in order for firms to hire the number of workers desired. This increase in labor costs in turn leads to higher inflation. Throughout most of the late 1990s, however, the unemployment rate continued to decline and inflation rates remained low. As a result, some believed that the NAIRU must have declined such that a stable inflation rate could be sustained at lower unemployment rates.<sup>6</sup>

Many economists attempted to quantify the factors contributing to a decline in the measured unemployment rate without increased inflationary pressure. Katz and Krueger (1999) consider the roles of the

aging of the population; the rise in the temporary help industry; the increase in incarceration rates; and declining unionization, worker insecurity, and the wage structure. Juhn, Murphy, and Topel (2002) look at the decline in labor force participation by low-skilled men



as a factor in the decline in measured unemployment. Finally, Autor and Duggan (2003) focus on the increase in Social Security Disability Insurance (SSDI) generosity and coverage, and Barrow and Butcher (2004) consider the role of increases in age-related morbidity. Several of these factors—incarceration rates, labor force participation, and disability—affect official unemployment rates through their effect on the size of the labor force.

Moving people with higher average rates of unemployment out of the labor force decreases the official unemployment rate. This results from the longstanding definition of the unemployment rate, not any “cooking of the books” by the government. The unemployment rate is calculated from survey data collected by the BLS *Current Population Survey* (CPS). The CPS surveys a representative sample of roughly 50,000 occupied households. In order to be included in the sample, individuals must be at least 15 years old and not a member of the armed forces. In addition, all persons living in institutions such as prisons and nursing homes are excluded from the survey. Using sampling weights and the answers from the survey questions on labor market activity during the survey reference week, the BLS estimates the number of people in the civilian non-institutionalized population age 16 years and over and, within that population, the number who are in the labor force, the number who are employed, and the number who are unemployed. The unemployment rate is then the percentage of the labor force that is unemployed.

#### Sampling frame

Changes in the population surveyed by the CPS may affect measurement of the unemployment rate. As mentioned above, the CPS only surveys the non-institutionalized, civilian population. Over time, the share and composition of the population that is institutionalized has changed.<sup>7</sup> Table 2 reports statistics from the *Census of Population* on the number of people

who are living in institutions. The numbers living in institutions have increased from 0.98 percent of the population in 1940 to 1.44 percent in 2000, and much of the recent increase has been attributed to increases in incarceration rates.<sup>8</sup> Since 1940 the share of the institutionalized population living in correctional facilities has more than doubled from roughly 22 percent in 1940 to nearly 50 percent today.<sup>9</sup> As long as the population of prisoners is different from the civilian non-institutionalized population in terms of labor market status (were they not institutionalized), removing them from the CPS sample will affect national labor market statistics. Katz and Krueger (1999) estimate that the increase in incarceration rates between 1995 and 1998 may account for a 0.3 percentage point drop in the male unemployment rate and a 0.17 percentage point drop in the overall unemployment rate.

#### Self-identification

Because the unemployment rate is calculated using survey data, counts of the employed, self-employed, unemployed, and the number of persons in and out of the labor force will depend on individuals’ responses to questions regarding their activity during the reference week. An individual is counted as in the labor force if they are either employed or unemployed. Individuals are counted as employed if they report that they: worked at least one hour for pay, worked in their own farm or business, worked at least 15 hours or more as an unpaid worker in a business owned by a family member, or were not working but had a job from which they were on temporary leave.<sup>10</sup> Individuals are classified as unemployed if they report that they were not employed but were actively searching for employment.<sup>11</sup> Thus, people who do not hold jobs must be actively searching for employment in order to be counted as part of the labor force.

Over the business cycle, individuals without jobs may be more or less likely to actively search for

TABLE 2

### The institutionalized population of the United States

|                                 | 1940        | 1950        | 1960        | 1970        | 1980        | 1990        | 2000        |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Total population                | 132,164,569 | 151,325,798 | 179,323,175 | 203,302,031 | 226,542,199 | 248,709,873 | 281,421,906 |
| Institutionalized (%)           | 0.98        | 1.04        | 1.13        | 1.11        | 1.10        | 1.34        | 1.44        |
| Institutionalized population in |             |             |             |             |             |             |             |
| Mental institutions (%)         | 44.26       | 39.14       | 34.50       | 19.37       | 9.87        | 3.86        | 1.95        |
| Correctional institutions (%)   | 22.27       | 17.41       | 17.61       | 14.68       | 18.50       | 33.45       | 48.68       |

Sources: Population and percentage of population institutionalized from census data available through the *Integrated Public Use Microdata Series* from the Minnesota Population Center (IPUMS). For 1940 through 1980, percentage of institutionalized population in mental or correctional institutions calculated from IPUMS data. For 1990 and 2000, number of persons in mental or correctional institutions from American FactFinder at [www.census.gov](http://www.census.gov).

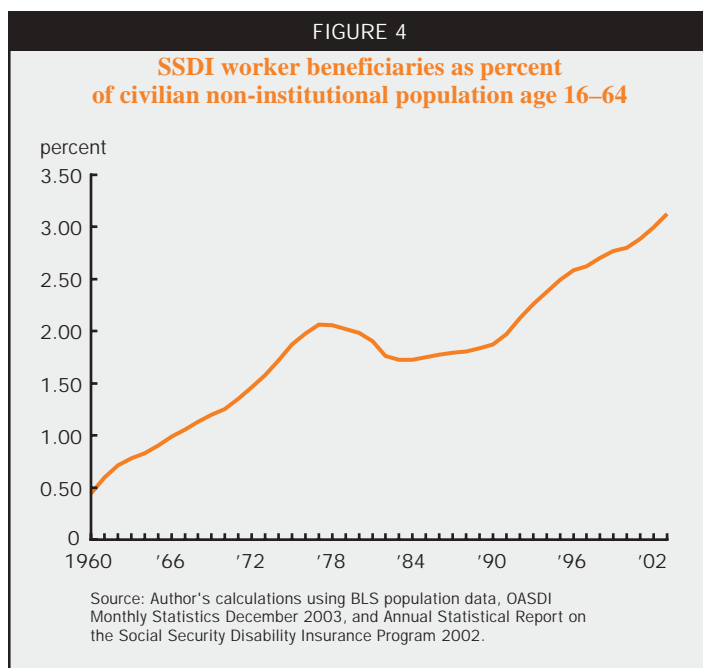
employment and, thus, be more or less likely to be counted as unemployed. During an economic recession, unemployed workers who become discouraged may give up searching for employment and thus move from a status of unemployed to one of out of the labor force. Similarly, other individuals may choose alternative options to job search that move them from unemployed to out of the labor force. For example, parents with young children may decide to stay home and care for their children full time, and individuals with disabilities may decide to apply for Social Security disability insurance (SSDI) payments. As discouraged workers and those with opportunities outside the labor market exit the labor force, all else equal, the number of unemployed will fall, the number of people in the labor force will fall, and the unemployment rate will fall. As the economy begins to pick up again, some of these same workers may decide to actively search for employment and enter the labor force once again. Until they find a job they will then be counted as unemployed, all else equal, leading to an increase in the unemployment rate.

Figure 4 plots the number of “worker” disability insurance recipients as a percentage of the civilian non-institutionalized population aged 16 to 64 from 1960 to 2002. Worker recipients are those who qualify for SSDI because they were employed before applying for disability insurance payments, and they made up 85 percent of disability insurance beneficiaries in 2002. Other disability insurance beneficiaries include widows, widowers, and adult children of worker beneficiaries. From 1960 to 2002, the number of worker beneficiaries increased from 0.5 percent to just over 3 percent of the civilian non-institutionalized population 16 to 64 years old, an increase from roughly 500,000 worker beneficiaries to over five million. The share of the relevant population receiving worker disability insurance payments has been increasing over much of the program’s history, even during the economic boom of the late 1990s. Most recently, the share of SSDI increased from 2.89 percent in December 2001 to 3.12 percent in December 2003. This increase is very comparable to that following the 1991 recession. From December 1991 to December 1993, the share of the population receiving SSDI increased from 1.97 percent to 2.26 percent.<sup>12</sup> We also observe similarly sized increases in the percentage of disabled worker beneficiaries

over two-year periods between 1960 and the late 1970s, suggesting that increasing disability insurance rolls may have affected changes in measured unemployment rates in earlier periods as well. On net, Autor and Duggan (2003) estimate that the increase in SSDI rolls between 1984 and 2001 accounts for a 0.5 percentage point drop in the measured unemployment rate over the same period.

As discussed in Aaronson et al. (2004), the decision to enter self-employment may also depend on the business cycle. During an economic recession, some individuals who lose their jobs may find low-paying self-employment options preferable to unemployment. To the extent that these individuals would earn more as an employee, one would expect many of them to find wage and salary employment after the economy begins to recover and job growth increases. The increase in the unemployment rate during an economic recession will be smaller to the extent that some workers choose self-employment over unemployment. Aaronson et al. (2004) find that the increase in self-employment following the most recent economic recession is not unusually large, so I do not consider below how changes in the percentage of the labor force that is self-employed may have affected measured unemployment rates.

From 1990 to 2000 the unemployment rate dropped from 5.6 percent to 4.0 percent. I use the assumptions from Katz and Krueger (1999) that 35 percent of the incarcerated population would be employed and 60 percent would be in the labor force; however, I apply



these assumptions to both men and women. This amounts to assuming that the unemployment rate for the incarcerated population equals 41.67 percent and that the incarcerated population increases from 0.53 to 0.83 percent of the labor force. Using the above assumptions and census incarceration data for 1990 and 2000, I find that the increase in the percentage of the population incarcerated accounts for a 0.12 percentage point decline in measured unemployment. Similarly, using a rough approximation from Autor and Duggan (2003), I find that the increase in the percentage of people on SSDI between 1990 and 2000 may account for a 0.45 percentage point decline in the measured unemployment rate.<sup>13</sup> Together, these estimates would suggest that 35 percent of the decline in the unemployment rate from 1990 to 2000 (0.57 percentage points) was due to increases in incarceration levels and disability insurance rolls. These assumptions would raise the 2000 unemployment rate to 4.6 percent and the maximum unemployment rate following the latest business cycle peak to 7 percent or a little higher.<sup>14</sup> An unemployment rate of 7 percent is still low relative to the most recent business cycles. That said, the adjustments depend on many assumptions and, for a more informative comparison, one would need to adjust the unemployment rate in earlier periods as well. Therefore, I consider other data for evaluating labor market strength in the following section.

### Alternative measures of the unemployment rate and labor market strength

Because unemployment rate calculations rely on the sampling frame and self-definitions as described above and because the size of the labor force may depend to some extent on whether the economy is expanding or contracting, the same unemployment rate in different periods may not reflect the same amount of labor underutilization. Fortunately, the BLS collects additional information and publishes additional statistics that help put the official unemployment rate in context.

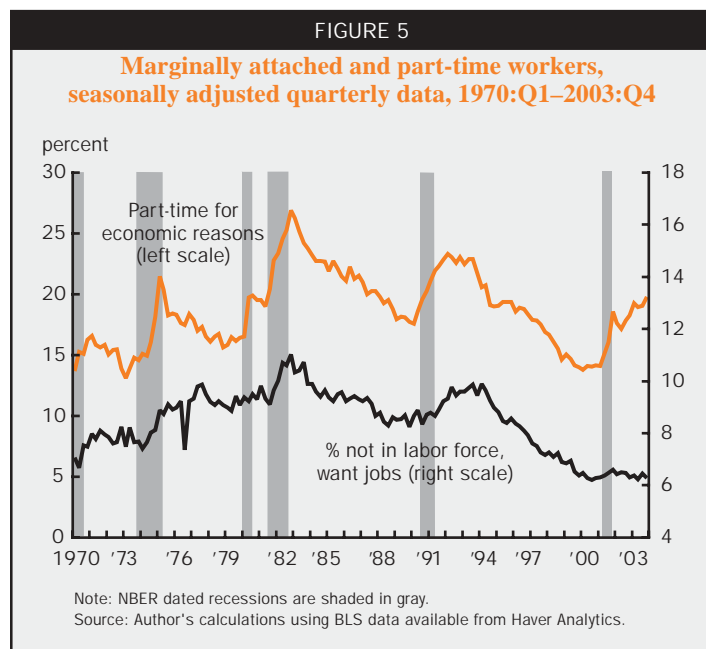
#### *Marginally attached and part-time workers*

The unemployed, underemployed, and those not in the labor force who want a job represent labor that is not being fully utilized. Since 1970, the CPS has included additional questions that one can

use to estimate alternative unemployment rates that account for the underutilization of these workers. These measures help account for discouraged workers and others who would like jobs but are unemployed, as well as people who would like to work full-time but can only find part-time employment.<sup>15</sup>

In figure 5, I plot the percentage of part-time workers who say they are working part-time for economic reasons in addition to the percentage of people not in the labor force who say that they want a job now (the marginally attached).<sup>16</sup> Workers who are part-time for economic reasons report that they are working part-time for reasons such as poor business conditions, inability to find full-time work, slack work, and so on. Generally speaking, both measures tend to increase during periods of recession and economic recovery.<sup>17</sup> From the first quarter of 2000 to the end of 2003, the percentage of part-time workers reporting that they were part-time for economic reasons rose from 13.8 percent to 19.8 percent. Similarly, from the first quarter of 1990 to the first quarter of 1992, the number of people working part-time for economic reasons rose from 17.6 percent of part-time workers to 23.3 percent.

Data on marginally attached workers suggests that the current recession–recovery period is milder than most. The percentage not in the labor force who want a job has been fairly steady from 2000 to the present, remaining between 6.3 percent and 6.6 percent. In notable contrast, from 1990 to 1992 the percentage of people not in the labor force who say they want a job rose from 8.7 percent to 9.8 percent. This suggests



that there have not been a large number of people exiting the labor force because they were discouraged about the prospects of finding work.

In figure 6, I plot the official quarterly unemployment rate, as well as the quarterly unemployment rate including the marginally attached and those who are working part-time for economic reasons and adding the marginally attached to the total labor force size. Counting those who are employed part-time and the marginally attached as unemployed raises the unemployment rate by as much as 10 percentage points above the official rate. At peak unemployment during the current recovery (2003:Q3), the augmented unemployment rate reached 12.1 percent, which is relatively low by historical standards and roughly 6 percentage points above the official rate. In contrast, following the 1990–91 recession, the augmented unemployment rate rose to 15.8 percent, roughly 8 percentage points above the official rate.

The augmented unemployment rate and low percentages of people not in the labor force who say they want a job both suggest that the current labor market is not as weak as in most periods of economic recovery between 1970 and the present. While there is evidence of an increase in labor underutilization due to the increase in the share of workers working part-time for economic reasons, this increase is not unusually large. In addition, there is no increase in the share of people not in the labor force who say they want a job. As a result, the augmented unemployment rate that takes into account these measures of labor underutilization is low relative to the past 30 years.

### Labor force participation rates

As seen in the alternative measures of labor underutilization, discouraged workers exiting the labor force from unemployment can reduce the official unemployment rate. Therefore, another useful statistic for evaluating the unemployment rate is the labor force participation rate. The labor force participation rate is the percentage of the civilian non-institutionalized population that is either employed or unemployed, that is, the percentage that is in the labor force. In figure 7, I plot the labor force participation rate over time, as well as the labor force participation rate when I include the institutionalized population. This second calculation represents the labor force as a percentage of the civilian population

16 years and older, either living in households or institutions. Because some percentage of the institutionalized population would likely participate in the labor force, the light orange line would be a lower bound estimate of the labor force participation rate with no institutionalized population.

Between the early 1960s and 1990, labor force participation rates increased dramatically due to increased participation by women. In addition, one can see that the increase in the percentage of the population living in institutions leads to a widening of the gap between the two measures of labor force participation. Because the data on the institutionalized population come from the census, the numbers institutionalized affect the denominator of labor force participation in a smooth manner that does not vary within each decade.

Since 1999, the labor force participation rate has declined fairly steadily, preceding the peak of the business cycle in March 2001 and continuing through 2003. Historically, recessionary periods often coincide with declines in labor force participation; see, for example, 1953–54, 1957–58, and 1990–91. During the rapid rise in labor force participation from 1962 to 1990, labor force participation remained relatively flat during recessionary periods, followed by a continuation in the secular trend. See, for example, 1973–75.

When considering the deterioration in labor market conditions, we might also want to consider how much labor force participation is declining relative to its trend rate both because of the large secular increase

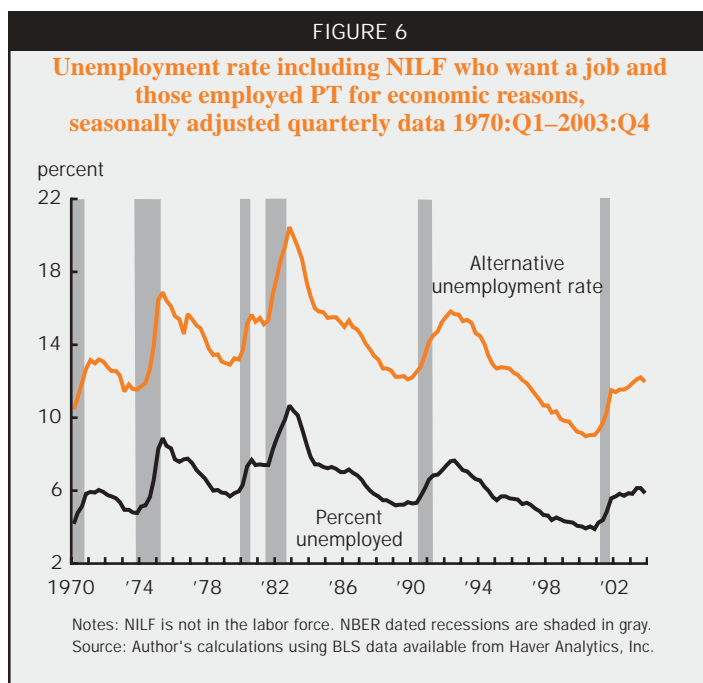
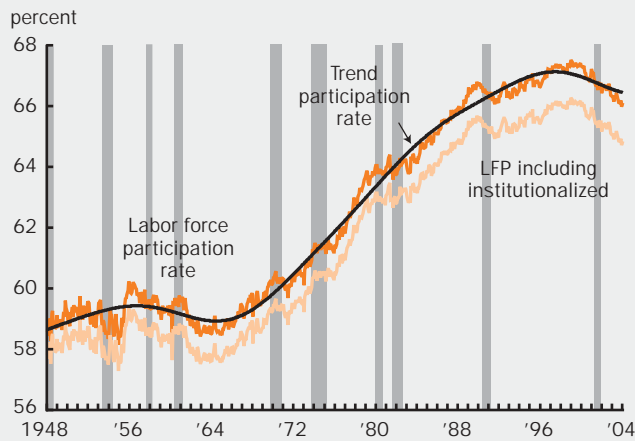


FIGURE 7

Labor force participation rates and trend participation



Notes: Trend employment to population is calculated using the Christiano-Fitzgerald band pass filter assuming the trend component of the series has frequencies of oscillation greater than 12 years. Adjustments due to changes in population estimates are smoothed in the underlying series. NBER dated recessions are shaded in gray.  
Source: Author's calculations using BLS data available from Haver and Census counts of the institutionalized population.

in labor force participation rates and because of the possibility that participation rates rise above trend during business cycle peaks. In particular, the decline in labor force participation was larger in the 2001 recession than in the 1991 recession; however, the percentage of those not in the labor force who want a job rose following the 1990 business cycle peak and remained steady following the 2001 peak. Combined, these data suggest that participation was above trend at the peak of the 2001 business cycle.

In figure 7, I include an estimate of trend labor force participation in addition to the observed participation rate.<sup>18</sup> In the months preceding the peak of a business cycle, labor force participation typically rises above the estimated trend level of participation. Following the peak, labor force participation falls below the estimate of trend during both the 1990–91 and 2001 recessions. In 1989, labor force participation is as much as 0.7 percentage points above the estimated trend, while in 1999 labor force participation rises 0.5 percentage points above trend. Following both the 1990–91 and 2001 recessions, labor force participation rates fall below trend by similar amounts. Labor force participation is 0.4 percentage points below the estimated trend in December 1991 and 0.5 percentage points below trend in December 2003.

Additionally, compared with past business cycle periods, the decline in labor force participation is disproportionately driven by a fall in participation rates

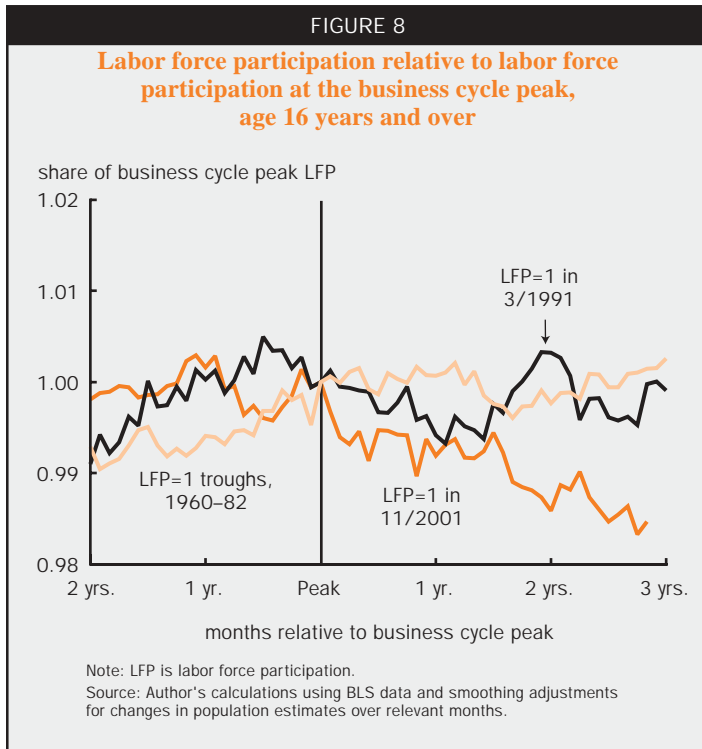
among those between the ages of 16 and 19. The relative decline in labor force participation since March 2001 is 50 percent larger for the population 16 years old and over than for the population 20 years old and over, while 16 to 19 year olds make up only 7.3 percent of the population 16 years old and over. This can be seen in figures 8 and 9 on the next page, which graph labor force participation rates as a share of peak labor force participation rates. The figures are created in the manner described for the employment numbers in figures 2 and 3. A value of 1.02 indicates that the labor force participation rate for that month is 2 percent above the labor force participation rate at the peak month of the corresponding business cycle. Figure 8 shows participation rates for the population aged 16 years old and over, and figure 9 shows participation rates for the population aged 20 and over.

In figure 8, the labor force participation rate in January 2004 is 1.5 percent below the participation rate in March 2001. However, looking at labor force participation rates for the population age 20 years and over, labor force participation in January 2004 is only 1 percent below the rate at the peak of the business cycle in March 2001. In contrast, participation rates relative to business cycle peak participation rates are virtually identical for both population groups in previous business cycles.

Because it is the youngest segment of the potential labor force population that is disproportionately driving the decline in labor force participation, one might also expect a corresponding increase in school enrollment. Using the March CPS survey data, I calculate that enrollment rates in high school and college for individuals 16 to 19 years old increased from 80 percent in 2000 to 83 percent in 2003. Over this same period, the labor force participation rate for 16 to 19 year olds fell from 52 percent to 44.4 percent. Because young adults have higher average unemployment rates than adults in the 20 to 55 age range, the larger decline in labor force participation of teenagers will dampen the rise in the overall unemployment rate.

Large declines in labor force participation overall and labor force participation among teenagers in particular will dampen the increase in the unemployment rate during periods of economic recession. Therefore, I consider how unemployment rates would compare





over time if some of those not in the labor force were included among the unemployed. Namely, I use the trend labor force participation estimates to recalculate unemployment rates assuming no change in the level of employment, while setting the labor force size equal to what it would be at trend labor force participation. I calculate this alternative monthly unemployment rate as

$$\left( 100 \times \frac{PR_t^T \times P_t - E_t}{PR_t^T \times P_t} \right), \text{ where } PR_t^T \text{ is}$$

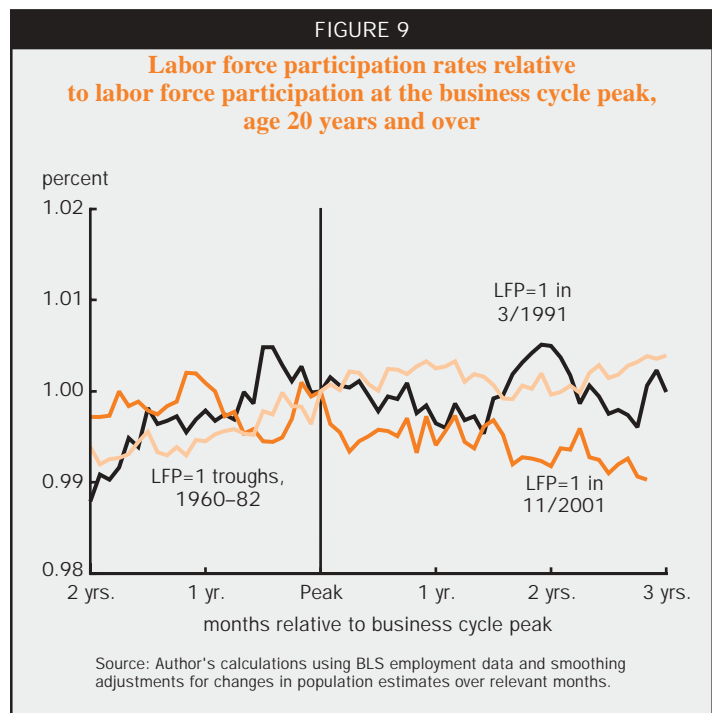
the estimate of trend labor force participation,  $P_t$  is the BLS civilian non-institutionalized population 16 and over,  $E_t$  is the BLS number of people employed, and  $t$  indexes the month.

In figure 10, I plot the official unemployment rate, as well as the alternative unemployment rate calculated as described above. As participation rates fall below trend during economic recessions, the unemployment rate calculated using trend-level participation rises above the measured unemployment rate. For example, following the business cycle trough in November 2001, labor force participation falls to 62.0 percent in September 2003 (see figure 7) and the unemployment

rate rises to 6.1 percent (see figure 10). For the same month, I estimate that trend labor force participation equals 63.0 percent. If the participation rate had remained at trend, all else equal, the associated unemployment rate would be higher at 6.7 percent. Similarly, following the trough of the 1991 recession, unemployment rises to 7.1 percent in December 1991 while the unemployment rate associated with trend participation equals 7.6 percent.

As shown in figure 10, the increase in the unemployment rate during an economic downturn is dampened by the accompanying decline in labor force participation. To the extent that the decline in labor force participation associated with economic downturns may differ over time, the official unemployment rate may indicate differing amounts of labor market strength. In other words, a 6 percent measured unemployment rate associated with a large decline in labor force participation relative to trend may reflect a weaker labor market than 6 percent

measured unemployment with a small fall in labor force participation. That said, once we consider what the unemployment rate might be if labor force participation remained at trend over all months, the unemployment rate in the current economic recovery is



still below peak alternative unemployment rates of the previous three business cycles.<sup>19</sup>

### Employment-to-population rates

As discussed above, changes in the sampling frame of the CPS and the fact that labor market status relies on self-definition mean that unemployment rates are not necessarily comparable over time. The employment-to-population rate, another employment statistic produced by the BLS, potentially offers a cleaner measure of the strength of the labor market. While it still relies on calculations from the survey data of the CPS, it does not suffer from changes in the labor force definition due to such things as discouragement during economic contraction or workers taking up other income opportunities such as SSDI.<sup>20</sup> Additionally, one can include the institutionalized population in the population denominator or make assumptions about the employment status of institutionalized persons, as in Katz and Krueger (1999), and calculate adjusted employment-to-population rates. Finally, one can also adjust the employment rates for hours worked, since people are classified as either employed or not, regardless of part-time/full-time status.

In figure 11, I plot the monthly employment-to-population rate from January 1948 to January 2004, including the institutionalized population in the denominator, as well as an estimate of the trend employment-to-population level.<sup>21</sup> The employment-to-population rate reached an all-time high of 63.5 percent in April

2000. By September 2003, it had fallen to 60.9 percent. Similar to labor force participation, employment to population has been trending upward for many years in the sample; however, the percentage point changes associated with the business cycle are much larger for employment-to-population rates. Most recently, employment to population dropped 2.6 percentage points from its peak in 2000. Preceding the 1991 recession, employment to population reached a peak of 62.3 percent in March 1990, falling to 60.4 percent in December 1991 before rising again. Although the decline from maximum employment to population to minimum employment to population around the 1990–91 recession is somewhat smaller than in 2001, one may want to consider how much employment to population changed relative to trend. The current decline in employment-to-population rates may be large in absolute value but represent a smaller decline relative to trend employment to population.

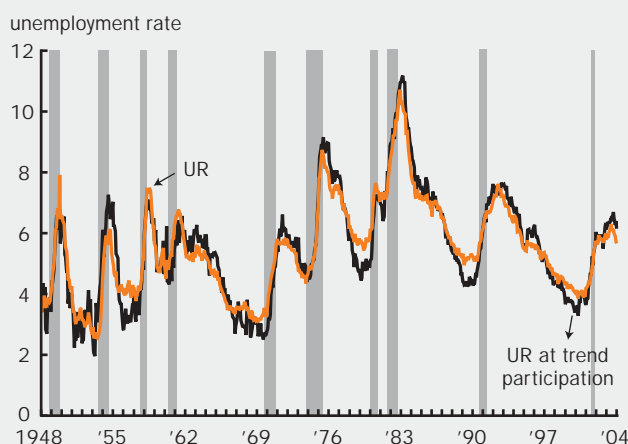
In order to more clearly assess how employment-to-population rates changed relative to trend near the business cycles, I plot the detrended employment-to-population series (employment to population minus trend employment to population) in figure 12. Here, one can see that the decline from trend is smaller during the most recent recession than in the recessionary periods of the mid-1970s and early 1980s and quite similar to the recovery post-1991. At the beginning of 2004, employment to population is 0.6 percentage points below trend.

Because it is difficult to determine trends at the end of a sample period, I also consider the extreme case of setting trend employment-to-population rates equal to the maximum employment-to-population trend rate (62.6 percent) for all months after March 1999. This is plotted with a black line in figure 12. Using this maximum rate as trend employment to population makes the current recovery period appear somewhat worse than the post-1991 recovery period. Employment-to-population falls 1.7 percentage points below trend compared with 1.1 percent below trend in 1992 and early 1993 and 1.7 and 2.3 percentage points below trend in 1975 and 1983, respectively.

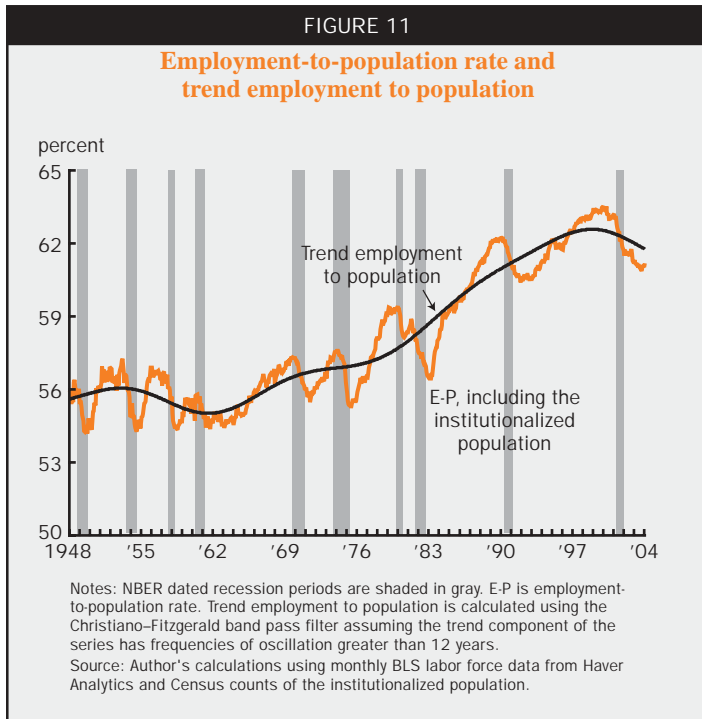
Finally, one can use data about hours worked per week to adjust annual employment-to-population measures to account for differences in hours worked. Instead of counting individuals as employed or not regardless of hours worked, I can

FIGURE 10

### Unemployment and unemployment at trend population



Notes: Trend employment to population is calculated using the Christiano–Fitzgerald band pass filter assuming the trend component of the series has frequencies of oscillation greater than 12 years. Adjustments due to changes in population estimates are smoothed in the underlying series. Neither series is adjusted for the size of the institutionalized population. NBER dated recessions are shaded in gray.  
Source: Author's calculations using BLS data available from Haver Analytics.



calculate the share of a 40-hour week an individual is employed and use the average employment share as an adjusted measure of the employment-to-population rate. Those who are not employed have an employment share of zero, and those employed 35 hours per week have an employment share of 0.875. I set no maximum employment share such that individuals working 80 hours per week will have an employment share of 2.<sup>22</sup> Figure 13 shows both the adjusted and unadjusted employment rate series. Unlike employment to population in figure 11, the institutionalized population is not included in calculating the series.

The dark orange line in figure 13 represents the annual employment-to-population rate from the official BLS series, 1968 to 2003. The black line represents employment to population calculated from the March CPS individual-level data, and the light orange line represents the March CPS series adjusted for hours worked. Official BLS employment-to-population rates and those calculated from the individual-level CPS data are quite similar. Adjusting for hours worked reduces the employment-to-population rate in all years, although the size of the gap between the measures differs

over time. From 2000 to 2003, the employment-to-population rate drops by 2.4 percentage points, while the adjusted series falls more steeply by 2.9 percentage points. Therefore, in addition to the decline in the percentage of persons employed, those who are employed are working fewer hours on average. In contrast, from 1990 to 1992 both the employment to population and adjusted employment-to-population rates fell by 1.6 percentage points. The 1990 to 1992 period is unusual, however. In all other periods around recessions, the series that takes into account hours worked falls by more than the rate that is not adjusted for hours.<sup>23</sup>

Taking into consideration labor force participation and the employment-to-population rates, the current period of economic recovery does not look quite as dire as some suggest. Participation rates have fallen, but they started at high levels, remain high by historical standards, and did not fall by a historically large amount below trend. Similarly, while the employment-to-population rate has fallen, it remains above 60 percent. Depending on assumptions about trend levels of employment to population, the current recovery period is either quite similar to the post-1991

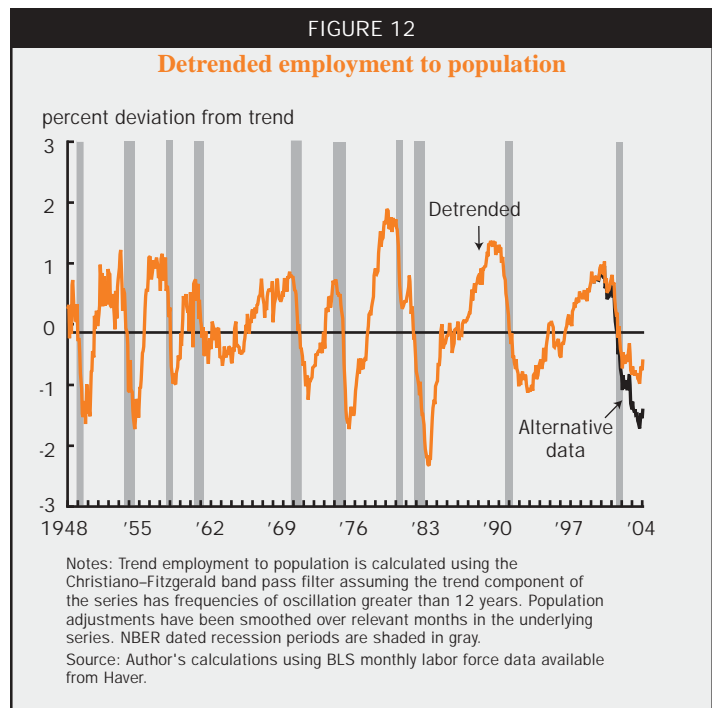
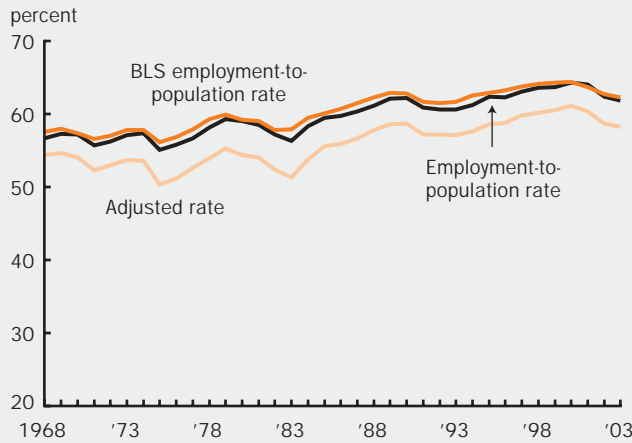


FIGURE 13

**Employment to population and full-time equivalent**



Source: BLS annual employment-population rates available from Haver Analytics. Author's calculations from March CPS data available from Unicon.

recovery period or somewhat worse. However, the fact that there has been no noticeable increase in the percentage of people not in the labor force who would like a job, particularly compared with other recovery periods, lends additional evidence in support of current labor markets being reasonably strong for a recovery period by historical standards.

**Real earnings**

Finally, I consider whether those who are employed are worse off than in previous recovery periods by looking at relative real average hourly and weekly earnings.<sup>24</sup> In both cases, earnings are for production or nonsupervisory workers in private industries. The data for real hourly earnings are presented in figure 14 as a share of earnings at the business cycle peak. Similarly, the data for real weekly earnings are presented in figure 16 as a share of business cycle peak earnings. Growth in real average hourly earnings since March 2001 has been stronger than in the 1990–91 recession and recovery period. Real hourly earnings in January 2004 are 2.3 percent above real hourly earnings in November 2001. In comparison, real hourly earnings were 2 percent lower in July 1993 than at the business cycle peak in July 1990. Averaged over the 1970 to 1982 business cycle peaks, real hourly earnings were up 1.2 percent three years after the business cycle peak.

Real average weekly earnings combine wages and hours. In figure 15, I plot the aggregate weekly hours index as a share of aggregate weekly hours at the peak of the business cycle. Aggregate weekly hours are 4.4 percent lower in January 2004 than in March 2001. On average, aggregate hours three years after the business cycle peak equals aggregate hours at the peak, and in July 1993, aggregate hours were up 1.5 percent relative to July 1990. Because hours have not recovered as quickly as in past recovery periods, real average weekly earnings in January 2004 are not up as much as real average hourly earnings; however, weekly earnings in January 2004 are 1 percent above average weekly earnings in March 2001. Three years following both the 1990–91 and the average business cycle peaks, real average weekly earnings re-

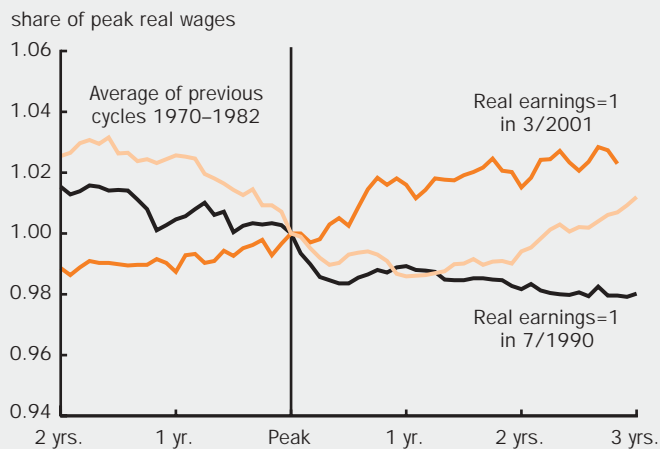
mained below weekly earnings at their respective business cycle peaks.

**Conclusion**

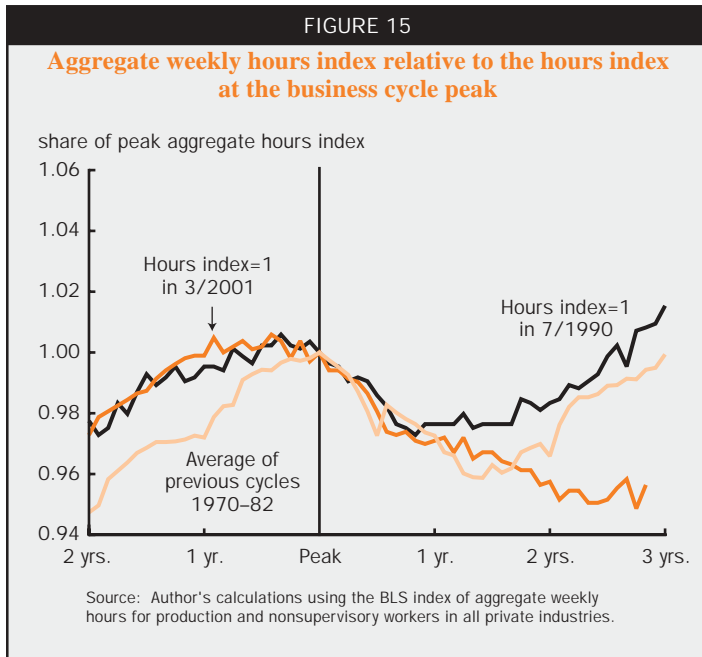
Is the unemployment rate misleading? While there are clear reasons to expect that unemployment rates are not comparable over time, additional labor market data do not suggest that labor market statistics during the current period of economic recovery are particularly

FIGURE 14

**Real average hourly earnings relative to hourly earnings at the business cycle peak**



Notes: Average hourly earnings come from BLS Establishment Survey data. Earnings are deflated using the consumer price index for urban wage earners and clerical workers. Source: Both series from Haver Analytics.



weak when compared with 1991 and earlier periods of economic recovery.

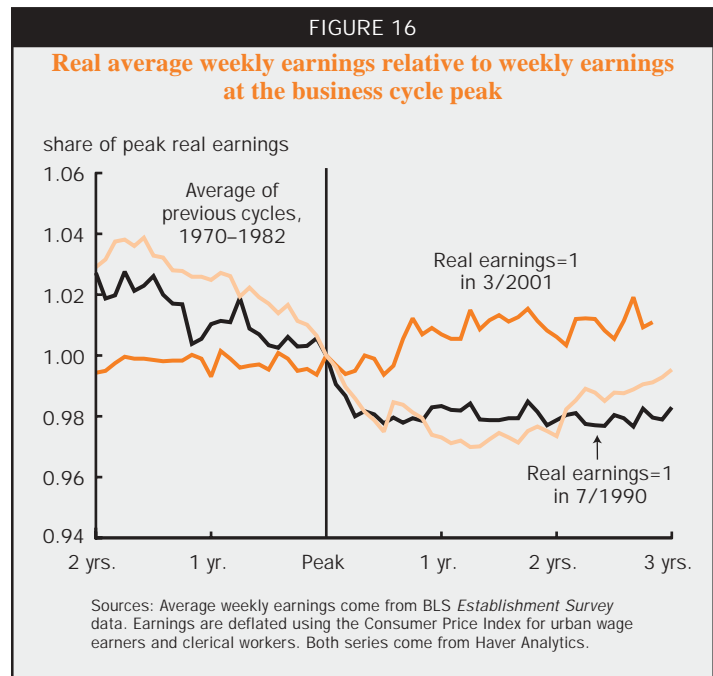
All else equal, declines in labor force participation due to increases in disability insurance rolls have no effect on employment-to-population rates, and similarly, the employment-to-population rates may be adjusted to include the institutionalized population so that increases in incarceration rates do not lead to changes in the population. As a result, employment-to-population rates are not overstated by factors that may bias unemployment downward and are therefore more comparable over time than the official unemployment rate.

Using employment-to-population rates to measure relative labor market strength, I find that the employment-to-population ratios adjusted for changes in the institutionalized population remain above the lowest levels reached in 1992, and comparing employment-to-population rates with estimates of their trend levels suggests that the current recovery period is somewhat better than 1991

because the decline from trend is smaller. The lack of an increase in those not in the labor force who say they want a job lends additional support to the conclusion that labor markets are not particularly weak by historical standards. Finally, among those employed, hourly and weekly earnings growth is stronger than growth rates following either the 1990–91 recession or the average economic recession.

The current period of economic recovery has yet to show signs of strong growth in jobs typical of past economic recoveries. At the same time, however, there is little evidence in other labor market statistics that the labor market in this economic recovery is much weaker than in previous recovery periods of the past 30 years. Employment-to-population rates are high and the decline from trend was not particularly large, the percentage not in the labor force who say they want a

job has not increased, and real hourly and weekly earnings are higher relative to levels at the peak of the business cycle in 2001.



## NOTES

<sup>1</sup>Goolsbee (2003).

<sup>2</sup>The shaded recessions represent the time from the month of the business cycle peak to the month of the business cycle trough.

<sup>3</sup>A discussion of the differences in these surveys can be found in Aaronson et al. (2004) in this issue.

<sup>4</sup>The underlying employment series differs from the published series. Adjustments to the number employed due to changes in population estimates have been smoothed over the relevant time periods in order to more accurately reflect month-to-month changes in the number employed. The population adjustments in the published data lead to breaks in the series because the BLS does not revise past data.

<sup>5</sup>The NAIRU is the level of employment consistent with a stable rate of inflation.

<sup>6</sup>See Staiger, Stock, and Watson (1997) for estimates of the change in the NAIRU over time. See Ball and Mankiw (2002) for a more recent discussion of the fall in the NAIRU in the late 1990s.

<sup>7</sup>The Census Bureau classifies housing units as households, group quarters (GQ), or vacant. Institutionalized people are estimates of the number of people living in group quarters that are categorized as institutions. From 1940 to 1970, GQ are units with five or more individuals unrelated to the householder. In 1980 and 1990, GQ are units with ten or more individuals unrelated to the householder. In 2000, the Census defined persons in GQ as those living in a list of GQ that is maintained by the Census Bureau. Group quarters that are not considered institutions include: military groups, college dormitories, rooming houses, boarding schools, hospitals, religious institutions, and work sites. According to the Census 2000 glossary, institutionalized individuals are generally classified as “patients” or “inmates.”

<sup>8</sup>For the subset of the population that is age 16 years and over, 1.22 percent were institutionalized in 1940 and 1.84 percent were institutionalized in 2000. These numbers are based on author’s calculations from the census data available through the *Integrated Public Use Microdata Series* from the Minnesota Population Center (IPUMS).

<sup>9</sup>This reflects an increase in the correctional institution population from around 290,000 to roughly two million.

<sup>10</sup>See U.S. Department of Labor (2002) for more details on the technical definitions of labor market status.

<sup>11</sup>Actively seeking employment means they had spent some time looking for employment during the four weeks ending with the reference week. Individuals who have been laid off but expect to be recalled are classified as unemployed even if they were not searching for employment.

<sup>12</sup>December data come from Social Security Administration (2002) for all years other than 2003. December 2003 data come from Social Security Administration (2003).

<sup>13</sup>Here I assume that a 1.38 percentage point increase in worker SSDI recipients as a share of the labor force (the percentage point increase between 1984 and 2001) is associated with a 0.5 percent decline in measured unemployment (the decline estimated by Autor and Duggan, 2003) and that this relationship is linear and holds over

all periods. Between 1990 and 2000, worker SSDI recipients as a share of the labor force rises by 1.26 percentage points.

<sup>14</sup>Measured unemployment rose to a high of 6.3 percent in 2003. Extending my version of the Katz and Krueger and Autor and Duggan estimates to 2003 suggests that increases in incarceration and disability rolls account for a 0.74 percentage point decline in the measured unemployment rate.

<sup>15</sup>Discouraged workers are defined as a subset of the marginally attached workers shown above. In the revised CPS data since 1994, discouraged workers were those who reported that they had looked for work in the past year in addition to saying that they had not looked for work because they believed no work was available, could not find work, lack necessary schooling or training, employer thinks they are too young or too old, or other forms of discrimination.

<sup>16</sup>The percentage of part-time workers who are part-time for economic reasons has been multiplied by (0.806/1.0983) in all quarters prior to 1994 using the multiplicative adjustments suggested by Polivka and Miller (1998) to account for the redesign of the CPS survey.

<sup>17</sup>The percentage of the employed who are working part-time for any reason also increases during recession and recovery periods; however, there was a general increase in the percentage working part-time between the late 1960s and early 1980s, followed by a decline in the late 1990s. In the late 1960s, just over 15 percent of the employed worked part-time; from 1985 to 1995 the percentage averaged 17.8 percent; by 2000 the share working part-time had fallen to 16 percent.

<sup>18</sup>Trend labor force participation is calculated using the band pass filter of Christiano and Fitzgerald (2003). Trend participation is defined as frequencies of oscillation greater than 12 years.

<sup>19</sup>The 2001 and 1990–91 recessions also look quite similar if I assume instead that the labor force participation rate never falls. Under this assumption, the peak alternative unemployment rates following the 2001 and 1990–91 recessions are 8.1 percent and 8.0 percent, respectively.

<sup>20</sup>This assumes that increases in labor force participation do not cause increases in employment. If participation does cause employment, declines in labor force participation would lead to declines in the employment-to-population rate as well.

<sup>21</sup>Trend employment–population rates are estimated using the Christiano and Fitzgerald (2003) band pass filter to subtract off frequencies of oscillation less than 12 years.

<sup>22</sup>If the employment share is set to one when hours exceed 40 per week, the series looks quite similar. It ranges from 5 percentage points to 6.5 percentage points below the adjusted series shown, although the gap is growing over time.

<sup>23</sup>The decline in hours combined with the decline in employment leads to a decline in aggregate hours worked, which can be seen in figure 15.

<sup>24</sup>The BLS data on average hourly and weekly earnings are from Haver Analytics. The series are converted to real 2003 dollars using the Consumer Price Index for urban wage earners and clerical workers, also available from Haver Analytics.

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