LONG-TERM UNEMPLOYMENT HAS NOT DAMAGED THE PRODUCTIVITY OF WORKERS

A Review of the Evidence on Long-Term Unemployment's Lasting Effects on Workers, Households, and the Economy

BY JOSH BIVENS

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Introduction and executive summary

Since 2009, the U.S. economy has been characterized by an elevated long-term unemployment (LTU) rate. As shown in **Figure A,** the share of workers who have been jobless for 27 weeks or more is elevated relative both to its historical rate and, until recently, to the short-term unemployment rate. This has justly raised concerns among many policymakers and economic observers, particularly over the degree to which long-term unemployment leads to "scarring" effects.

Short-term and long-term unemployment rates, 1979–2014
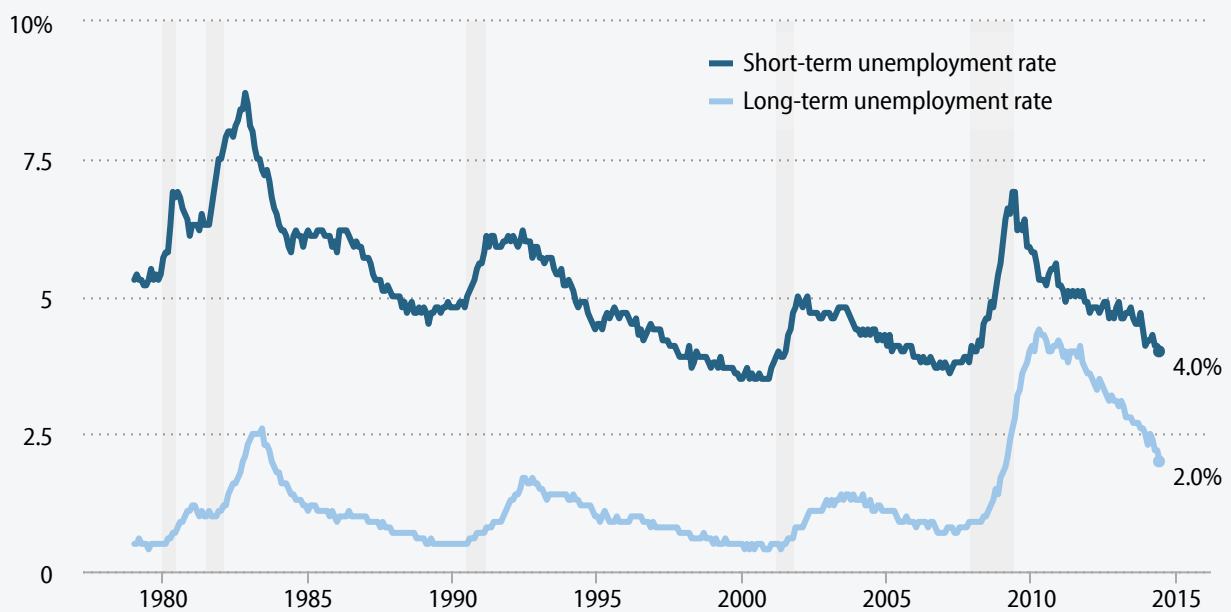
Note: The long-term unemployment rate is the share of workers who have been jobless for 27 weeks or more. Shaded areas denote recessions.

Source: EPI analysis of the Current Population Survey public data series from the Bureau of Labor Statistics

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While this concern is oft-repeated, a workable definition of "scarring" has been hard to pin down. Because it is so crucial to interpreting our findings, this paper starts with our definitions of economic scarring. It then examines evidence on long-term unemployment and scarring. In particular, this paper looks at two separate categories of scarring: *microeconomic* and *macroeconomic* scarring. And within each, it differentiates between scarring caused by *any* episode of involuntary unemployment, and scarring that is unique to episodes of elevated long-term unemployment.

Microeconomic scarring

We define *microeconomic* scarring stemming from any spell of job loss as the damage this episode inflicts on an individual's or household's future economic health *even after the spell of joblessness ends*. Therefore, if an episode of involuntary

job loss is associated with lower future earnings or other negative economic outcomes, and these adverse outcomes seem to persist *even after the initial spell of joblessness ends*, these outcomes are considered microeconomic scarring. This means we are *not* including the income declines that are contemporaneous with the jobless spell. It is trivial indeed to note that when people lose jobs, their income falls, and these income declines cause great economic distress. *Scarring,* however, implies something else: that capacity is diminished for an extended period of time even *after* the initial damage is healed (i.e., after the initial jobless spell has passed).

Because we are not including the damage inflicted by income declines that are contemporaneous with the jobless spell (this kind of damage is obviously correlated with the length of joblessness), it is *not* a foregone empirical conclusion that there is unique long-term damage to individuals and households stemming from a spell of LTU. This paper specifically addresses the question of whether or not the scars of long-term jobless spells are clearly worse than those of shorter jobless spells.

Finally, the paper highlights two channels through which a spell of LTU can scar workers. First, there could be a causal effect of extended LTU on workers' potential productivity, as skills depreciate or professional networks erode. Second, the spell could be used as a signal by employers looking to sort potential hires in the job queue. While it may be statistically rational for employers to use such a sorting device, the mere fact that they are doing so does not imply that we can make reliable inferences about LTU spells' causal impact on worker productivity. We label the scars left by these two channels as *productivity* scarring and *signal* scarring. These are quite important to distinguish, as they have very different policy implications.

This paper finds that regardless of duration, involuntary job loss leads to significant and *long-lasting* economic damage to individuals and their families. Specific findings on microeconomic scarring include:

- Excess unemployment during the Great Recession will likely lead to long-run wage losses just for displaced high-tenure workers (those who had the same job for more than three years) totaling more than *$1 trillion* over the next 20 years (or roughly $50 billion annually).

- Research shows that workers who lose their job involuntarily experience worse health outcomes, and during severe economic downturns, these effects can lead to life expectancy reductions of 1 to 1.5 years.

- According to rigorous studies, involuntary job displacement affects displaced workers' children by reducing school achievement and even the adult earnings of the affected children.

- Despite the deep and obvious damage done by *any* spell of involuntary job loss, there is very little compelling evidence that the scarring effects are worse for longer spells.

- Apart from scarring effects, the primary *economic* damage that is larger for long spells of joblessness (i.e., those lasting more than six months) is the lower incomes that result from unemployment insurance benefits being cut off, which occurs roughly around six months in most states.

- There is growing evidence that employers' hiring decisions may discriminate against those unemployed for long durations. However, this does not necessarily imply a causal linkage between extended durations and reduced worker productivity.

- In short, there is little in the microeconomic evidence to suggest that long-term unemployment somehow hardens into structural unemployment that is not amenable to addressing through macroeconomic measures to boost demand. As such, policies that will increase aggregate demand are the best way to alleviate long-term unemployment.

Macroeconomic scarring

We define *macroeconomic* scarring as the damage done to the economy's estimated long-term potential output that stems from periods of elevated unemployment. The criterion that the economy's long-term potential output declines is essentially equivalent to elevated unemployment leading to a rise in estimates of the *natural rate*, or the *non-accelerating inflation rate of unemployment* (NAIRU, henceforth). As before, we apply a more stringent criterion to scarring that is specific to LTU. Specifically, the damage must be greater when LTU is higher as a share of overall unemployment.

Finally, in regards to macroeconomic scarring, we also look for signs of *irreversibility* as a necessary criterion. That is, if extended periods of elevated unemployment (or LTU) lead to lower estimates of future potential output, this alone will not be enough to constitute a macroeconomic scar. Rather, we will also examine the evidence to see if this scarring effect can be sustainably reversed by an extended period of below-average unemployment (or LTU). If it can, we will then classify this as *reversible scarring*.

With respect to macroeconomic scarring, this paper finds:

- There is some compelling evidence—some of it quite recent—showing that elevated unemployment (which tends to be accompanied by longer-than-average spells of unemployment and higher LTU as a share of total unemployment) can lead to a reduction in the economy's estimated long-term growth potential.

- However, the damage done to potential output by an extended period of elevated unemployment and LTU tends to be reversed when the economy enters an extended period of abnormally *low* unemployment.

- The fact that the damage done by extended periods of elevated unemployment and LTU can be reversed means, in our view, that the evidence for macroeconomic scarring stemming from a period of elevated LTU is quite thin. Consequently, policies to reverse this damage should be a key priority.

Evidence on microeconomic scarring

The clearest finding from the literature on the scarring effects of unemployment is that the simple fact of an involuntary job loss causes significant economic damage, and that this damage lasts well past the end of the first jobless spell. Most strikingly, the fact of an involuntary job loss by a parent is associated with economic damage to the careers *of their children*. This evidence argues strongly that the cost of recessions is likely understated if measured simply in terms of foregone output.

However, what is much less clear is whether or not the scarring inflicted by involuntary displacement is worse for longer jobless spells. While a longer jobless spell is obviously associated with a larger cumulative income drop *during the spell*, it is not a foregone conclusion that longer bouts of unemployment result in more scarring—i.e., economic damage that persists *after* a given spell of joblessness is over. In fact, there is very little evidence that long jobless spells cause extra

scarring. Below we first survey the evidence on scarring inflicted by involuntary job loss of any duration, and then we note the (much thinner) evidence on whether longer jobless spells cause additional scarring.

Scarring from job loss of any kind

This first section documents the extensive evidence showing that any involuntary job loss is associated with very high economic costs, including clear evidence that such involuntary job loss can leave deep economic scars that persist well after the jobless spells pass.

Displacement and permanent wage losses

The most compelling recent empirical work documenting the long-run wage implications of involuntary job displacement is by Davis and von Wachter (2011). Davis and von Wachter (2011) investigate the Great Recession to estimate the impact of permanent layoffs among high-tenure workers (those who had the same job for more than three years) and the associated cumulative earnings losses. Using Social Security records for U.S. workers between 1974 and 2008, they measure how much the present value of career earnings falls due to job displacement. Perhaps their most important finding is that the costs of job loss vary significantly depending upon the labor market conditions prevailing at the time of the layoff.
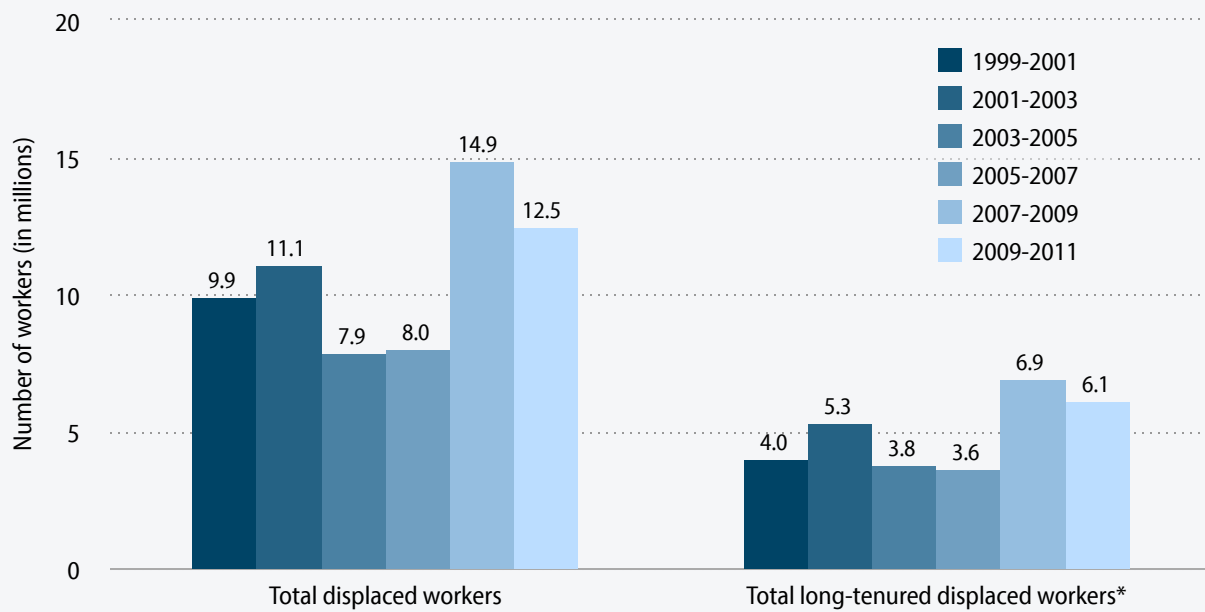
They find that when the unemployment rate is below 6 percent, men displaced from high-tenure jobs lose an average of 1.4 years of pre-displacement earnings. However, this number essentially doubles when the unemployment rate exceeds 8 percent. The results indicate that for the 20 years following displacement, the present value of earnings falls by roughly 11 to 19 percent, depending on labor market conditions prevailing at the time of displacement.

Their evidence indicates that the cost of job loss over the Great Recession has likely been staggering. For example, as shown in **Figure B**, just under 7 million adults were displaced from high-tenure jobs between January 2007 and December 2009, up from roughly half of that number during the much healthier labor markets that prevailed between 2005 and 2007. Additionally, because the displacements in the latter period occurred with aggregate unemployment at historically elevated rates, the cost per individual job loss was roughly twice as large.

Figure C further illustrates the Great Recession's impact on these high-tenure workers by showing, as a share of the overall labor force, the number of high-tenure workers who were displaced at any point in the three-year Displaced Worker Survey (DWS) sample period who remained unemployed as of the start of the next DWS sample period. This share jumped from 0.4 percent in 2008 to 1.6 percent in 2010.

Davis and von Wachter (2011) estimate that the average pre-displacement salary for high-tenure men laid off during recessions was $59,285 (expressed in 2013 dollars) between 1980 and 2003. If we take this estimate (which is quite conservative, given that annual earnings—particularly for high-tenure men—were likely higher before the Great Recession than their average between 1980 and 2003), we can use their parameters to estimate the long-run wage losses likely accruing to the excess unemployment generated by the Great Recession. To estimate this, we start with the number of high-tenure layoffs before the Great Recession (as shown in Figure B, these layoffs totaled about 3.6 million between 2005 and 2007). Using this baseline, we calculate the excess high-tenure layoffs over 2007–2009 and 2009–2011 using the data in Figure B.[1] These excess layoffs stemming from the Great Recession total 3.3 million over 2007–2009 (6.9 million minus 3.6 million) and 2.5 million over 2009–2011 (6.1 million minus 3.6 million). Then we multiply these

Number of displaced workers, total and long-tenured, 1999–2011 (in millions)

Legend:
- 1999-2001
- 2001-2003
- 2003-2005
- 2005-2007
- 2007-2009
- 2009-2011

Total displaced workers
- 9.9
- 11.1
- 7.9
- 8.0
- 14.9
- 12.5

Total long-tenured displaced workers*
- 4.0
- 5.3
- 3.8
- 3.6
- 6.9
- 6.1

Y-axis: Number of workers (in millions) — 0, 5, 10, 15, 20

* Long-tenured displaced workers are those who lost a job they had held for more than three years.

Source: EPI update of Borbely (2011, Figure 1) using data from the Bureau of Labor Statistics Displaced Worker Supplement

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5.8 million excess layoffs (3.3 million plus 2.5 million) by three times the pre-displacement (average) earnings of this group (as previously noted, when the unemployment rate is over 8 percent, as it was during the Great Recession and its immediate aftermath, displaced high-tenure men lose roughly three years of earnings, on average). This yields the estimate that excess displacement and excess unemployment during the Great Recession will likely lead to long-run wage losses just for this group of high-tenure workers totaling more than *$1 trillion* over the next 20 years (or roughly $50 billion annually). In short, the scars left by the widespread involuntary loss of stable employment during recessions are quite deep.

Displacement and mortality

The effects of displacement go beyond simple labor market outcomes. Sullivan and von Wachter (2009) study the long-run effects of mass layoffs from the 1980s recession to examine the link between displacement and the health of displaced workers. They use earnings and employment data for tenured male workers in Pennsylvania between the 1970s and 1980s and subsequent death records between 1980 and 2006 to compare displaced workers' subsequent mortality rates to those of workers who didn't suffer job loss.

Following the methodology of Jacobson, LaLonde, and Sullivan (1993), Sullivan and von Wachter (2009) focus on workers with stable employment relationships; specifically, those who had the same principal employer for at least three years in the late 1970s. They argue that displacement is likely to be particularly unexpected and costly for this group

FIGURE C   VIEW INTERACTIVE *on epi.org*

Long-tenured displaced workers unemployment rate,* 1984–2012
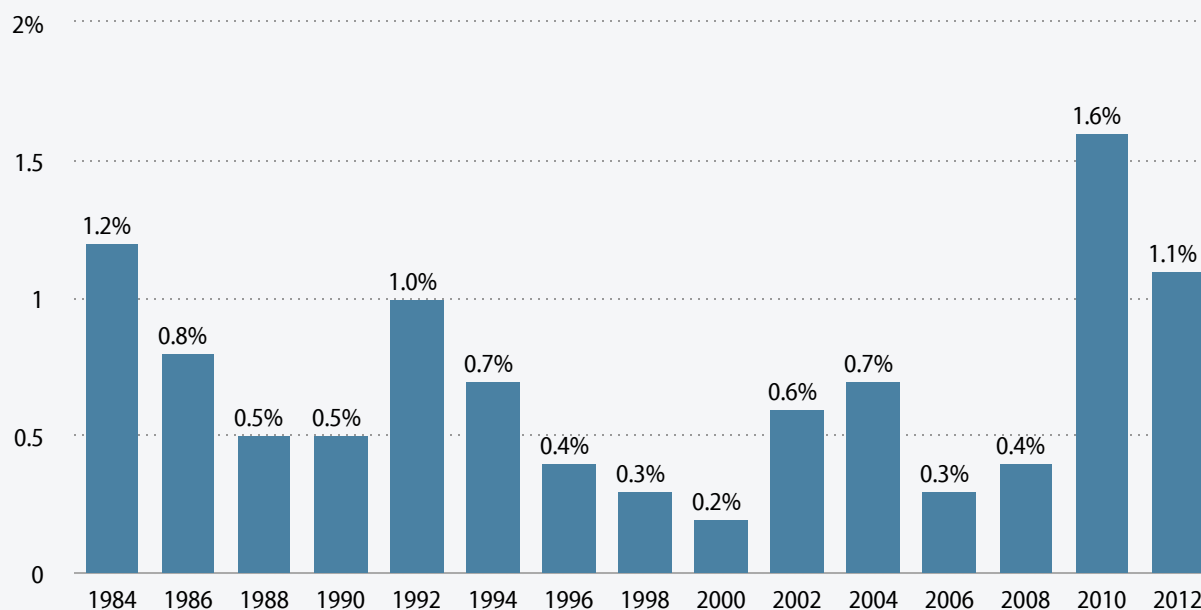
* The long-tenured displaced workers unemployment rate expresses, as a share of the overall labor force, the number of high-tenure workers (those who held the same job for more than three years) displaced at any point in the three-year Displaced Worker Survey (DWS) sample period who remained unemployed at the start of the next DWS sample period.

Source: EPI replication of Borbely (2011, Figure 4) using unpublished data from the Bureau of Labor Statistics Displaced Worker Supplement

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of workers. They hypothesize that the health effects of layoffs flow through two channels: (1) acute stress associated with a drop in earnings and increased unemployment, industry mobility, and earnings instability, and (2) chronic stress of displaced workers who can only find employment with lower mean earnings and higher levels of job and earnings instability. Sullivan and von Wachter's (2009) results show a sharp increase in mortality in the short term immediately following job loss and a long-run increase in the probability of dying of 10–15 percent for the next 20 years. This increased probability of death translates into an average lifespan reduction of 1 to 1.5 years.

Displacement and children

Finally, the damaging effects of displacement even harm successive generations by scarring the children of displaced workers. To understand the long-term consequences of unexpected job loss for future mobility, Oreopoulos, Page, and Stevens (2008) examine the effect of firm closings on the outcomes of the next generation. They also follow the methodology of Jacobson, LaLonde, and Sullivan (1993) to identify the impact of an exogenous employment shock (in this case, a firm closing).

The authors construct groups of men whose fathers had the same levels of permanent income and worked in similar types of firms prior to the 1980s recession, and then use the sons whose fathers were displaced as the "treatment" group.

The authors find that on average, sons whose fathers were displaced made 9 percent less than similar men whose fathers were not displaced. Children of displaced fathers in the bottom quarter of the income distribution were hit particularly hard, making 13 percent less than the control group. The authors note that while it's clear that job loss leads to large, long-lasting reductions in a family's income, job loss affects families through other nonfinancial channels as well (such as stress) that can further affect children's long-run outcomes.

Stevens and Schaller (2009) study the relationship between parental job loss and children's academic achievement to examine if parental job loss has a short-run effect on children. The authors utilize data from the Survey of Income and Program Participation between 1996 and 2006 to examine the effect of parents' involuntary job loss on their children's grade retention. The authors find that an involuntary parental job loss leads, on average, to a significant increase in the probability a child repeats a grade in school. The probability rises by 0.8 percentage points a year, or by roughly 15 percent. The authors note that effects are larger for families in which parents are at the lower end of the education spectrum, suggesting that certain families are disproportionately likely to experience intergenerational effects from job loss. Children whose involuntarily unemployed parents have completed college have a 3 percent probability of repeating a grade; this likelihood increases by roughly 1 percentage point for children whose involuntarily unemployed parents have a high school education or less. The authors postulate that these short-run difficulties may contribute to the previously discussed finding that parental job loss can reduce a child's future earnings.

Figure D presents the share of children living in households with at least one unemployed parent, as well as the share of children living in households with at least one long-term unemployed parent. It's easy to see the impact of the Great Recession and slow recovery in this figure, as these measures largely track the trajectory of the headline unemployment rate, albeit at a higher level. For example, the overall unemployment rate (not shown in the figure) peaked at 10.0 percent in the third quarter of 2009, while the share of children living in unemployment-affected households peaked at 10.7 percent. Further, while the overall unemployment rate has come down by 3.9 percentage points since that peak as of June 2014, the share of children living in unemployment-affected households has declined a bit less than 3 percentage points. In short, children will continue to be scarred by their parents' jobless spells.

Long-term unemployment and scarring

Despite the clear evidence that involuntary job loss of any duration leaves economic scars on households and workers, the evidence that these scars are worsened by longer-lasting jobless spells is actually quite thin. The primary evidence for longer jobless spells having worse scarring effects on potential workers is that the odds of reemployment decrease the longer a worker has been unemployed. However, this is very indirect evidence. Much of any statistical signatures of scarring may actually reflect employer behavior or selection effects (i.e., the fact that long-term unemployed workers may be inherently different from short-term unemployed workers) rather than damage done to workers' potential productivity by extended unemployment spells.

Are scarring effects on personal well-being worse for longer jobless spells?

The literature on personal well-being and unemployment is unambiguous: Any spell of unemployment has tremendously destructive effects on happiness and personal well-being. Clark and Oswald (2002), for example, in a panel study of individuals' life events, find that a spell of unemployment is exceeded only by widowhood as an event associated with falling happiness. Additionally, most studies show an independent effect of declining income in reducing happiness and

Share of children with at least one unemployed or long-term unemployed parent, 2000–2013
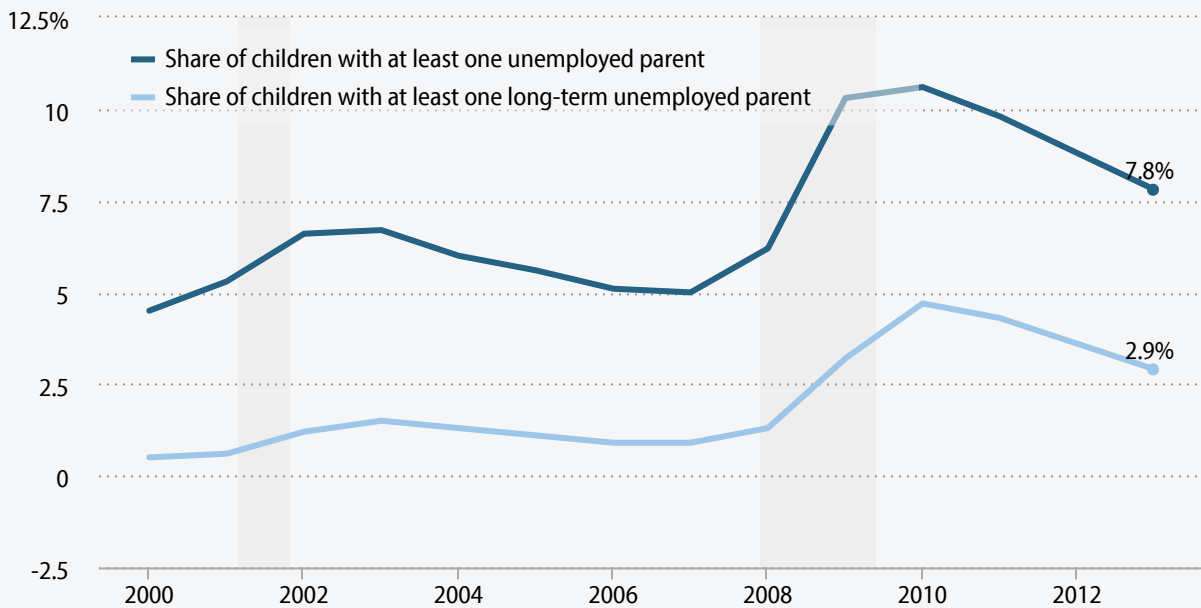
Note: The long-term unemployed are those who have been jobless for at least six months. Shaded areas denote recessions.

Source: EPI analysis of Current Population Survey basic monthly microdata

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personal well-being. Because longer durations of unemployment reduce income by more than shorter durations, this income effect will be exacerbated by longer spells of unemployment.

Somewhat surprisingly, however, independent of this income effect, unemployment's scarring effects on personal well-being do not seem to rise with unemployment duration. Winkelmann and Winkelmann (1998), for example, find no significant statistical correlation between reported life satisfaction and unemployment duration. Clark, Georgellis, and Sanfey (2001) actually find that unemployment's negative psychological impact is lower for those who have experienced longer durations of unemployment. Clark (2006) finds, "Overall, the panel results show that unemployment has a strong, well-defined negative effect on life-satisfaction, and that the size of this negative effect is mostly independent of length of the unemployment spell."

In an earlier survey of the research literature on unemployment duration and personal well-being, Machin and Manning (1999) came to largely the same conclusion:

> All of this suggests (unsurprisingly) that unemployment is damaging for those who experience it. What is much less clear is the relationship between unemployment duration and indicators of personal well-being. **What this suggests is that there is a large depressing effect when workers first become unemployed but not much may happen after that** [emphasis added].

Probability of unemployed workers finding employment in a given month, by duration of unemployment, selected years
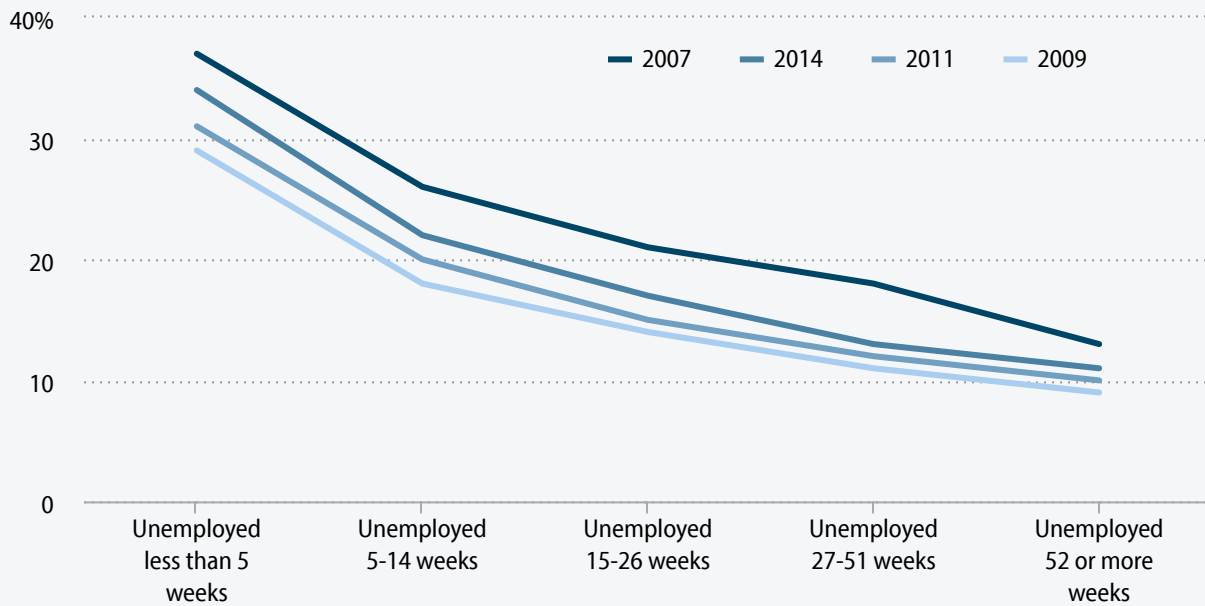
Source: EPI reproduction of Robertson and Terry (2014) using Current Population Survey basic monthly microdata

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There are, of course, some caveats that should be noted about these results. First, they focus overwhelmingly on European data. Data regarding personal happiness and life satisfaction seem to be better-developed in Europe than in the United States. Further, long-term unemployment has to date been a much more pronounced phenomenon in Western European countries than in the United States. The applicability of these findings to American workers is not guaranteed, of course. Second, one possible explanation for the non-relationship between unemployment duration and personal happiness is that those people most negatively impacted by a spell of unemployment have greater motivation to become reemployed.[2]

However, it remains the case that the research literature does not demonstrate that longer spells of unemployment leave deeper scars. Again, the real damage seems to be front-loaded, with any spell of unemployment inflicting great damage to personal well-being, but this damage is relatively constant over time.

Are reemployment probabilities scarred by long-term unemployment?

Perhaps the most common evidence cited for the proposition that long-term unemployment causes identifiably worse microeconomic scarring is the fact that reemployment probabilities decrease as the duration of unemployment increases. **Figure E** shows the probability of reemployment by weeks of unemployment.

This clearly shows that reemployment probabilities are lower for workers who have been unemployed for over six months than for those unemployed for less than six months, suggesting some link between long-term unemployment

and damage to reemployment prospects. However, there are a number of important things to note about this relationship.

First, the *causality* of this relationship is unclear. Too often the causality is viewed as running from a long duration of unemployment to reduced productivity that leads unemployed workers to become less attractive to employers. But it could well be the case that the causation runs in the opposite direction: *from* characteristics that lead workers to be less attractive to employers *to* a longer duration of unemployment. Second, after six months, there is very little relationship between unemployment duration and the probability of reemployment. This weak relationship is a bit puzzling if one expects a causal effect running from long duration of unemployment to damaged potential productivity that harms reemployment prospects. If the causality does indeed run in this direction, we would expect a sharper decline in reemployment prospects after six months.

This fact that reemployment probabilities fall from months one to six but remain relatively steady thereafter suggests a non-linear relationship between duration and job-finding probabilities. A number of studies have suggested one possible reason for this discontinuity: Employers use the fact of an unemployment spell longer than six months as a filter for job applicants. A set of recent papers suggests this is the mechanism through which long-term unemployment results in additional microeconomic scarring.

Ghayad (2013) uses a résumé audit study to examine the tipping point at which employers become substantially less forgiving of longer non-employment spells. Ghayad sent résumés across different regions of the United States between August and December 2012. Résumés were constructed using a résumé generator to randomize work histories and other characteristics. The generator is designed such that when randomly combined, every part of the résumé can become a control. Résumés were then sent to each metropolitan statistical area (MSA) in response to job postings from finance, wholesale and retail trade, professional, and business services industries for administrative, sales, and professional occupations.

The responses indicate that applicants with long non-employment spells are less likely to be invited for job interviews, with a particularly sharp dropoff in average interview requests after six months of non-employment. This is true even in a situation in which one applicant is being compared with another applicant whose résumé is inferior in every dimension except for having a shorter non-employment spell. Ghayad (2013) estimates that applicants with one month of non-employment need to send about 10 résumés, on average, to get an interview, while applicants with seven months of non-employment need to send an average of 35 résumés to get an interview.

Kroft, Lange, and Notowidigdo (2013) undertake a similar research design. The authors also use a large-scale résumé audit study in which they submit fake résumés to real job postings in 100 of the largest MSAs in the country and track the number of callbacks for each submission. Employment status and length of current unemployment status are randomized for each résumé. The results show that the average callback rate declines steeply during the first eight months of unemployment before stabilizing. At the eighth month, callbacks are about 45 percent lower than at one month (falling from 7 percent to 4 percent). The authors find that duration dependence is stronger when labor markets are tight, meaning that the long-term unemployed are relatively more disadvantaged during times of low unemployment. These results are broadly consistent with the hypothesis that employers view the length of unemployment as a signal

of unobserved productivity, a signal that's weaker during periods when the labor market is weak. In such times, even clearly productive workers can suffer a long spell of joblessness simply due to macroeconomic dysfunction.

This employer sorting based on long durations of unemployment is obviously bad for the long-term unemployed. However, it again does not suggest that long spells of unemployment make potential workers less employable by inflicting damage on their productivity. Instead, these workers' employment prospects are harmed by the signaling mechanism. Further, in an economy where employment growth is constrained by a lack of aggregate demand (as is currently the case in the U.S. economy), then this employer sorting strategy is irrelevant to the pace at which overall unemployment is reduced. Instead, it just allocates the new hires according to unemployment duration. But if the pace of overall employment growth were to appreciably pick up, there is little reason to doubt that long-term unemployment would fall rapidly (this point is made forcefully in Elsby et al. 2011).

Finally, it is worth noting that a one-month job-finding rate of 13–15 percent for those unemployed six months or more (meaning that 13–15 percent of these individuals find jobs within one month), as shown in Figure E, implies that *most* of the long-term unemployed will find a job within six months to a year. This is obviously not to minimize the distress felt by the long-term unemployed, but it does provide some comfort to those worried that a spell of long-term unemployment is a near–death sentence for their future employment prospects.

Conclusions on microeconomic scarring

There is clear evidence that involuntary job loss inflicts deep scars on individuals' economic prospects even after the spell of joblessness ends. This should certainly be added in to the cost of recessions and sub–full employment. What is much less clear, however, is if there is a causal effect running from a long duration of joblessness to reduced worker productivity that will lead to deeper scars for the long-term unemployed after their jobless spell is over. There is, however, some evidence of signal scarring. In other words, when overall employment growth is demand-led, the allocation of jobs in the employment queue may disproportionately favor the shorter-term unemployed because employers use long-term unemployment as a signal about the attractiveness of potential hires. But again, there is nothing in that finding that suggests a causal link that runs from long unemployment durations to damage inflicted on workers' potential productivity.

This is one of the rare encouraging findings in the research regarding long-term unemployment, and provides another reason to upgrade the importance of boosting aggregate demand quickly in response to demand-led downturns: There is little in the microeconomic evidence to suggest that long-term unemployment somehow hardens into structural unemployment that is not amenable to addressing through macroeconomic measures to boost demand. The next section directly assesses the *macroeconomic* evidence to see if this basic finding holds.

Evidence on macroeconomic scarring

There is growing evidence that periods of extended elevated unemployment can impact estimates of the economy's potential output. Generally, this effect is thought to run through an increase in the economy's NAIRU, as well as through reductions in capital investment during periods of slack demand. For example, if a period of extended high unemployment left many potential workers with degraded skills or social networks, this could raise the NAIRU and

force policymakers to accept a higher unemployment rate target. A higher NAIRU in turn means a smaller workforce, and hence smaller potential GDP (which is simply the product of the workforce multiplied by average productivity).

The clearest sign in the U.S. context that policymakers should be worried about this effect is simply the sharp reduction in estimated potential output from the Congressional Budget Office (CBO). As **Figure F** shows, between projections made in 2008 and in 2014, the CBO has reduced its estimate of potential output in the coming decades significantly. By 2017 this decline in estimated potential output reaches more than 7 percent—or roughly $1 trillion when expressed in current-year dollars. Relatedly, the CBO estimate of the NAIRU has risen by a full 0.7 percentage points, from 4.8 percent to 5.5 percent.

FIGURE F   VIEW INTERACTIVE *on epi.org*

Actual GDP and Congressional Budget Office estimates of potential GDP, 2007Q4–2013Q4
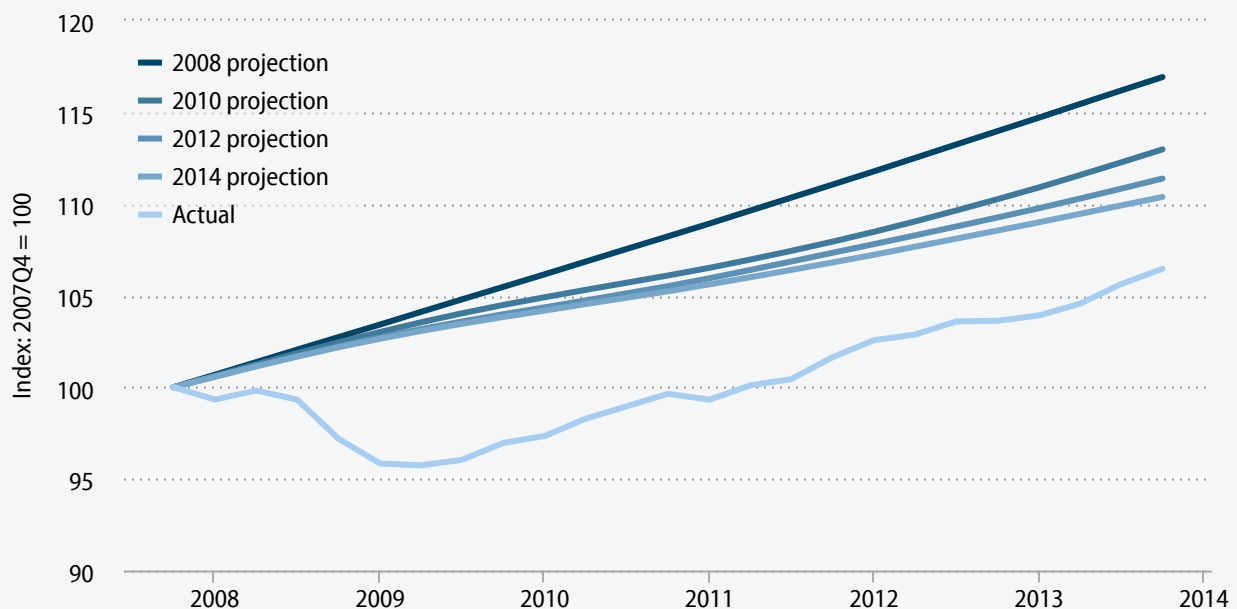
Source: CBO (2014) and Bureau of Economic Analysis National Income and Product Accounts (NIPA) Table 1.1.6

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Ball (2014) replicates this exercise of comparing 2008 estimates of potential output with contemporaneous estimates for 23 Organization for Economic Cooperation and Development (OECD) member economies. Between 2008 and 2013, he finds that, on average, estimates of potential output declined by a cumulative 8.4 percentage points, with some countries (Greece, Hungary, and Ireland) seeing estimated potential output losses of nearly 30 percentage points of GDP. Haltmaier (2012) similarly finds evidence in a cross-country data panel that abnormally deep recessions are associated with significant losses in estimates of potential output for advanced economies.

This evidence looks grim on first accounting. However, more than a few words of caution are in order. First, the methods used to estimate potential output (which is meant to be an estimate, roughly speaking, of aggregate supply) too

often allow episodes that are clearly simple aggregate *demand* shortfalls to drag down estimates of potential output. This is particularly true when estimates are updated during times of large amounts of demand slack in the economy. Second, an under-explored issue, given the importance of the topic, is whether or not damages to potential output are *reversible* through a period of faster demand growth. Finally, much like in the previous discussion of microeconomic scarring, there is essentially nothing in this literature on macroeconomic scarring that cleanly identifies a causal channel that runs from elevated LTU to reduced estimates of potential output.

Each of these issues is examined below in some more detail.

Reduction in potential output measures that are mechanically influenced by demand shortfalls

Potential output measures are supposed to represent the maximum amount of economic activity consistent with stable rates of inflation. When actual output falls below estimates of potential output, the expectation is that price inflation will decelerate, and vice-versa.

Too often, however, estimates of potential output measures are not disciplined enough by this simple insight, and instead potential output is estimated simply by taking an average of actual GDP growth over a relatively long timespan. The logic behind using this long-run average of actual output data to infer the path of potential output rests on the assumption that over the long run in question, deviations between actual and potential output sum to zero. This is highly questionable.

Take, for instance, a recent (and quite influential) blog post from researchers at the Federal Reserve Bank of New York (Kapon and Tracy 2014). The authors argued that the U.S. economy was, by the end of 2013, already quite near full employment. The basis for this claim was an estimate of the employment-to-population ratio (EPOP) made by applying a Hodrick–Prescott (HP) filter to the actual EPOP between 1982 and 2013 to infer a trend (or, potential) EPOP over that period. They find that by the end of 2013, the U.S. economy was nearly back on this estimated trend, with only a 0.7 percentage-point gap between actual and trend (potential) EPOP.

However, this *method* actually answers the question that the *data* should be answering: How much slack remains in the U.S. economy (or, alternatively, what is potential output). This is because by including a year (2013) where there may well have been a large remaining gap between actual and potential output but *defining* the period as one where the sum of all deviations between trend and actual EPOP over that period was zero, they are essentially allowing large periods of time with large demand shortfalls (namely, 2007 to 2012) to mechanically pull down their estimate of potential supply.

This could have been avoided by closely examining the behavior of prices and inflation over their period of estimation. If the economy is on average at the intersection of actual and potential output and employment, this should imply that inflation has a stable trend over the full period. But to the contrary, inflation (and even core inflation) shows a strong downward trend over the period. Besides allowing persistent output gaps between aggregate demand and potential supply to pull down estimates of potential supply, these types of filter methods for estimating potential output also become very sensitive to the endpoints chosen.

At first glance, some estimates of potential output—such as those made by the CBO—seem to not suffer from this problem; instead of applying statistical filters to GDP growth, they use a "production function" approach. The produc-

tion function approach forecasts growth in each of the inputs of potential output: labor force, capital investment, and technological change. However, the same criticism that applies to the aggregate filtering often applies to forecasts for each of the components of the production function: Future forecasts are generally made in line with past performance over some time period, during which it is assumed that deviations of input growth from long-run trend sum to zero.[3]

The upshot of this discussion of potential output estimates actually segues perfectly into the next section: Too often reductions in potential output (again, estimates of aggregate supply) that are spurred by recessions are actually simply a flaw in the method of calculation. This flawed method allows periods of extended demand shortfalls to be reclassified as a reduction in the economy's productive capacity. This blurring of the difference between measures of aggregate demand and aggregate supply leads quickly to the next question: Would the estimated reductions in potential output surveyed above simply reverse if the economy entered a period of strong aggregate demand growth? In other words, are potential output losses reversible?

Are potential output losses reversible?

A simple summary of the argument above is that the reductions in potential output that have been proliferating since the end of the Great Recession are simply driven by the demand shortfall that caused the Great Recession—and which continues even today.[4]

There are two ways to look at this "blurring" between estimates of potential output and developments on the demand side of the economy. First, it could simply be an error in how we estimate potential output. Or, it could be correct, but strongly imply that potential output losses would be reversed by a period of above-trend demand growth.

The theoretical rationale presented by many of the studies arguing the Great Recession has reduced potential output suggests strongly that the effects are or should be reversible. Authors frequently point to capital investment and technological change as endogenous to the amount of available productive slack, arguing that slow demand growth can impede growth in both capital-deepening and technological change. The empirical case for reversibility is made strongly by Ball (2009), using a panel dataset of 23 OECD countries between 1985 and 2009.

These rich panel data allow Ball (2009) to examine periods when a nation's estimated NAIRU rose or fell. He finds that extended periods of slack demand (periods when actual unemployment rose and inflation decelerated) increase estimated NAIRUs (and hence reduce estimates of potential output). Crucially, however, he finds clear evidence that periods with significant declines in estimated NAIRUs were characterized by relatively rapid demand growth (periods when actual unemployment fell and inflation increased).
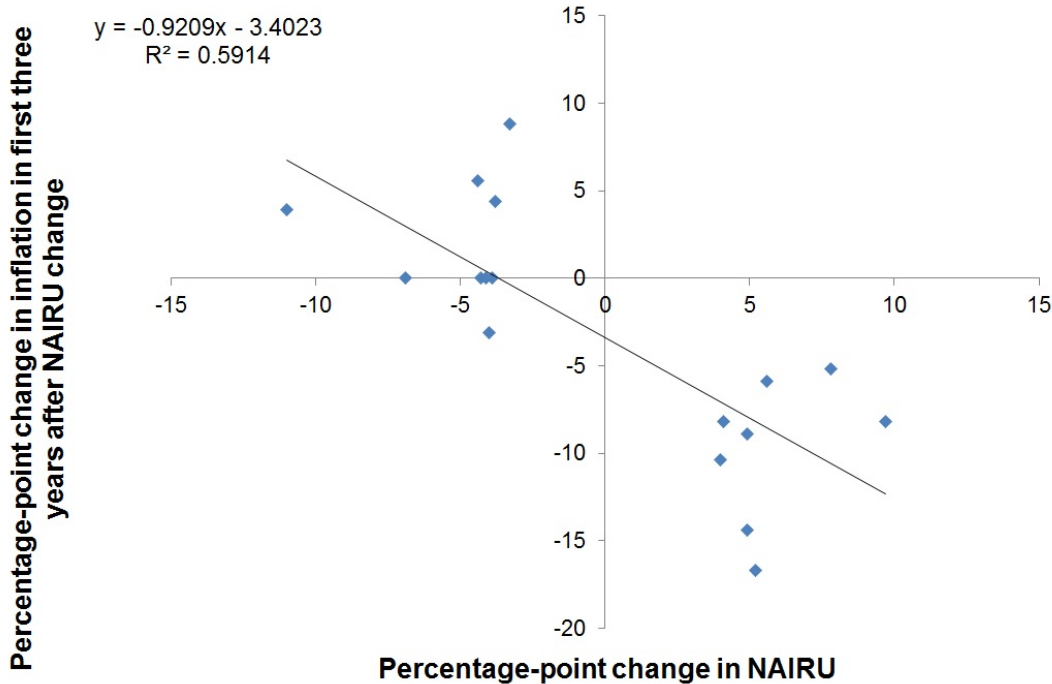
What is especially crucial in Ball's findings is that while periods of relatively rapid demand growth are associated with increases in inflation rates, these increases are *temporary.* As he writes:

> A substantial run-up in inflation also accompanied the NAIRU decreases in Portugal and the Netherlands (although not Ireland). As in the U.K., central banks did not raise inflation intentionally, but they failed to offset expansionary shocks. In my view, the coincidence of rising inflation with a falling NAIRU suggests that hysteresis is at work, that is, that a demand expansion is driving the NAIRU down. I return to this point below. **An important nuance is that the inflation run-ups in the U.K. and elsewhere were not permanent. A period of overheating and rising inflation was needed to reduce the NAIRU, but eventually inflation went back**

Change in NAIRU versus change in inflation in first three years after the NAIRU change, selected OECD countries, 1980–2007

$y = -0.9209x - 3.4023$
$R^2 = 0.5914$

Percentage-point change in inflation in first three years after NAIRU change

Percentage-point change in NAIRU

Source: EPI analysis of Ball (2009)

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down. And when that happened, the NAIRU did not go back up. . . . The evidence shows, however, that reducing the NAIRU does not require a permanent increase in inflation [emphasis added].

These results can be seen in **Figure G, Figure H,** and **Figure I**. Figure G simply shows the relationship between episodes that saw large changes in estimated NAIRUs and the resulting three-year change in inflation. This evidence shows clearly that large increases in estimated NAIRUs are associated with disinflationary movements, while large declines in estimated NAIRUs are associated with an increase in inflation levels.

Importantly, such changes in inflation are not persistent. Figures H and I show the change in inflation in three-year periods following large changes in estimated NAIRUs in various OECD countries. Figure H shows the inflation changes for large increases in the estimated NAIRU, while Figure I shows the inflation changes for large decreases. In both types of episodes, most inflation changes following the very predictable first three-year periods are of insignificant magnitude, and in some instances, even unpredictable direction.

Essentially, Ball's (2009) results argue that the substantial damage done to estimates of potential output by periods of slack demand growth can be repaired—so long as policymakers are willing to tolerate a short-term increase in the level of inflation. This insight should be incorporated into today's debates about productive slack.

No evidence of inflation persistence

Percent change in inflation following a large increase in estimated NAIRUs for various OECD countries
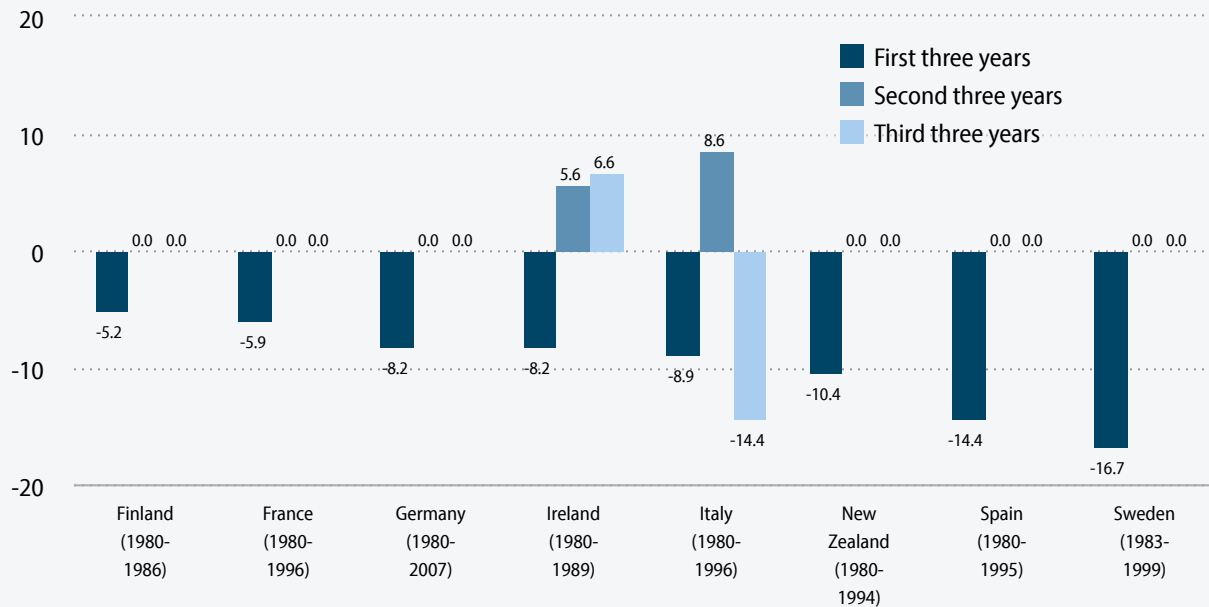
Note: The date range for each country encompasses the period in which the NAIRU changed, as well as the nine years following the NAIRU change.

Source: EPI analysis of Ball (2009)

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### The role of long-term unemployment in potential output

Finally, it should be noted that the vast majority of the literature relating declines in estimated potential output to periods of elevated unemployment rarely distinguish between short- and long-term unemployment.

Ball (2009) does note that the increases in potential output that accompany periods of strong growth and low unemployment are associated with inflation increases of quite different magnitudes. Some of these episodes were accompanied by very little increase in inflation, while others were accompanied by nontrivial (but always *temporary*) increases in inflation. Ball (2009) hypothesizes that some of this difference in inflation magnitudes may be driven by whether or not the period of elevated unemployment under examination led to a large increase in short- or long-term unemployment. It has been hypothesized that steep reductions in unemployment that is dominated by the long-term unemployed may require larger one-time increases in inflation levels than reducing unemployment dominated by short-term unemployment.

There are two important issues to note about this hypothesis that boosting potential output through sharp reductions in unemployment requires a larger inflation pick-up when unemployment is dominated by the long-term unemployed.

FIGURE I

No evidence of inflation persistence

Percent change in inflation following a large decrease in estimated NAIRUs for various OECD countries
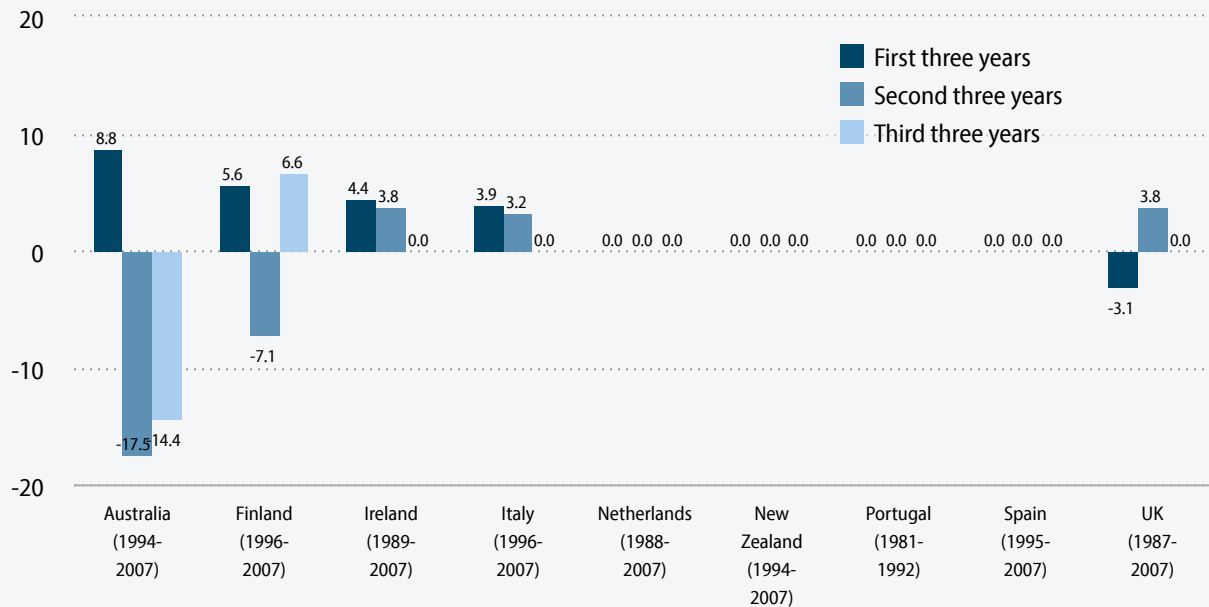
Note: The date range for each country encompasses the period in which the NAIRU changed, as well as the nine years following the NAIRU change.

Source: EPI analysis of Ball (2009)

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First, it has not been verified in a robust set of studies (though Llaudes 2005 offers some preliminary suggestive evidence). Second, and much more importantly, even if this hypothesis is true—that reducing long-term unemployment requires accepting a larger one-time increase in inflation—it remains the case that potential output declines occurring because of extended periods of unemployment *still are reversible*. In none of the cases that Ball examines does the increase in potential output engineered by an extended period of strong growth and low unemployment lead to accelerating inflation. In the context of today's U.S. economic situation, with extraordinarily low inflation rates, the increase in inflation needed to reduce long-term unemployment—even if on the high end of previous episodes identified by Ball (2009)—would still likely leave inflation far below historical averages.

Conclusion

The fact that long-term unemployment remains elevated more than five years after the official end of the Great Recession has understandably led many to worry that the downturn inflicted permanent damage on households, workers, and the economy as a whole.

On the one hand, these fears are clearly well-founded. The very large increase in unemployment has surely left deep, long-lasting scars on American households.

On the other hand, the vast bulk of evidence on both microeconomic and macroeconomic scarring identifies only the increase in total involuntary unemployment—not long-term unemployment—as the driving mechanism. Further, to the limited degree that microeconomic scarring does exist, it seems that it is overwhelmingly driven by employers using long-term unemployment as a signal to screen workers. As such, any greater difficulty the long-term jobless have in securing employment is not a result of long durations of unemployment lowering their potential productivity.

This has important implications for policymakers. It means that fighting the determinants of *overall* unemployment will continue to be the most effective way to reduce long-term unemployment (again, a finding reinforced by Elsby et al. 2011). Additionally, measures to convince employers to stop using unemployment duration as a signal would be a more direct attack on the problem than solutions that presume long-term unemployed workers' skills have been degraded.

In regards to macroeconomic scarring, while extended periods of slack demand can indeed scar an economy's estimated long-run potential output, the most important finding from this research is that such scars are *reversible*. Most importantly, they are reversible without necessarily sparking a permanent increase (or an acceleration) of inflation. This implies that efforts to boost aggregate demand not only would not lead to accelerating inflation, but they could substantially restore the losses to estimated potential output registered during and after the Great Recession.

About the author

Josh Bivens joined the Economic Policy Institute in 2002 and is currently the director of research and policy. His primary areas of research include macroeconomics, social insurance, and globalization. He has authored or co-authored three books (including *The State of Working America, 12th Edition*) while working at EPI, edited another, and has written numerous research papers, including for academic journals. He appears often in media outlets to offer economic commentary and has testified several times before the U.S. Congress. He earned his Ph.D. from The New School for Social Research.

Endnotes

1. In the calculations that follow, we assume that displaced high-tenure women make the same amount and are equivalently harmed by displacement as high-tenure men. While there is a gender wage gap, it is likely smaller for high-tenure employees. Further, our estimates use average salaries over the 1980–2003 period, which are likely too conservative for men. Given all of this, we argue the aggregate losses from displacement of all high-tenure workers is pretty well estimated by our calculations.

2. When the pool of long-term unemployed grows dramatically during times when reemployment possibilities are severely impaired by macroeconomic constraints (i.e., since 2008 in the United States), then this composition effect may be less powerful. As such, the pool of long-term unemployed could contain a higher fraction of workers who find unemployment spells quite psychologically damaging.

3. Of course, the CBO (and other forecasters) do account for easily foreseeable ways that future input growth will deviate from the past, such as a reduction in labor force growth driven by demographic changes.

4. The CBO (2014) claims that its smaller estimates of potential output following the Great Recession are not associated with the downturn and instead simply reflect better estimates of pre–Great Recession trends in input growth. Ball (2014) disputes this characterization.

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