



TECHNICAL APPENDIX FOR

The Lasting Effects of the Great Recession:
Six Million Missing Workers and a New Economic Normal

The Hamilton Project
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This appendix explains the details and data sources for the figures and calculations in the post “The Lasting Effects of the Great Recession: Six Million Missing Workers and a New Economic Normal.”

Figure 1. Population Growth Compared to 2009 Projections.

Source: Toossi 2009; Bureau of Labor Statistics (BLS) 2013; authors’ calculations.

Figure 1 compares the change in the civilian noninstitutional population (CNIP) from 2008 to 2013 (data from [BLS 2013](#)) with the 2009 BLS projections of the CNIP through 2015 (data from [Toossi 2009](#)).

Year	2009 BLS projected CNIP (thousands)	Actual CNIP (thousands)
2008	233,788	232,807
2009	236,854	234,912
2010	239,418	236,997
2011	241,890	238,852
2012	244,324	242,436
2013	246,690	244,828
2014	249,047	n/a
2015	251,432	n/a

Figure 2. How Lower Labor-Force Participation Has Changed the Work Force.

Source: Toossi 2009; BLS 2013; authors’ calculations.

Figure 2 shows how the decline in the labor-force participation rate (LFPR) relative to the 2009 BLS projections has decreased the size of the labor force in each age group. The magnitude of the decrease was calculated by taking the difference between the 2009 BLS forecast of the LFPR

of each group in 2013 (data from [Toossi 2009](#)) and the actual LFPR for each group in 2013, and multiplying that rate difference by what the population in that age group was in 2013 (data from [BLS 2013](#)).

Age group	2009 BLS projected LFPR (percent)	Actual LFPR (percent)	Actual population (thousands)	Change in labor force (thousands)
16 to 19	37.4	31.8	16,854	-944
20 to 24	72.7	69.7	22,006	-660
25 to 34	82.9	81.3	41,314	-661
35 to 44	83.7	82.2	39,643	-595
45 to 54	81.7	79.7	43,394	-868
55 to 59	74.5	73.4	20,921	-230
60 to 64	56.6	55.2	17,844	-250
65 to 69	34.0	31.7	14,277	-328
70 to 74	20.0	18.8	10,233	-123
75 and up	8.6	8.6	18,344	0

Figure 3. Labor-Force Growth Compared to 2009 Projections.

Source: Toossi 2009; BLS 2013; authors' calculations.

Figure 3 compares the actual change in the labor force from 2008 to 2013 (data from [BLS 2013](#)) with the 2009 BLS projections of the size of the LF through 2015 (data from [Toossi 2009](#)).

Year	2009 BLS projected labor force (thousands)	Actual labor force (thousands)
2008	154,287	152,822
2009	156,083	154,142
2010	157,502	153,889
2011	158,875	153,617
2012	160,109	154,975
2013	161,304	155,266
2014	162,493	n/a
2015	163,642	n/a

Calculating the Jobs Gap

In this month's employment report, we update our methodology for calculating the jobs gap. The basic approach remains unchanged. The jobs gap began at zero when the Great Recession started in November 2007. For each month after that, the jobs gap is equal to the previous month's jobs gap, plus the monthly change in payroll employment estimated by the BLS (including revisions over time), plus an estimate of the number of jobs needed to keep up with the monthly increase in the labor force.

A key challenge is estimating how many jobs the economy must gain every month to accommodate labor-force growth, which is a function of changes in the population, trends in the labor-force participation rate, the assumed normal unemployment rate, and the relationship between these population-based measures of employment and employer-based measures from the payroll survey.

In prior estimates of the jobs gap, we used estimates from the BLS published in 2009 that provided year-by-year estimates of the growth of the labor force as a starting point in our analysis. Those estimates allowed for a simple calculation of monthly employment needs straight from their estimates. However, those estimates were subsequently revised heavily, both to reflect changes in immigration and also as BLS updated its methodology and assumptions regarding labor-force participation rates, in part because of effects of the recession. Incorporating such revisions into the job gap was difficult for both practical reasons of bridging incompatible year-to-year estimates and also conceptually, because we preferred to use estimates of the labor force that did not incorporate reductions in labor-force participation that arise as a direct result of the recession.

Instead, beginning this month we use projections of the potential labor force from the Congressional Budget Office (CBO). The [CBO's estimates](#) are updated annually with their *Budget and Economic Outlook*, but those projections are intended to control for business-cycle fluctuations to assume full employment, given current demographic forecasts (CBO 2013). In short, the CBO projections give us an up-to-date picture of the potential U.S. labor force that is close to what would have emerged in the absence of the recession. To see the full set of assumptions underlying the CBO methodology, click [here](#).

From these data, we calculate the year-to-year change in the labor force and divide by twelve to find the monthly change. Next, we assume that 95 percent of these new entrants need to find employment to maintain the unemployment rate at 5 percent (roughly its pre-recession level). However, employment as measured in the household survey (which is used to calculate the unemployment rate) includes a larger scope of workers than the payroll survey (which is used to estimate month-to-month employment gains by employers). To scale down the household-based

measure to a payroll-based measure, we multiply the monthly job needs by .94, the ratio of payroll employment to household employment that prevailed in 2007.

Works Cited

Bureau of Labor Statistics (BLS). 2013. “Databases, Tables & Calculators by Subject.” Available at <http://www.bls.gov/data/>.

Congressional Budget Office (CBO). 2013. “Key Assumptions in Projecting Potential GDP—February 2013 Baseline.” February 5. Available at <http://www.cbo.gov/publication/43910>.

Toossi, Mitra. 2009. “Labor force projections to 2018: older workers stay active despite their age.” *Monthly Labor Review* November: 30–51. Available at <http://www.bls.gov/opub/mlr/2009/11/art3full.pdf>.