

September 7, 2012

## Employment from the BLS household and payroll surveys: summary of recent trends

*This report is updated monthly in conjunction with the release of the [Employment Situation](#). The release dates are available on the [BLS website](#).*

The Bureau of Labor Statistics (BLS) has two monthly surveys that measure employment levels and trends: the Current Population Survey (CPS), also known as the household survey, and the Current Employment Statistics (CES) survey, also known as the payroll or establishment survey.

Employment estimates from both the household and payroll surveys are published in the Employment Situation news release each month. These estimates differ because the surveys have distinct definitions of employment and distinct survey and estimation methods. (See the comparison of the surveys on page 4.) This report is intended to help data users better understand the differences in the surveys' employment measures as well as divergences that sometimes occur in their trends.

Both the payroll and household surveys are needed for a complete picture of the labor market. The payroll survey provides a highly reliable gauge of monthly change in nonfarm payroll employment. The household survey provides a broader picture of employment including agriculture and the self employed.

### Latest trends in payroll and household survey employment

Seasonally adjusted, numbers in thousands

Reference period	Payroll survey employment <sup>1</sup>	Household survey employment <sup>2</sup>	Adjusted household survey employment <sup>3</sup>
Over-the-month change <b>July–August 2012</b>	96	-119	247
Over-the-year change <b>August 2011–2012</b>	1,808	2,138	2,359
Since the business cycle peak <sup>4</sup> <b>December 2007–August 2012</b>	-4,682	-4,322	-3,846
Since the business cycle trough <sup>4</sup> <b>June 2009–August 2012</b>	2,797	1,928	2,293

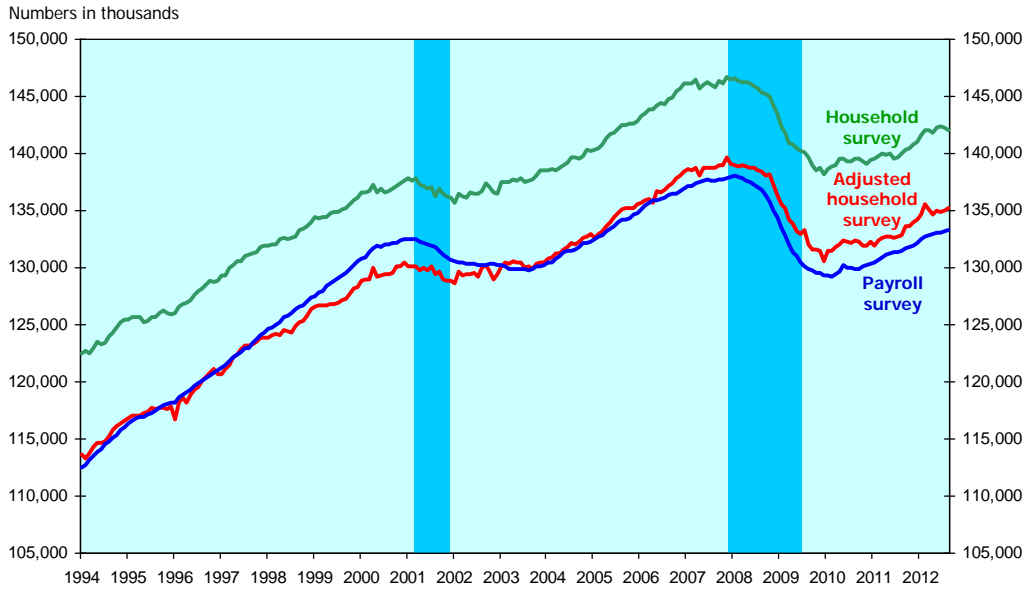
<sup>1</sup> Payroll survey estimates for July and August 2012 are preliminary and subject to revision.

<sup>2</sup> The effect of the Census 2010-based population control adjustment introduced in January 2012 has been smoothed out in the historical household survey employment estimates used here; thus, the changes shown above will differ from those calculated using the official estimates in the Employment Situation and in the public databases available on the BLS website. See Appendix for further explanation.

<sup>3</sup> This is a research series created from household survey employment to be more similar in concept and definition to payroll survey employment. Household survey employment is adjusted by subtracting agriculture and related employment, nonagricultural self employed, unpaid family workers, private household workers, and workers absent without pay from their jobs, and then adding nonagricultural wage and salary multiple jobholders. The effects of population control revisions also have been smoothed out in the historical data in this series.

<sup>4</sup> As designated by the [Business Cycle Dating Committee of the National Bureau of Economic Research \(NBER\)](#).

Chart 1. Household and payroll survey employment, seasonally adjusted, 1994–2012



NOTE: The household series presented here has been smoothed for population control revisions. The “adjusted” household series has been adjusted to an employment concept more similar to the payroll survey’s and smoothed for population control revisions. Shaded areas represent recessions as determined by the National Bureau of Economic Research (NBER).

SOURCE: Bureau of Labor Statistics, September 7, 2012.

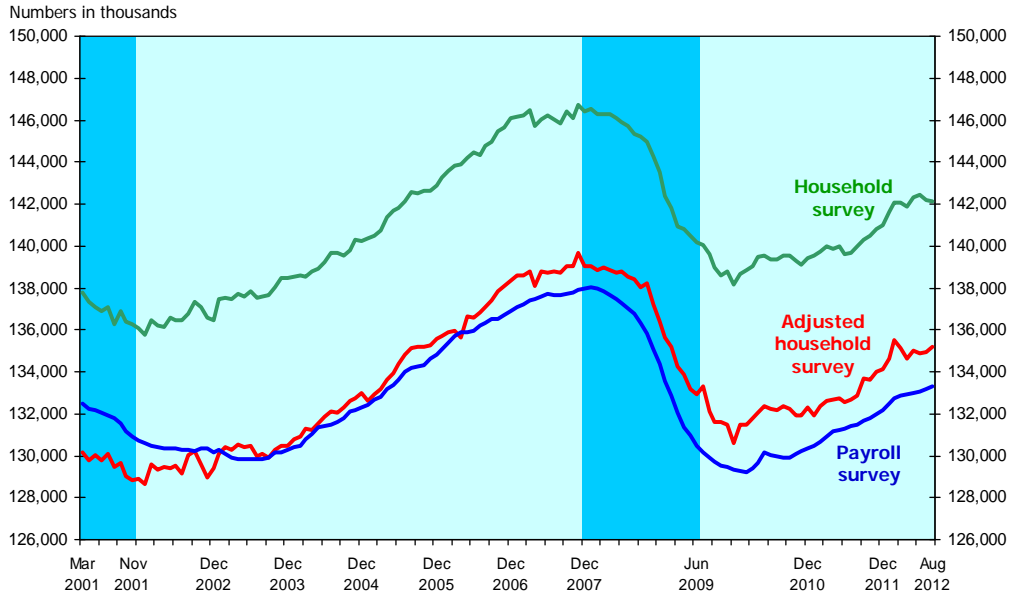
**Chart 1** shows employment from the household and payroll surveys from January 1994 through the most recent month available.

Because the household survey has a broader employment definition than the payroll survey, the household employment level (**green** line) exceeds that of the payroll survey (**blue** line).

For research and comparison purposes, BLS creates an “adjusted” household survey employment series (**red** line) that is more similar in concept and definition to payroll survey employment. The adjusted household survey employment series is calculated by subtracting from total employment agriculture and related employment, nonagricultural self employed, unpaid family and private household workers, and workers absent without pay from their jobs, and then adding nonagricultural wage and salary multiple jobholders. The resulting series is then seasonally adjusted. (See Appendix for data series.)

The adjusted household survey employment tracks much more closely with the payroll survey measure; nonetheless, occasional trend discrepancies occur. For example, there is a noticeable period from the late 1990s until the 2001 recession when payroll employment grew at a faster rate than household survey employment. Possible causes of employment trend differences are discussed on pages 5-8.

Chart 2. Household and payroll survey employment, seasonally adjusted, March 2001–August 2012



NOTE: The household series presented here has been smoothed for population control revisions. The “adjusted” household series has been adjusted to an employment concept more similar to the payroll survey’s and smoothed for population control revisions. Shaded areas represent recessions as determined by the National Bureau of Economic Research (NBER).

SOURCE: Bureau of Labor Statistics, September 7, 2012.

**Chart 2** shows the same payroll and household employment series as chart 1, but begins with the March 2001 peak of the previous recession period. [The Business Cycle Dating Committee of the National Bureau of Economic Research \(NBER\)](#) has designated December 2007 as the most recent business cycle peak and June 2009 as the most recent business cycle trough.

## Summary comparison of survey concepts, definitions, and methodologies

Major features and distinctions of the two surveys are shown below. Additional information on the methodologies of the two surveys can be found in the Quick Guide to Methods and Measurement Issues on the BLS website at <http://www.bls.gov/bls/empsitquickguide.htm>.

<b>Comparison by:</b>	<b>Household Survey (CPS)</b>	<b>Payroll Survey (CES)</b>
Universe	Civilian noninstitutional population age 16 and over	Nonfarm wage and salary jobs
Type of survey	Monthly sample survey of approximately 60,000 households	Monthly sample survey of about 141,000 businesses and government agencies covering approximately 486,000 establishments
Major outputs	Labor force, employment, unemployment, and associated rates with demographic detail	Employment, hours, and earnings with industry and geographic detail
Reference period	Calendar week that includes the 12 <sup>th</sup> of the month	Employer pay period that includes the 12 <sup>th</sup> of the month (could be weekly, biweekly, monthly or other)
Employment concept	Estimate of employed persons (multiple jobholders are counted only once) Includes individuals absent from work without pay	Estimate of jobs (multiple jobholders counted for each nonfarm payroll job) Includes only those receiving pay for the reference pay period
Employment definition differences	Includes the unincorporated self employed, unpaid family workers, agriculture and related workers, private household workers, and workers absent without pay	Excludes all of the groups listed at left, except for the logging component of agriculture and related industries
Size of over-the-month change in employment required for a statistically significant movement	±436,000	±90,900 (updated annually in February)
Benchmark adjustments to survey results	No direct benchmark for employment. Adjustments to underlying population base revised annually to intercensal estimates, and every 10 years to the decennial census	Employment benchmarked annually to employment counts derived primarily from Unemployment Insurance (UI) tax records

## Comparing employment trends from the two surveys

Although the payroll and household surveys track well over the long term, periodic discrepancies in trend have occurred. The following sections summarize some issues with the surveys that are important to consider when comparing employment changes and trends from the two sources.

### Sampling error

Both surveys are subject to sampling error. The payroll survey has a much larger sample size than the household survey. The payroll survey's active sample covers approximately 486,000 business establishments of all sizes representing about one-third of total nonfarm employment. The household survey is much smaller at 60,000 households, covering a very small fraction of total employed persons. Over-the-month changes in household survey employment are therefore subject to larger sampling error, about four times that of the payroll survey on a monthly basis.

When looking at short-term trends in either survey, especially over-the-month changes, it is therefore essential to assess the statistical significance of the change. (The sizes of the over-the-month changes in employment needed to be statistically significant are shown on page 4.) When comparing the two series over longer periods of time, however, other factors also need to be considered; some of these are discussed below.

### Payroll survey benchmark revisions

Benchmark revisions are a standard part of the payroll survey estimation process. The benchmark revision represents a once-a-year re-anchoring of the sample-based employment estimates to full employment counts derived primarily from unemployment insurance (UI) tax records that nearly all employers are required to file with State Employment Security Agencies. Following standard BLS methodology, the sample-based estimate for the month of March is replaced by the March UI-based employment level and estimates for the 12 months preceding and the months following the March benchmark reference month are recalculated. Estimates for the 12 months preceding the March benchmark are recalculated by wedging back the difference between the UI-based employment level and the sample-based estimate: 1/12 of the difference is applied to April of the prior year, 2/12 to May, and so forth, through February of the benchmark year which receives 11/12 of the difference. Estimates for April of the benchmark year forward are recalculated by applying the over-the-month changes from the sample to the new benchmark level, along with recomputed net birth/death factors. (See "New business births" below.)

The payroll survey's most recent benchmark—to March 2011 employment records—resulted in an upward adjustment of 162,000 (165,000 on a seasonally adjusted basis). Detailed information about this and previous benchmarks can be found on the BLS website at <http://www.bls.gov/ces/tables.htm#benchmark>.

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### **Payroll survey benchmark, continued**

With regard to the benchmark source data, BLS issued a report in 2004 evaluating the timeliness of new business enrollments into the UI system. The report, "Assessing the Timeliness of Business Births in BLS Establishment Statistics," is available on the BLS website at <http://www.bls.gov/cew/eta581study.pdf>.

### **New business births in the payroll survey**

The payroll survey sample cannot include new firms immediately. These are incorporated with a lag. In the interim, a model-based estimate is used each month to account for employment resulting from new firm births. A summary of how the birth/death model improves the payroll survey estimates is on the BLS website at <http://www.bls.gov/opub/ils/pdf/opbils70.pdf>.

Technical information about the birth/death model methodology used in the payroll survey estimates can be found at <http://www.bls.gov/ces/cesbdtech.htm>. The latest monthly adjustments resulting from the birth/death model are available at <http://www.bls.gov/web/cesbd.htm>.

### **Population control adjustments to the household survey**

Population controls are used to weight the household survey sample results to reflect the overall level of the U.S. population. The population controls are developed by the U.S. Census Bureau. They are derived from decennial census information and, between census years, from administrative and other data. There are limitations with the intercensal population controls in part due to the difficulties associated with estimating the net international migration component of population change. The population controls contributed significantly to discrepancies between payroll and household survey employment in the 1980s and 1990s when the household survey showed less growth than the payroll survey due to understated population growth in the intercensal controls.

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### **Population control adjustments, continued**

With the release of January data each year, BLS incorporates population control adjustments into the household survey estimates. The adjustments reflect the Census Bureau's review of the components of population change—births, deaths, and net international migration—and of the methodology used to estimate population. BLS typically does not revise the historical household survey data series to reflect new population controls because of the extensive effort needed to completely revise and verify all of the time series produced, and because the revisions would be negligible for most series. (Information on the specific effects of recent population control adjustments is found on page 9 of this report and on the BLS website at <http://www.bls.gov/cps/documentation.htm#pop.>)

Substantial revisions to the population controls in some years have created historical data comparability problems in some household survey data series, particularly the labor force and employment levels. In December 2003, BLS outlined a method to “smooth” such level shifts in major CPS data series as a convenience to its data users. See the Appendix, “Interpreting household survey employment data with population control adjustments,” on pages 9-11 of this report.

### **Worker classification in the household survey**

For research and comparison purposes, BLS creates an “adjusted” household survey employment series that is more similar in concept and definition to payroll survey employment. (This adjusted household survey employment series is featured in the charts and comparisons in this report.) The adjusted household survey employment series is calculated by subtracting from total employment agriculture and related employment, nonagricultural self employed, unpaid family and private household workers, and workers absent without pay from their jobs, and then adding the number of nonagricultural wage and salary multiple jobholders.

This adjustment process is imperfect, however, because precise data are not available in some cases to make the best possible adjustment. For example, some independent contractors mistakenly report themselves as wage and salary workers, rather than as self employed, in the household survey. This leads to some overstatement of the adjusted household survey employment. Separately, the adjustment for multiple jobholding adds the number of workers whose primary job is nonagricultural wage and salary, but not necessarily their secondary job. Some may in fact be self employed in their secondary job. This, too, will cause some overstatement of the adjusted employment. On the other hand, BLS does not make an adjustment to account for the number of multiple jobholders with three or more jobs; the adjustment process presumes all multiple jobholders have only two jobs. This introduces some understatement into the adjusted household survey employment. These types of worker classification issues limit the ability of BLS to fully reconcile the two employment measures.

### **“Off-the-books” employment**

Workers who are paid “off-the-books” are not reported in the payroll survey. The household survey could possibly include some of these workers, but BLS cannot determine the extent to which they might be reflected in household survey employment.

### **Job changing**

Employment estimates from the payroll survey are a count of jobs, unlike the household survey which provides a count of employed persons. If a person changes jobs and is on the payrolls of two employers during their pay periods that include the 12th of the month, both jobs would be counted in the payroll survey estimates.

If the rate of job-to-job movement changes substantially over time, it could impact trends produced from the payroll survey. While there is no method to directly measure effects from job changing, BLS researched this issue using job change rates from the household survey. The findings from this research are provided in the report “Effects of Job Changing on Payroll Survey Employment Trends” at <http://www.bls.gov/ces/cesjobch.pdf>.

### **Research on trend discrepancies**

- Research that examined micro-level household survey data linked to employer-reported administrative data to identify sources of discrepancy between household and payroll employment was published in a National Bureau of Economic Research (NBER) Working Paper in March 2009. The paper is available from the NBER website at <http://www.nber.org/papers/w14805>.
- An article was published in the February 2006 *Monthly Labor Review* that discusses BLS research and findings on the divergence between the two surveys. The article is available on the BLS website at <http://www.bls.gov/opub/mlr/2006/02/art2full.pdf>.
- A summary of BLS research into the late 1990s discrepancy was presented to the Federal Economic Statistics Advisory Committee (FESAC) in October 2003. The paper is available on the BLS website at <http://www.bls.gov/bls/fesacp2101703.pdf>.
- In 2005, a FESAC subcommittee carried out its own review of the two surveys’ employment measures at the request of BLS. The FESAC report to BLS is available on the BLS website at <http://www.bls.gov/bls/fesacp2120905.pdf>.



**Appendix: Interpreting household survey employment data with population control adjustments**

The adjustments to the population controls introduced into the household survey each year represent the cumulative over- or under-estimation of population since the last decennial census. For example, the January 2000 adjustment, which incorporated the Census 2000 population base, represented the cumulative underestimation over the 10-year period since the 1990 census. The January 2012 adjustment, which introduced the Census 2010 population base, represented the cumulative underestimation during the 11-year period since Census 2000.

The following table shows the employment effect of population control adjustments made in January 2000 and January 2012.

**Effect on household survey employment from population control adjustments, January 2000 and January 2012**

	(In thousands)
January 2000.....	+1,555
January 2012.....	+216

The usual BLS practice is to introduce the entire population adjustment amount into the January data each year, without making retroactive revisions to apply the adjustment back to the decennial census base year. In years when the population adjustments are large, this can result in significant shifts in the January labor force and employment levels that can be problematic for data analysis. When calculating changes in the employment level over certain time periods, for example, a level shift due to a population adjustment may distort the actual trend. Consequently, as a convenience to its data users, BLS created a research series that smoothes out the level shifts in employment resulting from the January 2000 (Census 2000 base) and January 2012 (Census 2010 base) population control adjustments. The population adjustments are wedged back incrementally to the previous decennial census base year, rather than incorporating the entire change in January of the years that they were implemented. For more information, see the technical documentation on the BLS website at <http://www.bls.gov/cps/cpspopsm.pdf>.

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This household survey employment research series was used in Charts 1 and 2 and the box on page 1 to provide a clearer picture for analysis. The full series is shown in the following table. Users should be aware that this research series will not match the official household survey employment estimates in BLS publications and on the BLS website.

**Household Survey Employment Smoothed for Population Controls, Seasonally Adjusted,  
January 1990–December 1999 and January 2000–December 2011**

(In thousands)

	January	February	March	April	May	June	July	August	September	October	November	December
1990	119,093	119,082	119,238	118,898	119,209	119,052	118,891	118,894	118,628	118,651	118,432	118,379
1991	118,089	117,915	117,823	118,293	117,634	117,845	117,785	117,712	118,169	118,052	118,033	117,740
1992	118,265	118,050	118,454	118,748	118,709	118,764	119,071	119,195	119,101	119,020	119,280	119,413
1993	119,503	119,715	119,995	119,938	120,594	120,781	120,970	121,373	121,081	121,363	121,722	122,031
1994	122,547	122,679	122,534	122,908	123,497	123,277	123,362	124,013	124,372	124,811	125,230	125,448
1995	125,402	125,681	125,720	125,722	125,207	125,321	125,629	125,677	125,972	126,241	126,052	125,963
1996	126,013	126,542	126,779	126,924	127,189	127,562	127,922	128,161	128,540	128,909	128,801	128,904
1997	129,358	129,370	129,981	130,247	130,584	130,544	130,970	131,172	131,194	131,368	131,859	131,898
1998	131,958	132,053	132,072	132,484	132,614	132,545	132,643	132,718	133,333	133,359	133,655	133,994
1999	134,436	134,276	134,381	134,402	134,775	134,855	134,905	135,097	135,227	135,529	135,862	136,092
2000	136,560	136,601	136,705	137,276	136,637	136,949	136,541	136,674	136,906	137,103	137,338	137,632
2001	137,797	137,633	137,805	137,322	137,117	136,899	137,099	136,270	136,877	136,424	136,271	136,082
2002	135,737	136,476	136,216	136,167	136,581	136,459	136,458	136,752	137,350	137,058	136,572	136,478
2003	137,471	137,538	137,491	137,692	137,604	137,852	137,537	137,614	137,675	138,052	138,493	138,482
2004	138,544	138,616	138,528	138,757	138,930	139,254	139,638	139,656	139,572	139,818	140,319	140,215
2005	140,336	140,478	140,748	141,350	141,707	141,814	142,127	142,537	142,506	142,654	142,607	142,862
2006	143,261	143,570	143,856	143,877	144,207	144,473	144,323	144,748	144,940	145,441	145,663	146,101
2007	146,160	146,191	146,456	145,723	146,041	146,203	146,047	145,825	146,389	146,092	146,743	146,423
2008	146,548	146,310	146,262	146,286	146,086	145,896	145,690	145,357	145,221	144,956	144,242	143,493
2009	142,352	141,826	140,921	140,822	140,463	140,173	140,063	139,630	138,948	138,575	138,783	138,145
2010	138,679	138,845	139,018	139,490	139,526	139,324	139,327	139,528	139,536	139,265	139,131	139,416
2011	139,528	139,750	139,965	139,830	140,012	139,590	139,657	139,963	140,318	140,509	140,828	141,006

NOTE: This series reflects seasonally adjusted household survey employment levels that have been revised to smooth out the effects of population control adjustments introduced each January. Data from January 1990–December 1999 were revised to smooth out the effect of the Census 2000 population control adjustment. Data from January 2000–December 2011 were revised to smooth out the effect of the Census 2010 population control adjustment. This is a research series and will not match the official employment estimates in BLS publications or the BLS website databases.

Source: Bureau of Labor Statistics, February 3, 2012.

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The “adjusted” household survey employment research series used in Charts 1 and 2 and the box on page 1 is a variation of the smoothed household survey employment research series that has been adjusted to be more similar in concept and definition to payroll employment. That series, which begins in January 1994 and is updated monthly, is provided below.

**Household Survey Employment Smoothed for Population Controls and Adjusted to a Payroll Concept, Seasonally Adjusted,  
January 1994–August 2012**

(In thousands)

	January	February	March	April	May	June	July	August	September	October	November	December
1994	113,684	113,268	113,797	114,366	114,603	114,661	114,826	115,260	115,800	116,101	116,345	116,565
1995	116,763	117,097	117,018	117,094	117,226	117,443	117,750	117,667	117,720	117,766	117,661	117,817
1996	116,727	118,208	118,582	118,144	118,873	119,334	119,547	120,141	120,435	120,760	121,146	120,716
1997	120,629	121,144	121,532	122,202	122,348	122,804	123,192	123,238	123,276	123,553	123,839	123,888
1998	123,888	124,044	124,253	124,055	124,499	124,470	124,362	124,848	125,252	125,292	125,820	126,380
1999	126,638	126,653	126,721	126,680	126,798	126,833	126,904	127,166	127,296	127,784	128,227	128,331
2000	128,810	128,929	128,946	130,016	129,205	129,369	129,381	129,456	129,566	130,124	130,074	130,462
2001	130,098	130,139	130,126	129,758	130,013	129,764	130,100	129,472	129,641	128,996	128,855	128,886
2002	128,664	129,608	129,314	129,478	129,391	129,512	129,180	130,045	130,247	129,607	128,967	129,412
2003	130,103	130,439	130,291	130,539	130,408	130,441	129,985	130,111	129,897	130,295	130,477	130,494
2004	130,799	130,923	131,275	131,226	131,561	131,836	132,132	132,051	132,295	132,596	132,758	132,970
2005	132,583	132,944	133,151	133,602	133,950	134,385	134,789	135,111	135,206	135,211	135,243	135,600
2006	135,689	135,869	135,983	135,660	136,655	136,555	136,853	137,105	137,426	137,835	138,106	138,368
2007	138,607	138,578	138,798	138,082	138,760	138,728	138,787	138,725	139,028	139,028	139,641	139,059
2008	139,011	138,854	138,955	138,865	138,712	138,790	138,520	138,422	138,036	138,200	137,234	136,419
2009	135,620	135,228	134,245	133,898	133,205	132,920	133,338	132,102	131,619	131,608	131,509	130,606
2010	131,488	131,467	131,817	132,017	132,344	132,218	132,143	132,333	132,253	131,948	131,932	132,280
2011	131,950	132,366	132,584	132,677	132,770	132,580	132,689	132,854	133,671	133,610	133,984	134,154
2012	134,645	135,524	135,106	134,611	135,011	134,858	134,966	135,213				

NOTE: This series represents household survey employment that has been adjusted to an employment concept more similar to the payroll survey by subtracting from total not seasonally adjusted employment agriculture and related employment, the self employed, unpaid family workers, private household workers, and workers on unpaid absences and then adding nonagricultural wage and salary multiple jobholders. The data were then revised to smooth out the effects of population control adjustments introduced each January. Data from 1994–1999 were revised to smooth out the effect of the Census 2000 population control adjustment. Data from 2000–2011 were revised to smooth out the effect of the Census 2010 population control adjustment. The resulting employment series was then seasonally adjusted.

Source: Bureau of Labor Statistics, September 7, 2012.

[http://www.bls.gov/web/ces\\_cps\\_trends.pdf](http://www.bls.gov/web/ces_cps_trends.pdf)