

November 6, 2009

## 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>September-October 2009</b>	-190	-589	-402
Over-the-year change <b>October 2008-2009</b>	-5,504	-5,979	-6,466
Since the business cycle peak <sup>4</sup> <b>December 2007-October 2009</b>	-7,304	-7,053	-7,013

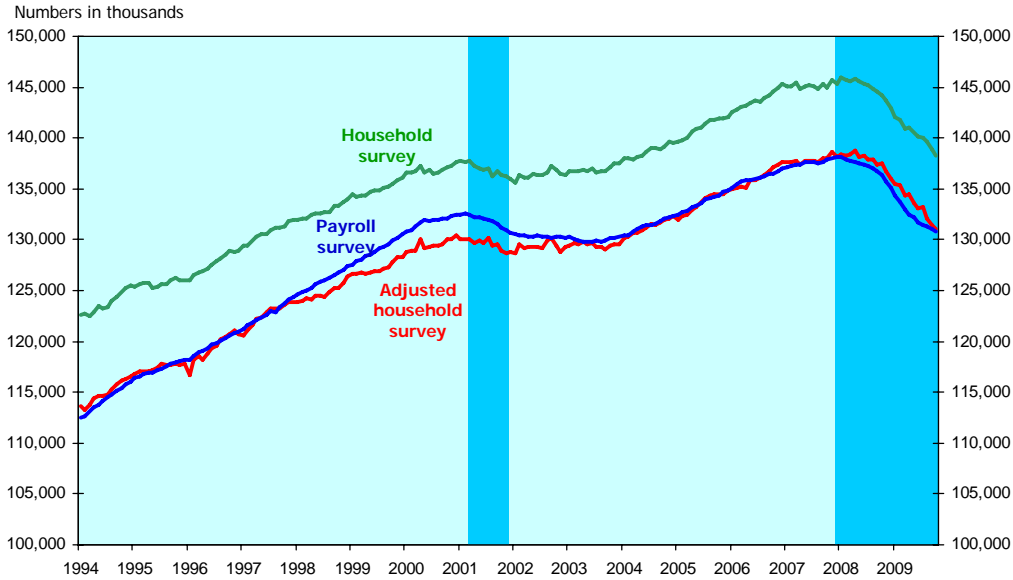
<sup>1</sup> Payroll survey estimates for September and October 2009 are preliminary and subject to revision.

<sup>2</sup> The effects of population control revisions in January 2000 and January of 2003-09 have 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 database 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 and 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> The Business Cycle Dating Committee of the National Bureau of Economic Research (NBER) has designated December 2007 as the most recent business cycle peak. NBER has not yet determined an endpoint for the recession that began in December 2007.

Chart 1. Household and payroll survey employment, seasonally adjusted, 1994-2009



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). NBER has not yet determined an endpoint for the recession that began in December 2007.

SOURCE: Bureau of Labor Statistics, November 6, 2009.

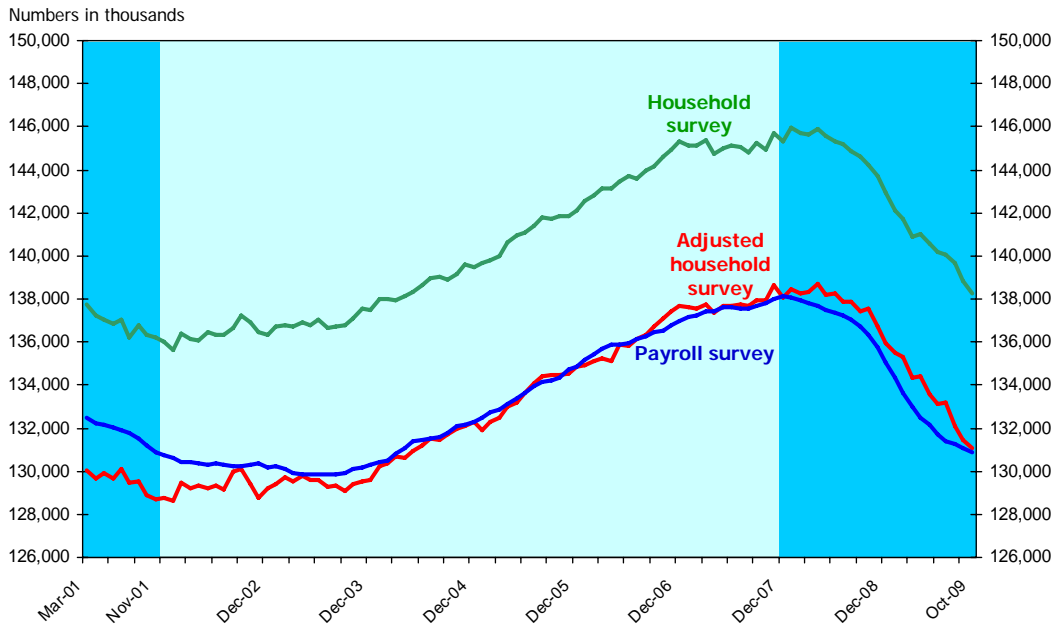
**Chart 1** above shows employment from the household and payroll surveys from January 1994 through the most recent month available.

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-October 2009



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). NBER has not yet determined an endpoint for the recession that began in December 2007.

SOURCE: Bureau of Labor Statistics, November 6, 2009.

**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. NBER has not yet determined an endpoint for the recession that began in December 2007.

## 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 150,000 businesses and government agencies covering approximately 390,000 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	±107,000 (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 390,000 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. Household survey employment is 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 primarily available through 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 2008 employment records—resulted in a downward revision of 89,000 (17,000 on a seasonally adjusted basis), or about -0.1 percent of total nonfarm employment. The average benchmark revision over the past decade has been plus or minus 0.2 percent. 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**

The preliminary estimate of the next benchmark revision is for a downward adjustment of 824,000, or 0.6 percent of total nonfarm employment, for the March 2009 reference month. The final benchmark revision will be incorporated into the payroll survey with the publication of January 2010 data on February 5, 2010.

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/opus/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 due primarily 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 population control adjustments made since Census 2000 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. The method distributed the January 2000 and January 2003 level shifts incrementally over a multiyear period rather than incorporating the entire change in January of the years that they were implemented. 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 represented the cumulative underestimation over the 10-year period since the 1990 census, whereas the January 2009 adjustment represented the cumulative overestimation during the 9-year period since Census 2000.

The following table shows the employment effect of population control adjustments made in January of 2000 and 2003-09.

**Effect on household survey employment from population control adjustments, 2000-09**

(In thousands)

January 2000.....	+1,555
January 2003.....	+576
January 2004.....	-409
January 2005.....	-45
January 2006.....	-123
January 2007.....	+153
January 2008.....	-598
January 2009.....	-407

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 results 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 and January 2003-09 population control adjustments. The population adjustments are wedged back incrementally to the decennial census base year, rather than incorporating the entire change in January of the years that they were implemented.

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, 1990-2008, is shown in the following table (see next page). 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.

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**Household Survey Employment Smoothed for Population Controls, Seasonally Adjusted,  
January 1990-December 2008**

(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	136,556	136,593	136,693	137,260	136,617	136,925	136,513	136,642	136,870	137,062	137,294	137,583
2001	137,745	137,576	137,744	137,258	137,048	136,827	137,022	136,190	136,792	136,336	136,179	135,986
2002	135,637	136,371	136,108	136,054	136,464	136,338	136,333	136,623	137,217	136,920	136,431	136,333
2003	136,731	136,777	136,711	136,890	136,783	137,009	136,676	136,732	136,773	137,128	137,546	137,515
2004	137,972	138,032	137,933	138,149	138,310	138,621	138,991	138,998	138,902	139,135	139,622	139,506
2005	139,662	139,783	140,021	140,626	140,972	141,072	141,379	141,773	141,736	141,870	141,864	142,081
2006	142,540	142,826	143,105	143,147	143,467	143,723	143,605	143,992	144,145	144,617	144,906	145,298
2007	145,130	145,129	145,392	144,766	145,022	145,153	145,059	144,810	145,268	144,924	145,707	145,328
2008	145,944	145,699	145,643	145,873	145,586	145,347	145,202	144,876	144,629	144,254	143,739	142,931

NOTE: This series reflects seasonally adjusted CPS employment that has been revised from January 1990-December 2008 to smooth out the effects of population control revisions introduced in January 2000 and January of 2003-09.

Source: Bureau of Labor Statistics, February 6, 2009.

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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-October 2009**

(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	128,818	128,911	128,919	130,024	129,166	129,326	129,435	129,445	129,525	130,041	129,991	130,384
2001	130,080	130,076	130,048	129,685	129,919	129,655	130,122	129,435	129,559	128,856	128,708	128,750
2002	128,602	129,491	129,182	129,345	129,238	129,336	129,156	129,981	130,122	129,406	128,771	129,233
2003	129,426	129,712	129,538	129,763	129,604	129,609	129,245	129,342	129,066	129,390	129,559	129,592
2004	130,220	130,350	130,696	130,650	130,942	131,215	131,548	131,464	131,681	131,944	132,099	132,317
2005	131,883	132,262	132,462	132,965	133,214	133,666	134,067	134,391	134,488	134,488	134,513	134,876
2006	134,948	135,141	135,254	135,084	135,876	135,811	136,107	136,360	136,693	137,109	137,395	137,649
2007	137,596	137,565	137,738	137,337	137,691	137,693	137,731	137,685	137,967	137,966	138,650	138,070
2008	138,428	138,267	138,334	138,725	138,165	138,248	137,897	137,862	137,433	137,523	136,726	135,937
2009	135,500	135,325	134,331	134,411	133,578	133,095	133,165	132,121	131,459	131,057		

NOTE: This series represents not seasonally adjusted household survey employment that has been adjusted to an employment concept more similar to the payroll survey by subtracting from total employment agriculture and related employment, the self employed, unpaid family and 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 revisions introduced in January 2000 and January of 2003-09. The resulting employment series was then seasonally adjusted.

Source: Bureau of Labor Statistics, November 6, 2009.