

February 5, 2010

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 ¹	Household survey employment ²	Adjusted household survey employment ³
Over-the-month change December 2009-January 2010	-20	785	841
Over-the-year change January 2009-2010	-4,022	-3,660	-4,031
Since the business cycle peak ⁴ December 2007-January 2010	-8,424	-6,670	-6,786

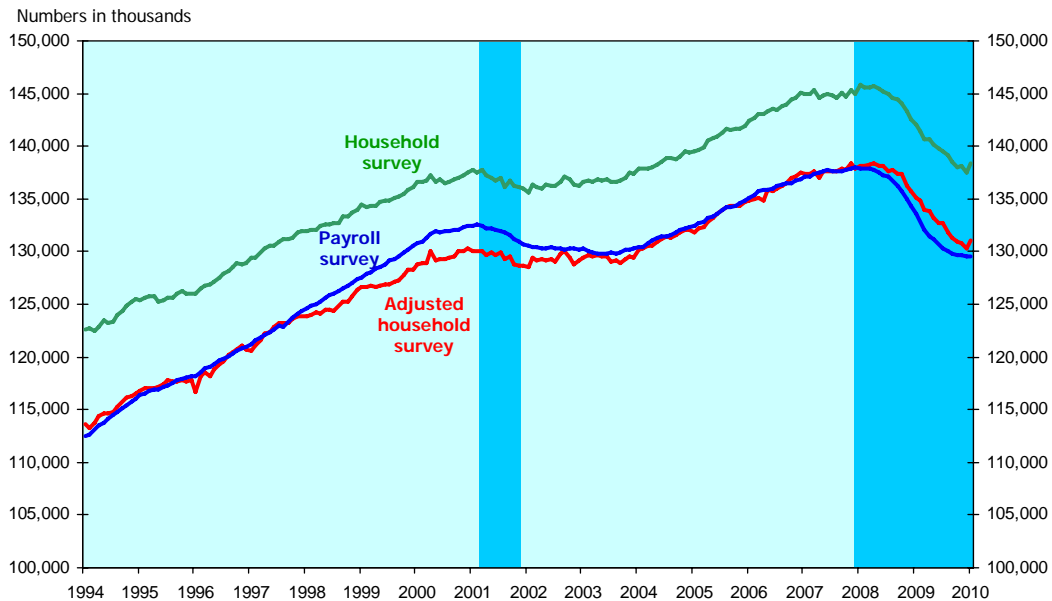
¹ Payroll survey estimates for December 2009 and January 2010 are preliminary and subject to revision.

² The effects of population control revisions in January 2000 and January of 2003-10 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.

³ 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.

⁴ 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, 1994-2010



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, February 5, 2010.

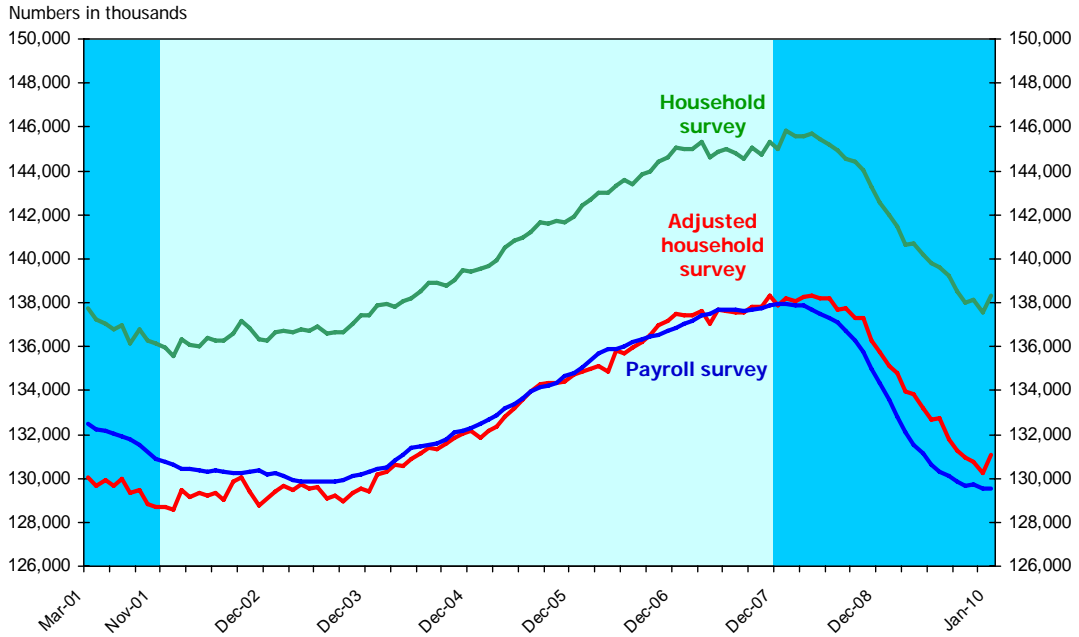
Chart 1 above shows employment from the household and payroll surveys from January 1994 through the most recent month available.

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-January 2010



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, February 5, 2010.

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>.

Comparison by:	Household Survey (CPS)	Payroll Survey (CES)
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 th of the month	Employer pay period that includes the 12 th 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	±101,000 (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 2009 employment records—resulted in a downward revision of 902,000 (930,000 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 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 2010 adjustment represented the cumulative overestimation during the 10-year period since Census 2000.

The following table shows the employment effect of population control adjustments made in January of 2000 and 2003-10.

Effect on household survey employment from population control adjustments, 2000-10

(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
January 2010.....	-243

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 2003-10 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, 1990-2009, 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 2009**

(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	136,554	136,589	136,687	137,252	136,607	136,913	136,499	136,626	136,852	137,042	137,272	137,559
2001	137,718	137,548	137,714	137,226	137,014	136,791	136,984	136,150	136,750	136,292	136,133	135,938
2002	135,587	136,319	136,054	135,998	136,406	136,278	136,271	136,558	137,150	136,851	136,360	136,261
2003	136,656	136,700	136,632	136,809	136,700	136,924	136,590	136,644	136,683	137,035	137,451	137,417
2004	137,873	137,930	137,829	138,043	138,202	138,510	138,878	138,883	138,785	139,016	139,501	139,383
2005	139,535	139,663	139,919	140,504	140,845	140,938	141,237	141,631	141,586	141,720	141,660	141,900
2006	142,400	142,690	142,999	143,018	143,320	143,570	143,420	143,809	143,964	144,446	144,619	145,043
2007	144,997	144,995	145,306	144,617	144,869	144,982	144,818	144,567	145,059	144,741	145,323	145,003
2008	145,839	145,578	145,580	145,706	145,418	145,159	144,901	144,568	144,397	144,048	143,276	142,554
2009	141,993	141,457	140,624	140,669	140,204	139,803	139,580	139,195	138,529	138,002	138,138	137,548

NOTE: This series reflects seasonally adjusted CPS employment that has been revised from January 1990-December 2009 to smooth out the effects of population control revisions introduced in January 2000 and January of 2003-10.

Source: Bureau of Labor Statistics, February 5, 2010.

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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-January 2010**

(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	128,823	128,925	128,936	129,988	129,181	129,338	129,345	129,404	129,495	130,045	129,990	130,366
2001	130,068	130,069	130,044	129,667	129,916	129,658	129,987	129,345	129,490	128,848	128,707	128,681
2002	128,585	129,470	129,161	129,315	129,220	129,331	128,995	129,847	130,021	129,392	128,768	129,105
2003	129,410	129,670	129,491	129,715	129,557	129,567	129,097	129,202	128,954	129,348	129,534	129,404
2004	130,201	130,283	130,617	130,561	130,891	131,131	131,416	131,327	131,558	131,860	132,022	132,132
2005	131,834	132,159	132,352	132,822	133,163	133,548	133,942	134,262	134,358	134,361	134,375	134,696
2006	134,847	135,011	135,125	134,860	135,846	135,691	135,966	136,235	136,551	136,945	137,182	137,475
2007	137,427	137,408	137,617	137,018	137,669	137,596	137,567	137,564	137,832	137,783	138,331	137,879
2008	138,191	138,091	138,234	138,322	138,164	138,176	137,684	137,750	137,318	137,317	136,297	135,729
2009	135,124	134,800	133,946	133,845	133,156	132,700	132,739	131,774	131,264	130,936	130,779	130,252
2010	131,093											

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 2003-10. The resulting employment series was then seasonally adjusted.

Source: Bureau of Labor Statistics, February 5, 2010.