

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](#).

Overview

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.

Estimates from both surveys are published in the “Employment Situation” news release each month. The household and payroll surveys use different definitions of employment and distinct survey and estimation methods. To help data users better understand the differences in the surveys’ employment measures and divergences that sometimes occur in their trends, the following information is provided.

- Summary comparison of household and payroll survey concepts, definitions, and methodologies
- Employment trends as measured by the payroll and household surveys
- Possible causes of differences in employment trends
- Summary of recent changes made to each survey:
 - Population control adjustments to the household survey
 - Benchmark revisions to the payroll survey

Summary comparison of household and payroll survey concepts, definitions, and methodologies

Major features and distinctions of the two surveys are compared below in Box 1. 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.

Box 1. How the household and payroll surveys compare

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 160,000 businesses and government agencies covering approximately 400,000 establishments
Major outputs	Labor force, employment, unemployment, and associated rates with significant demographic detail	Employment, hours, and earnings with significant 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)	Estimate of jobs (multiple jobholders counted for each nonfarm payroll job)
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

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Comparison by:	Household Survey (CPS)	Payroll Survey (CES)
Size of over-the-month change in employment required for a statistically significant movement	$\pm 436,000^1$	$\pm 104,000$
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

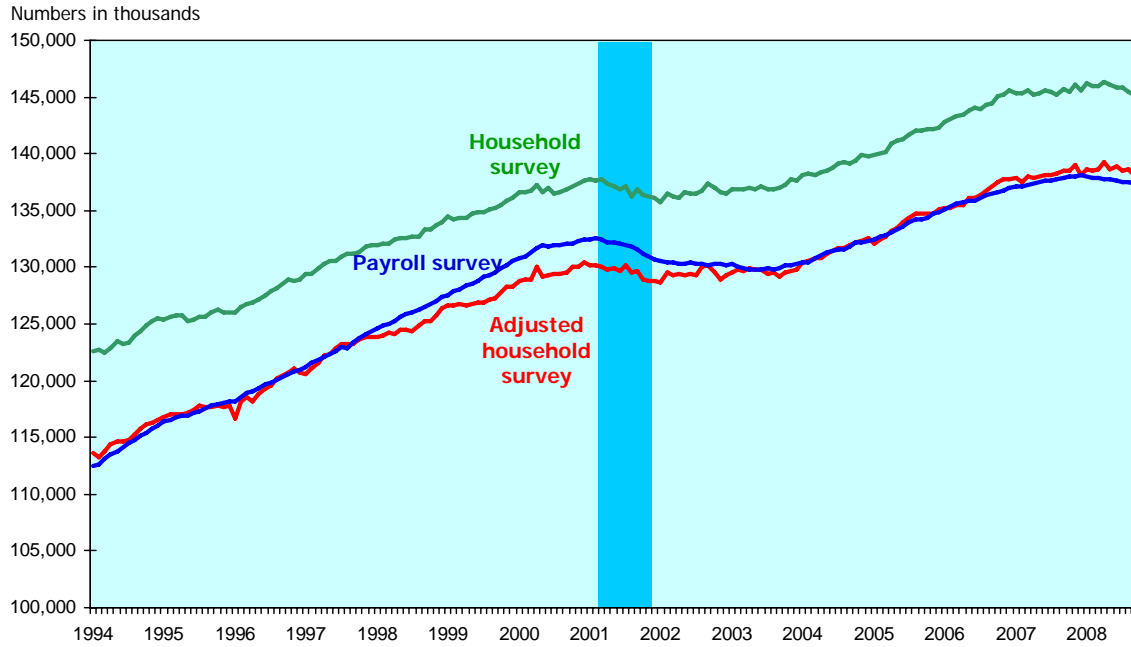
¹ This figure is updated periodically to incorporate more current data. The latest update (in March 2005) also included a correction in the program used to calculate it. For more information, see “Updates and adjustments to Current Population Survey standard errors” at http://www.bls.gov/cps/cps_err_update.htm.

Employment trends as measured by the household and payroll surveys

Chart 1 shows employment from the household and payroll surveys from January 1994 through the most recent month. Two variations of household survey employment used in BLS research are presented (these variations differ from the official series that appears in the “Employment Situation” and in the public database available through the BLS website). The green household survey line represents a version of total household survey employment where the effects of population control revisions in January 2000 and January of 2003-08 have been smoothed. The red “adjusted” household survey line represents the smoothed household survey employment series that has been further modified to make it more similar in concept and definition to payroll survey employment. This adjustment to household survey employment subtracts 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 adds nonagricultural wage and salary multiple jobholders.

Chart 1 shows that, because of its broader employment definition, the household survey employment level (green line) normally exceeds that of the payroll survey. When the household survey is adjusted to more closely match the payroll survey definition (red line), trend discrepancies between the two surveys are more discernible. In particular, there is an obvious multi-year period from the late 1990s until the onset of the 2001 recession when payroll employment was growing significantly faster than household survey employment.

Chart 1. Household and payroll survey employment, seasonally adjusted, 1994-2008

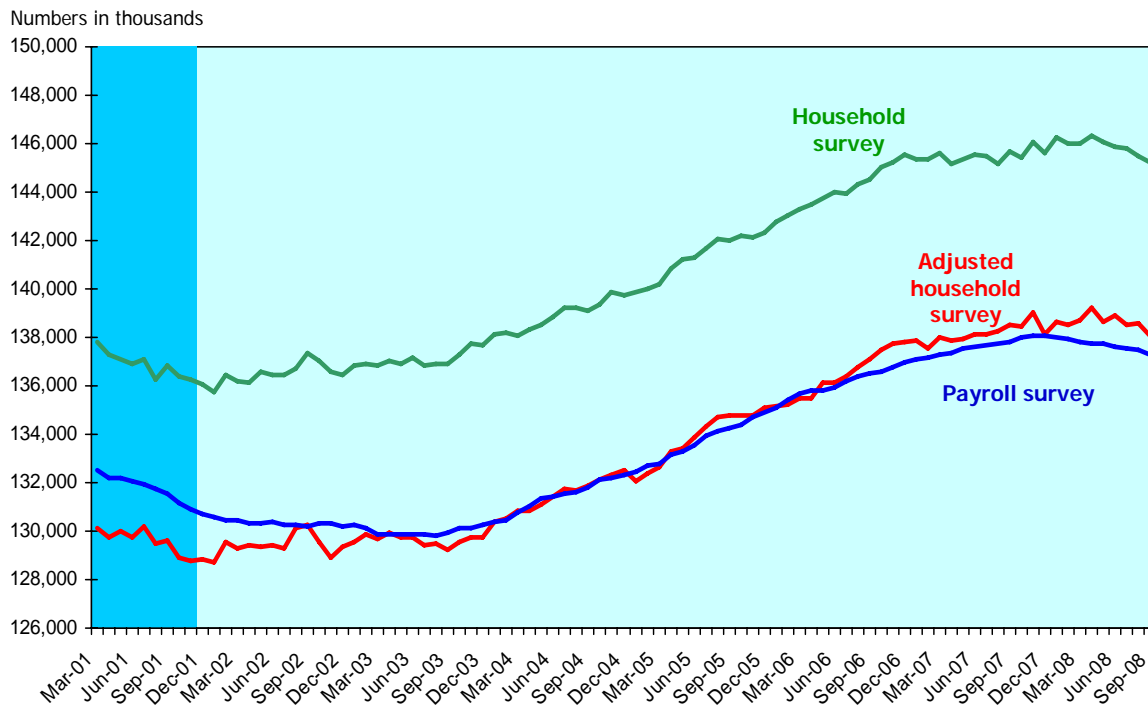


NOTE: The household series presented here has been smoothed for population control revisions. The "adjusted" household series has been adjusted to an employment concept more similar to the payroll survey's and smoothed for population control revisions. Shaded area indicates recession.

SOURCE: Bureau of Labor Statistics, October 3, 2008.

Chart 2 shows the same payroll and household employment series as chart 1, but highlights only the 2001 recession and post-recessionary period from March 2001 through the most recent month. The Business Cycle Dating Committee of the National Bureau of Economic Research (NBER) designated March 2001 as the most recent business cycle peak and November 2001 as the most recent trough. (The NBER is a private, nonprofit, nonpartisan research organization that is the generally acknowledged arbiter of business cycle dating.)

Chart 2. Household and payroll survey employment, seasonally adjusted, March 2001-September 2008



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 surveys and smoothed for population control revisions. Shaded area indicates recession.

SOURCE: Bureau of Labor Statistics, October 3, 2008.

Box 2 shows the change in employment levels from the payroll and household surveys as measured across the following time periods: 1) over the most recent month, 2) over the most recent year, 3) since March 2001, the last business cycle peak, and 4) since November 2001, the last business cycle trough. The peak and trough dates are determined by the National Bureau of Economic Research (NBER).

Box 2. Recent trends in payroll and household survey employment

Numbers in thousands

	Over-the-month change: August- September 2008	Over-the-year change: September 2007- September 2008	From March 2001 (peak)- September 2008	From November 2001 (trough)- September 2008
Payroll survey: total nonfarm employment, seasonally adjusted ¹	-159	-519	4,818	6,417
Household survey: total employment, smoothed for population control revisions and seasonally adjusted	-222	-426	7,456	8,993
Difference	63	93	2,638	2,576

¹ Payroll employment for September 2008 is preliminary and subject to revision.

NOTE: The household survey figures in Box 2 are calculated from a variation of household survey employment used in BLS research (also shown by the green lines in Charts 1 and 2). This version of household survey employment smoothes out the effects of population control revisions to the survey in January of 2003-08.

Box 3 shows employment trends in the payroll and household surveys over the same periods as in Box 2, but this illustration uses adjusted household employment that is more comparable to the payroll survey (also shown in Charts 1 and 2). Even with this adjustment, the difference in employment change as measured by the two surveys since March or November of 2001 is significant.

Box 3. Recent trends in payroll employment and household survey employment adjusted to an employment concept more similar to that of the payroll survey

Numbers in thousands

	Over-the-month change: August- September 2008	Over-the-year change: September 2007- September 2008	From March 2001 (peak)- September 2008	From November 2001 (trough)- September 2008
Payroll survey: total nonfarm employment, seasonally adjusted ¹	-159	-519	4,818	6,417
Household survey: total employment, smoothed for population control revisions, adjusted to be more like the payroll survey, and seasonally adjusted	-511	-414	7,971	9,283
Difference	352	105	3,153	2,866

¹ Payroll employment for September 2008 is preliminary and subject to revision.

NOTE: The household survey figures in Box 3 are calculated from a variation of household employment used in BLS research (also shown by the red lines in Charts 1 and 2). This version of household employment adjusts household survey employment to make it more similar in concept and definition to payroll employment. This adjustment to household survey employment subtracts from total employment agriculture and related employment, nonagricultural self employed, unpaid family and private household workers, and workers on unpaid leave from their jobs, and then adds nonagricultural wage and salary multiple jobholders. It also smoothes out the effects of population control revisions to the survey in January of 2003-08.

Possible causes of differences in employment trends

The following summarizes some issues with the surveys that are important when comparing changes in employment from the two sources.

Sampling error – The payroll survey has a much larger sample size than the household survey. The payroll survey’s active sample covers approximately 400,000 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 4 times that of the payroll survey on a monthly basis (see Box 1). When looking at short-term trends in either survey, especially over-the-month changes, it is essential to assess the statistical significance of the change. 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 – The payroll survey estimates are benchmarked once a year against a full universe count of employment derived from Unemployment Insurance (UI) tax records that nearly all employers are required to file. The payroll survey’s latest benchmark—to March 2007 employment records—resulted in a downward revision of 293,000 (284,000 on a seasonally adjusted basis), or about -0.2 percent of total nonfarm employment. The average benchmark revision over the past decade has been plus or minus 0.2 percent.

The preliminary estimate of the next benchmark revision is for a small downward adjustment of 21,000, or 0.02 percent of total nonfarm employment, for the March 2008 reference month. The final March 2008 benchmark revision will be incorporated into the payroll survey on February 6, 2009, with the publication of the January 2009 Employment Situation news release.

With regard to the benchmark source data, BLS has reviewed information from publicly available UI management reports concerning the timeliness of new business enrollments into the UI system. The findings are available in the report “Assessing the Timeliness of Business Births in BLS Establishment Statistics” on the BLS Internet site at <http://www.bls.gov/cew/eta581study.pdf>.

New business births in the payroll survey – The payroll survey sample does not include new firms immediately. They 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. Technical information about the birth/death model used in the payroll survey estimates is on the BLS Internet site at <http://www.bls.gov/ces/cesbdtech.htm>. The latest adjustments resulting from the birth/death model are available at <http://www.bls.gov/web/cesbd.htm>.

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 within a payroll survey reference period, which is defined as the pay period including the 12th of the month, both jobs will be counted by 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 is researching this issue using job change rates from the

household survey. The initial findings of this research are provided in the report “Effects of Job Changing on Payroll Survey Employment Trends” at <http://www.bls.gov/ces/cesjobch.pdf>.

Population controls in the household survey – Population controls determine the weights used in the household survey to adjust the sample results to 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 to the population control estimates due primarily to the difficulties associated with estimating the net international migration component. The population controls contributed significantly to the discrepancy between payroll and household survey employment in the 1980s and 1990s when the household survey showed less growth than the payroll survey.

Worker classification in the household survey – As was illustrated in Box 3 above, adjusting for the measurable differences in the surveys’ employment definitions resolves only a portion of the discrepancy. This adjustment process is imperfect, however, because precise data are not available in many cases to make the best possible adjustment. For example, some independent contractors are not reported as self employed in the household survey, but rather as wage and salary workers. This type of reporting issue limits BLS’ ability 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.

Summary

- BLS has estimated the measurable definitional differences between the household and payroll surveys and found they provide a partial explanation for the employment trend differences. There are a number of definitional differences between the surveys that cannot be readily measured or quantified. These differences may contribute to divergences in the surveys’ trends, but their effects are either unknown or can only be conjectured. In addition, although BLS has devoted considerable attention to this issue, there may be other contributing factors that have not been identified.
- A summary of some of BLS’ research was presented to the Federal Economic Statistics Advisory Committee (FESAC) in October 2003. The paper is available on the BLS Internet site 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 BLS’ request. The FESAC report to BLS is available on the BLS Internet site at <http://www.bls.gov/bls/fesacp2120905.pdf>. 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>.
- BLS is continuing to investigate possible causes of recent divergences in employment growth between the payroll and household surveys. BLS also has implemented improvements that addressed past limitations. The redesign of the payroll survey, for example, led to the use of a probability sample, more frequent updating of the survey sample frame, and the development of a more effective means to estimate business births and deaths. With regard to the household survey population controls, the Census Bureau remains engaged in efforts to improve the intercensal

population estimates. In particular, they have begun utilizing information from the large American Community Survey (ACS) to improve the estimates of net international migration.

- 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 wage and salary employment. The survey has a large probability sample, and is benchmarked annually to a universe count of jobs derived from the unemployment insurance tax system. The payroll survey offers industry and geographic information at very detailed levels. The household survey provides a broader picture of employment including agriculture and the self employed, as well as detailed information on the demographic composition of the employed and the unemployed.

Population control adjustments to the household survey

January 2008 adjustment – As part of its annual review of intercensal population estimates, the U.S. Census Bureau determined that a downward adjustment should be made to the household survey population controls. This adjustment stemmed from revised estimates of net international migration and the institutional population for 2000 through 2007 and updated information on births and deaths. In keeping with usual practice, the new controls were used in the survey starting with data for January 2008. Estimates for December 2007 and earlier months were *not* revised to reflect the new population controls.

The table below provides a comparison of December 2007 data based on the old and new controls with the effects on the estimates of the labor force, employment, and unemployment.

January 2008 household survey population control adjustment effect

Employment status of the population, not seasonally adjusted, December 2007

(Numbers in thousands)

	December 2007 as published, without the adjustment to population controls	December 2007 based on adjusted population controls	Difference ¹
Civilian noninstitutional population	233,156	232,411	-745
Civilian labor force	153,705	153,068	-637
Participation rate	65.9	65.9	-.1
Employed	146,334	145,736	-598
Employment-population ratio	62.8	62.7	-.1
Unemployed	7,371	7,331	-40
Unemployment rate	4.8	4.8	.0
Not in labor force	79,451	79,334	-107

¹ Differences are calculated from unrounded estimates.

Previous population control adjustments

In January 2003, BLS introduced two separate adjustments that significantly increased the household survey population controls and had a major impact on employment levels.

- 1) Beginning with household survey estimates for January 2000 forward, the population controls were revised upward to reflect the results of Census 2000. Previous estimates used population controls based on the 1990 census.
- 2) In January 2003, the household survey population controls were adjusted upward to reflect higher estimates of net international migration in the population from 2000 through 2002.

The 2004 adjustment in population controls resulted in a fairly significant level shift in January 2004 employment. The adjustments in 2005-07 had a relatively minor effect on employment.

The following table shows the employment effect of population control adjustments made in January of 2000 and 2003-07.

Effect on household survey employment from population control adjustments, 2000-07

(In thousands)

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

Interpreting household data with the population control adjustments

The adjustments to the population controls introduced 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 2007 adjustment represented the cumulative underestimation during the 7-year period since Census 2000.

The level shifts in household survey employment resulting from these population adjustments make it difficult for data users to compare changes in employment over time periods that include these adjustments. 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 2003-08 population control adjustments over a multi-year period rather than incorporating the entire change in January of the years that they were implemented.

This household employment research series was used in Charts 1 and 2 and Box 2 above to provide a clearer picture for analysis. The full series, 1990-2007, is shown in the table below. Users should be aware that this research series will not match the official estimates in BLS publications and on the BLS website.

**Household Survey Employment Smoothed for Population Controls, Seasonally Adjusted,
January 1990-December 2007**

(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	136,600	136,704	137,274	136,635	136,946	136,538	136,670	136,902	137,098	137,334	137,627
2001	137,792	137,627	137,799	137,316	137,110	136,892	137,091	136,262	136,868	136,415	136,262	136,072
2002	135,726	136,465	136,205	136,155	136,569	136,446	136,445	136,738	137,336	137,043	136,556	136,462
2003	136,864	136,914	136,851	137,034	136,931	137,161	136,831	136,891	136,935	137,294	137,716	137,688
2004	138,141	138,201	138,086	138,332	138,499	138,818	139,201	139,215	139,123	139,372	139,853	139,739
2005	139,864	139,988	140,191	140,864	141,210	141,315	141,655	142,050	142,016	142,193	142,138	142,346
2006	142,771	143,042	143,294	143,462	143,754	144,030	143,951	144,322	144,492	145,036	145,219	145,579
2007	145,387	145,354	145,604	145,167	145,360	145,527	145,479	145,182	145,681	145,432	146,054	145,614

NOTE: This series reflects seasonally adjusted CPS employment that has been revised from January 1990-December 2007 to smooth out the effects of population control revisions introduced in January 2000 and January of 2003-08.

Source: Bureau of Labor Statistics, February 1, 2008.

Box 3 used a variation of the smoothed household survey employment research series that was adjusted to be more similar in concept and definition to payroll employment. That series, which begins in January 1994, is provided below.

**Household Survey Employment Smoothed for Population Controls and Adjusted to a Payroll Concept, Seasonally Adjusted
January 1994-September 2008**

(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	128,820	128,918	128,930	130,038	129,183	129,347	129,458	129,474	129,557	130,076	130,030	130,427
2001	130,123	130,125	130,100	129,740	129,977	129,717	130,188	129,509	129,632	128,932	128,788	128,833
2002	128,685	129,580	129,276	129,442	129,339	129,440	129,264	130,100	130,239	129,525	128,892	129,356
2003	129,547	129,842	129,673	129,905	129,748	129,755	129,393	129,511	129,226	129,551	129,720	129,752
2004	130,372	130,514	130,868	130,854	131,127	131,404	131,743	131,696	131,894	132,156	132,305	132,517
2005	132,068	132,419	132,665	133,267	133,435	133,902	134,320	134,702	134,775	134,767	134,779	135,072
2006	135,186	135,234	135,474	135,502	136,116	136,122	136,419	136,783	137,088	137,479	137,729	137,803
2007	137,866	137,548	137,972	137,853	137,959	138,101	138,117	138,252	138,485	138,448	139,053	138,114
2008	138,653	138,527	138,680	139,254	138,637	138,888	138,533	138,582	138,071			

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 2003-08. The resulting employment series was then seasonally adjusted.

Source: Bureau of Labor Statistics, October 3, 2008.

Benchmark revisions to the payroll survey

Benchmark revisions are a standard part of the payroll survey estimation process. The benchmark adjustment represents a once-a-year re-anchoring of sample-based employment estimates to full employment counts available through unemployment insurance (UI) tax records filed by nearly all employers with State Employment Security Agencies.

The incorporation of March 2007 benchmarks published on February 1, 2008, led to a revision of data for the period subsequent to the last benchmark; that is, for April 2006 forward. Also with this release, payroll survey data were updated to the 2007 North American Industry Classification System (NAICS) from the 2002 NAICS. Data from January 1990 forward were subject to revision resulting from the NAICS classification change; the seasonally adjusted series from January 1990 forward also were subject to revision due to the introduction of updated seasonal adjustment factors.

March 2007 Benchmark Effects on the Nonfarm Payroll Series

The total nonfarm employment level for March 2007 was revised downward by 293,000 (284,000 on a seasonally adjusted basis) or -0.2 percent. The average benchmark revision over the past decade has been plus or minus 0.2 percent.

Following standard BLS methodology, estimates were recalculated for the year preceding and the months following the March 2007 benchmark reference month. The March 2007 UI-based benchmark level replaced the March 2007 sample-based employment estimate. The difference between the benchmark level and the estimate was wedged back to the previous benchmark level: 1/12 of the difference was added to the April 2006 employment level, 2/12 to May 2006 and so forth, through February 2007, which received 11/12 of the difference.

Estimates for April 2007 forward were recalculated by applying over-the-month changes from the sample to the new benchmark level, along with recomputed net birth/death factors, and new seasonal adjustment factors.

The net impact of the benchmarking process for January through October 2007 is shown in the table below.

Revisions in total nonfarm employment, seasonally adjusted, in thousands

	Employment levels as previously published	Employment levels as revised		Over-the-month changes as previously published	Over-the-month changes as revised	Difference
2007						
January	137,329	137,108		162	126	-36
February	137,419	137,133		90	25	-65
March	137,594	137,310		175	177	2
April	137,716	137,356		122	46	-76
May	137,904	137,518		188	162	-26
June	137,973	137,625		69	107	38
July	138,066	137,682		93	57	-36
August	138,159	137,756		93	74	-19
September	138,203	137,837		44	81	37
October	138,362	137,977		159	140	-19