

Understanding the employment measures from the CPS and CES survey

The monthly BLS “Employment Situation” news release includes two distinct employment measures from two different surveys; although these measures track well over the long term, occasional differences in trend have confounded labor market analysts

Mary Bowler
and
Teresa L. Morisi

Each month, the Bureau of Labor Statistics (BLS, the Bureau) releases data on current employment in the “Employment Situation” news release. The data come from two different surveys: the Current Population Survey (CPS), also known as the household survey, and the Current Employment Statistics (CES) survey, also known as the establishment or payroll survey. These data are important indicators of the strength of the labor market and provide an early snapshot of the state of the Nation’s economy.

Although both surveys measure employment in the United States, they have different definitions of employment, along with different samples, estimation procedures, and concepts. Despite these differences, the two series track well together over long periods; at times, however, their rates of growth or decline differ significantly. These diverging movements in employment between the two surveys have been researched in the past. Most recently, they gained prominence in the mid- to late 1990s and during the recession and recovery from 2001 to 2004.¹ In the mid- to late 1990s, employment from the establishment survey grew faster than employment as measured by the household survey. During the recent recession and postrecession period, establishment survey employment declined for a number of months after the end of the recession, while household survey employment expanded.

Why do these two employment surveys sometimes give different pictures of the labor market? There are a number of differences between the

two surveys that can be quantified. Other areas of difference, however, are more difficult to measure. This article discusses the various differences and suggests reasons those differences may or may not affect the divergences between the two employment series. The first portion of the article offers a general background on the two surveys and a summary of past research into earlier divergences in the 1960s, 1970s, and 1980s. The second portion examines the latest BLS research into the divergences in the mid- to late 1990s through 2004.²

The two surveys

The CPS and the CES survey are monthly sample surveys; the CPS is a household survey, while the CES survey is a survey of businesses as well as government establishments. (Exhibit 1 summarizes the key features of the two surveys.) With a sample of about 60,000 eligible households, the CPS covers the U.S. civilian noninstitutional population aged 16 years and older. The survey results are collected for the Bureau of Labor Statistics by the U.S. Census Bureau. Interviewers from the Census Bureau contact households and ask questions regarding the labor force status of members of the household during the calendar week that includes the 12th day of the month. The broad coverage of the CPS encompasses not only wage and salary workers, but also the self-employed, farmworkers, unpaid family workers, persons employed by private households, and workers temporarily absent from work without pay. The CPS provides information

Mary Bowler and Teresa L. Morisi are economists in the Office of Employment and Unemployment Statistics, Bureau of Labor Statistics. E-mail: bowler.mary@bls.gov or morisi.teri@bls.gov

Exhibit 1. Comparison of Current Employment Statistics (CES) survey and Current Population Survey (CPS)

CES survey	CPS
<ul style="list-style-type: none"> • Monthly sample survey of 160,000 <i>businesses and government agencies</i>. Firms of all sizes are included • Designed to measure employment, hours, and earnings with significant <i>industrial and geographic</i> detail • Reference period is the <i>pay period</i> (could be weekly, biweekly, monthly, and so forth) that includes the 12th of the month • Employees of <i>all ages</i> are included • Employment measure reflects the number of nonfarm payroll <i>jobs</i> • Multiple jobholders are counted <i>for each payroll job</i> • Self-employed persons are <i>excluded</i> • Agriculture sector is <i>excluded</i> • Private household workers (nannies, housekeepers, and the like) are <i>excluded</i> • Unpaid family workers (persons working without formal pay in their family's business) are <i>excluded</i> • Workers on leave without pay throughout the reference period are <i>excluded</i> 	<ul style="list-style-type: none"> • Monthly sample survey of approximately 60,000 <i>households</i> • Designed to measure employment <i>and</i> unemployment with significant <i>demographic</i> detail • Reference period is the <i>week</i> that includes the 12th of the month • Only workers <i>aged 16 and older</i> are included • Employment measure reflects the number of employed <i>persons</i> • Multiple jobholders are counted <i>once</i> • Self-employed persons are <i>included</i> • Agriculture sector is <i>included</i> • Private household workers are <i>included</i> • Unpaid family workers are <i>included</i> • Workers on leave without pay throughout the reference period are <i>included</i>

on labor force status by detailed demographic characteristics, such as sex, age, race, and ethnicity. Data are collected not only on the employed, but also on the unemployed and on those persons who are not in the labor force.³

The CES survey is a Federal-State cooperative program in which the Bureau of Labor Statistics works with State employment security agencies to collect data each month on employment, hours, and earnings from a sample of nonfarm establishments, including government. The CES survey sample, which includes about 160,000 U.S. firms of all sizes, covers about 400,000 worksites. The survey counts nonfarm payroll jobs only—with no age restriction on the employed—and does not include the self-employed. Businesses report the number of persons on their payrolls who received pay during the pay period that includes the 12th day of the month. Workers who did not receive pay during the pay period are not counted. CES data are available by detailed industry and geographic area. In addition to collecting data on employment, the CES program provides

data on average hours paid and average hourly and weekly earnings for private-sector production or nonsupervisory workers.

Data strengths and limitations

The CPS has a broad definition of employment and provides detailed demographic characteristics on individuals by their labor force status. The CPS includes groups of workers that are not included in CES estimates: the self-employed, agricultural workers, unpaid family workers, workers on unpaid leave, and employees of private households. In addition, the CPS provides information on the Nation's workers by sex, race, Hispanic ethnicity, educational attainment, marital status, and other characteristics. Finally, the CPS categorizes data by occupation and industry. While, of course, useful, occupation and industry information provided by household respondents are more subject to nonsampling error than are establishment-based

surveys. Moreover, the relatively small sample that the CPS uses limits the ability of the survey to produce statistically reliable geographic information below the national level.

The CES survey provides detailed industrial and geographic information on the Nation's workers. Approximately 1,200 national series, some down to the most detailed level available under the 2002 North American Industry Classification System (NAICS), are generated from the survey. The CES State and area program provides data by industry for States and more than 270 metropolitan areas.

By design, the CES survey is a highly reliable gauge of monthly employment change. The CPS is designed to provide highly accurate *rates*, including estimates of unemployment rates and labor force participation rates. At about 60,000, the household survey sample is much smaller than the CES survey sample.⁴ As a result, and because of the design of the CPS, its employment estimates are subject to a larger sampling error than those of the CES survey—indeed, about 4 times as large on a monthly basis—and so are more volatile than estimates derived from the latter survey. In order for a change to be statistically significant, larger over-the-month changes are required in the CPS series than in the CES series.

The CES employment estimates are benchmarked annually to universe counts. Benchmarking is a regular “anchoring” of the estimates to universe counts of employment. The universe counts are derived from administrative data from the State Unemployment Insurance (UI) system and are collected by the Bureau of Labor Statistics for the Quarterly Census of Employment and Wages (QCEW) program (also referred to as the ES-202 program). The QCEW data cover about 97 percent of nonfarm employment. The Bureau uses various sources to benchmark the remaining nonfarm employment that is exempt or partially exempt from UI coverage. CPS employment estimates, by contrast, are not directly benchmarked to a universe count, but are controlled to estimates of the civilian noninstitutional population. The Census Bureau develops the population controls for the household survey from the decennial census and, between census years, projects population estimates based on administrative information on births and deaths and Census Bureau estimates of net international migration. The Census Bureau conducts an annual review and adjustment of the intercensal population controls.

Both the CPS and the CES survey publish data on a seasonally adjusted basis; that is, the data are adjusted for the normal seasonal variations that regularly occur in certain months during the year. For example, one kind of seasonal movement that occurs every year is the hiring of retail workers in December to staff stores for the holiday season. Seasonally adjusting the data for normal seasonal movements such as holiday hiring allows non-seasonal movements in the series, such as cyclical, trend, or irregular movements, to be analyzed.

The CPS conducts supplemental inquiries that are added to the regular CPS questions asked of households. Often, the sup-

plements are repeated annually or biennially. Topics include computer use, contingent workers, displaced workers, employment of veterans, volunteerism, and job tenure. The data gathered from these supplemental surveys provide further insight into the social, economic, and demographic characteristics of the labor force.

Recent changes to the surveys

Both surveys underwent major redesigns in the past decade. In 1994, the CPS survey questionnaire was completely redesigned to utilize computer-assisted interviewing methods, rather than a paper survey form.⁵ The new electronic format includes dependent interviewing techniques, whereby some questions are based on respondents' earlier answers, and it also allows complex skip patterns in the series of questions asked. In addition, the CPS redesign was intended to modernize the questions themselves in order to gather better information about respondents' employment status. The CES survey underwent a multiyear redesign beginning in 2000 and ending in 2003 that included replacing its quota sample design with a probability-based survey design and introducing model-based estimation for business births and deaths. Quota samples are known to be at risk for biases. Probability samples are designed to ensure a more representative sample and more accurate estimates. Both the CPS and CES redesigns included changes suggested by outside experts to address their various limitations.

The CES survey also introduced a number of changes in June 2003, in addition to completing the sample redesign and switching to the birth/death model.⁶ Another major change was the conversion to an entirely new industry classification scheme: the 2002 North American Industry Classification System (NAICS). In addition, the survey converted from a seasonal adjustment process in which seasonal factors were forecasted 6 months in advance to concurrent seasonal adjustment, in which seasonal factors are developed each month. Concurrent seasonal adjustment is preferable to forecasted factors because the most current information is used in the calculations. Furthermore, research showed that revisions between CES estimates and benchmarked data are smaller with concurrent seasonal adjustment.⁷

The CPS also introduced a number of changes in 2003. In January, it moved to new population controls that reflected the results of the 2000 census; the new controls raised the estimates of the civilian noninstitutional population level and, therefore, increased the estimated numbers of the employed and unemployed.⁸ The CPS data from January 2000 through December 2002 were revised to reflect these controls. Another change in January 2003 was the adoption of the 2002 Census Bureau occupational and industry classification systems, which are based on the 2000 Standard Occupational Classification (SOC) system and the 2002

NAICS. The CPS also moved to concurrent seasonal adjustment in January 2003.⁹

Methodological and conceptual differences

There are a number of differences in how employment is counted in the two surveys. One major difference has to do with counting jobs as opposed to counting employed persons. Another is how paid and unpaid workers are counted. There are also special cases that occur periodically, such as academic faculty in summer and decennial census workers, for which employment is counted differently.¹⁰

Count of jobs as opposed to count of employed persons. In the CES survey, the employment estimate provides a count of all nonfarm jobs. This means that persons working at more than one job would appear on more than one payroll and thus would be counted for each job. In contrast, the household survey provides an estimate of employed *persons*, and each worker is counted once regardless of how many jobs he or she holds.

Reference periods and paid and unpaid workers. The reference period for the household survey is the calendar week that includes the 12th day of the month. The CPS counts a person as employed if the person performed at least 1 hour of work during the reference week, whether as a wage and salary worker, as a self-employed individual in his or her own business or farm, or as an employee of a private household. Unpaid family workers are counted if they worked at least 15 hours in a family-owned business. Workers away on temporary unpaid absences also are included as employed, falling into a category known as “with a job, not at work.” This category includes workers who have a job at which they did not work during the survey week because they were on vacation, were ill, needed to take care of family or personal obligations, were on maternity or paternity leave, were involved in a labor dispute such as a strike, or could not work due to bad weather.

For the establishment survey, the reference period is the pay period that includes the 12th day of the month. The pay period can be weekly, biweekly, semimonthly, monthly, or some other period. Workers must have received pay for the pay period in order to be counted, regardless of whether they were present or on paid leave. Those on paid leave for the entire pay period are included in the survey, whereas those on unpaid leave are not. Workers on strike or on other unpaid work stoppages for the entire pay period are not included in the CES employment estimates.

Scope of coverage. As previously noted, the CPS has a much broader scope than the CES survey. The CPS includes the self-

employed, unpaid family workers, agricultural workers, those on unpaid absences, and employees of private households. The CES survey is a survey of nonagricultural business establishments, excludes the unincorporated self-employed, and requires that workers be paid in order to be counted.

Age limit. CPS data on employment are restricted to persons aged 16 years and older, while there is no age limit on who is reported to the CES survey. The CPS provides employment data categorized by age, whereas the CES survey does not have any details on age for its employment data.

Institutionalized workers. By definition, workers in any type of institution, such as a prison or a mental health facility, are not counted in the CPS, because the CPS sample represents the civilian *noninstitutional* population. The establishment survey also excludes workers in prison-sponsored work programs that take place *inside* the prison or other institution. However, Federal law did not specifically exclude prison workers from UI coverage (and hence from the CES benchmark data) until 1997. It is not known to what extent prison workers were reported in the benchmark data, if they were at all, before 1997. Inmates working *outside* the walls of a correctional institution are counted by the CES survey if they are covered by the State’s UI laws.

Persons on active duty in the U.S. military. In the CPS, active-duty members of the resident Armed Forces are considered to be out of the scope of the survey. Nor are active-duty service members counted in the CES survey, on the basis of their employment in the Armed Forces; however, if the service member also holds a secondary civilian (private-sector) job, the civilian job is counted in the CES.

Periodic trend differences

Although short-term movements in the two surveys’ employment measures sometimes differ (see box on next page), their long-term trends track rather well. An effective way to identify the notable divergences in trend in the two series’ histories is to chart the ratio of establishment survey employment to non-agricultural wage and salary employment from the household survey. (See chart 1; as the next section makes clear, the non-agricultural wage and salary series also is a convenient starting point for reconciling the two surveys.) When the surveys’ trends are viewed in this manner, some cyclical behavior can be observed: in many, but not all, instances, establishment survey employment increases relative to household survey employment during business cycle expansions (that is, the ratio increases), and household survey employment increases relative to the establishment survey measure during recessions (that is, the ratio declines).

Short-term differences in the employment measures

Over-the-month and short-term differences in the two surveys' employment measures are not uncommon. These divergences often result from large monthly swings in household survey employment, because the household survey is statistically much more volatile or "noisy" than the establishment survey. This volatility is due to the fact that the household survey has a smaller sample and is designed to optimize the measurement of the *unemployment rate*, not the employment level. The establishment survey, besides having a larger sample, is designed to optimize the measurement of the *over-the-month change in employment* and so provides a much more stable estimate of employment.

To illustrate, from 1994 through 2004, there were 23 months when household survey employment changed by about 500,000 over the month (using originally published data and not including months when survey changes caused breaks in the series). The establishment survey, by contrast, showed a change of that magnitude only once in those 10 years (also using originally published data), and that was due to an unusual weather event: a major blizzard that affected much of the Northeast.

Historically, the ratio has tended to remain within the range from 1.00 to 1.03, regardless of the business cycle. Brief exceptions occurred in the 1950s and 1960s. A more significant divergence in the 1990s, however, clearly stands out: beginning in 1992, establishment survey employment began growing more rapidly than household survey nonagricultural wage and salary employment. The ratio moved up fairly steadily and was nearly 1.06 by 2000; the discrepancy was unprecedented in size and duration.

Comparing and reconciling employment trends

Despite the numerous differences in the employment measures of the establishment and household surveys, it is possible to adjust them to a relatively similar concept for comparison. This "reconciliation" of the employment measures adjusts household survey employment to make it look more like establishment survey employment. As currently carried out by the Bureau of Labor Statistics, reconciliation involves subtracting the following categories from total household survey employment: all agricultural and related employment, the nonagricultural self-employed, nonagricultural unpaid family workers, private household workers, and workers on unpaid absences from their jobs. This series of subtractions roughly eliminates all major categories

of employment that are not in the scope of the establishment survey. (Note that the self-employed are specifically taken to be the *unincorporated* self-employed; the incorporated self-employed are considered employees of their own businesses and therefore are classified as wage and salary workers in the household survey.)

Next, the number of multiple jobholders whose primary job is nonagricultural in nature and who are wage and salary workers is added to the reduced household employment number. This step is needed because multiple jobholders are counted for each nonagricultural wage and salary job they hold in the establishment survey. These adjustments result in a household employment estimate with a definitional scope more like that of the establishment survey measure and one that reflects a "jobs" concept rather than an "employed persons" concept. This adjusted household survey employment measure can then be better compared with establishment survey employment to examine differences in trends between the two. (See table 1.)

It is important to remember that the adjustment of household survey employment is an imprecise exercise. For example, the adjustment for multiple jobholders is based only on the classification of those workers' primary jobs; the classification of their secondary jobs is not taken into account.¹¹ Because some of them are self-employed in their secondary jobs (and hence not counted twice in the establishment survey), this adjustment somewhat overestimates the multiple-jobholder effect. In addition, one must bear in mind that a number of other survey differences—in reference periods, age limits, and more—between the surveys are not accounted for in this reconciliation process.

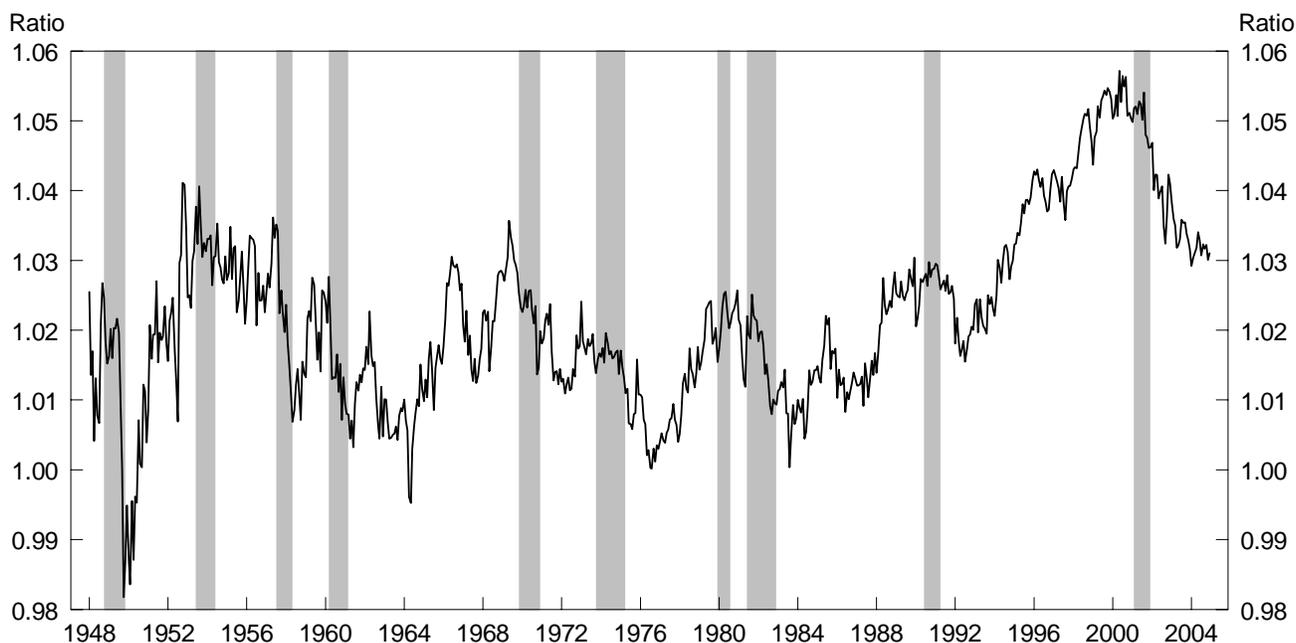
The household survey employment adjustment process just described can be carried out effectively only from 1994 forward. This is because the data on multiple jobholders became available on a monthly basis only following the 1994 major redesign of the household survey. After the nonagricultural self-employed, multiple jobholders represent the largest adjustment to household survey employment in the reconciliation process.

In comparing the earlier history of the two employment measures, the Bureau of Labor Statistics typically uses the nonagricultural wage and salary employment series from the household survey, as illustrated previously in the use of the ratio of establishment survey employment to household survey nonagricultural wage and salary employment. This comparison has some limitations, but is still very useful.

Previous work on reconciling the surveys

The issue of examining and attempting to reconcile differences between the household and establishment surveys has existed for decades. On September 27, 1962, a report from the President's Committee to Appraise Employment and Unemployment Sta-

Chart 1. Ratio of establishment survey employment to household survey nonagricultural wage and salary employment, 1948–2004



NOTE: Shaded areas indicate recessions. Data were current as of December 2, 2005.

tistics was released. Entitled “Measuring Employment and Unemployment,” it has come to be known as the Gordon report, after Robert A. Gordon, the chairman of the committee. A chapter in the report compared the employment series from the household and establishment surveys and noted that, in 1960 and 1961, the two series moved in opposite directions, with the household series showing an over-the-year increase of 203,000 while the establishment survey declined by 270,000. The authors noted the differences between the two series and created a reconciled household series for December 1960 by adjusting for (1) dual jobholders, (2) the 1950 census undercount, (3) postal workers who were not employed during the CPS survey week (at the time, CES Federal Government employment figures for the Postal Service reflected all temporary workers employed during December), and (4) unpaid absences. Before adjustment, the levels were 3.4 million apart; afterwards a difference of 1 million remained.¹²

The authors concluded that there were a number of explanations for the remaining difference, but few firm facts. They mentioned the effect of pay periods longer than 1 week, which should have increased the estimate of the number of multiple jobholders and job changers on payrolls. The authors also mentioned that the counts of multiple jobholders from the CPS may have been incomplete. In addition, some workers who reported that they were self-employed in the household survey

may have appeared on payroll records as employees. (At the time of the Gordon report, the incorporated self-employed were not separated from the unincorporated self-employed in the household survey. It was not until 1967 that a question on incorporation was added to the CPS questionnaire.) It also was theorized that the establishment data included some military personnel, institutionalized persons, persons under 14 years of age (at the time the household data encompassed those aged 14 and older), and Mexican and Canadian residents. Finally, the authors noted that there was a small, but persistent, undercount of part-time and occasional workers in the CPS and that it was possible (although no evidence existed for the claim) that the benchmark source used for the CES was overstated.

A number of studies followed the 1962 Gordon report. A December 1969 article by BLS economist Gloria Green examined over-the-year differences during the 1962–68 period and attempted to reconcile the annual levels.¹³ Green reconciled the two series for 1968 and discussed factors affecting the comparability of the data. She noted that unpaid absences, multiple jobholding, age limitations, the Census undercount of 1960, differences in survey coverage and periods, dissimilar ways of treating academic faculty, and different sampling and estimating procedures were all factors in the divergence between the employment series from the two surveys.¹⁴

Table 1. Adjusting household survey employment to a payroll-type concept, annual averages

[In thousands]

Employment	1994	2000 ¹	Change, 1994–2000	2001	2004	Change, 2001–04 ²
Payroll jobs	114,291	131,785	17,494	131,826	131,480	–346
Household employment	123,060	136,891	13,831	136,933	139,252	2,319
Less: Agriculture	3,409	3,382	–27	2,299	2,232	–67
Nonagricultural self-employed	9,003	8,765	–238	9,121	9,467	346
Nonagricultural unpaid family workers	131	104	–27	107	90	–17
Private household workers	966	900	–66	694	779	85
Unpaid absences	1,991	2,017	26	2,021	1,926	–95
Total	15,500	15,168	–332	14,242	14,493	251
Plus: Multiple jobholders ³	6,776	7,124	348	6,934	7,067	133
Adjusted household employment	114,336	128,847	14,511	129,625	131,825	2,200

¹ Household survey data for 2000 reflect revised population controls based on the 2000 census, not as originally published. Prior to the introduction of the population controls following the 2000 census, the adjusted discrepancy was approximately 1.5 million larger.

² Changes are based on unrounded data.

³ Multiple jobholders who are nonagricultural wage and salary workers on their primary job.

NOTE: CPS data for 1994 and 2000 are based on the 1990 census industry classification; data for 2001 and 2004 are based on the 2002 census industry classification. Data were current as of December 2, 2005.

In 1979, the National Commission on Employment and Unemployment Statistics' report *Counting the Labor Force* (also known as the Levitan report) compared employment figures from the CPS and CES from 1958 to 1978 and reconciled the two series for the year 1978.¹⁵ The authors noted that the two employment series tracked well between 1958 and 1978, although, during that period, the CES declined by larger amounts in recessions than the CPS did and expanded more in recoveries. One explanation given was that, because of the decennial census undercount and the resulting undercoverage every month, the CPS gave insufficient weight to the poor, minorities, and other disadvantaged groups. The authors noted that these types of workers experience the largest employment gains when labor markets tighten, yet suffer the largest declines in employment when labor demand is slack.

Later articles by BLS economists John Stinson and Paul Flaim looked at employment growth over various periods in the 1970s and 1980s in the household and establishment surveys. A 1983 study by Stinson examined the period from 1981 to 1983, in which the household survey showed more employment growth than the establishment survey.¹⁶ Data on multiple jobholding were not available during that time; therefore, Stinson was not able to include multiple jobholders in the reconciliation. Another study by Stinson in 1987 covered the 1982–86 period, in which CES employment grew more than CPS employment, and concentrated on the treatment of multiple jobholders.¹⁷ Data on multiple jobholding were collected from supplemental questions to the CPS asked in May of 1980 and 1985. Stinson noted that there was indirect evidence that the growth in multiple jobholding between 1980 and 1985 likely occurred during the recovery period after

the 1981–82 recession and would have contributed to the gap between the two surveys. Flaim examined the period from 1982 to 1989, when the CES showed more employment growth than the CPS.¹⁸ He reviewed the dual-jobholding issue and found that all of the excess employment growth in the CES relative to the CPS occurred in services industries, particularly retail trade and services. He noted that many of the jobs in these two industries are of a part-time nature, and rapid growth in the industries would have provided ample opportunities for workers to moonlight. Flaim also noted the difficulties in estimating the number of undocumented immigrants and their effect on population growth. During a period in which undocumented immigrants increased their numbers, problems with estimating the undocumented might have led to understated CPS population levels and employment. Flaim looked at individual States and noted that CES series tended to grow at a faster rate than CPS series in areas with strong labor demand and that this geographic pattern supported the hypothesis that the gap between the two series was related to an increase in multiple jobholding and a rise in undocumented workers.

All of these studies examined the divergence between the two surveys and offered reconciliation procedures, but none came to a definitive conclusion regarding the cause of the discrepancy.

The discrepancy during the 1990s

The most recent BLS study on the divergence issue was presented to the Federal Economic Statistics Advisory Committee in 2003.¹⁹ The report reviewed the most substantial employment

discrepancy in the surveys' history, which occurred in the 1990s, when establishment survey employment growth outpaced the employment growth measured by the household survey. The cumulative discrepancy in employment from 1994 to 2000 was approximately 4.5 million, after a definitional and conceptual reconciliation like that described earlier was carried out and before population control revisions to the household survey were introduced. (Table 1 shows that, after revision of the population controls following the 2000 census, the cumulative employment discrepancy between the payroll survey and the adjusted household survey from 1994 to 2000 was 2,983,000—that is, 17,494,000 payroll jobs minus 14,511,000 adjusted household employment.)

The study came to no definite conclusions as to the causes of the divergence. No complete explanation has been found to date, either by the Bureau of Labor Statistics or by outside researchers who have wrestled with the issue. Notwithstanding this frustration, at least one major factor in the discrepancy did come to light: understatement in the household survey population controls. In the years between decennial censuses, the population controls for the household survey are based on population estimates that the Census Bureau projects from the previous decennial census level. These intercensal estimates are derived from administrative data, namely, birth and death statistics, along with the Census Bureau's best estimate of net international migration. Gauging net international migration is the difficult part of the intercensal estimation process, because no data source exists that captures the full gamut of immigration—most obviously, the number of undocumented entrants to the United States. When new population controls based on the 2000 census became available in 2003, they showed that, by January 2000, the intercensal population estimates projected from the 1990 census base were approximately 2.6 million too low, and as a result, the household survey employment estimate was understated by about 1.6 million.²⁰ This understatement in the household survey population controls explained one-third of the 4.5 million cumulative gap in employment growth between the surveys in the late 1990s.

Many other possible factors in the 1990s discrepancy were investigated. In some instances, there was at least limited information on which to estimate their effect. For other factors, the Bureau could only speculate. The obvious starting point was to look at known definitional and conceptual differences that are not part of the standard reconciliation process. These factors include an age minimum in the household survey, persons with more than two jobs, secondary civilian jobs of members of the Armed Forces, employment among the institutional population, foreign commuters, and differences in the reference periods of the surveys. For three of these issues—the age minimum, persons with more than two jobs, and the reference period differences—some information was available from the household survey to help assess the potential effect.

With regard to the age minimum, the household survey employment estimates include only those aged 16 years and older; the establishment survey has no such restriction. Therefore, if an increasing number of teens younger than 16 began working in the 1990s, that factor might be a cause of the discrepancy. To test this hypothesis, the Bureau generated estimates of the number of employed 15-year-olds from the household survey.²¹ The estimates indicated an increase in employment among this age group from 1994 to 2000 (+79,000 over the 6-year period), but not nearly enough to provide an adequate explanation of the employment gap between the surveys.

A similar exercise was carried out to estimate the number of persons with more than two jobs. As discussed earlier, the standard reconciliation of the surveys adjusts roughly for multiple jobholders with two jobs; however, it does not account for those who have more than two jobs. A growing number of persons with more than two jobs (of a nonfarm payroll nature) could contribute to the discrepancy. Tabulations of these persons (not restricted by type of job) from the household survey indicated very little change (+21,000) from 1994 to 2000, effectively ruling this factor out as a major contributor to the gap.

BLS research also looked at reference period differences between the surveys. Because the establishment survey uses a “jobs” concept, it is possible that a worker who changes jobs in a short period of time will be counted twice in the survey (once by the old employer and again by the new employer), in particular because the establishment survey reference period may be longer than 1 week for some employers. The Bureau theorized that if job-to-job movement was picking up during the 1990s expansion, it could create some upward bias in establishment survey employment. Certainly, anecdotal information about rapid job changing abounded in the media during the expansion, particularly around 1999–2000, when the job market seemed especially tight, but data to support this impression were harder to come by.²² At the time the research was underway—from the late 1990s into 2000, for example—data from the BLS Job Openings and Labor Turnover Survey were not yet available. BNA, Inc., a private news and publishing firm, had (and still has) a turnover survey, the results of which indicated growing turnover with a peak in 1999. Regardless, both of these sources have a key limitation pertaining to this particular research: they measure job separations and are not necessarily indicative of rapid job-to-job movement.

The best measure of job changing was found in the household survey: respondents who have been identified as employed in consecutive months are asked if they still work for the same employer. This question is used to flag a potential occupation or industry classification change and is not normally tabulated. It has been part of the survey since 1994. The Bureau generated special tabulations of those who answered “yes” to the question and evaluated the trend since 1994 by looking at these job changers as a percentage of the total employed. Somewhat

surprisingly, this job-changing rate did not show any increase from 1994 to 2000.²³ As a result, what had seemed to be a promising explanation for the discrepancy did not pan out. The Bureau revisited this issue when it evaluated the discrepancy from the 2001 recession forward, and it was estimated that job changing played a small part. (The next section discusses the discrepancy after the 2001 recession.)

Three other conceptual differences between the surveys were examined as well. The first concerned secondary civilian jobs of members of the resident Armed Forces, which would be counted in the CES survey, whereas active-duty members of the Armed Forces are out of the scope of the CPS. On the basis of the relative levels and steady decline of active-duty military ranks during the 1990s, the Bureau essentially dismissed this factor as a possible contributory one. Second, the Bureau looked at employment among the institutional population—that is, the prison population. Prisoners working outside a correctional institution are counted by the CES survey if they are covered by the State’s UI laws; prisoners are out of the scope of the CPS.²⁴ Employment among the institutional population, too, was dismissed as a factor in the discrepancy, given the relative small number of employed prisoners nationwide.²⁵

The third conceptual difference examined was foreign commuters. In the CPS, only people who live in the 50 U.S. States and the District of Columbia are surveyed about their employment status. In the CES survey, only business establishments located in the United States are surveyed, regardless of where their employees actually reside. The BLS hypothesis was that if foreign commuters into the United States were a significant factor in employment growth, they would be reflected in the establishment survey, but not the household survey, because only U.S. households are in the latter’s scope. The Bureau tested this possibility by comparing employment from the two surveys at the State level. There was no consistent pattern of discrepancy among border States, although Texas, Arizona, and Minnesota had sizeable differences in employment growth between the two measures. In addition, the Bureau looked at the relative size and strength of establishment survey employment growth in selected metropolitan areas near border crossings. Even under the unlikely assumption that most of the growth in those areas resulted from foreign commuters, they would have accounted for about one-fifth of the discrepancy. So although the effect of foreign commuters cannot be ruled out altogether, it probably played only a small role at most.²⁶

Other areas of BLS research into the 1990s discrepancy had less direct information to utilize. Instead, the Bureau attempted to test various theories with what information was available. One such exercise tried to shed light on whether undocumented immigrant workers were a factor. The Bureau cannot determine the extent to which undocumented workers are reflected in either survey. However, reports from the Social Security Administration indicated that the 1990s saw sharp growth in the use of invalid

Social Security numbers on employer payroll records reported to tax authorities and that these records often were from industries that commonly employ undocumented workers.²⁷ Given this finding, the Bureau hypothesized that the establishment survey might be counting more undocumented workers in its employment measure than the household survey does. The assumption was that if employers were unknowingly or uncaringly submitting invalid worker Social Security numbers to the Internal Revenue Service and the Social Security Administration, it stood to reason that they also would include these workers in their establishment survey responses or their UI tax reports (which provide the benchmark data for the establishment survey).

On the household survey side, one could imagine that undocumented workers might be reluctant to disclose their labor market activities to the survey interviewer, despite the pledge of confidentiality that is given to all respondents. In addition, households with undocumented workers may be more likely to be missed by the survey sample, or, if these households are not missed altogether, then not all occupants in the household may get included.²⁸ What is called “undercoverage” bias may enter the household survey estimates when households or household members are missed in the sample. The missed portion of the sample is reflected in the final estimates when the survey results are weighted to the population controls; the persons missed will be assigned the labor force characteristics of their counterparts who were in the sample. To the extent that the labor force characteristics of those in the sample differ from the labor force characteristics of those missed, bias may be present in the final estimates. Put another way, it is often assumed that those in the sample have a higher employment rate than those who are likely to be missed and, furthermore, that the employment patterns of those who are missed are more cyclically sensitive. Therefore, if, during an expansion, employment growth was relatively greater among those missed by the survey, that growth might not have been fully reflected in the final estimates. Hence, household employment growth would have been understated.²⁹

Working under these assumptions, the Bureau looked for evidence of a discrepancy in counting undocumented workers by comparing household and payroll employment at the State level. This State employment comparison was examined in conjunction with the Immigration and Naturalization Service’s (INS’s) State estimates of the population growth of unauthorized immigrants. On the one hand, on the basis of INS estimates, a number of States with large discrepancies—Texas, Florida, Massachusetts, North Carolina, and Virginia—were believed to have experienced significant growth in undocumented immigrants in the 1990s. On the other hand, States such as California and New York did not have particularly large discrepancies relative to their size, yet were estimated by the INS to be the first- and third-ranked States for undocumented immigration growth. Thus, the role of undocumented workers in the discrepancy between the surveys remains unclear.

In another issue related to the household survey sample, the Bureau tested whether the geographic distribution of the sample might have missed employment growth during the 1990s expansion. The issue is that, although the household survey sample is designed to be nationally representative, it does not include all U.S. counties. The Bureau reviewed county-level data from the QCEW program (the establishment survey benchmark source) to see if employment growth in the counties that were excluded from the sample was greater than those which were in the sample. The growth rates of the counties in and the counties out of the sample compared favorably, and in fact, the rates were somewhat higher in the counties that were in the sample. Consequently, the Bureau dismissed the geographic distribution of the household survey sample from having played a role in the 1990s discrepancy.

The Bureau also looked at various types of response error that might occur in the two surveys and how they might play a role in the discrepancy. In the household survey, none of the known types of response error have a systematic bias that would fit the discrepancy pattern exhibited. In the establishment survey, a response error that caused an upward bias in the benchmark data (but not in the survey itself) was discovered in 1991 and later corrected. Since then, the Bureau has found no evidence that it has recurred.³⁰ Also, with regard to the establishment survey benchmark, the Bureau reviewed the secondary benchmark data sources (the so-called presumed noncovered) for errors and possible bias, but there were no indications of problems.

The discrepancy after the 2001 recession

During the 2001 recession, employment from the establishment and household surveys showed similar declines. Following the official trough of the recession in November 2001, however, establishment survey employment continued to decline while household survey employment began to show signs of growth. Because establishment survey employment was at a higher point entering the 2001 recession, this divergence in trend actually brought the two measures closer together. (See chart 2.) In early 2003, employment from the two surveys converged, and a few months later, establishment survey employment turned upwards. Employment from the two surveys tracked fairly closely from that point through the end of 2004.

Nevertheless, the conflicting directions of the two employment measures in late 2001 through early 2003—a period that was a critical juncture in the business cycle—drew much scrutiny from labor market analysts, perhaps more than the large discrepancy in the late 1990s. Even though the employment estimates from both surveys later trended upwards, the difference in employment growth measured by the two surveys was notable; from November 2001 through December 2004, for example, the CES survey showed an increase of 1.6 million while the CPS exhibited

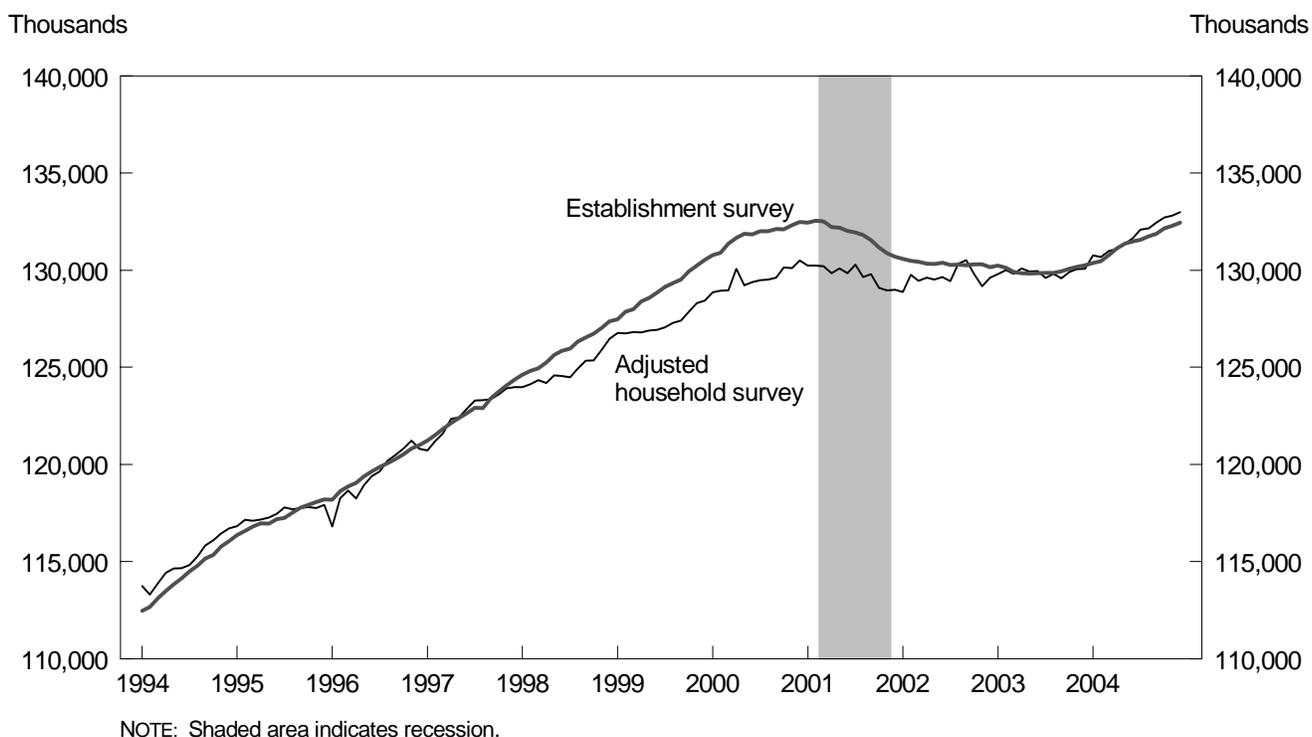
a rise of 4 million. This absolute difference added to the consternation of some observers, especially because it occurred during the period leading up to the 2004 election, when many were focusing on the state of the job market.³¹ (Table 1 shows the cumulative employment discrepancy between the payroll survey and the adjusted household survey, using annual average data for 2001 and for 2004. The discrepancy was $-2,546,000$ —that is, $-346,000$ payroll jobs minus $2,200,000$ adjusted household employment.)

The causes of the discrepancy following the post-2001 recession are not known, but it is possible that this discrepancy shared common factors with that of the 1990s. That is, the greater growth in establishment survey employment during the expansion of the 1990s may be correlated with the sharper decline it showed during and after the 2001 recession. It also is interesting to note that, when employment from the two surveys is evaluated in ratio form, as illustrated in chart 1, one sees that the ratio has been moving back to its “normal” range since the 2001 recession.

Some of the factors examined in the late 1990s have continued to be evaluated as contributors to the more recent discrepancy. Chief among these factors is the potential effect of rapid job changing on establishment survey employment. Although job-changing rates derived from household survey data did not help explain the discrepancy during the 1990s expansion, they did indicate that the rate of job changing slowed after the economy peaked in 2001. Since the last recession, the Bureau has undertaken a somewhat more sophisticated analysis in an attempt to gauge the potential effect of job changing on payroll employment. The approach takes into account the fact that the longer the employer’s pay period, the more likely a job changer is to be captured twice in the establishment survey. Because pay-period length is highly correlated with industry, BLS researchers established industry weights and looked at job-changing rates by industry and then at the aggregate level. As reported in August 2004, the results of the examination indicated that, from March 2001 through June 2004, the job-changing effect may have accounted for about 250,000, or 10 percent, of the discrepancy over that period.³² The Bureau is continuing to examine this issue and also is looking at other ways to test the impact of job changing.

Among many outside analysts, the household survey population controls also continued to be eyed as a source of discrepancy between establishment and household survey employment. With household survey employment showing so much more growth after the 2001 recession, some speculated that the CPS population controls were now overstating U.S. population growth and therefore employment growth. Specifically, some argued that the Census Bureau’s estimates of population growth after the 2000 census were too high, particularly because undocumented immigration might have slowed due to heightened security measures after September 11, 2001. No one, of course, can effectively prove or disprove this argument, given

Chart 2. Establishment survey employment and household survey employment adjusted to a payroll-type concept, 1994–2004



that full enumerations of the population are carried out only every 10 years to gauge the relative accuracy of the intercensal estimates. Between decennial censuses, no one knows how accurately the population estimates reflect the true population at any point. For example, the population control revision to the household survey following a decennial census could be relatively small, but in reality, the intercensal estimates at times may have strayed significantly high and low during the previous decade. The Census Bureau continues to look for ways to improve the relative accuracy of the intercensal population estimates and controls, but the task of quantifying undocumented immigration remains a daunting one.

Various other potential factors in the post-2001-recession discrepancy remain under review. Following are some additional areas that the Bureau of Labor Statistics has researched or continues to examine.

CES births. The CES survey is not able to include new firms (births) immediately. There is a lag between a firm's opening for business and appearing in the sampling frame. Likewise, there is a lag in capturing business deaths: if a sampled firm goes out of business, it usually stops reporting instead of reporting zero employees. The CES survey cannot immediately determine the

status of a reporter that is not responding; it takes time to learn whether a firm indeed has closed down. In order to reduce the sampling error due to not having timely information on entries and exits of firms, the CES survey uses a model-based approach, known as a "birth/death model," to adjust the sample-based estimates for the existence of new firms and for firms that go out of business. With the release of data in June 2003 and the full implementation of the new probability-based sample design, the survey began to use model-based birth/death factors across all industry series.

The birth/death model uses an estimation procedure with two components, the first of which utilizes business deaths to impute employment for a portion of business births and the second of which is an ARIMA time-series model designed to estimate the residual net birth/death employment not accounted for by the first component's imputation.³³ The net birth/death model component factors are unique to each month and include negative adjustments in some months.

Since the implementation of the birth/death model, there have been some criticisms from outside sources.³⁴ Analysts have suggested that, in some months, the number of jobs added due to the birth/death model was close to the total number of CES jobs created in a given month. However, one must note that

birth/death figures are not seasonally adjusted and therefore should not be compared with seasonally adjusted over-the-month changes in employment. In addition, the birth/death model contributes negative adjustments in some months. Comparisons of CES monthly estimates with the universe data, along with the relatively small benchmark revisions for March 2003 and 2004, indicate that the model has been performing well in recent times.

CES benchmark data. Along with some recurrent criticism of the establishment survey's effectiveness in estimating employment from business births, questions have been raised about the quality of the establishment survey benchmark data from the QCEW. QCEW statistics come from mandatory quarterly tax reports that employers file with State UI programs. Additional characteristics help make the QCEW a reasonably complete and accurate data source; for example, there are financial penalties for noncompliance. The UI system also has something of a built-in check mechanism: if a noncompliant firm lays off a worker and that worker files a UI claim, the employer will be identified and penalized. In addition, many States have integrated tax and licensing systems that check for compliance among sales, UI, and other tax rolls, as well as among applicants for licenses such as those required for selling alcoholic beverages.

Other questions and criticisms have concerned the timely capture of business births in the QCEW, because that, too, would have repercussions for the quality of the establishment survey data, specifically causing it to miss growth associated with the formation of new businesses. In 2004, the Bureau of Labor Statistics undertook a study to address just that issue, reviewing detailed administrative reports on State UI operations. The study found that, since 1995, about 80 percent of new businesses were in the database within 90 days and about 90 percent were captured within 180 days (including the years 1999 and 2000, when new-business formations were at peak levels). By third quarter 2003 (the latest quarter available at the time of the study), the percentage of new businesses captured in the database within 90 days had risen to 84.9 percent and the percentage captured within 180 days was 92.8 percent. Therefore, no change has emerged in the normal lag of capturing new-business formation in the benchmark data that would detrimentally affect the establishment survey employment estimates.³⁵

"Off-the-books" employment. Separately, some have theorized that "off-the-books" employment has caused or at least contributed to the postrecession discrepancy in the surveys' employment measures. The idea is that, although this type of economic activity obviously is not counted by the establishment survey, because the workers would not be shown on employer payrolls, the household survey will capture some or all of such activity. Some also theorize that "off-the-books" employment increases in a poor or weak labor market. Unfortunately, the Bureau cannot

test this theory, because there is no way to determine the extent to which such employment is reported in the household survey. "Off-the-books" employment undoubtedly will remain one of the issues associated with the employment discrepancy. It does not seem likely to hold any possible answers for the discrepancy that occurred in the 1990s, however, and for that reason, it may be questionable how much of an effect it has had since the recession.

Self-employment. Much has been written about the role of self-employment in the post-2001-recession job market. As previously discussed, the Bureau adjusts for this definitional difference in the surveys in its routine reconciliation; however, we know that the adjustment is imprecise. Any number of the self-employed work as independent contractors. In past years, periodic special supplements to the household survey have provided estimates of the number of independent contractors. When these estimates have been compared with information in the "basic," or standard, part of the household survey, the Bureau has found that about 12 percent to 15 percent of independent contractors are mistakenly reported as wage and salary workers, rather than self-employed, in the monthly employment estimates. In February 2001, this figure was about 1.2 million workers, or approximately 13 percent of all independent contractors. In February 2005, it was 1.4 million workers, still about 13 percent. Thus, despite the Bureau's best efforts to reconcile the employment measures from the two surveys, the household survey may be overstating the number of wage and salary workers to some extent through misclassification of some independent contractors. To the degree that this has occurred, the discrepancy since the 2001 recession would have been exaggerated.

Following the 2001 recession, there were many anecdotal reports about the growing use of independent contractors, because employers were thought to be reluctant to hire permanent workers on their payrolls. These contractors were dubbed "1099 workers" by some, after the Internal Revenue Service (IRS) form on which employers report payments made to independent contractors. The Bureau attempted to confirm the hypothesis of greater use of independent contractors with IRS tax data. Examining the trend in the issuance of IRS Form 1099-MISC, "Miscellaneous Income," in the pre- and postrecession years was not especially useful, because the form is used to report numerous types of income, not just that paid to independent contractors. The Bureau then obtained a special IRS summary of a subset of data from Form 1099-MISC. Specifically, the IRS provided a count of the number of taxpayers with nonemployee income reported on Form 1099-MISC, excluding instances in which a corporation issued the form to another corporation. The data showed an increase of about 565,000, or 4 percent, between 2001 and 2002. Viewed as a proportion of household survey employment, the number increased from 9.3 percent of total employment in 2001 to 9.7 percent in 2002. This special tabulation

probably came closer to identifying independent contractors, but still had its limitations,³⁶ a key one of which is that it is unknown whether the nonemployee income represents the worker's sole or primary work income. Undoubtedly, it represents secondary work income for any number of individuals, in which case they would already be included in household survey employment on the basis of their primary job. If that job is a nonfarm wage and salary job, those individuals also would be reflected in establishment survey employment. Although these data may provide some support to the notion that the use of contractors grew following the 2001 recession, any possible effect on the employment discrepancy in the surveys is unclear.

On a related note, some analysts have suggested that comparisons be made between self-employment data from the CPS and "nonemployer" statistics from the Census Bureau. The concepts and definitions used to create each of these data series are so different, however, that it is difficult to make comparisons between the two. The Census Bureau nonemployer data include businesses with no paid employees and that (1) have annual business receipts of more than \$1,000 (\$1 or more for construction establishments) and (2) are subject to Federal income taxes. The business may or may not be the primary job of the owner and can be either an unincorporated business (individual proprietorship), a partnership, or a corporation. The CPS is a household survey that categorizes persons into classes of worker—wage and salary, self-employed, or unpaid family worker—according to their primary job. There are no rules regarding receipts or taxability of the self-employed person's business. As previously mentioned, to be classified as self-employed in the CPS, the person must be performing his or her work as an unincorporated business; the incorporated self-employed are classified as wage and salary workers.

One specific group of self-employed workers the Bureau examined was real-estate agents, most of whom work solely for commission and are not covered under State UI laws. These employees tend to set their own work schedules and receive no benefits or leave. They are not considered employed in the establishment survey. In the household survey, real-estate agents who work only for commission are counted as employed. It is likely that many of these commissioned agents report themselves as self-employed in the CPS. CPS data show little increase in the number or proportion of self-employed real-estate agents between 2000 and 2004. However, these data do show an increase in the number of real-estate agents classified as wage and salary workers (about 100,000) over the period. What is not known is the extent to which any of these agents are *misclassified* as wage and salary workers. The increase in real-estate agents classified as wage and salary workers from 2000 to 2004 is small enough, though, that even if they were all misclassified, there would be little effect on the gap between the CPS and the CES survey.

Limited-liability companies. The limited-liability company (LLC) is a fairly new type of business organization. An LLC is a type of business entity used by small-business owners; its liability is similar to that of a corporation, in that none of the members of an LLC are personally liable for its debts. An LLC may be classified for Federal income tax purposes as a sole proprietorship (referred to as an entity to be regarded as separate from its owner), a partnership, or a corporation. According to statistics from the Internal Revenue Service, the number of LLC's rose from about 119,000 in 1995 to 946,000 in 2002.³⁷ There is some question as to how these persons are reported in the CPS. Owners of LLC's should be reported as self-employed, and their being misclassified as wage and salary workers would influence the discrepancy between the two surveys. The Bureau of Labor Statistics cannot be certain how much, if any, misclassification of LLC owners is occurring in the CPS. Nor is it known to what extent LLC owners are included in the CES survey. An informal survey of State government Web sites showed that UI coverage mandated by States varied. In some States, LLC owners were not covered at all, and in others they could elect coverage. In determining eligibility for UI coverage, some States also take into account the LLC's IRS filing status or the owners' proportions of ownership interest. The Bureau is continuing to review the LLC issue.

Welfare-to-work programs. Beginning in 1996, the welfare program known as Aid to Families with Dependent Children was replaced by Temporary Assistance for Needy Families (TANF) as part of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996. TANF requires participation in work opportunities as a condition for receiving benefits, and there is a 5-year limit to each family's participation in the program. Work activities under TANF include unpaid and paid work, both subsidized and unsubsidized, along with activities such as training and education that are directly related to employment. Theoretically, the CES survey and the CPS treat these workers differently, depending on whether the jobs are subsidized or unsubsidized; however, the actual reporting practices of survey participants and their employers are not known. Paid, unsubsidized employment should be covered by both surveys. Subsidized employment would be treated differently. Workers in subsidized jobs would be covered in the CPS, because such workers would be considered to be employed, regardless of who pays them. Under the CES survey, if the employer is paying any portion of the wages of a worker in a subsidized job, then the worker should be reported as employed. If the subsidy is paid directly to the welfare recipient and the employer does not pay his or her wages, then the worker would not be counted as employed. It is not known to what extent welfare-to-work participants in subsidized jobs are included in CES employment.

According to data from the Administration for Children and Families, of the Department of Health and Human Services, the

number of adult participants in TANF has been declining, as has the proportion of participating adults engaging in work for which they received pay.³⁸ By contrast, the proportion of participating adults engaging in *unpaid* work activities has been increasing. In fiscal year 1999, the average monthly number of adults who participated in work activities was about 885,000. Of these participating adults, about 590,000, or 67 percent, participated in at least some paid activities. By fiscal year 2004, the number of adults who participated in at least some work activities was down to about half a million, with 49 percent of adults, or about 245,000, on average, participating in paid work activities.

Because, theoretically, the CPS would count all welfare-to-work participants, whether in subsidized or unsubsidized work activities, that survey would include more of these workers than the CES would. However, the number of adults in TANF who participate in paid work activities is fairly small and has been declining. It is not likely that the different coverage between the two surveys would have contributed much to the discrepancy in growth as estimated by the CPS and by the CES.

Other factors. Although several other factors were previously found to be rather small and to have little or no impact on the discrepancy, the Bureau continues to look at them. Among these factors are multiple jobholders with more than two jobs and employed 15-year-olds. More recent observations for 2001–04 are similar to what was observed before the recession: 15-year-old employment accounts for a small portion of the discrepancy (–110,000), and multiple jobholders with more than two jobs had a small increase (+44,000). The net effect still explains very little of the discrepancy.

THE EMPLOYMENT MEASURES FROM THE BLS HOUSEHOLD

Notes

ACKNOWLEDGMENTS: The authors gratefully acknowledge the earlier work of Thomas Nardone, Jurgen Kropf, Katie Kirkland, and Signe Wetrogan, as well as research on job changing by Anne Polivka and John Stewart. All of their work made an important contribution to this article. The authors also thank Peter Sailer of the Internal Revenue Service for his assistance in creating the special tabulations of IRS form 1099–MISC.

¹ The National Bureau of Economic Research is generally recognized as the arbiter of business-cycle turning points. The organization determined that the latest recession began in March 2001 and ended in November of that year.

² Since this article was prepared, data for recent years have been subject to routine revisions for seasonal adjustment, household survey population controls, and establishment survey benchmarking. These revisions do not significantly change the discrepancy between the surveys as it is described herein.

³ Detailed information on both the CES survey and the CPS is found in the *BLS Handbook of Methods*, on the Internet at <http://www.bls.gov/opub/hom/homtoc.htm>. (See chapter 1 for the CPS and chapter 2 for the CES survey.)

and establishment surveys have different definitional scopes and concepts, are produced by means of distinct survey methodologies, and have their own relative strengths and weaknesses as statistics. It is possible to adjust the employment measures to a more similar concept for comparison. This adjustment process addresses some of the primary differences in concept and scope: number of jobs compared with number of employed persons (resulting in the multiple-jobholder effect) and coverage of the agricultural sector, the self-employed, unpaid family workers, private household workers, and workers on unpaid absences.

Adjusted for major differences, the employment measures track rather well over time, but they have exhibited periodic trend discrepancies throughout their histories. Although many theories about the discrepancies have been put forth, complete explanations have never been found for any of the divergences, despite a significant amount of research by the Bureau of Labor Statistics and by outside analysts. Population controls in the household survey have been shown to be a factor in the past, and the Bureau also has some evidence that the misclassification of some self-employed and rapid job changing may contribute to the discrepancy. Other potential factors are extremely difficult to test or measure. Questions remain, for example, about the possible effect of “off-the-books” employment and the inclusion of undocumented workers in the two surveys. The Bureau continues to investigate many of the factors described in this article and also to look for new avenues of research. Divergences in the two surveys’ employment measures may occur again. At such times, data users and analysts would be well served not to think of one survey as “right” and the other “wrong,” but to consider their statistical strengths and the distinct information that each provides and then weigh them accordingly. □

⁴ The household survey sample of approximately 60,000 addresses is selected from all counties and independent cities in the United States. The 3,141 counties and cities are formed into 2,007 sample areas (Primary Sampling Units, or PSU’s), which are then grouped into strata within each State. Then one sample area is chosen from within each stratum, with the probability of selection proportional to the population within the PSU; this totals 754 PSU’s. Sampling groups within these PSU’s are in the sample for 4 consecutive months, leave the sample for the next 8 months, and then return for the next 4 months. In each month, 1 of the 8 rotation groups is in its first month, while another rotation group is in its second month, and the group in its fifth month is returning after a break of 8 months. This rotation procedure allows the sampled households not to be overburdened.

The CES sample includes about 160,000 businesses and government agencies in the United States, covering about 400,000 worksites. In June 2003, the CES program completed a redesign and moved from a quota-based sample to a probability-based sample. The program began to introduce the new sample in 2000 with one industry, and by June 2003, it was used for all industries under NAICS. The new sample design is a stratified, simple random sample of worksites clustered by Unemployment Insurance (UI) account number. The sampling frame for the

CES survey is the list of employers in the Longitudinal Database (LDB), a universe file of business establishments that is derived from the UI tax system and collected by the BLS Quarterly Census of Employment and Wages (QCEW) program. The frame and the sample are updated twice a year. The sample is stratified by State, employment size, and industry. Each year, approximately 40,000 new units are added to the sample in order to rotate part of it, get representation from new firms, and realign the sample distribution with the universe distribution.

⁵ For more information on the 1994 CPS redesign, see “Revisions in the Current Population Survey Effective January 1994,” *Employment and Earnings* (Bureau of Labor Statistics, February 1994), pp. 13–37.

⁶ For further details on changes in the CES survey in 2003, see Teresa L. Morisi, “Recent changes in the national Current Employment Statistics survey,” *Monthly Labor Review*, June 2003, pp. 3–13; on the Internet at <http://www.bls.gov/opus/mlr/2003/06/art1full.pdf>.

⁷ Concurrent seasonal adjustment for the CES uses updated seasonal factors not only for the latest month, but also for the previous 2 months. With the release of each new estimate, these factors are routinely revised to incorporate additional sample responses for those months. Once a year, 5 years of historical monthly estimates are revised with the latest seasonal factors. For further information on concurrent seasonal adjustment for the CES, see Chris Manning, “Concurrent seasonal adjustment for national CES survey,” *Monthly Labor Review*, October 2003, pp. 39–43; on the Internet at <http://www.bls.gov/opus/mlr/2003/10/ressum2.pdf>.

⁸ Some changes to the composite weighting also were implemented in the CPS in January 2003, and the survey questions on race and Hispanic ethnicity were modified to comply with new standards set by the Office of Management and Budget. Further details on the CPS changes in January 2003 are found in “Revisions to the Current Population Survey Effective in January 2003,” on the Internet at <http://www.bls.gov/cps/rvcps03.pdf>, and in *Employment and Earnings* (Bureau of Labor Statistics, February 2003), pp. 4–23.

⁹ In the CPS, only the latest month is seasonally adjusted with the latest seasonal factors. Once a year, 5 years of historical monthly estimates are revised with the latest seasonal factors.

¹⁰ Two such situations are as follows:

Faculty in schools. The CES survey has a special treatment for “regular” faculty members of elementary and secondary schools and colleges and universities. Regular faculty are those persons who are professional or certified and who have a contractual arrangement (written or otherwise) for 1 or more years. Regular faculty are counted as employed the entire year, regardless of whether they get paid year round or have 9- or 10-month payment plans. This means that regular faculty members who do not work during the summer break or other breaks are still counted as employed. The treatment of regular faculty members differs from that of workers in all other industries in the CES program, who must have been paid during the reference week in order to be counted. In the CES survey, if regular faculty take another job during the summer months, they are counted twice for those months. The household survey has no such special treatment for faculty. One of the categories for those “with a job, not at work” includes vacation; therefore, faculty with a written or verbal contract to return to teaching in the fall would still be counted as employed during the summer break. Because CPS employment is a count of those employed, faculty who take a second job during the summer are not counted twice.

Census workers. Every 10 years, the Census Bureau hires a number of temporary workers to staff the decennial census. Although some hiring is done prior to the census year, the bulk of the increase in workers and of the subsequent decline occurs in approximately February through May of the census year. The influx of these workers causes spikes in Federal Government employment and in total nonagricultural employment in the CES survey as additional jobs are added to payrolls.

In order to count the new workers accurately, the Census Bureau transmits to the CES program actual counts of temporary workers hired to staff the census, and the CES program incorporates the counts into the CES survey estimates. The household survey does not add in outside counts for temporary census workers. Because the CPS counts each person who is employed once and does not count jobs, persons who have second jobs as temporary census workers will not be counted twice, as they would be in the CES survey. Household survey employment does not show any discernible effects due to the hiring of temporary census workers.

¹¹ These data on secondary jobs are available from outgoing rotation groups in the CPS sample.

¹² “Measuring Employment and Unemployment,” President’s Committee to Appraise Employment and Unemployment Statistics, 1962, pp. 113–21.

¹³ Gloria P. Green, “Comparing employment estimates from household and payroll surveys,” *Monthly Labor Review*, December 1969, pp. 9–20.

¹⁴ See note 10, earlier, for a description of the treatment of faculty.

¹⁵ *Counting the Labor Force* (National Commission on Employment and Unemployment Statistics, Labor Day 1979), pp. 193–99.

¹⁶ John F. Stinson, Jr., “Comparison of Nonagricultural Estimates from Two Surveys,” *Employment and Earnings*, March 1994, pp. 6–9.

¹⁷ John F. Stinson, Jr., “Moonlighting: a key to differences in measuring employment growth,” *Monthly Labor Review*, February 1987, pp. 30–31.

¹⁸ Paul O. Flaim, “How many new jobs since 1982? Data from two surveys differ,” *Monthly Labor Review*, August 1989, pp. 10–15.

¹⁹ Thomas Nardone, Mary Bowler, Jurgen Kropf, Katie Kirkland, and Signe Wetrogan, *Examining the Discrepancy in Employment Growth between the CPS and the CES*, report to the Federal Economic Statistics Advisory Committee on October 17, 2003; on the Internet at <http://www.bls.gov/bls/fesacp2101703.pdf>. Note that the reconciliation methodology used at the time was somewhat different from the current procedure. As a result, the report to the committee shows the unexplained portion of the employment discrepancy for 1994–2000 to be 4.2 million, somewhat less than the 4.5 million derived with current methods for this article.

²⁰ See Mary Bowler, Randy E. Ilg, Stephen Miller, Ed Robison, and Anne Polivka, “Revisions to the Current Population Survey Effective in January 2003,” *Employment and Earnings*, February 2003, pp. 4–23; on the Internet at <http://www.bls.gov/cps/rvcps03.pdf>.

²¹ In the household survey, the questions designed to elicit household members’ employment status are asked about all household members aged 15 years and older. The published estimates, however, reflect only those aged 16 years and older.

²² The idea that both job changing and the different survey reference periods contribute to the discrepancy between the surveys has been around for some time. Earlier research in this area—by Antos, Barkume, Mixon, and Triplett in 1976, for example (cited in Nardone, Bowler, Kropf, Kirkland, and Wetrogan, *Examining the Discrepancy*)—was hindered by even less information than is available now.

²³ Research by Bruce C. Fallick and Charles A. Fleischman, economists at the Federal Reserve Board, came to a similar conclusion. (See *The Importance of Employer-to-Employer Flows in the U.S. Labor Market*, Finance and Economics Discussion Series working paper 2001–18 (Federal Reserve Board, Division of Research and Statistics and Monetary Affairs, April 2001).)

²⁴ The establishment survey benchmark data are based primarily on administrative tax reports filed with State UI programs and provided to the Bureau of Labor Statistics for the agency’s QCEW program. Prison workers were not formally excluded from coverage under Federal UI law until 1997. Although the Bureau never identified any instances in

which prison workers were reported in the QCEW employment figures, the possibility that they were did exist before 1997.

²⁵ See *2000 CIA Directory* (Baltimore, Correctional Industries Association, 2000).

²⁶ On a related note, the CES employment measure includes a relatively small number of American workers employed by U.S. companies overseas. These workers are not in the scope of the CPS. In the mid- to late 1990s, there were fewer than 10,000 such workers, representing only a tiny portion of the discrepancy between the surveys.

²⁷ See *Patterns of Reporting Errors and Irregularities by 100 Employers with the Most Suspended Wage Items*, Audit Report A-03-98-31009 (Office of the Inspector General, Social Security Administration, September 1999); and *The Social Security Administration's Earnings Suspense File Tactical Plan and Efforts to Reduce the File's Growth and Size*, Evaluation Report A-03-97-31003 (Office of the Inspector General, Social Security Administration, February 2000).

²⁸ See, for example, Manuel de la Puente, *Using Ethnography to Explain Why People Are Missed or Erroneously Included by the Census: Evidence from Small Area Ethnographic Studies* (U.S. Census Bureau, Center for Survey Methods Research, 1995); on the Internet at <http://www.census.gov/srd/papers/pdf/mdp9501.pdf>.

²⁹ Simon Potter and Chinhui Juhn of the Federal Reserve Bank of New York present an excellent discussion of undercoverage in their article "Explaining the Recent Divergence in Payroll and Household Employment Growth," *Current Issues in Economics and Finance* (Federal Reserve Bank of New York, December 1999); on the Internet at http://www.ny.frb.org/research/current_issues/ci5-16.html.

³⁰ The response error that occurred in the CES benchmark data—monthly employment figures reported by employers in their State UI tax reports and provided to the Bureau of Labor Statistics for the QCEW program—was discovered when CES employment estimates and the benchmark data diverged significantly in 1991.

³¹ Although many focused on the absolute difference in employment growth between the surveys, others conducted a more thoughtful analysis that compared the trend in the employment-population ratio from the CPS—a statistically stronger measure than the CPS employment level—with CES employment and found that they both indicated a similar, less-than-robust labor market. (See Mark Schweitzer and Guhan Venkatu, "Employment Surveys are Telling the Same (Sad) Story," *Economic*

Commentary (Federal Reserve Bank of Cleveland, Research Department, May 15, 2004); on the Internet at <http://www.clevelandfed.org/Research/Com2004/05-15.pdf>.

³² More detailed information is available on the BLS Internet site at <http://www.bls.gov/ces/cesjobch.pdf>.

³³ In its seasonal adjustment process, the Bureau of Labor Statistics uses x-12 ARIMA software developed by the Bureau of the Census. For further information on both the net birth/death model and benchmark revisions, see Kirk Mueller, "BLS Establishment Estimates Revised to Incorporate March 2005 Benchmarks," *Employment and Earnings*, February 2006; on the Internet at <http://www.bls.gov/web/cesmart.htm>.

³⁴ On a related note, some who criticized the establishment survey for failing to capture new firms have used the terms "new firms" and "startups" interchangeably with "self-employed." These are distinct employment concepts and such usage is misleading. As previously mentioned, the CES survey does not include the unincorporated self-employed; the household survey provides this information. The CES birth/death model is used to estimate employment associated with new firms that have payroll employees.

³⁵ For additional information, see "Assessing the Timeliness of Business Births in BLS Establishment Statistics" (Bureau of Labor Statistics, Apr. 7, 2004); on the Internet at <http://www.bls.gov/cew/eta581study.pdf>.

³⁶ The IRS Statistics of Income Division tabulated for the Bureau the number of taxpayers with nonemployee income reported on Form 1099-MISC from Individual Statistics of Income samples matched to Forms 1099-MISC from the Information Returns Master File. These samples excluded instances in which a corporation issued a 1099-MISC to another corporation. Even this refined tabulation, however, would include a number of types of payments that were not necessarily for independent contractor services, so it should not be construed as an estimate of the number of independent contractors.

³⁷ Statistics of Income Division, Internal Revenue Service, Table 11, Partnership Returns: Selected Balance Sheet and Income Statement Items for Specific Income Years. These types of companies are under-stated because some businesses failed to answer the question about type of partnership on their tax returns.

³⁸ The BLS analysis categorized paid and unpaid work as follows: paid work includes unsubsidized employment, subsidized private employment, and subsidized public employment; unpaid work includes work experience programs, on-the-job training, job searches, community service, vocational education, job skills training, education, providing childcare, and other TANF-approved activities.