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DIVERGING EMPLOYMENT DATA:  
A CRITICAL VIEW OF THE  
PAYROLL SURVEY

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# DIVERGING EMPLOYMENT DATA: A CRITICAL VIEW OF THE PAYROLL SURVEY

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One of the most visible economic issues in this presidential primary election cycle is the apparent failure of the economy to create jobs. Even though the U.S. economy has been growing strongly for over two years, many analysts have focused on an illusion of 2.2 million “lost jobs” since President George W. Bush took office. The illusion stems from a survey of employment conducted each month by the U.S. Bureau of Labor Statistics (BLS), officially referred to as the Current Employment Statistics (CES) survey and commonly known as the *payroll survey*.

Like all surveys, the CES suffers from a number of problems that are well known to data analysts. However, the payroll survey contains a unique methodological problem: It systematically overcounts the jobs held by one person when that person changes employers. The existence of a potential turnover effect is not new. But worker turnover is far below its pre-war norm, with potentially large consequences for estimates of total employment.

This paper takes a critical view of the payroll survey and finds that:

- **The payroll survey double-counts many workers who change jobs and is now artificially deflated because job turnover is down.** Decelerating turnover in 2002–2003 explains up to 1 million jobs artificially “lost” in the payroll survey since 2001.
- **The BLS household survey indicates record high employment.** The disparity of

3 million jobs (in employment growth) between the household and payroll surveys since the recovery began is unprecedented.

- **The disparity between the two BLS surveys of total employment is cyclical.** The disparity widens during recessions and narrows during periods of rapid growth in gross domestic product (GDP). Such variation strongly suggests a statistical bias in one of the surveys.
- **Payroll survey data are always preliminary.** Past revisions have regularly shown the initial estimates to be off by millions of jobs. For example, initial estimates of job losses in 1992 were revised in 1993, 1994, and 1995 and now show net job creation.
- **The payroll survey does not count the surge in self-employment.** The household survey has recorded a surge of 650,000 self-employed workers. This number may be even higher if modern workers in limited liability companies and in consulting positions with traditional firms are not identifying themselves as self-employed.

Most economic indicators suggest an improving economy since November 2001, except for the loss of payroll jobs according to the CES. Aside from the payroll survey, most labor indicators suggest an improving labor market: Real wages are rising, unemployment is low and declining, and jobless claims are down. The sharpest contrast is the record high level of total employment: 138.6 million according to the Labor Department’s *household*

survey, formally known as the Current Population Survey (CPS).

Since the recession ended in November 2001, payroll jobs are down by 716,000 as opposed to a CPS increase of 2.2 million employed Americans. This 3 million–job mystery can be resolved through a critical examination of what the two surveys measure and how those measures should be recalibrated for an economy that has evolved dramatically. Congress should not be moving to protect jobs or meddle in labor markets if, as the facts show, those markets are functioning well. This report reviews the problems with the payroll survey and highlights two new innovative data series recently introduced by the Department of Labor.

The level of total employment according to the household survey, shown in Chart 1, is different from the payroll level by definition. For example, nonfarm payrolls do not count agricultural and self-employed workers. More important, payrolls will count an individual twice if he or she works two jobs or changes jobs during the pay period. Although the two survey employment levels track closely over time, the gap between them is somewhat irregular.

Chart 2 shows the accumulated increase in employment in the months after a recession ends and compares the current recovery period to the two survey levels averaged over the last five recessions. Trends of job recovery in the different surveys after the last five recessions appear almost identical, whereas this recovery has seen unprecedented declines in payroll employment. With the other economic indicators signaling a normal recovery during 2003, Chart 2 makes a compelling case that the payroll survey—not the household survey—is behaving oddly.

**IS THE BLS TO BLAME?**

The statistical and economic staff at the BLS has built a well-deserved reputation for professionalism and public service, yet the recent divergence among surveys during a sensitive political season has led some to cast doubt on the government

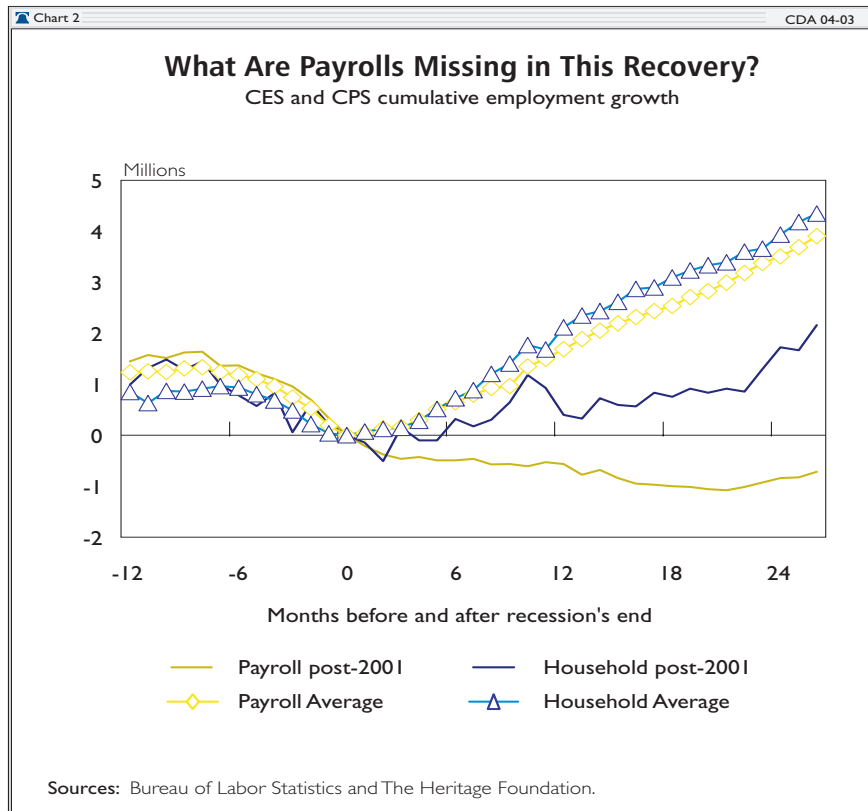
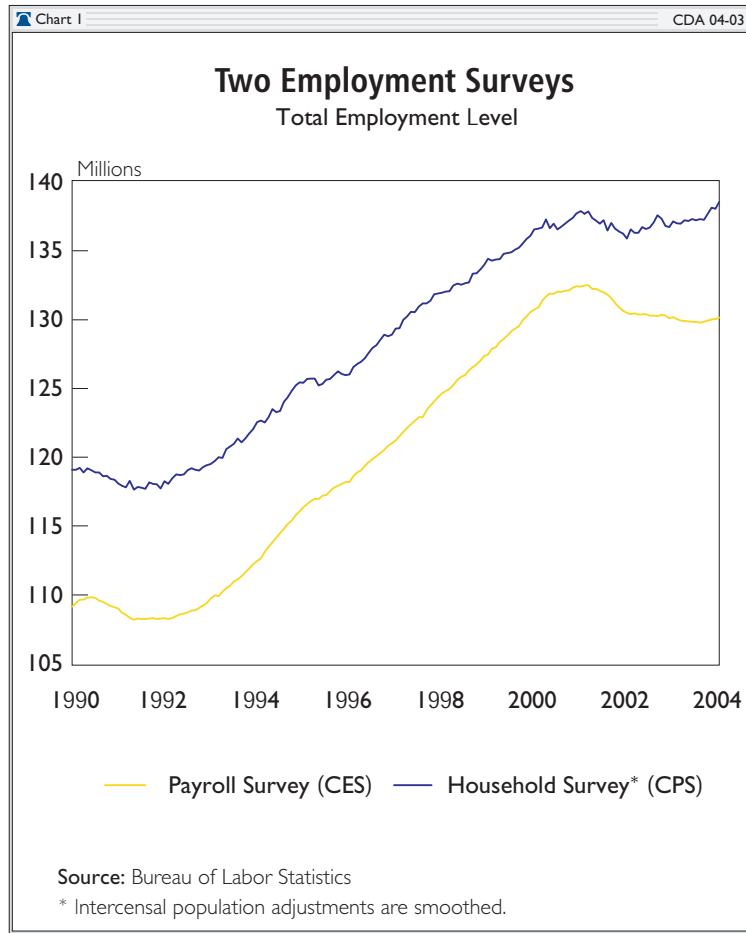
Table 1		CDA 04-03
<b>Labor Market Indicators</b>		
<u>Positive Indicators</u>	<u>Negative Indicators</u>	
138.6 million working Americans, a record high	Payroll job growth is anemic.	
+2.2 million working Americans since Nov. 2001	19.6 week average unemployment duration	
Unemployment rate declined 6 of the last 7 months to 5.6%		
Real earnings up 3% over 3 years		
Productivity growth at record levels		
Jobless claims 10% below historical average		

workers who publish the data or to question their methodology. But many doubts are politically driven and are a poor substitute for objective inquiry. It is unfair to criticize the BLS for the job growth mystery, especially when the first possible explanation is that both surveys are behaving normally.

The results are puzzling because the surveys are measuring a changing economy, not because the surveys are any different or less correct in their methodology. Analysts know intuitively that today’s economy is structurally different from the economy of five or 10 years ago, but the consequences of the new economy are difficult to predict. Perhaps payroll jobs are weak simply because the modern company relies less on payrolls for engaging the labor force.

If that is the case, the current pattern of declining payroll jobs alongside rising individual employment makes perfect sense. However, additional measurements are needed to prove the hypothesis.

In fact, without any additional funding or guidance, the BLS quietly unveiled an innovative data series known as Business Employment Dynamics (BED) on September 30, 2003. The BED series aspires to reveal “creative destruction” in labor markets. The BED reports gross job flows on all new jobs gained and all jobs lost, in contrast to the net result available in the CES and CPS surveys. The results are startling and may serendipitously solve the current mystery of the diverging surveys. More than 7 percent of jobs are destroyed each quarter, and another 7 percent are created. The implications of total job turnover and its effect on net payroll counts are profound.



## CONVENTIONAL WISDOM PREFERS THE PAYROLL SURVEY

*It is our judgment that the payroll survey provides more reliable information on the current trend in wage and salary employment.—Kathleen P. Utgoff, Commissioner, Bureau of Labor Statistics<sup>1</sup>*

Analysts of U.S. labor markets have usually preferred the payroll survey data over the household survey data. Since the two total employment series have generally moved in tandem, there was little need even to question the payroll data. In fact, the large swings from one month to the next in CPS employment estimates made them less useful for forecasting. However, the widening divergence in the two series has shaken the conventional wisdom.

On numerous occasions, the BLS has reaffirmed the reliability of the payroll survey, especially for comparisons of employment levels over time. Other respected observers, including economists at the Federal Reserve and Congressional Budget Office (CBO), have also expressed a preference for the payroll survey. A recent paper by Elise Gould of the Economic Policy Institute makes one of the strongest cases for the orthodox view and serves as a good baseline for conventional errors in the conventional wisdom.<sup>2</sup> The rationale for favoring the CES payroll series is often repeated in the media and boils down to three seemingly clear and compelling arguments:

### Rationale #1: The household survey is volatile.

This rationale is fundamentally a critique that the CPS is not designed as a time series. Gould says, “The household survey is extremely volatile,

Table 2		CDA 04-03	
Labor Department Definitions			
CPS “Household Survey”		CES “Payroll Survey”	
<p>“The household survey provides the information on the labor force, employment, and unemployment that appears in the A tables, marked HOUSEHOLD DATA. It is a sample survey of about 60,000 households conducted by the U.S. Census Bureau for the Bureau of Labor Statistics (BLS).</p> <p>“The sample is selected to reflect the entire civilian noninstitutional population. Based on responses to a series of questions on work and job search activities, each person 16 years and over in a sample household is classified as employed, unemployed, or not in the labor force.”</p>		<p>“The establishment survey provides the information on the employment, hours, and earnings of workers on nonfarm payrolls that appears in the B tables, marked ESTABLISHMENT DATA. The sample includes about 160,000 businesses and government agencies covering approximately 400,000 individual worksites. The active sample includes about one-third of all nonfarm payroll workers.</p> <p>“Employees on nonfarm payrolls are those who received pay for any part of the reference pay period, including persons on paid leave. Persons are counted in each job they hold.”</p>	
Source: Bureau of Labor Statistics.			

indicating its inadequacy for analyses of month-to-month employment trends,” which she attributes to its “smaller sample size.” But the experts at the Labor Department assert that the CPS is designed as a time series, notably ratios like the unemployment rate and the employment–population ratio.

However, level estimates like total employment and the size of the labor force reported in the CPS are extrapolated based on population estimates and are consequently subject to large annual adjustments to the Census Bureau’s population estimate. Footnotes in the Joint Economic Committee’s *Economic Indicators* warn that civilian employment levels from the household survey are “not strictly comparable with earlier data.”<sup>3</sup> Comparability is problematic because the annual fix gets lumped into the month of January for every year. Those adjustments could be smoothed over each month of the year if the goal was to make the series comparable over time. Until now, the BLS had no incentive to do so, especially because the payroll survey was already serving as the time series to watch.

The high variability on a month-to-month basis is a concern, but critics should take care to understand its real cause. High variability in the CPS,

1. Kathleen P. Utgoff, “Commissioner’s Statement on the Employment Situation,” U.S. Department of Labor, Bureau of Labor Statistics, September 5, 2003, at [www.bls.gov/news.release/archives/jec\\_09052003.pdf](http://www.bls.gov/news.release/archives/jec_09052003.pdf).
2. Elise Gould, “Measuring Employment Since the Recovery: A Comparison of the Household and Payroll Surveys,” Economic Policy Institute *Briefing Paper* No. 148, December 12, 2003.
3. *Economic Indicators January 2004*, prepared for the Joint Economic Committee by the Council of Economic Advisers, p. 11.

beyond the January population spikes, is not a result of a small sample size. Instead, the rotating nature of the CPS sample drives its variability. One-quarter of respondents are rotated out of the survey each month, which keeps the survey respondents fresh. The overriding advantage of the household survey is its direct interface with American workers, which makes it a higher quality measure in many ways.

While high variability might rule out relying on the household survey for short-term movements, it by no means disqualifies it for longer periods. Considering that the divergence controversy spans the three years since the recession began in March 2001, holding the short-term variability rationale against the household survey seems to be a stretch.

### **Rationale #2: The sample size is much larger for the payroll survey.**

Payroll numbers are based on a much wider sample than the CPS, covering one-third of all U.S. workers every month. Moreover, CES survey results are confirmed and updated annually by *benchmarking* the data to records for *all* U.S. businesses that file unemployment insurance papers. The result is nearly complete coverage of the U.S. workforce, or 98 percent of all jobs. The household survey has a smaller sample of 60,000 individual households.

A brief introduction to statistics would confirm that a survey sample of 60,000 is more than adequate. Much smaller samples are used every day in media polls assessing everything from voter attitudes to consumer product ratings, and they are perfectly valid.

The danger in the “payroll survey is bigger” rationale is mistaking quantity for quality. True, the CES has a bigger sample—but of what?

The payroll survey is largely automated. Companies in the sample file their payroll figures based on computer software that simply counts up the number of unique payroll recipients each pay period, whether an employee works for one day or

30. A waiter who works at five establishments in one pay period will be counted as five jobs. Meanwhile, self-employed and agricultural workers are not on a payroll and are left uncounted by the CES. If modern companies are employing fewer workers on traditional payrolls, the CES is not currently designed to take such a trend into account.

### **Rationale #3: The payroll survey has a stronger relationship with GDP.**

If forecasting GDP growth is the goal, then 50 years of research suggest that the payroll survey is preferable because of its proven high correlation with GDP. This rationale is not one used in public debates, but it may be more important than anything else for academic economists and Wall Street analysts. Billions of dollars ride on the accuracy of economic forecasts.

But what if the payroll–GDP correlation is an illusion of revised data? While the historical CES employment series has an indisputably strong relationship with growth rates, those historical data have undergone multiple revisions. An even bigger concern is whether the strong relationship is due to an internal statistical bias. Economists should be very careful to check for an endogenous influence of growth rates on payroll counts.<sup>4</sup>

### **ANALYSTS CONFOUNDED BY THE DIVERGENCE**

Many analysts have reviewed the survey divergence, and it remains one of the most fascinating economic mysteries of the modern recovery. However, policymakers, who rely on simplicity and certainty, have an intuitive need to select a favorite of the two surveys. The CBO weighed in with its August 2003 *Economic Outlook*, stating:

The establishment survey better reflects the state of labor markets, the CBO believes, not only because other indicators also imply rather weak labor-market conditions but because large revisions or misreporting

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4. It is well-known that GDP growth is driven by increases in factor inputs such as labor and capital, implying a direction of causality: Increases in employment lead to faster GDP growth. However, estimating this relationship is problematic if growth rates also cause higher employment. Because growth and employment are jointly determined, they are known as endogenous. Subsequent forecasts of GDP growth that do not take the endogenous effect into account can be biased, overestimating the impact of employment on growth. This paper's hypothesis is not that growth causes employment *per se*, but that higher growth inflates the CES measure of jobs.

appears less likely for the establishment than the household data.<sup>5</sup>

Ben Bernanke, a prominent academic economist and recently appointed Governor of the Federal Reserve, commented on the survey disparity on November 6, 2003. His views are a fair reflection of the academic economists, and he confesses, “[W]e do not fully understand the differences in employment reported by the payroll and household surveys, and the truth probably lies in between the two series.” Nevertheless, Bernanke was quick to emphasize the conventional wisdom that “greater reliance should probably be placed on the payroll survey.”<sup>6</sup>

Yet many serious investigations into the details have been unable to solve the mystery. The BLS reviewed the disparity in a major study for its October 2003 Advisory Committee, concluding, “To date, BLS has not been able to pinpoint a source or sources of these differing trends in employment growth.”<sup>7</sup> More recently, the February 2004 *Economic Report of the President* noted that “the explanation for why these two surveys’ results have diverged so markedly over the last few years, and what this might indicate about the economic recovery, remains a puzzle.”<sup>8</sup>

Clearly, the tide is turning, and many analysts are reconsidering the conventional wisdom. As the months go by, the payroll data are growing seriously out of step with other indicators, such as higher real earnings, booming hiring indices, and declining jobless claims. (See Table 1.)

Leading the turnaround, the CBO’s January 2004 *Economic Outlook* modified its earlier support for the payroll survey, suggesting that “it is less

clear which survey provides a more accurate picture of labor market conditions in the second half of 2003.” The CBO notes that tax withholding also seems to be consistent with stronger employment growth.<sup>9</sup>

## SMOOTHING THE HOUSEHOLD SERIES

As the divergence between the surveys has grown, analysts have become increasingly frustrated that the household data are not comparable over time because of the population adjustments that are lumped into the January data for every year. The Joint Economic Committee recommended a process for smoothing the adjusted population level over the entire time period and produced a comparable household employment time series in late 2003.<sup>10</sup>

In response, the BLS recently published two briefs that describe a process for making incremental population adjustments to the household series.<sup>11</sup> The first brief, “Creating Comparability in CPS Employment Series” by Marisa Di Natale, was published in December 2003 and is the BLS’s first effort to make its household series on total employment comparable across different months. The second paper was published on the BLS Web site on February 6, 2004, and offers, for the very first time, a smoothed total employment CPS series dating back to 1990.<sup>12</sup>

This innovation allows analysts to use CPS measures of employment growth in the same manner that the payroll numbers are used each month. It also eliminates the key rationale against household survey employment data.

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5. Congressional Budget Office, *The Budget and Economic Outlook, An Update*, August 2003, p. 34.
  6. Governor Ben S. Bernanke, remarks at the Global Economic and Investment Outlook Conference, Carnegie Mellon University, Pittsburgh, November 6, 2003.
  7. Tom Nardone, Mary Bowler, and Jurgen Kropf, “Examining the Discrepancy in Employment Growth Between CPS and the CES,” October 17, 2003.
  8. *Economic Report of the President*, February 2004, pp. 49–50.
  9. Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2005 to 2014*, January 2004.
  10. Joint Economic Committee, *A Tale of Two Employment Surveys*, October 14, 2003.
  11. Marisa L. Di Natale, “Creating Comparability in CPS Employment Series,” U.S. Department of Labor, Bureau of Labor Statistics, December 2003, at [www.bls.gov/cps/cpscomp.pdf](http://www.bls.gov/cps/cpscomp.pdf).
  12. U.S. Department of Labor, Bureau of Labor Statistics, “Current Population Survey 1990–2003 Employment Adjusted for Population Controls,” at [www.bls.gov/cps/cpspopsm.pdf](http://www.bls.gov/cps/cpspopsm.pdf) (March 2, 2004).



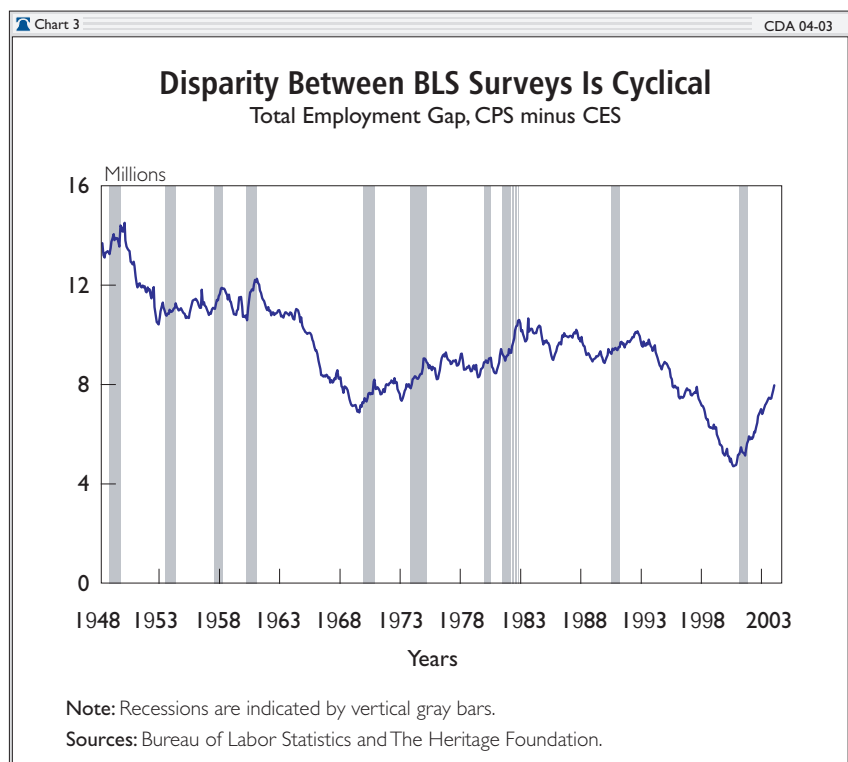
## THE DIVERGENCE IN SURVEYS IS UNPRECEDENTED

With the new, comparable household employment data, this report presents a side-by-side comparison of employment growth unclouded by population spikes. This new view confirms previous suspicions that the present divergence in job growth between surveys is unprecedented. The last five recessions experienced survey discrepancies, but nothing like the 3 million–job divergence of recent years. In fact, the household survey outpaced the payroll survey by around 500,000 jobs in three of the last five recoveries, while payrolls surged faster in the other two recoveries. But the divergence has never before reached this magnitude.

Interestingly, a historical view of the two series reveals that the total employment gap has widened and narrowed with regularity over the years, suggesting a relationship between the disparity and the business cycle.

Chart 3 shows the total level of civilian employment (from the household survey) minus the total nonfarm employment (from the payroll survey).<sup>13</sup> The household survey count is always higher because it includes some categories of workers that the payroll survey does not. Obviously, payroll counts only *nonfarm jobs on business payrolls* (with corporate benefits like health care), while the household measure includes *every American who says he or she has a job*. The disparity makes some sense then, but a change in the survey disparity, especially a divergence that follows the business cycle, raises questions. Which survey is mis-measuring the economy?

One can see that the disparity has been trending downward since 1948, which is probably a reflection of the net decline in farmers. The curious



cyclical movements are three sudden declines in the early 1950s, mid-1960s, and mid-1990s. The only sharp increase in the disparity has occurred during the past three years. Economic expansions mark the three periods when the gap declined.

The 2000–2003 spike in the survey disparity clearly coincides with the current recession and recovery. The question, then, is whether this recovery is somehow unique. First, the late-1990s stock and dot-com bubbles coincided with high worker confidence and high job turnover, and this inflated payroll counts. Second, the recovery in late 2001 began immediately in the wake of terrorist attacks on America followed by two wars. Turnover has not recovered because employees are expressing a preference for job stability over job movement, and this deflates payroll statistics.

A little noticed study published in 1999 supports this line of reasoning.<sup>14</sup> Economists Chinhui Juhn and Simon Potter at the Federal Reserve Bank of New York were concerned about the

13. The household series for this figure is a four-month moving average, based on the revised household survey measure of total employment, which is smoothed for census population adjustments of 1990–1999 and 2000–2002, using a methodology recommended by the BLS.

14. Chinhui Juhn and Simon Potter, “Explaining the Recent Divergence in Payroll and Household Employment Growth,” *Current Issues in Economics and Finance*, December 1999.



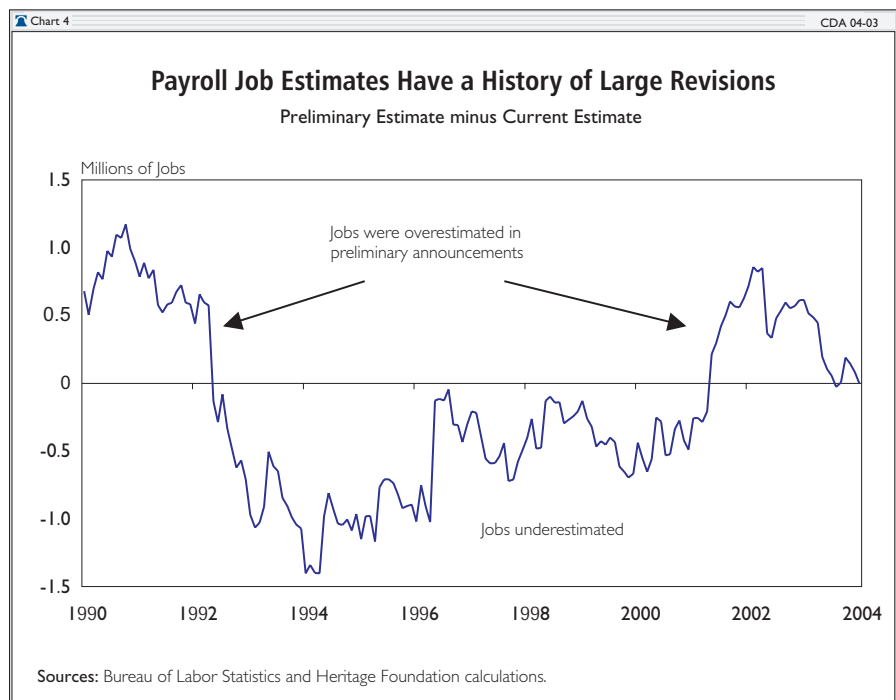
growing divergence between the two employment surveys. It may come as a surprise from today's perspective, but the concern then was that payroll jobs were growing much *faster* than the number of workers in the CPS. Faced with the inverse of today's puzzle but lacking any clear solution to the divergence, they pointed to a potential error in population estimates underlying the household survey. Analysts now know that population adjustments still leave much of the survey divergence unexplained and that the jobs gap "bubble" of 1999 mirrored the stock market bubble.<sup>15</sup> The question remains: How much was a bubble of real jobs and how much was a statistical illusion?

## PROBLEMS WITH THE PAYROLL SURVEY: REVISIONS

The conventional wisdom that the CES is superior for month-to-month trends has one major drawback: Monthly payroll data are preliminary. For example, the initial payroll number for December 2003 was a meager 1,000-job increase; yet it was revised up to 16,000 after one month and will be revised again. Since January 1990, 15 percent of preliminary CES reports that showed job growth were later revised to show job losses (or vice versa).

The following disclaimer accompanies every month's Employment Situation report:

[I]n the establishment survey, estimates for the most recent 2 months are based on substantially incomplete returns; for this reason, these estimates are labeled preliminary in the tables. It is only after two successive revisions to a monthly estimate, when nearly all sample reports have been received, that the estimate is considered final.



Thus, while the payroll survey may *eventually* be better for month-to-month analysis of the economy in retrospect, it is by no means appropriate for *real-time* analysis.

Preliminary revisions are not, in fact, the end of the story. Even after all the establishment responses are submitted for the CES, the final estimate is still based on a sample, not on the entire universe of establishments. Those estimates are significantly revised once per year when the comprehensive universe of payroll employers is incorporated into the benchmark.

The result of benchmarking is another lesson in caution, as post-benchmark CES data are usually—not rarely—quite different from the pre-benchmark series. Chart 4 shows the dramatic difference between preliminary estimates of total U.S. jobs and current estimates. During the early 1990s and 2000s, payroll jobs were overestimated, and during the mid-1990s, they were underestimated, often by 1 million jobs.

**The Myth of a Jobless Recovery in 1992.** The critical months of the 1992 presidential campaign coincided with a string of erroneous payroll survey reports. Although the recession was officially over

15. The Census Bureau does in fact revise U.S. population estimates annually. In January 2004, for example, the population estimate since the 2000 census was revised down by 560,000. But census revisions do not explain either the "narrowing" survey convergence in 1996–1999 or the "widening" survey divergence of 2001–2003.

as of March 1991, jobs continued to erode according to the payroll survey. In April 1991, total nonfarm employment was a preliminary 109.3 million. Today, that number is listed as 108.5 million. In October 1992, the payroll count was announced as 108.4 million, and voters went to the polls with that number in mind. It was called a jobless recovery and blamed on President George H. W. Bush. But today, the October 1992 payroll survey measure of total nonfarm employment is listed as 109.0 million.

The CES was overestimating total employment in the early months of the 1991–1992 recovery by 700,000–860,000 jobs, but underestimating in the last five months of 1992 by 235,000–522,000. Interestingly, corrections were made not just during the initial benchmarks, but also in 1993 and 1994 and even in later years.

Fair-minded observers should recognize that the payroll survey methodology is not to blame for the snafu. Rather, the problem was traced back to errors in unemployment insurance records, which have since been fixed.

On one hand, the peculiar situation is a reminder that statistics—especially survey data—are not ultimate truth and are prone to bugs. On the other hand, one would then expect 1992's situation to be unique. It is not.

**A History of Large Revisions in Payrolls.** The variance of 1992 payroll reports was not unique. Table 3 summarizes the differences between originally reported data and current revised data. The first column reports the average difference for the 12 months of each calendar year, where error equals the preliminary estimate of payroll jobs minus the current estimate of payroll jobs. In 1990, for example, initial payroll counts were overestimated by an average of 883,800 jobs.

Oddly, the average error for 1992 was much lower, typically an underestimation of 79,000. However, an average may be misleading: Half the months could have positive errors of 200,000, and the other half could have negative errors of 200,000.

The second column in Table 3 reports standard deviation, which is a measure of monthly error variability over a given year—not variability from one month to the next, but from the typical month's preliminary estimate to the revised cur-

<b>Preliminary Minus Current Payroll Employment Estimate</b>		
Year	Average Difference	Standard Deviation
1990	883.8	196.6
1991	678.5	120.4
1992	-79.0	<b>512.6</b>
1993	-883.1	192.6
1994	-1,117.2	210.7
1995	-894.9	156.9
1996	-455.9	<b>369.6</b>
1997	-503.7	165.5
1998	-262.8	132.6
1999	-460.1	173.8
2000	-442.9	130.8
2001	231.7	<b>377.2</b>
2002	607.5	175.1
2003	234.3	221.0

Sources: Bureau of Labor Statistics and The Heritage Foundation calculations.

rent estimate. The year 1992 saw the highest standard deviation in payrolls (512,600), while 1991 data were relatively stable. However, high variability is the rule, not the exception, and is thus a concern for anyone relying on real-time payroll data.

The lessons are that preliminary data are not final, final data are subject to annual benchmark revisions, and a single year's benchmark is not the end of seasonal adjustments. And there is always the odd case like 1992, in which a statistical error corrupts the data. In its defense, the BLS has made great strides in 2003 in updating its methodology—primarily by changing to what is called a probability sample—to avoid large future revisions. This should remind any observer that current methodologies are not written in stone.

The bottom line is that either the current payroll data will be revised significantly or they will not. If they are revised, the CPS is essentially vindicated. The more intriguing possibility is that there are structural problems within the payroll survey that

have only just now surfaced in the wake of the odd recovery of the “new” economy. If this is the case, then the payroll numbers will not be revised in the traditional sense. The loss of payroll jobs may be permanent as the workforce shifts to new forms.

## **PROBLEMS WITH THE PAYROLL SURVEY: SELF-EMPLOYMENT**

As the debate over the survey disparity has unfolded, most observers have focused on the definitional case against the payroll survey. However, most attempts to refine the apples-to-oranges comparison into an apples-to-apples comparison miss the heart of the matter. This is not a case of a household survey that counts all workers (traditionally employed plus self-employed) versus a survey that counts only payroll jobs (traditionally employed). Instead, it is a case of a new class of workers who have consulting contracts, are not counted on payrolls, and still see themselves as traditional employees.

We can think of the payroll survey as counting all the “brown-eyed” workers at traditional firms, plus an extrapolation of the “blue-eyed” workers at start-ups who do not yet have payroll records. It does not count “green-eyed” individuals who are self-employed.

As for start-up firms, nobody knows exactly how many exist in the economy, but the BLS uses a careful process of estimating that number based on the observable fact that some portion of start-ups eventually grow into larger, traditional firms. In fact, BLS Commissioner Kathleen Utgoff addressed the issue when the major revisions were announced on February 6:

An issue often raised with regard to the establishment survey is that it might lag in recording a substantial portion of the job growth generated by new business formation. We do not believe that is the case.<sup>16</sup>

It seems that their effort to extrapolate the “blue-eyed” population of workers performed well during this recovery, though future benchmarks may revise the totals.

Start-ups should not be confused with self-employed workers. Economists Brian Wesbury,<sup>17</sup> Allan Meltzer,<sup>18</sup> and Robert Barro<sup>19</sup> have independently suggested a rise in self-employment as the answer to the divergence mystery. Fortunately, the CPS specifically asks individuals whether they are self-employed, and indeed the ranks have swelled in the past two years. Seasonally adjusted self-employment levels are 647,000 higher than in November 2001. At a minimum, the “green-eyes” explain 20 percent of the divergence since the recession ended.

**Self-Employee or Consultant?** The problem with CPS counts of self-employment is that the workforce is evolving. It is by no means clear that Americans understand self-employment in the same sense that the government does. For example, a worker who leaves the IBM payroll and switches to a full-time consulting role with IBM is likely still to consider himself or herself an IBM employee. Certainly, the worker’s family is likely to misidentify the worker’s role as employed rather than self-employed. Likewise, partners at a limited liability company (LLC, a new company form) often consider themselves traditional employees when the government classifies them as self-employed partners.

The Internal Revenue Service first approved the limited liability company as a form of business organization in 1988. The most current data from Congress report an astounding 719,000 LLCs in 2000, with a growth rate of 34 percent per year.<sup>20</sup> Clearly, the emergence of a “hazel-eyed” workforce is at hand—self-employees who consider themselves payroll “brown-eyes.”

This is a seismic institutional shift in the structure of the economy. These kinds of changes imply

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16. Kathleen P. Utgoff, “Commissioner’s Statement on the Employment Situation,” U.S. Department of Labor, Bureau of Labor Statistics, February 6, 2004, at [www.bls.gov/news.release/jec.nr0.htm](http://www.bls.gov/news.release/jec.nr0.htm).

17. Brian Wesbury, “The Bush Boom,” *The Wall Street Journal*, September 15, 2003, p. A20.

18. Allan H. Meltzer, “A Jobless Recovery?” *The Wall Street Journal*, September 26, 2003, p. A16.

19. Robert J. Barro, “Don’t Sweat the Sickly Employment Numbers,” *Business Week*, January 26, 2004, p. 32.

20. Joint Committee on Taxation, “Background and Proposals Relating to S Corporation,” June 18, 2003 at <http://www.house.gov/jct/x-62-03.pdf>.

that the CES levels will seem artificially low because workers will misidentify themselves as traditionally employed in the CPS, creating a wider divergence. A contract worker may no longer have benefits such as health insurance but may enjoy a higher paycheck. This “hazel-eyed” misidentification hypothesis gathered a boost from Utgoff’s recent statement:

There are other differences between the two surveys that are more difficult to quantify. We know, for example, that some independent contractors are not reported as self-employed in the household survey but rather as wage and salary workers.<sup>21</sup>

One consequence of the emergence of a consultant-driven workforce is that U.S. labor markets are even more flexible—which, ironically, will improve the economy even as it makes payrolls look anemic. Sclerotic labor markets lead to higher unemployment rates, and this new economy is based on labor flexibility.

Another consequence is that statistics based on payroll counts will experience a level shift. The most obvious impact has been on productivity growth rates, which recently accelerated. Since productivity is simply a firm’s output divided by the number of its payroll workers, the logical result of a reclassification of payroll workers is a boom in the productivity measure. Consultants are accounted as an expense, not a factor input.

Quantifying the consultant population is difficult given existing survey methods. The fundamental problem is psychological: If Americans have preconceived notions of what “self-employee” and “independent contractor” mean, there will be large degrees of misreporting in the CPS.

According to BLS economists, the best assessment of the new workforce comes from the biennial survey of *Contingent and Alternative Employment Arrangements*, most recently con-

ducted in February 2001,<sup>22</sup> which is regrettably right before the recession began. The relative size of the alternative workforce did not change from the 1999 survey, and no comparison to today’s economy can be made because BLS did not have enough funding to conduct the survey in 2003. Even so, it is no clearer that survey respondents would identify themselves as independent contractors instead of self-employees when they maintain a self-image as traditional employees.

A rough estimate of “hazel-eyed” workers who misidentify themselves as “brown-eyed” may be useful. If new self-employed workers misidentify themselves in the household survey in 50 percent of cases, then the measured number of self-employed workers should actually be doubled. That would imply 1.3 million new self-employed workers, not 650,000. Congress and the BLS should consider rephrasing some questions on the household survey to begin tracking this emerging class of workers. In the meantime, awareness of the modern company structure and modern workforce will help policymakers to keep “anemic” payroll growth in perspective.

## **PROBLEMS WITH THE PAYROLL SURVEY: DECELERATING TURNOVER**

The final problem with the payroll survey stems from the methodology that automatically counts payroll jobs, not workers. Consequently, the payroll survey indicates net job losses when the rate of worker turnover slows. This will occur even if the total level of employment is stable or slightly rising.

BLS experts Tom Nardone and co-authors proposed this intriguing theory in their October 2003 paper:

If a person leaves one job and starts another during a relatively short time span, they could appear on both employers’ payrolls for the CES reference period. They would be counted twice.<sup>23</sup>

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21. Utgoff, “Commissioner’s Statement on the Employment Situation,” February 6, 2004.

22. “The survey found 8.6 million independent contractors (6.4 percent of total employment), 2.1 million on-call workers (1.6 percent of total employment), 1.2 million temporary help agency workers (0.9 percent of the employed), and 633,000 contract company workers (0.5 percent of total employment). *The proportions of workers employed in all four alternative arrangements were about unchanged since February 1999.*” U.S. Department of Labor, Bureau of Labor Statistics, *Contingent and Alternative Employment Arrangements*, February 2001 (emphasis added).

23. Nardone *et al.*, “Examining the Discrepancy in Employment Growth Between CPS and the CES.”

The payroll survey double-counts any individual who changes jobs during the pay period in which the worker is on two payrolls. Such turnover overcounting would normally be irrelevant if (1) the turnover rate was stable over time and (2) pay periods were stable. But if turnover rates increase or pay periods expand from weekly to monthly, overcounting will inflate the payroll count of total employment.

This is especially interesting because job turnover skyrocketed during the fast-paced labor markets of the 1990s, when labor demand was very high. In fact, Nardone and his team cite statistics from the Bureau of National Affairs showing that “in 1999 employee turnover reached its highest level in nearly two decades.” Economic theory suggests that both hiring and quits, and maybe even layoffs, are pro-cyclical. Nevertheless, the BLS researchers did not attempt to quantify the inflationary effect of turnover on the CES.

The critical challenge facing any attempt to quantify the effect of turnover on payroll jobs is a dearth of data. Labor statistics for decades focused on whether a person was employed, in what sector, at what pay, and so on. It is much harder to keep track of a worker between jobs and over any length of time. Workers who have plentiful job opportunities were less interesting than the dilemma of those without. A 2001 paper by Federal Reserve economists Bruce Fallick and Charles Fleischman noted, “One important flow that has been poorly measured is the movement of workers from one employer to another without any significant intervening period of nonemployment.”<sup>24</sup>

**Deflating the Payroll Survey.** The payroll survey systematically overestimates the level of jobs due to turnover, and it likely does so in a manner that varies with the business cycle. The following equation is a rough sketch of the process:

$$(1) \text{Payroll}_{\text{recorded}} = \text{Payroll}_{\text{true}} + T$$

where  $\text{Payroll}_{\text{recorded}}$  is the level of total nonfarm employment published by the BLS,  $\text{Payroll}_{\text{true}}$  is the actual number of payroll jobs held by individuals, and  $T$  is the amount of job turnover during

the month. If turnover has a baseline minimum level as well as a variable component, the equation becomes:

$$(2) \text{Payroll}_{\text{recorded}} = \text{Payroll}_{\text{true}} + T_{\text{baseline}} + T_{\text{variable}}$$

Taking the process one step further, the variable amount of turnover could be influenced by employer confidence, worker confidence, GDP growth, and the increased use of monthly pay periods (as opposed to weekly or biweekly). The result can be described with:

$$(3) \text{Payroll}_{\text{recorded}} = \text{Payroll}_{\text{true}} + T_{\text{baseline}} + \alpha_1(\text{GDP growth}) + \alpha_2(\text{Confidence}) + \alpha_3(\text{Pay period})$$

where the coefficients ( $\alpha_1$ ,  $\alpha_2$ , and  $\alpha_3$ ) represent the size of each variable’s effect on inflating the recorded payroll level over the true payroll level at a moment in time. When workers are hesitant to change jobs in the early part of a recovery, that effect can be partially captured by measures of GDP growth rates and lower levels of consumer-business confidence.

**New Data on Gross Job Gains and Losses.** Innovative new data from the BLS on gross job flows can illuminate the amount of turnover. Interestingly, the BLS has introduced not one, but two new data series on the gross numbers of jobs created and lost. These broader views of gross job flows, as opposed to the more limited data on net job changes in the CES and CPS, offer a potential confirmation of the turnover hypothesis.

The Labor Department recently started reporting a monthly data series on Job Openings and Labor Turnover (JOLTS) with data starting in December 2000. JOLTS measures ES-202 establishment data on “hires, quits, layoffs, discharges, and other separations for the entire month.”<sup>25</sup> In late 2003, the BLS unveiled another new series—Business Employment Dynamics (BED)—with quarterly data starting in the third quarter of 1992. Both series confirm that the rate of gross job flows has decreased during the past five years.

Job creation actually peaked in mid-1999 at 9 million jobs in one quarter, declining to 7.5 million in the second quarter of 2003, as shown in Chart 5. Gross job losses peaked in 2001 and have

24. Bruce Fallick and Charles Fleischman, *The Importance of Employer-to-Employer Flows in the U.S. Labor Market*, Federal Reserve Board *Finance and Economics Discussion Series* 2001–18, April 2001.

25. Kelly Clark and Rosemary Hyson, “New Tools for Labor Market Analysis: JOLTS,” *Monthly Labor Review*, December 2001, p. 33.

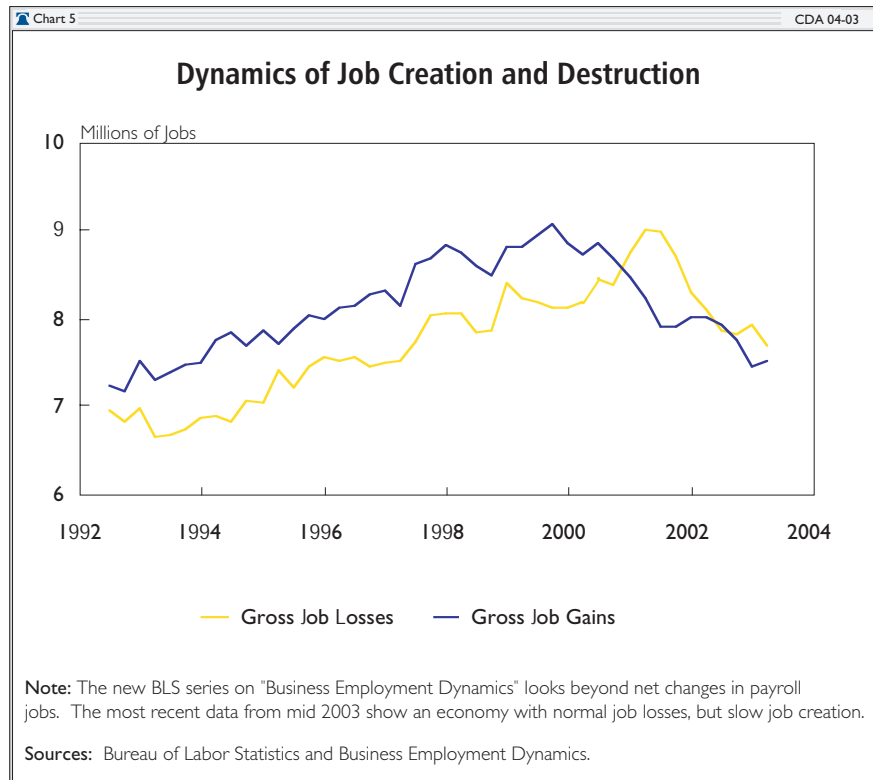
dropped back to normal levels. It seems that the problem with labor market payrolls is not high rates of job loss, but slower rates of job creation.

This report accepts the traditional assumption that job turnover equals the sum of gross job losses and gross job gains.<sup>26</sup> The JOLTS turnover rate presented in this report equals the sum of the hires rate and separations rate. The BED turnover rate presented here is likewise a sum of the rate of job gains and rate of job losses.

Table 4 presents a summary of data on gross turnover from two different surveys. There are many caveats to using either JOLTS or BED as measures of turnover, and readers should realize that these are proxy measures. Gross job flows are not equivalent to turnover, because flows include departures (due to retirement, pregnancy, and injury) and new entrants (e.g., college graduates and immigrants). But the focus is on changes in gross flows, which logically are driven by changing turnover rates.

JOLTS and BED data concur that turnover rates have declined over the past two years, and the BED data show a peak in 1998 and 1999. JOLTS data show 0.8 percent fewer gross payroll jobs turned over per month in 2003 than in 2001. The BED series is quarterly but shows the same decline on a quarterly basis over the past two years. The BED data go even further back and show a large decline (1.7 percent) from 1999 turnover rates.<sup>27</sup>

A more complex concern with this paper's model of overcounting is that most pay periods are



weekly, implying that the impact of these turnover rates is overstated by a factor of four or 12 because they are monthly and quarterly measures, respectively. If this were the case, one might think that the monthly JOLTS turnover would be one-third of BED turnover and that the change in rates would also be one-third as large. Instead, the decline in turnover rates is identical in both series in 2002 and in 2003. This implies a similar decline in turnover rates over any period. Nevertheless, the impact on payroll counts is muddled because the CES asks establishments to consider only the payroll period that includes the 12th day of the month. Hence, the decline in turnover would only potentially overcount a quarter of turnover cases per month, assuming (1) no response error by establishments and (2) no overlaps beyond the day of job change.

26. "[Gross] job reallocation at time  $t$  is the sum of all plant-level employment gains and losses that occur between  $t-1$  and  $t$ ." Stephen J. Davis, John C. Haltiwanger, and Scott Schuh, *Job Creation and Destruction* (Cambridge, Mass.: MIT Press, 1996), p. 12. See also the discussion on the state of data on worker flows (pp. 129–133 and 149–150). The real variable of interest is, of course, worker flows, not job flows, and we use job flows as a proxy in this *CDA Report*.

27. After reviewing an early draft of this paper, economists at the Bureau of Labor Statistics suggested that the BED may not be appropriate for gross worker-flow turnover. The alternative suggested is an employer-to-employer worker flow from CPS surveys. These data show a decline from 2.89 percent per month in November 1999 to 2.09 percent in November 2003—half of the rate derived from the BED, and still large. The CPS number is not definitive, however, and potentially underestimates the effect by ignoring respondents who drop out of the sample. This attrition bias is likely to be made up of a large proportion of individuals who move in response to employment change.



Common sense suggests that workers prefer no break in employment, especially if employment carries health insurance. One can even argue that the predominance of weekly pay periods mixed with payroll overlaps would heighten the degree of overcounting in the CES. This is mostly a speculative debate until researchers can help clarify the re-employment behavior of workers. The model presented below uses simple and clear assumptions in order to introduce the payroll survey's problem with overcounting.

**Calculating Payroll Deflation.** What is the impact of lower turnover on job counts? The answer depends on the rate at which departing workers are replaced (or, alternatively, the rate at which departing workers find new jobs) within the typical pay period. Calculating payroll deflation is a simple function:

$$(4) \text{ Payroll deflation} = \text{Payroll}_{\text{recorded}} (\text{Turnover Decline})(\text{Re-employment rate})$$

The re-employment rate is difficult to specify. By definition, re-employed workers in the context of this model are never categorized as unemployed during their job transition, so figures on unemployment and unemployment durations are partially informative at best.

Research from the Labor Department offers some clues. One study of 1997–1998 labor turnover showed that the median duration between jobs for long-tenured displaced workers was 5.3 weeks, and only three weeks for younger workers.<sup>28</sup> We can infer that most workers are re-employed quickly, especially if they are younger and are shorter-tenure. Another relevant study found that baby boomers held an average of 9.8 permanent jobs between the ages of 18 and 36. Common sense dictates that a majority of separations are described by workers who take up new opportunities without any gap of unemployment. The study also found that “more than two-thirds of these jobs were held in the first half of the period, from ages 18 to 27.”<sup>29</sup>

These two findings imply that re-employment rates within a pay period are high for a great many

Table 4		CDA 04-03	
<b>Two New Data Series on Job Turnover Rates</b> (Jobs created and lost per period, as a percent of total jobs)			
	JOLTS (monthly)	BED (quarterly)	
1992	-	15.8	
1993	-	15.6	
1994	-	15.5	
1995	-	15.6	
1996	-	15.8	
1997	-	15.8	
1998	-	15.9	
1999	-	16.0	
2000	-	15.5	
2001	7.0	15.5	
2002	6.4	14.9	
2003	6.2	14.3	

Source: The Bureau of Labor Statistics publishes the Job Openings and Labor Turnover Survey (JOLTS) and Business Employment Dynamics (BED). The data in this table are averages for each year.

workers and that an 80 percent rate is reasonable. Returning to Equation 4 and substituting in actual values for the payroll deflation since 1999 yields:

$$(4a) \text{ Payroll deflation} = 130,000,000 (1.7\%)(80\%) = 1,768,000$$

Thus, the payroll survey may have been deflated by nearly 1.77 million jobs since 1999 due to turnover alone. Considering the period since the recession ended, roughly 1 percent fewer jobs are counted per month in 2003 than during 2001, deflating the payroll survey by 1 million jobs.

Observers should keep in mind that these calculations are based on only a sketch of the turnover problem, using the best available data on gross job flows. Critics will remark that re-employment rates are inexact,<sup>30</sup> but the fact that these rates are also pro-cyclical suggests a stronger, not weaker, deflation in payrolls. (See the Appendix.) Nevertheless, the existence of sizeable payroll deflation is the important point, because this problem in the pay-

28. Ryan T. Helwig, “Worker Displacement in a Strong Labor Market,” *Monthly Labor Review*, June 2001, p. 18.

29. U.S. Department of Labor, Bureau of Labor Statistics, “Number of Jobs Held, Labor Market Activity, and Earnings Growth Among Younger Baby Boomers: Results from More Than Two Decades of a Longitudinal Survey,” news release, August 27, 2002.



roll survey is simply not in the public conversation on jobs, and it should be.

Two implications of decelerating turnover are that:

- A constant-turnover payroll correction would increase January's total nonfarm employment from 130.1 million to about 131.1 million, using a 2001 baseline for turnover rates. The illusion of 716,000 payroll jobs lost during the recovery becomes instead a gain of 300,000 jobs.
- If worker confidence returns to its normal levels of the 1990s, more workers will be willing to change jobs and the payroll count will re-inflate.

Why are workers not changing jobs as frequently two years into the recovery? The likelihood is that many factors are reinforcing one another. First, economic studies show that turnover declines during a recession. Worker anxiety is probably heightened now more than usual by pessimism prevalent in the media. Certainly, the perception of losing jobs to workers in Mexico, India, and China is more profound than in previous eras.

It is non-economic factors, however, that make this era unique. The attacks of September 11, two wars in the Middle East, and constant terrorism alerts all generate psychological insecurity, which logically affects employment decisions. Americans are likely to place more emphasis on stability and other priorities as opposed to career opportunities during these times.

## CONCLUSION

The payroll survey may be systematically undercounting job growth, creating an unprecedented job growth gap between its total employment measure and the household survey's. In the past six months, the BLS has approved new techniques to smooth the household survey's measure of total employment in order to make month-to-month comparisons. Analysts can now point with confi-

dence to the employment of a record number of Americans as of January 2004 and the employment of an additional 2.2 million workers since the recession ended.

Why has the payroll survey missed so much recent job creation? The BLS is skeptical of the start-up explanation, and recent benchmarks confirm the BLS's position. Self-employment is a different matter, and the latest statement by the BLS commissioner confirms the appearance of a new class of contractors. The evolution of the workforce—specifically, the demographic emergence of consultants and contractors who do not consider themselves self-employed—is a likely wedge between the surveys. Self-employment has grown by over 600,000 in two years, and misidentification by the LLC and consulting workforce implies a much higher number.

Finally, a new hypothesis quantified in this report is that decelerating turnover is artificially deflating company payrolls, creating an illusion of 1 million jobs lost since 2001. The heightened insecurity since September 11, the Iraq war, and the specter of outsourcing are logical explanations for reduced turnover. Here again, innovative new data series on employment dynamics from the BLS allow economists to confirm this hypothesis.

Policymakers and analysts should treat payroll data with caution when making comparisons to employment levels in 2001 and earlier years. Contrary to the conventional wisdom, the best measure of job growth now comes from smoothed total employment reported in the household survey. Consequently, policies aimed at protecting illusory lost jobs are ill-advised. Employment in America is rebounding strongly, and the increasing dynamism of U.S. job markets should not be clogged by misguided and misinformed cures.

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30. Using very complicated CPS calculations, Fallick and Fleischman estimate a comparable re-employment rate of 40 percent. This estimate is a lower bound, and the authors discuss an "attrition bias" that would result in an upper bound rate of 80 percent. Of course, other estimates based on other methodologies will offer different rates. All researchers in this area acknowledge that there is no definitive study of worker flows, and the one clear fact is that employer-to-employer transitions are much more prevalent than economists realized a generation ago.

## APPENDIX: TECHNICAL NOTE ON CALCULATING PAYROLL OVERCOUNTS DUE TO TURNOVER

A more complex approach to payroll overcounts due to turnover would incorporate re-employment rates that vary over time. Because the aggregate re-employment rate within a pay period is pro-cyclical, it will amplify the cyclical overcount in the payroll survey.

A better model of overcounts would also divide the turnover rate in half in order to correct the double-count of job-changers rather than ignoring them altogether. This approach would use the following equation to calculate payroll inflation every year and adjust accordingly:

$$(5) \quad \text{Overcounts} = \text{Payroll}_{\text{recorded}} \left( \frac{T}{2} \right) R$$

where  $T$  is the monthly turnover rate and  $R$  is the average re-employment rate within the pay period.

**Re-Employment Rate.** As utilized here, the re-employment rate is defined as the ratio of workers who are employed at a new job within the same pay period of their old job. This assumes that most employer-to-employer transfers are not interrupted by unemployment spells or departures out of the labor force, but are voluntary movements to an immediately better opportunity. In those cases, the worker will appear on two payrolls in a single pay period. There are also many cases where a transitioning worker will appear on both payrolls for multiple periods, but these considerations are excluded here. The basic re-employment rate can be described by:

$$(6) \quad R = \frac{EE}{EE + EU + EN}$$

where  $EE$  is the number of workers who move from employment to employment during the pay period,  $EU$  is the number moving to unemployment, and  $EN$  is the number moving to “not in the

labor force” status. Thus, the denominator repre-

Table 5		CDA 04-03		
<b>Calculating Payroll Job Overcounts in Different Years</b>				
	Payroll Jobs	Turnover Rate	Re-employment Rate	Payroll Overcounts
1999	130,000,000	7.5%*	90.0%*	4,387,500
2001	132,000,000	7.0%	80.0%*	3,696,000
2003	130,000,000	6.2%	60.0%*	2,418,000

Source: Bureau of Labor Statistics and The Heritage Foundation calculations.  
\* Author Estimates.

sents total separations. Here the simplifying assumptions are that all  $EE$  job transitions have a single payroll overcount (realistically, some will have no overcounts and some will have multiple overlapping payrolls) and that all  $EU$  and  $EN$  transitions are defined completely by a spell that outlasts the pay period.

This paper assumes a re-employment rate of 80 percent within a monthly pay period. Using CPS data from 1994–2000, Fallick and Fleischman estimate  $R$  to be around 40 percent.<sup>31</sup> Their paper does not offer a time series for re-employment rates. While the 80 percent rate used here may seem high, it is based on assumptions derived from Labor Department research. Furthermore, this does not calibrate for multiple payroll overlaps.

A model that incorporates half turnover and changing re-employment rates yields results similar to the simple model presented in Equation 4. Calculation of the “complicated” model indicates that payroll jobs were inflated as shown in Table 5. The net effect is a 1.3 million–job deflation since the recovery began (a deflation of 2.0 million since 1999), higher than the simple model.

31. Fallick and Fleischman, *The Importance of Employer-to-Employer Flows in the U.S. Labor Market*, pp. 11–12.