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Employment Statistics: Differences and Similarities in Job-based and Person-based Employment and Unemployment Estimates

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Summary

Employment statistics are key indicators of the performance of the economy, measuring how many jobs exist in the economy as well as how individuals fare in the labor market. Payroll employment estimates track the number of wage and salary jobs created and lost in the economy. In comparison to this *job-based* measure, (un)employment statistics measure the quantities and ratios of those *individuals* who are employed or unable to find employment despite actively seeking jobs.

This paper defines and distinguishes two commonly used groups of employment estimates: payroll employment (derived from a job-based survey) and employment and unemployment (derived primarily from a person-based survey) statistics. (A third unemployment statistic derived from the Unemployment Compensation system, the Insured Unemployment Rate, is less frequently used as it excludes many groups of workers.) The report then examines two somewhat counter-intuitive situations: how there may be aggregate job loss with decreased unemployment rates and how increased payroll employment does not necessarily imply decreased unemployment.

Payroll employment figures are estimated from a survey of employers in non-farm industries. These figures directly correspond to each individual job held within the economy and not to individual workers. A particular worker may hold more than one position and each of those jobs will be counted as a separate position, increasing the total number of jobs reported through the payroll employment estimates. In comparison, individual employment and unemployment statistics measures are based on individuals and their labor force status. The individual statistics are derived from the non-institutionalized civilian population. The self-employed, those temporarily absent from work but who have a job, and certain farm workers are also counted as workers (although their positions are not counted by payroll employment). A worker may have one or more jobs, but will be counted only once as employed while a worker without any job will be considered unemployed.

Although it may seem reasonable to expect that as the number of payroll jobs increases there would be a similar trend in the number of persons employed, the job-based measure of payroll employment does not require that the person-based measure of (un)employment statistics move in the same direction. This paper provides two examples of these somewhat counter-intuitive situations.

This report will be updated as events warrant.

Contents

List of Figures

List of Tables

Employment Statistics: Differences and Similarities in Job-based and Person-based Employment and Unemployment Estimates

Employment statistics are key indicators of the performance of the economy, measuring how many jobs/positions exist in the economy as well as how individuals fare in the labor market. These estimates receive substantial Congressional attention and are used in policy decisions in many areas including economic stimulus packages, extending of Unemployment Compensation benefits, and funding of employment and training programs.

Typically, these statistics are reported in one of two basic forms: payroll employment statistics and individual (un)employment statistics. Payroll statistics track the number of filled jobs in the economy and may be used to infer job creation and loss. (Un)employment statistics measure the quantities and ratios of people in the labor market who are actively working or seeking jobs. These statistics are used to estimate the unemployment rate as well. A third type of unemployment statistic, derived from the Unemployment Compensation system — the Insured Unemployment Rate — is less frequently used as it excludes many important groups of workers.

This report explains the data sources used to calculate payroll employment and individual employment and unemployment estimates. The report also examines several somewhat counter-intuitive situations, explaining how there may be aggregate job loss with decreased unemployment rates and how increased payroll numbers do not necessarily imply decreased numbers of unemployed persons.

Creation of Payroll Employment and (Un)employment Statistics

Payroll employment statistics and (un)employment statistics receive increased attention during and immediately after recessions occur.[1] These statistics are useful indicators of how the overall economy and how individuals within the economy are faring. For example, increasing unemployment rates imply that some of the labor input (human capital) available to the economy is not used, suggesting production

[1]Calculations of the timing of the business cycle (and subsequent designations of *recessions* or *recoveries*) place substantial weight on output measures with only some weight on the payroll employment statistics. See [http://nber.org/cycles/recessions.html#faq] for more information.

and/or efficiency losses.[2] Likewise, measures of payroll employment and the unemployment numbers are important in quantifying the substantial costs experienced by workers and their families from the loss of a job as well as associated losses experienced by society. These worker and family costs include loss of income, the scarring effect from prolonged periods of joblessness,[3] and potentially significant psychological and emotional costs. Societal costs include increased payments of unemployment compensation benefits and other pressures on the social welfare system, and potential increases in crime, drug use, and incarceration.

Data Sources

The Unemployment Compensation (UC) system, measures the number of unemployed workers covered by the UC system.[4] However, UC records, which many people think are the source of total unemployment data, relate only to persons who have applied for UC benefits. Since it is both impractical to actually count every unemployed person each month and equally impractical to measure the number of jobs in each firm, the federal government conducts two monthly sample surveys: the Current Population Survey (CPS) and the Current Employment Statistics survey (CES). Both of these data sources are *survey* based and therefore, the statistics generated by these surveys are estimates from samples rather than actual counts.

CPS.[5] The CPS is a monthly survey of households conducted by the Bureau of the Census for the Bureau of Labor Statistics and designed to represent the civilian noninstitutional population of the United States. The CPS (approximately 50,000 households) includes certain farm and domestic workers, the self-employed, persons working 15 hours or more a week as unpaid workers in a family-operated business, employees of certain nonprofit organizations, and railroad workers. The CPS also counts employees uncompensated because of temporary absence or strikes, but excludes workers under 16 years old. It provides a comprehensive body of data on persons in the labor force, their employment and unemployment, and persons not in the labor force.

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[2]Okun's Law is often used to estimate the size of economic loss from unemployment. It estimates that for every one percentage point increase in unemployment, gross domestic product drops by 2%. See CRS Report RS21139, *Unemployment and Economic Growth*, by Brian Cashell.

[3]Employers may regard long spells of unemployment as an indicator about workers' potential productivity, causing a *scarring effect.* Workers may experience decreased chances of finding new jobs and ascending their career ladder. Maura Sheehan and Mike Tomlinson, "Unemployment Duration in an Unemployment Blackspot," *Labour* 12 (winter 1998), pp. 643-73.

[4]Covered employment includes all positions where the employer pays federal and state unemployment taxes on the worker's wages. While almost all jobs are covered by the UC program, not all workers qualify for UC benfits. Those who file for UC benefits are different from the general unemployed population. See Stephen Wandner and Andrew Stettner, "Why are Many Jobless Workers not Applying for Benefits?" *Monthly Labor Review*, June 2000, pp. 21-32. Most of those who do not file do so because they think they are not eligible or because they are optimistic about finding employment.

[5]See [http://www.bls.census.gov/cps/cpsmain.htm].

CES.[6] The CES is a monthly employer survey collected from payroll records by the Bureau of Labor Statistics with the cooperation of state agencies. The sample has approximately 160,000 businesses and government agencies which have about 400,000 separate sites. The CES collects the number of jobs as reported by establishments. The survey provides information on the employment, hours, and earnings of jobs that exist on nonfarm payrolls.

In the most basic terms, statistics that count the number of *jobs* rely upon the CES, and statistics that count the number of *persons* employed (or unemployed) rely upon the CPS. That is, statistics reporting *rates* of employment, unemployment, or that report demographic characteristics of workers will generally be from the CPS. The number of jobs (rather than the number of workers) in the economy and information about these jobs by industry will typically be calculated from the CES.

The CPS provides measures of all types of work done by the non-institutionalized civilian population, including part-time work, self-employment, and some farm employment. In comparison, the CES does not differentiate between full- or part-time employment, does not measure self-employment, and excludes all agricultural jobs.

Calculation of Payroll Employment and Employment and Unemployment Statistics

The rule of thumb that the CES measures the number of jobs and the CPS measures both the employment of workers and estimates the unemployment rate, is complicated by detailed analyses and demographic breakdowns. In particular, for smaller geographic areas or for monthly rather than annual information, these two surveys are used in conjunction with each other and may be supplemented with information from other sources including administrative information from state UC systems and the decennial census.

National, State, and Local Payroll Employment Statistics. These statistics are from the CES payroll survey which, as noted earlier, includes employment numbers, employment by industry, hours, and earnings. Information is also available for smaller geographic regions (states and certain metropolitan areas). These survey data are used to calculate the net number of jobs created or lost in a period. The jobs tallied from this information are not linked to individuals but rather to firms and industries. Generally, these data are released in the BLS publication *The Employment Situation* in their preliminary form on the first Friday of the following month.

National Employment and Unemployment Statistics and Unemployment Rate. National estimates of the number of employed and unemployed as well as the unemployment rate are calculated using data collected in the CPS. The CPS is a nationally representative household survey and includes employment and unemployment of the non-institutionalized civilian population by age, sex, race, and ethnicity. The unemployment statistics are defined by individuals

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[6]See [http://stats.bls.gov/ces/home.htm].

who have responded to survey questions that indicate they have: (1) searched for work in the previous four weeks and (2) were unable to find a position. Generally, these data are released in the BLS publication *The Employment Situation* on the first Friday of the following month.

State and Local Employment and Unemployment (Local Area Unemployment Statistics). While survey information collected for the national unemployment rate (CPS) includes information on geography, these data may need to be supplemented with up to three other information sources (the CES, the census, and state UC information) in order to obtain statistical significance. State and local employment and unemployment estimates are calculated from a combination of these different sources depending on the size of the population of the particular area.

- *Annual* average data for all states, the District of Columbia, New York City (NYC), and the Los Angeles-Long Beach (LA) metropolitan areas are estimated directly from the CPS.
- *Monthly* estimates for these areas are produced using estimating equations based on regression techniques. These models combine current and historical data from the CPS, the CES, and state UC data. Generally, these data are released on the third Friday of the following month.
- Estimates (*monthly* and *annual*) for smaller labor market areas (below the state level, including metropolitan statistical areas other than NYC or LA, counties, cities of at least 25,000, and cities and towns in New England regardless of population) are estimated by a procedure that uses techniques based on inputs from the decennial census, annual population estimates, and current state UC data. Generally, these data are released on the fourth Wednesday of the next month.

The Total Unemployment Rate (TUR) and Insured Unemployment Rate (IUR)

What is the Total Unemployment Rate (TUR)? The Total Unemployment Rate (TUR) is simply another name for the unemployment rate derived from the CPS data.

What Does the Insured Unemployment Rate (IUR) Measure? Statistics on insured unemployment in the United States are collected as a byproduct of the unemployment compensation program. Workers who lose their jobs and are covered by the programs typically file claims which serve as notice that they are beginning a period of unemployment. Those who qualify for benefits are counted in the insured unemployment statistic, the Insured Unemployment Rate (IUR).

What Is the Difference Between the IUR and the TUR? The IUR is substantially different than the TUR because it excludes several important groups: self-employed workers, unpaid family workers, workers in certain not-for-profit organizations, and several other, primarily seasonal, worker categories. In addition to those unemployed workers whose last jobs were in the excluded kinds of employment, the insured unemployed exclude the following: those who have exhausted their UC benefits; new entrants or reentrants to the labor force;

disqualified workers whose unemployment is considered to have resulted from their own actions rather than from economic conditions, and eligible unemployed persons who do not file for benefits. Because of these and other limitations, statistics on insured unemployment, cannot be used as a count of total unemployment in the United States. In 1988, for example, when there were virtually no extended unemployment benefits paid to persons who had otherwise exhausted their benefits, the number receiving UC benefits represented only 31% of the total unemployed. In 1992, when extended UC benefits were in effect, this proportion was 51%.

Definitions of Employment

To better understand the various definitions used in calculating the payroll employment and (un)employment statistics, it is important to clearly define various employment concepts as they will have direct implications for the usefulness of the statistics. **Table 1** below lists the manner in which the CPS and CES define various employment concepts. The first column lists the generally accepted title for the employment concept for the individual-based estimates, the third column lists the titles for the job-based estimates. The second column lists the definition according to the CPS and the fourth column lists the definition according to the CES.

In the Labor Force and Out of the Labor Force. The CPS considers all non-institutionalized, civilian individuals (16 and older) who either currently have a job or who have looked for work in the previous four weeks to be *in the labor force*. All others are considered to be *out of the labor force.*

The CES does not measure employment from the perspective of the individual but rather measures paid employment in certain industries. All positions counted in the payroll survey may represent persons who according to the CPS are in the labor force. However, not all persons in the labor force (i.e., the unemployed or the self-employed) will be represented by the payroll statistics.

Employed. In the CPS, an individual who is paid for working at least 1 hour or who worked 15 hours without pay in a family-owned business during the previous week is considered to be *employed*. An individual is also counted as employed even if he or she is on vacation, not at work due to temporary illness, on temporary unpaid leave, or involved in a strike. *Unlike the CES, the CPS counts individuals only one time, even if they hold more than one job.*

Payroll Employment. In comparison, the CES tallies each job that exists within each sampled firm toward estimating aggregate *payroll employment* statistics if the position paid a worker for working any portion of the reference pay period (the pay period that includes the 12th of the month). A position is omitted from this tally if the person did not receive pay for the entire reference pay period. *Employees working at more than one job — therefore appearing on more than one payroll — would be counted separately for each appearance.* All positions counted by *payroll employment* have persons who may qualify as being *employed* according to the CPS definition. However, not all *employed persons* as defined in the CPS (e.g., the self-employed) will have their positions counted in the *payroll employment* statistics.

Unemployed. The CPS measures unemployment by defining those workers to be *unemployed* if they do not have a job but have searched for work in the previous four weeks and are available to work. The *unemployment rate* is the ratio of unemployed persons to the total number of persons in the labor force.

Job Loss and Job Gain. The CES does not measure the number of unemployed persons. Instead, the CES data from current and previous periods may be used to calculate the net *job loss* (gain) from one period to the next. An increase in the unemployment rate generally would imply an expected decrease in the payroll employment numbers; however, this is not always true. A more detailed explanation of how this occurs appears later in this paper.

Involuntarily Part-time.[7] In the CPS, *involuntary part-time* workers are those who report working fewer hours than they wish either due to fewer hours allotted by the employer or because they were unable to find full-time work. Since these workers have reported at least one hour of work in the survey week, they are considered to be *in the labor force* and to be *employed*.

In the CES each paid position, regardless of the number of hours, is counted as *payroll employment*. In effect, the CES does not measure jobs that have persons who are working less hours than they wish (*involuntarily part-time*) any differently than other jobs within the survey sample.

Discouraged Workers.[8] In the CPS, these are people currently without a job but who have expressed a desire to work and have searched for work in the past year; however, they have made no effort to find a job in the past four weeks due to either a perceived lack of jobs or a perceived inability to get a job due to some personal factor such as lack of skills or education. These persons are considered to be *out of the labor force* and are not included in calculations of unemployment statistics. The U.S. Bureau of Labor Statistics does, however, calculate alternatives to the official unemployment rate which do include discouraged workers among others in their measures. As these workers do not hold a paid position, the CES data do not include them.

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[7] See CRS Report 98-695, *Part-time Job Growth and the Labor Effects of Policy Responses*, by Linda Levine.

[8] See CRS Report RL322292, *Offshoring (a.k.a. Offshore Outsourcing) and Job Insecurity Among U.S. Workers*, by Linda Levine. There is often some misunderstanding surrounding the difference between a discouraged and a dislocated worker. A dislocated worker has several years' job tenure and loses his or her job through plant closings or through permanent layoff.

Table 1. CPS and CES Employment and Unemployment Definitions

Term	Current Population Survey (household/person level)	Term	Current Employment Statistics (establishment level jobs)
Labor force	All non-institutionalized civilians, 16 years and older, who are working **OR** are searching for work.	NA	NA
Out of labor force	Under 16 years old **OR** institutionalized **OR** not searching for work in previous four weeks	NA	NA
Employed	At least 16 years old, who worked **at least** 1 hour for pay **OR** 15 hours without pay in a family-owned business. They may be on vacation or not at work due to temporary illness.	Payroll employment	All jobs in establishments that paid a wage in the reference period excluding: agricultural, self-employed, unpaid family workers, and private household workers.
Unemployed	At least 16 years and older who are not currently employed and have searched for work in the previous four weeks.	job loss/gain	The current number of jobs in establishments less the sum of jobs during the previous period. (Negative number implies employment loss, positive number implies employment growth.)
Involuntarily part-time	Workers who report working fewer hours than they wish. (Still considered to be in the labor force and to be employed.)	NA	All jobs are counted as payroll employment whether the job is full- or part-time.
Discouraged worker	Would like a job but has not searched in previous four weeks due to perception that no jobs exist and would not be hired because of lack of skills. Considered to be out of the labor force.	NA	These workers do not hold paid employment and do not figure into payroll employment.

Source: CRS table created using BLS data dictionaries for the CES and CPS.

NA= Not applicable

Example: Decreased Employment but Increasing Jobs. **Table 2** contains data taken from the Bureau of Labor Statistics' *The Employment Situation* for September 2004 (released October 8, 2004). Notice that the number of employed persons (139,480,000) was greater than the number of jobs reported by the CES (131,567,000, the (p) indicates that the number is preliminary and is subject to revision). Since agricultural workers (estimated seasonally unadjusted to be 2,374,000); self-employed workers (9,616,000); and unpaid family members (90,000) work in jobs that are not included in the CES estimates but are considered to be

workers by the CPS, it is reasonable to find that the CES number of jobs is less than the number of employed workers according to the CPS.

From August 2004 to September 2004, the number of persons who were employed was estimated to have dropped by 19,000; in comparison the net number of jobs added to the economy, according to the CES, increased by 96,000.

Table 2. Example: The Employment Situation for September 2004

Term	Current Population Survey (household/person level) (thousands)	Term	Current Employment Statistics (establishment level jobs) (thousands)
Labor force	147,483	NA	NA
Out of labor force	76,458	NA	NA
Employed	139,480	Payroll employment	131,567(p)
Unemployed	8,003	NA	NA
Aug.-Sept. Change	-19	Aug.-Sept. change	96(p)
Unemployment rate	5.4%	NA	NA

Source: CRS table created from data published in the Bureau of Labor Statistics' *The Employment Situation* for Sept. 2004.

NA= Not applicable
(p)= Preliminary

Total employment as measured by the CES and the CPS

Figure 1 tracks the monthly employment statistics as reported by the CPS and CES. In general the CPS accounts for more persons working than the CES calculates for the number of jobs in the economy. This is in part attributable to inclusion in the CPS of self-employed workers and a few other types of workers whose jobs are not measured by the CES.

While the overall pattern between the CPS and CES employment estimates has been fairly consistent, the difference between the two surveys narrowed in the late 1990s but has been increasing in the 2000s. In particular, while the CPS consistently has estimated job growth during this period, this trend is not reflected with the same consistency in the CES.[9]

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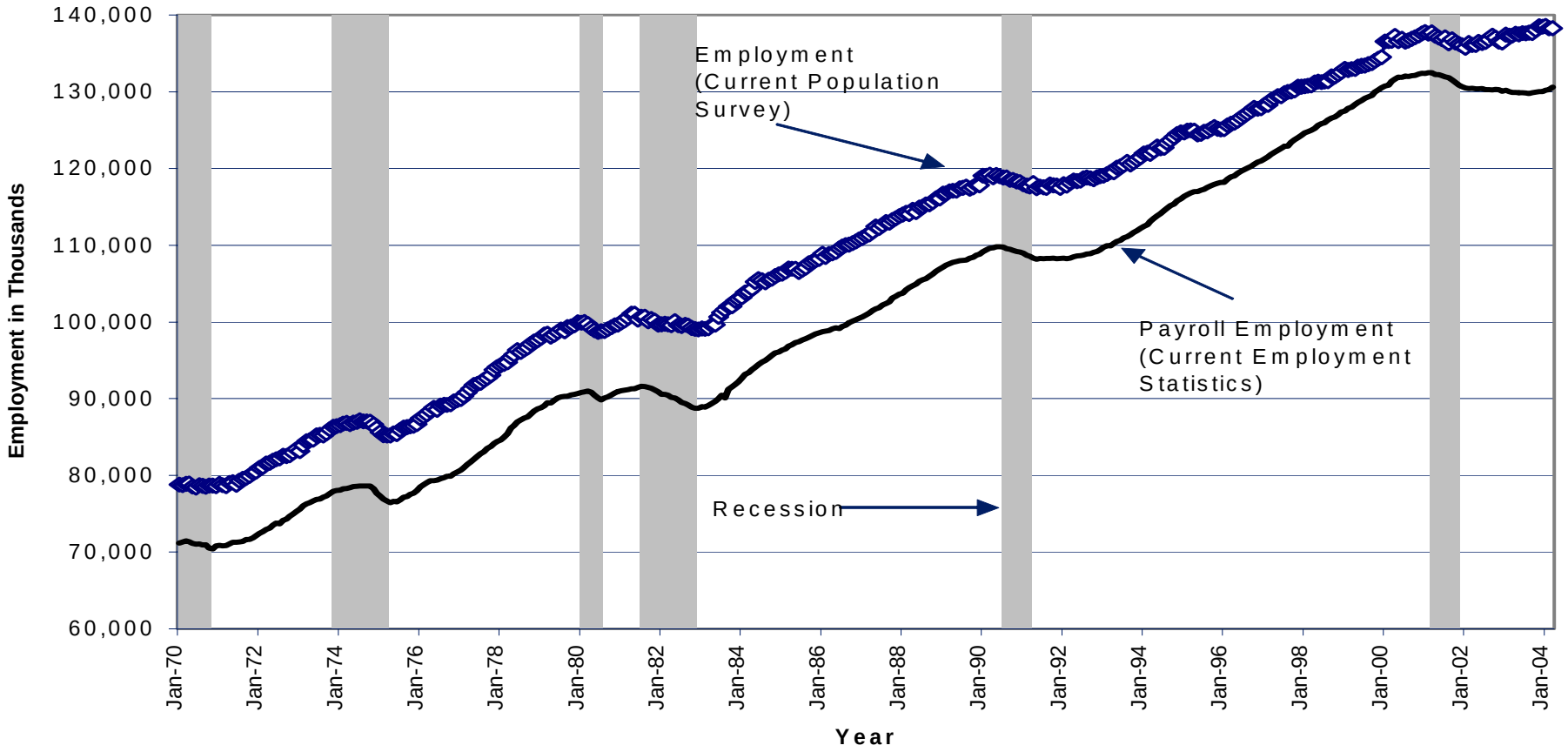
[9]For information on the path of payroll employment following the 2001 recession see CRS Report RL32047, *The "Jobless Recovery" From the 2001 Recession*, by Marc Labonte and Linda Levine.

Figure 1. Current Employment Survey and Current Population Survey
Estimated Employment in Thousands (Seasonally Adjusted)
January 1970-March 2004



Source: Figure prepared by CRS based on Bureau of Labor Statistics data from the Current Population Survey (CPS) and Current Employment Statistics (CES).

How Falling Employment and a Growing Payroll Employment May Coexist

It may be confusing when economic indicators such as payroll employment statistics, employment numbers, and unemployment rates seem to suggest opposite trends. **Tables 3** and **4** below demonstrate how this outcome occurs because of the underlying definitions of the unemployment rate and payroll employment that measure employment in very different ways.

In any given economy, it is possible for both the number of employed persons and the unemployment rate to increase at the same time within the same household survey (the CPS). An interesting case to illuminate this point can be found in studying the growth of Hispanic employment shown in **Table 3** below.

Table 3. Hispanic Employment and Unemployment Rate, 2000 and 2003

Year	Labor Force (thousands)	Employed (thousands)	Unemployed (thousands)	Unemployment Rate
2000	16,689	15,735	954	5.7%
2003	18,813	17,372	1,441	7.7%
Difference	+2,124	+1,637	+487	2.0%
Percentage Change	12.7%	10.4%	51.0%	35.1%

Source: CRS table created using BLS statistics calculated from the CPS.

Hispanic *employment* increased by 1,637,000 persons between 2000 and 2003, but the Hispanic *rate of unemployment* increased from 5.7% to 7.7%. The explanation is that at the same time as 1,637,000 new jobs filled by Hispanics were added to the economy, approximately 2,124,000 Hispanics entered the workforce. The growth in employment was more than offset by the number of new job seekers entering or returning to the labor market.

On average, the labor force grows at approximately 1% per year. As a result, employment must grow at least at that same rate (1%) to prevent an increase in the unemployment rate.

It is typical for the unemployment rate to continue to rise after a recession's end, such as occurred after November 2001. This may be because some persons reenter the labor force with the belief that job prospects have improved and thus, are less willing to accept certain jobs. It may also be due to other unemployed workers who are unable to find new work in a substantially reconfigured labor market where their skills are no longer in demand.

Table 4. The Number of Employed and Payroll Employment Moving in Opposite Directions, November-December, 2003 (Seasonally Adjusted)

Month	Unemployment Rate	Labor Force (thousands)	Employed Persons (thousands)	Payroll Employment (thousands)
November 2003	5.9%	147,187	138,533	130,123
December 2003	5.7%	146,878	138,479	130,124
Difference	-0.2%	-309	-54	+1
Percentage Change	-3.3%	-0.2%	-0.0%	0.0%

Source: CRS table created using BLS statistics calculated from the CPS and the CES.

Just as **Table 3** demonstrated how the number of employed and the unemployment rate can increase at the same time within the same household survey, **Table 4** delineates how the CES may have nominally increasing payroll employment while the CPS has a substantial decrease in number of employed persons and at the same time a decreased unemployment rate.

In December 2003, the national unemployment rate was 5.7% — a statistically significant decrease from 5.9% in November 2003. At the same time, the estimated number of employed decreased by approximately 54,000 individuals from 138,533,000 to 138,479,000. The unemployment rate was able to decrease despite the drop in persons reporting employment because approximately 309,000 persons reported that they left the labor force.[10] Payroll employment, on the other hand, remained essentially the same, increasing by an estimated 1,000 positions

[10]The number of individuals identifying themselves as discouraged workers decreased from 457,000 in November to 433,000 in December. This decline, however does not take into account any expected seasonal variations in this statistic and should be viewed with caution.