Studying the labor market using BLS labor dynamics data

Three relatively new data sources released by the BLS help analysts track the rich dynamics underlying the changes in employment and unemployment; these data add depth and context, and they ultimately provide a better understanding of movements in the labor market

Zhi Boon, Charles M. Carson, R. Jason Faberman, and Randy E. Ilg

Over the past 5 years, the Bureau of Labor Statistics (BLS) has released three new data products that measure the dynamics of the U.S. labor market. These data illustrate the fluid nature of the labor market by highlighting the millions of jobs that appear or disappear and the millions of individuals who become employed, become unemployed, or leave the labor force entirely every month.

In 2002, the BLS began releasing data from the Job Openings and Labor Turnover Survey (JOLTS). This survey of establishments has collected data since December 2000 on the number of hires, quits, layoffs, and job openings businesses have each month. In 2003, the BLS began releasing the Business Employment Dynamics (BED) data. The BED counts are based on 6.9 million mandatory reports submitted by businesses subject to State Unemployment Insurance (UI) programs; these records are longitudinally linked over time so that one can observe employment changes at the establishment level. The BED measures the gross number of jobs gained each quarter at expanding or opening establishments, as well as the gross number of jobs lost each quarter at contracting or closing establishments. The BED data are available back to 1992. Finally, beginning in October 2007, the BLS has released seasonally adjusted monthly estimates of labor force status flows (also known as "gross flows") from the Current Population Survey (CPS), a survey best known as the source of the monthly unemployment rate. The estimates of labor force status flows, which begin in 1990, use month-to-month changes in the employment status of individuals to estimate the population-level changes in labor force status between being employed, unemployed, or out of the labor force.

This article explains how these new data on employment dynamics provide a more detailed picture of the labor market. It also explains how these data—when used in conjunction with existing labor market information, such as the more familiar BLS data on employment and unemployment—enhance understanding of how the labor market functions and how it changes with the business cycle. The main point of the study is that these data add context to the observed changes in the labor market and help answer questions that the more traditional employment data cannot address. By providing a deeper understanding of movements in the labor market, this information can aid analysts and policy makers alike.

Zhi Boon, Charles M. Carson, and Randy E. Ilg are economists in the Office of Employment and Unemployment Statistics, Bureau of Labor Statistics (BLS); R. Jason Faberman, formerly of BLS, is an economist at the Federal Reserve Bank of of Philadelphia. E-mail: Jason.Faberman@phil.frb.org

Why study labor dynamics?

Most observers of the U.S. labor market are familiar with the standard gauges used to measure its health, such as employment growth and the unemployment rate. Every month, these estimates provide a useful measure of the overall health of the labor market, and consequently they are closely watched by analysts and others. Data on the underlying labor dynamics are useful because they add depth to these standard measures. For example, knowing that employment grew by 150,000 jobs or that the unemployment rate fell by 0.2 percentage point provides a reasonable sense of overall labor market health, but for those looking to make policy, financial, or other economic decisions, this information leaves key questions related to how these changes came about unanswered.

When the economy adds 150,000 jobs, it represents a net gain summed over millions of businesses simultaneously expanding, contracting, starting up or closing down each month. Some businesses have hired new employees, others have let workers go or have had workers quit, and others still have had some mix of workers starting work and separating from employment. As a result, there are several ways the economy can generate a net gain of 150,000 jobs. For example, there could be a rise in job creation that outpaces an increase in job losses. On the other hand, there could be a fall in job loss that is steeper than a decline in job gains. One could think of many possible scenarios. The policy-related and financial decisions related to each of these scenarios can be quite different. The first scenario paints a picture of increased employment coupled with increased turbulence, while the second scenario implies employment gains coupled with a decline in labor market churning. The gross job gains and gross job losses statistics of the BED capture exactly these types of flows, thereby giving some context to the dynamic environment in which jobs are added or lost during a given period.

Labor market analysts might also be interested in knowing about the movement of workers into and out of those jobs. While this is related to the gains and losses of jobs, this is a slightly different question to ask, and requires different tools to answer. Returning to the example of a net gain of 150,000 jobs, did such a gain come about through a relative increase in hiring or a relative decline in workers separating from their jobs? Of those who separated, how many were laid off and how many chose to quit? A period of high turnover with a lot of quits is obviously much different from a period of high turnover with many layoffs. The data on labor turnover from the JOLTS program provide answers to these questions.

Just as multiple scenarios can generate a gain of 150,000 jobs, multiple scenarios can cause a 0.2-percentage point decline in unemployment. Each month, millions of people move into and out of unemployment, as well as into and out of the labor force (the sum of the employed and the unemployed) altogether. Because the unemployment rate is defined as the number of unemployed persons divided by the number of people in the labor force, it can decline in several different ways. The most obvious way that the unemployment rate can decline is for the number of unemployed persons to decline. However, this, too, can occur either because of a drop in recently unemployed individuals (that is, a drop in the flows into unemployment) or because of a rise in the number of unemployed persons who find a job or drop out of the labor force entirely (that is, a rise in the flows out of unemployment). The unemployment rate can also decline because of a rise in the number of employed individuals. The economic and policy implications of each change are quite different. The labor force status flows data from the CPS quantify the flow of people into and out of each of the major labor market states: employed, unemployed, and not in the labor force. These flows data provide analysts with critical information on the detailed changes in the labor market in a given month.

Labor dynamics data from the BLS

Job Openings and Labor Turnover Survey. The Job Openings and Labor Turnover Survey (JOLTS) is an establishment survey that publishes monthly data on job openings, as well as monthly and annual data on hires and separations, by major industry and region.[1] The survey samples about 16,000 establishments. It covers all nonfarm employment and is benchmarked to the BLS Current Employment Statistics (CES) survey, which is commonly referred to as "the payroll survey."

Job openings are a count of the number of vacancies on the last business day of the month. They provide a measure of unmet labor demand. *Hires* are all additions to the payroll for the month. Similarly, total *separations* are all subtractions from the payroll for the month. The JOLTS distinguishes between three types of separations: quits (generally voluntary separations), layoffs and discharges (generally involuntary separations), and other separations (such as transfers and retirements). Hires and separations are commonly referred to as "worker flows," because they measure the movement of workers across business establishments. These flows are presented as rates and are calculated by dividing each by employment for the month.

Business Employment Dynamics. The Business Employment Dynamics (BED) data series is a virtual census of the U.S. private sector. It includes all establishments covered by State unemployment insurance (UI) programs—about 6.9 million in 2006—with each establishment longitudinally linked so that its employment history can be tracked by BLS.[2] Each quarter, these data include gross job gains and gross job losses by major industry, employer size class, and by State. *Gross job gains* are the sum of increases in employment from expansions at existing businesses and the addition of new jobs at opening businesses. *Gross job losses* are the sum of decreases in employment from contractions at existing businesses and the loss of jobs at closing businesses. The BED data include job gains and losses for all four types of employment changes. Employment changes in the BED are measured from the third month of one quarter to the third month of the next quarter. The net change in employment is the difference between the gross number of jobs gained and the gross number of jobs lost.

Gross job gains and losses are often referred to as "job flows," because they measure changes in the number of positions rather than the actual movement of workers. Finally, gross job gains and losses are expressed as rates, calculated by dividing by the average of the previous and current quarter's third-month employment.[3]

CPS Labor force status flows. The labor force status flows data are derived from the Current Population Survey (CPS), a monthly sample survey of approximately 60,000 households.[4] Each month, the CPS is administered to about three-quarters of the households that were also in the survey during the previous month. (The other one-fourth consists of new households.) The month-to-month overlap allows the BLS to track individuals who change labor force status from one month to the next. The dynamic "flows" of these individuals underlie changes observed in the official labor force stock estimates published by BLS (employment, unemployment, and not in the labor force). Gross flow estimates are available for the total working-age population (age 16 and over) and separately for men and women.

In a given month, a person is in one of three labor force states: employed (E), unemployed (U), or not in the labor force (N). The following month, the person could either have the same status or change to one of the other two states. Thus, one can express the complete set of labor market gross flow possibilities with the following 3 x 3 matrix:

	Status in current month		
Status in prior month	*Employed*	*Unemployed*	*Not in labor force*
Employed.....	**EE**	EU	EN
Unemployed.....	UE	**UU**	UN
Not in the labor force	NE	NU	**NN**

The notation of the matrix is such that the first letter of each flow denotes the labor force status of an individual in the previous month, and the second letter of each flow denotes the state of an individual in the current month. The diagonal elements, EE, UU, NN (shown in bold), represent individuals who did not change their labor force status over the month.

The flows into employment, listed in the first column, represent all individuals who remained employed, but not necessarily with the same employer, over the month (EE); the number of unemployed persons who became employed (UE); and the number of persons previously not in the labor force who became employed (NE). The flows into unemployment, listed in the second column, represent the number of employed who become unemployed (EU), the number of unemployed who remained unemployed from the previous month (UU), and the number of individuals not in the labor force who became unemployed (NU). Finally, the flows out of the labor force, listed in the third column, represent the number of previously employed individuals who leave the labor force (EN), the number of previously unemployed individuals who leave the labor force (UN), and the number of individuals who remained out of the labor force (NN).

Note that the CPS labor force status flows data do not provide insight into how or why individuals change their labor force status. For example, among EN flows, the data do not distinguish between persons who drop out of the labor force voluntarily or involuntarily. They do not identify whether flows out of employment (EN or EU) represent quits, layoffs, or other separations; they do not identify whether those who enter the labor force (NE or NU) are new entrants or re-entrants; and they do not identify if those who quit looking for work (UN) do so because they are discouraged over job prospects.[5]

The most interesting estimates for studying labor dynamics are the gross flows not on the matrix's diagonal (UE, NE, EU, NU, EN, UN). The gross flow statistics from the CPS have actually been available in some form intermittently since 1948. Unlike previous versions, however, the current labor force status flows data are available on a seasonally adjusted basis and have flow estimates that are compatible with the monthly stock estimates published each month.[6]

Like the JOLTS estimates, the CPS labor force status flows can be referred to as "worker flows," because they measure the movements of actual workers. One can express these flows as rates in several different ways, depending on the specific question one wants to answer. The more common gross flow rates used are expressed as percentages of the population, of the labor force, of employment, or of their original stock's level.

How the data relate to each other

At first glance, it might appear that the JOLTS, BED, and CPS gross flow data essentially measure the same basic economic phenomena, but each series measures a different and distinct aspect of labor market dynamics. Exhibit 1 highlights the differences in measurement and concepts between the three data sources. Both the JOLTS and BED data are based on establishments, while the CPS data are based on household information. The JOLTS and CPS report monthly data, while the BED reports quarterly. The data also differ in their coverage, timeliness, detail, and periods covered. More importantly, each series is conceptually different, with BED focusing on the perspective of businesses, CPS focusing on the perspective of individuals, and JOLTS focusing on workers at businesses.

Both the JOLTS and CPS data measure worker flows. The JOLTS data does so from the establishment viewpoint, measuring the number of workers each month who are hired, who are laid off, who quit, or who separate in some other way. The CPS data measure worker flows from the individual's viewpoint, measuring the number of workers who change their status between being employed, unemployed, or out of the labor force. The two sources complement each other well. For example, assume that the number of quits rises in the JOLTS data. To infer the implications of such a rise, it would be useful to know where these workers went. The CPS data address this question by reporting the number of workers who move from employment to either unemployment or out of the labor force entirely. It is possible that neither gross flow measure would change, suggesting that those who quit found new jobs quickly and remained in the pool of employed persons.[7]

The BED data measure job flows. The BED calculates the net change in jobs at each establishment over the reference period. Establishments that add workers on net either opened or expanded, and those that lose workers on net either closed or contracted. One can think of these job flows as a subset of worker flows, because even an establishment-level net change will mask turnover that occurs within the period. For example, if a worker quits and is quickly replaced during the same reference period, no job gain or loss will be observed in the BED data. In the JOLTS data, on the other hand, a quit and a hire would be observed.[8] Compared with the other data sources, this fact makes the BED data somewhat more appropriate for analyzing the business side of the labor market, because it ignores much of the routine labor market churning and focuses on the reallocation of actual jobs in the labor market. Similarly, the CPS is more appropriate for analyzing the worker side of the market, because it measures the flow of individuals into and out of unemployment as well as into and out of employment. The JOLTS data on hires and separations lie somewhere in between, measuring employed workers but giving a more complete picture of their movements in and out of different businesses.

Graphical examples help to illustrate the different labor dynamics concepts each data source measures. Exhibit 2 depicts some relatively common employment changes during both recessions and expansions. The hypothetical example shows two establishments. Establishment A faces difficult business conditions and must contract its workforce as a result. Establishment B has been doing well financially and is planning to expand. Establishment A is forced to lay off half of its eight workers. In addition, another worker from establishment A quits after learning that establishment B is hiring and accepts a position there. Of the four laid-off workers, three immediately start searching for new work and thus are counted as unemployed. The fourth decides not to actively search for work and drops out of the labor force. Under this scenario, even though establishment B is doing well, it must still deal with the routine turnover of workers. Of its original six workers, suppose one longtime employee retires and another quits because of family responsibilities at home. Thus, in order to expand, establishment B will need to hire additional workers as well as replace the two who left. Establishment B would hire four new workers: the one worker who was previously at establishment A and three recent college graduates who just entered the labor force.

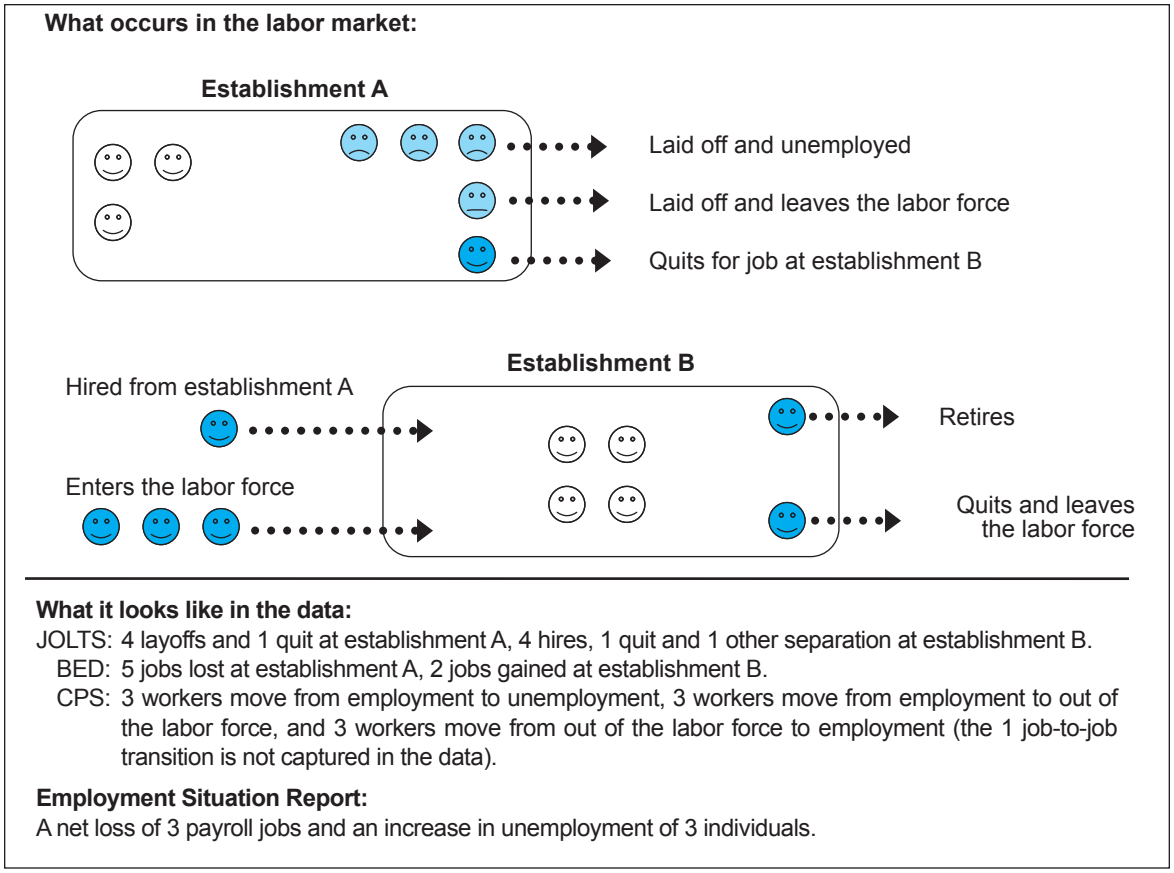
How is this all reflected in the data? In JOLTS, there would be 4 hires (all at establishment B) and 7 separations (4 layoffs and 1 quit at establishment A, and 1 quit and 1 "other separation" at establishment B). In the BED data, there would be 2 job gains (the net gain at establishment B) and 5 job losses (the net loss at establishment A). In the CPS data, there would be 3 workers going from employment to unemployment (the 3 layoffs at establishment A), 3 workers leaving employment and dropping out of the labor force entirely (the 1 layoff at establishment

Exhibit 1. Summary of BLS labor dynamics data

Data characteristics	Job Openings and Labor Turnover (JOLTS)	Business Employment Dynamics (BED)	Current Population Survey (CPS) labor force status flows
Data source	Survey of roughly 16,000 establishments	Virtual census of establishments from UI administrative records	Six of the eight rotation groups of the Current Population Survey; represents roughly 45,000 households
Coverage	All nonfarm employment	All private employment	Individuals aged 16 and over
Frequency	Monthly	Quarterly	Monthly
Related data sources	Survey of employment benchmarked to the Current Employment Statistics (CES)	Longitudinal data based on the Quarterly Census of Employment and Wages (QCEW)	Gross flow data based on continuous respondents in the Current Population Survey (CPS)
Timeliness	Available approximately 2 months after the end of the reporting month	Available approximately 8 months after the reporting quarter	Available approximately 1 week after the end of the reporting month
History	Data available from December 2000	Data available from 1992Q3	Data available from January 1990
Data elements	Total number of **Job Openings** on the last business day of the month Total number of **Hires** during the month Total number of Separations (disaggregated into **Quits, Layoffs and Discharges,** and **Other Separations**) during the month	Total number of **Gross Job Gains** at *Expanding* and *Opening* establishments Total number of **Gross Job Losses** at *Contracting and Closing* establishments	Total number of individuals moving between two of the three labor market states: **Employment, Unemployment**, and **Out of the Labor Force** (the total number moving from unemployment to employment, from employment to out of the labor force, and so on)
Detail available	Data available for major (2-digit NAICS) industries and for four geographic regions	Data available for major (2-digit NAICS) industries, by size class of the employer, and by State	Data available by sex

A, plus the retirement and quit at establishment B), and 3 workers entering the labor force and immediately becoming employed (the 3 college graduates hired at establishment B). The worker who switched from establishment A to establishment B never became unemployed, so that worker's status would not change in the CPS data—such a worker would be counted as part of the employment-to-employment (EE) flow. The monthly BLS Employment Situation news release would report a decline in employment of 3 payroll jobs and an increase of 3 in the number of unemployed persons, with no change in the labor force. As this example shows, though, these aggregate level numbers do not describe all of the activity occurring in the labor market. There are many dynamics in this example: of the 17 workers in the two establishments, 10 had some change in their work status. The JOLTS data would show that 4 people were hired while 7 separated from their jobs. The BED data would show that 2 new jobs were created while 5 others were lost. Finally, the CPS data would show that 3 people flowed into the employment pool, while 6 others flowed out.

Exhibit 2. **An example of employment dynamics**



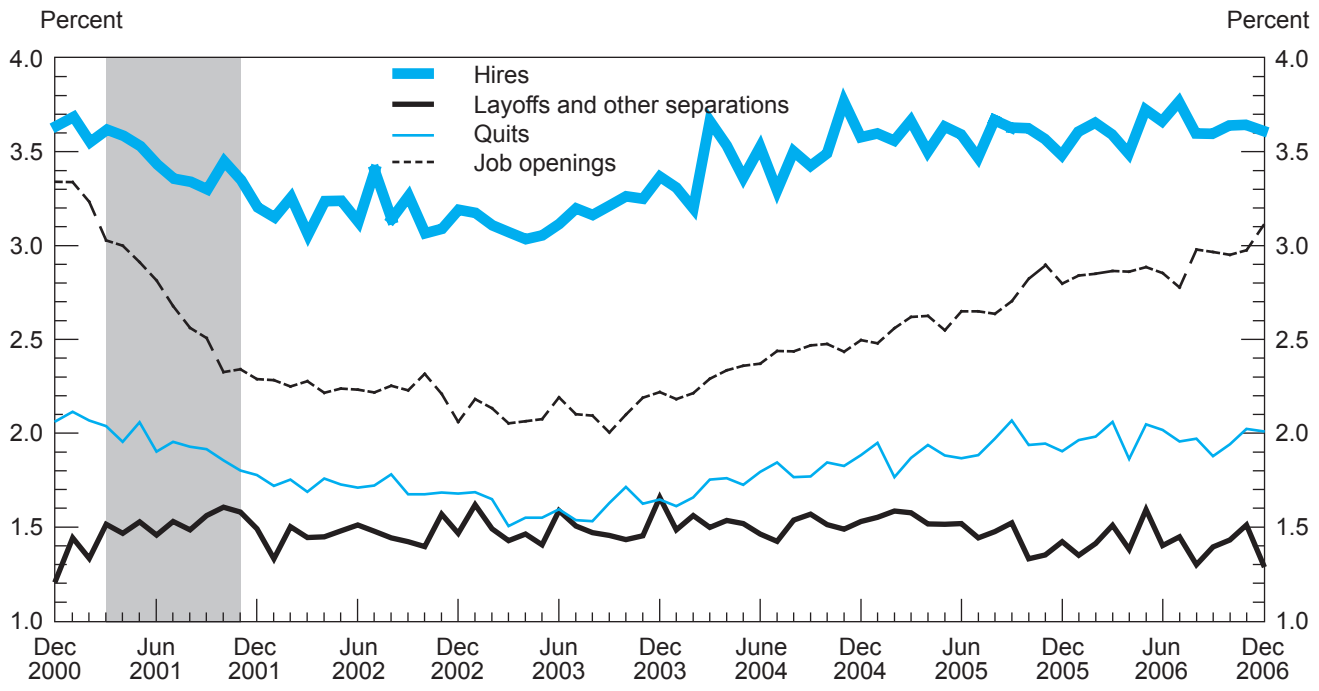
What the data show

The preceding example highlights some common changes that occur in the labor market. Together, the three data sources show dynamics that represent millions of jobs and workers in every measurement period. In an average month during periods covered by the CPS and JOLTS data, more than 14 million individuals, or 6.9 percent of the working-age population, will change their labor force status in some way. More than 4 million will be hired and about as many will separate from their jobs. In a given quarter, more than 15 percent of all jobs will reallocate across different establishments. In other words, the flows of workers and jobs in any given period are quite large.

Consider the JOLTS estimates, for example. Chart 1 presents the JOLTS monthly estimates of hires and separations as a percent of employment, and the job openings estimates as a percent of employment plus job openings (the total number of positions available). All flows move in accordance with the business cycle, but they also remain relatively high throughout its duration. For example, even at its lowest point, the hiring rate still represents more than 3 percent of employment (about 4 million workers), and even when hiring is strong, the rate of layoffs and other separations account for at least 1.3 percent of employment (about 2 million workers). Quits consistently account for between 1.5 and 2.0 percent of employment, implying that they are the more common type of separation, while the job openings rate fluctuates considerably between 2.0 and 3.5 percent of all positions.

Chart 2 depicts the gross job gains and gross job losses estimates from the BED. The estimates are broken out by type of employment change (such as expansions, contractions, openings, and closings) and are expressed as rates, calculated by dividing the job flows by the average of the current and previous quarters' employment. The combined gross job gains and losses each averaged about 7.5 percent of employment (nearly 8 million jobs) per quarter over the 1992–2006 period. Most gains occurred at expanding establishments, while most losses occurred at contract-

Chart 1. JOLTS monthly job openings and labor flows, seasonally adjusted, nonfarm employment



NOTE: Rates are percent of monthly employment. Job opening rate is percent of vacancies + employment

Chart 2. BED quarterly job flow rates, seasonally adjusted, private employment

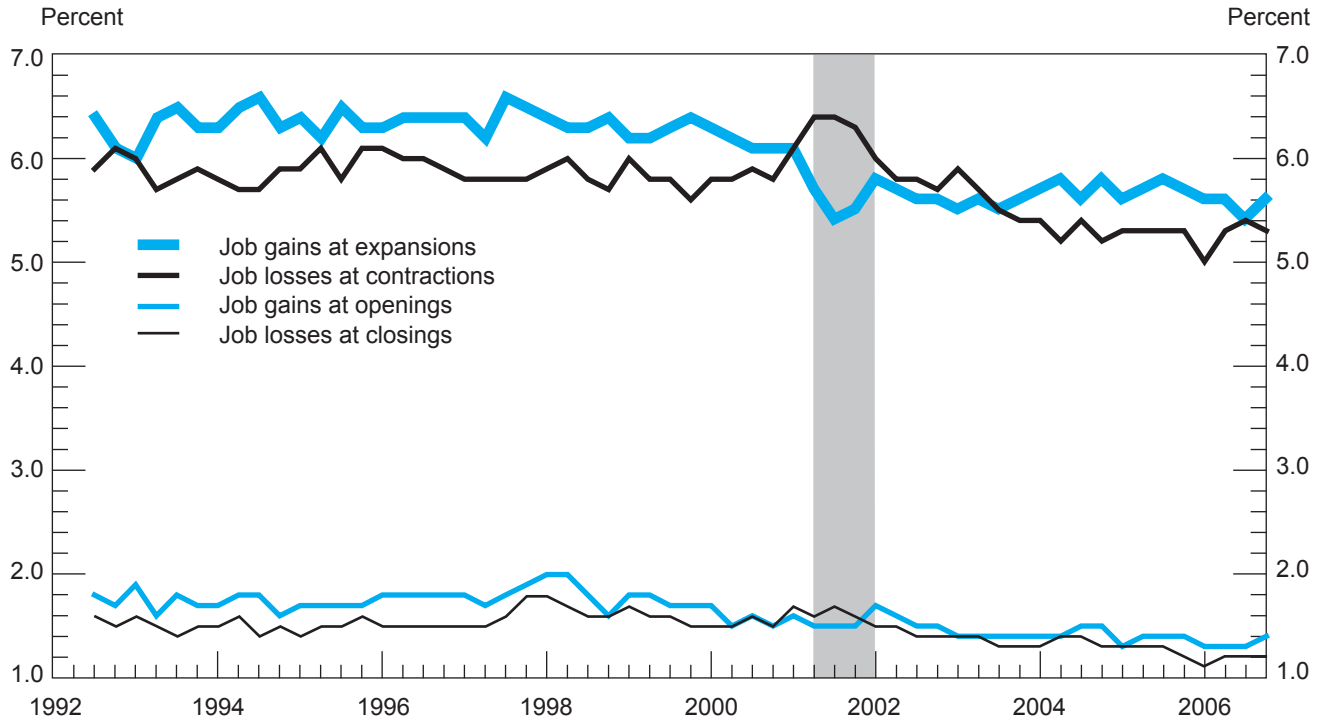


Table 1. Labor force status flows, average monthly estimates, CPS data, 1990–2006

Labor force flows	Number of individuals (in thousands)	Percent of population	Percent of labor force	Percent of original stock
Employed to unemployed (EU)	1,821	0.9	1.3	1.4
Employed to not in labor force (EN)	3,561	1.7	2.6	2.7
Unemployed to employed (UE)	2,035	1.0	1.5	27.4
Unemployed to not in labor force (UN)	1,642	.8	1.2	22.1
Not in labor force to employed (NE)	3,398	1.6	2.5	4.9
Not in labor force to unemployed (NU)	1,832	.9	1.3	2.7

ing establishments. Gains at opening establishments and losses at closing establishments each averaged less than 2 percent of employment. Additionally, gross job gains and loss rates tended to be higher prior to the 2001 recession.

Table 1 presents the monthly averages of the CPS labor force status flows data, both in levels and as percentages of the population, labor force, and the original "stock" or labor force category (employment, unemployment, or out of the labor force). Between 1990 and 2006, the largest flows were between employment and out of the labor force, averaging about 7.0 million workers going either into or out of each labor market status each month. Flows between employment and unemployment are smaller, averaging around 3.9 million individuals per month. An even smaller number of individuals, on average, move between unemployment and out of the labor force. Of the three stocks, unemployment exhibits the greatest amount of churning, relatively speaking. On average, 27 percent of the unemployed in a given month get a job the following month, while 22 percent drop out of the labor force.

Charts 3 and 4 depict the flows into and out of employment and unemployment, respectively, over time. Since the monthly series of these flows can be quite "noisy," in a statistical sense, the estimates are presented as quarterly sums of the monthly data expressed as percentages of the labor force. Chart 3 shows that employment inflows (UE + NE) and employment outflows (EU + EN) exhibit small movements over time and both consistently represent about 12 percent of the labor force. Outflows exceed inflows during both recessionary periods, so employment falls. Chart 4 shows unemployment inflows (EU + NU) and unemployment outflows (UE + UN), again, as percentages of the labor force. These flows exhibit more cyclical variation over the period, ranging from 6.4 to 9.4 percent, and they tend to track each other closely, with inflows into unemployment exceeding outflows during economic downturns.

Worker and job flows vary in the cross section as well as over time. For example, the JOLTS and BED data in table 2 show that worker and job flows differ widely across major industries. Industries such as natural resources and mining, construction, and leisure and hospitality tend to have a high turnover of workers, as well as a high reallocation of jobs, while industries such as manufacturing and wholesale trade tend to have low levels of both. In addition, as the CPS data in table 3 shows, during the sample period used in this study, worker flow patterns differ by sex. Men account for more than half of the labor force, but women account for the majority of labor force dynamics, exhibiting higher flow rates into and out of both employment and unemployment.

Labor dynamics and the business cycle

These new data sources complement each other and provide a better understanding of the labor market. This is especially true when studying these changes over the business cycle. The CPS seasonally adjusted labor force status flows data go back to 1990, covering the last two recessions, while the BED data begin after the 1990–91 recession.[9] The JOLTS data begin just before the start of the 2001 recession. Thus, the 2001 recession is the only one for which movements in all three surveys together can be compared.

Chart 5 shows the movements of payroll employment growth (from the CES) and the unemployment rate (from the CPS) on a quarterly basis since 1990. In each recession, employment growth dropped sharply and remained negative for several quarters after the recession ended. Follow-

Chart 3. **CPS employment flows: quarterly sums, percent of the labor force**

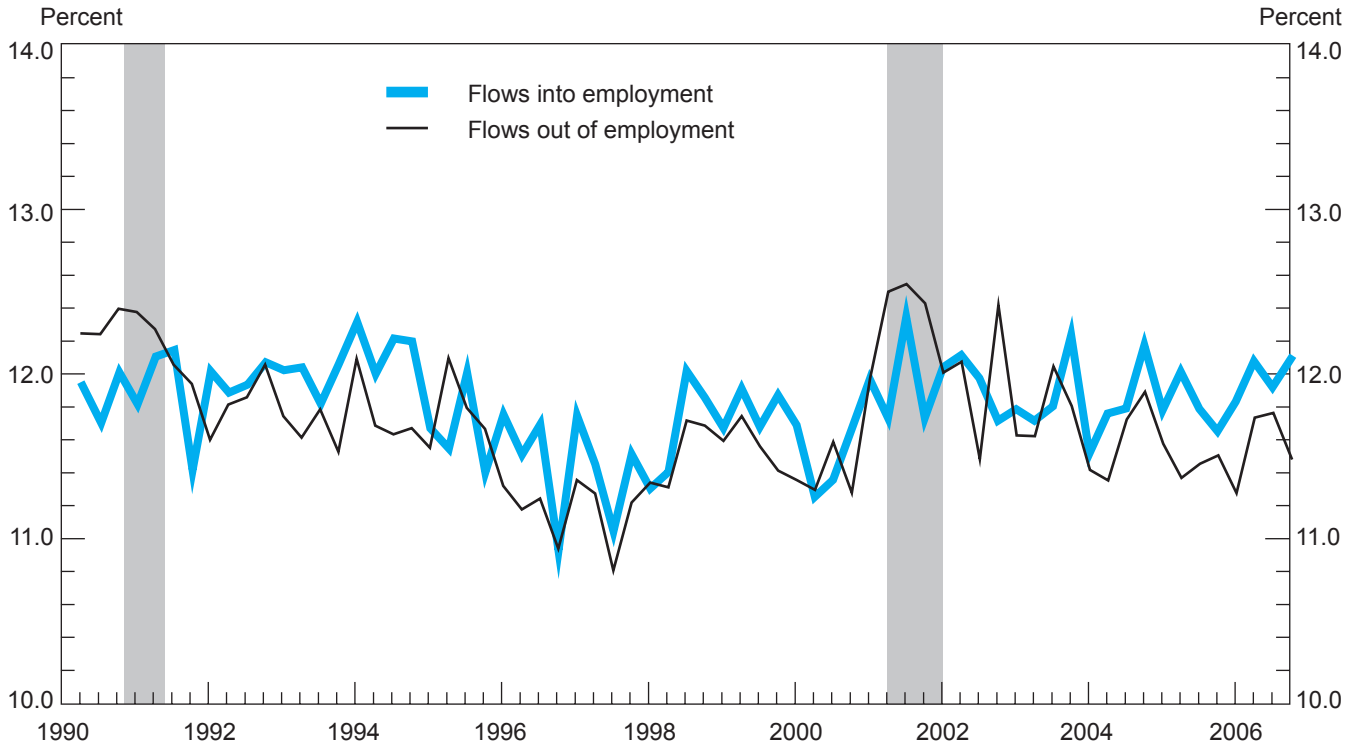


Chart 4. **CPS unemployment flows: quarterly sums, percent of the labor force**

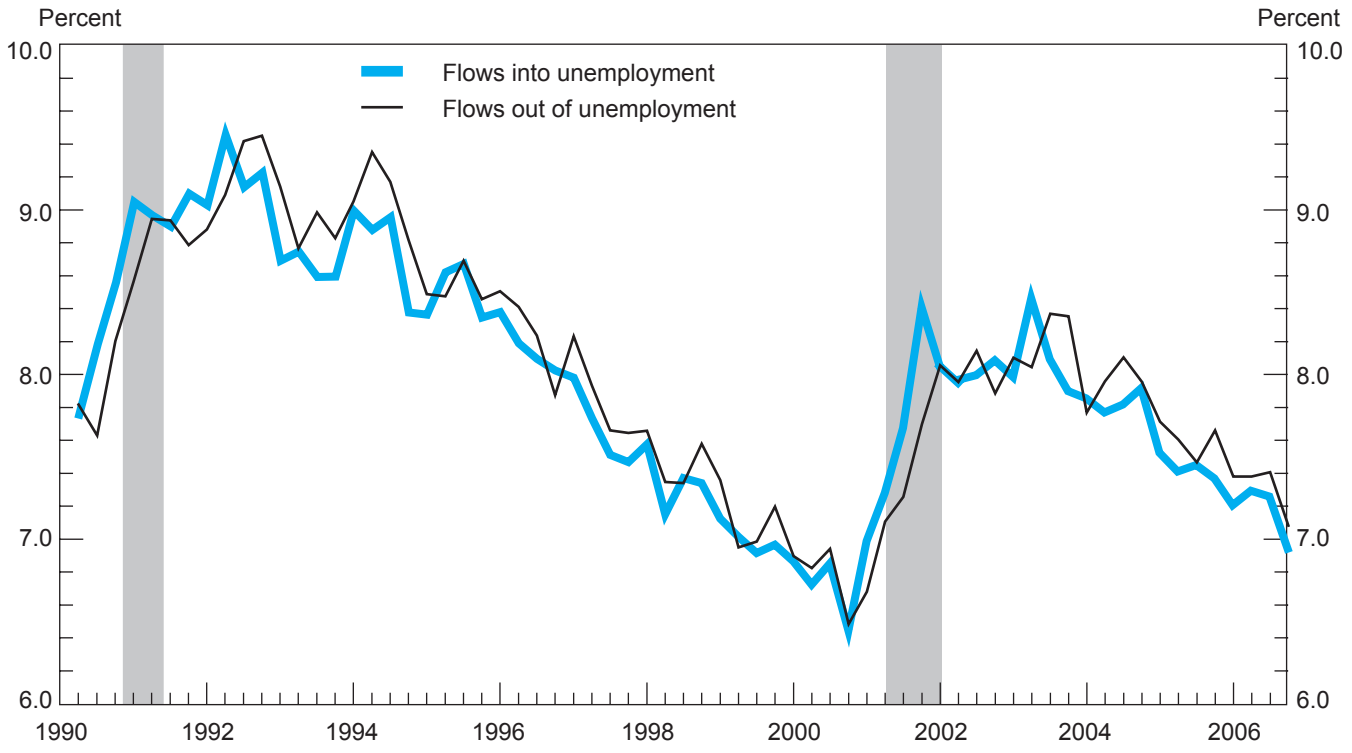


Table 2. Worker and job flow estimates by major industry, JOLTS and BED data, January 2001–June 2006

Industries	JOLTS monthly estimates, percent of employment				BED quarterly data, percent of average employment	
	Job openings	Hires	Quits	Layoffs and other separations	Gross job gains	Gross job losses
Natural resources and mining	1.4	3.2	1.4	1.7	17.1	17.0
Construction	1.7	5.6	2.2	3.4	11.7	11.4
Manufacturing	1.6	2.3	1.2	1.5	3.9	4.8
Wholesale trade	1.8	2.4	1.3	1.2	5.7	5.7
Retail trade	2.3	4.5	2.7	1.7	7.0	6.9
Transportation, warehousing, and utilities	1.9	3.0	1.4	1.6	5.3	5.4
Information	2.4	2.2	1.4	1.0	5.2	6.1
Financial activities	2.5	2.3	1.3	.9	5.8	5.6
Professional and business services	3.4	4.6	2.1	2.1	8.5	8.4
Health and education	3.5	2.7	1.5	.9	4.8	4.2
Leisure and hospitality	3.3	6.5	4.0	2.2	9.4	9.2
Other services	2.3	3.3	2.0	1.3	7.9	7.9
Government	1.8	1.5	.6	.6	...	...

Table 3. Labor force status flows by gender, average monthly estimates, CPS data, 1999–2006

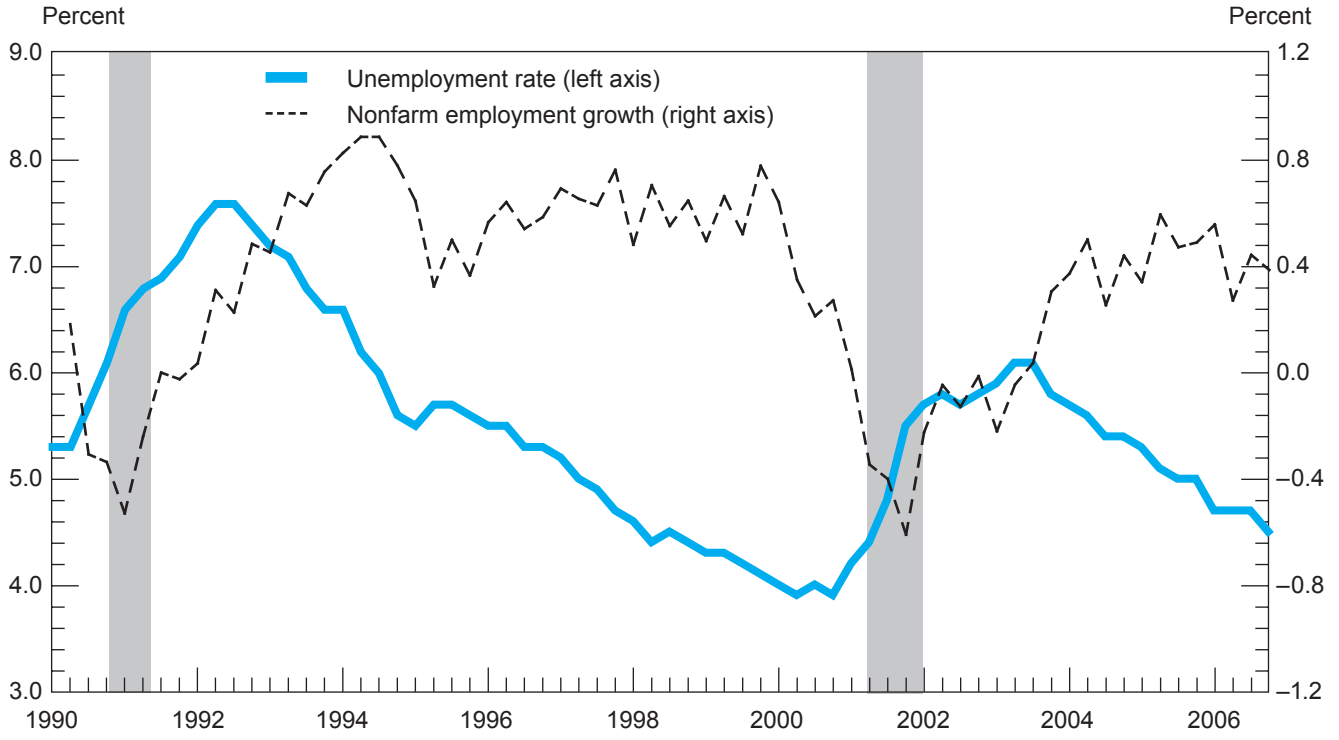
Labor force flows	Number of individuals (in thousands)	Percent of total labor force	Percent of gender's labor force
Men			
Employment inflows (UE + NE)	2,611	1.9	3.5
Employment outflows (EU + EN)	2,586	1.9	3.5
Unemployment inflows (EU + NU)	1,898	1.4	2.6
Unemployment outflows (UE + UN)	1,911	1.4	2.6
Women			
Employment inflows (UE + NE)	2,822	2.0	4.4
Employment outflows (EU + EN)	2,796	2.0	4.4
Unemployment inflows (EU + NU)	1,755	1.3	2.8
Unemployment outflows (UE + UN)	1,766	1.3	2.8

ing the 2001 recession, employment continued to contract until the middle of 2003. The unemployment rate rose during both recessions and did not peak until after they had officially ended. The unemployment rate declined over a long period from 1993 to 2001. After the 2001 recession, the unemployment rate did not rise nearly as high as it did following the 1990–91 recession.

Comparing these data to the gross flows data in chart 4, one can see that the unemployment stock and the unemployment flows exhibited very similar patterns. When unemployment was high, the flow of people moving into and out of the unemployment pool was high as well. By definition, when unemployment inflows exceed outflows, the unemployment rate rises, and one can observe that this happened during and immediately following both recessions. Note that it takes only relatively small differences between inflow and outflow rates to generate large changes in the unemployment rate.

The information presented in charts 6 and 7 provides a clearer picture of the relationship between the movements of worker and job flows from the JOLTS, BED and CPS gross flows data. Chart 6 depicts the flows into employment

Chart 5. **CES nonfarm employment growth and the CPS unemployment rate, quarterly and seasonally adjusted**



(hires, gross job gains, and employment inflows, respectively), while chart 7 shows the flows out of employment (separations, gross job losses, and employment outflows, respectively). The monthly JOLTS and CPS flow data are summed for each quarter to make them comparable to the quarterly BED data. For consistency, all flows are expressed as percentages of the average of the current and previous periods' employment.[10] In addition, the JOLTS job openings rate (measured at their level as of the beginning of the quarter) is included in chart 6. Chart 7 presents the JOLTS separations rate broken out into quits and layoffs plus all other separations.

Chart 6 shows that hiring and gross job gains declined during the 2001 recession. Hiring had a particularly large drop during the recession and did not rebound until mid-2003. By the end of 2004, the hiring rate had returned to its prerecession levels. Job openings followed a similar pattern, although they were still somewhat below their prerecession level at the end of 2006. The rate of gross job gains, which was fairly steady in the last 18 months of the 1990s, began to decline in the first half of 2000, well before the recession began. The rate of job gains fell during the recession and continued its decline until well after it ended. In fact, even though net job gains rebounded starting in mid-2003, gross job gains remained relatively low through the middle of 2006. Finally, flows into employment showed little change over the business cycle, other than to rise modestly during each recession. At first glance, this might appear inconsistent with the other data measures, but these are the individuals who find work after having been unemployed or out of the labor force in the prior month. The flows from these labor force states will tend to be higher when their stocks are larger.

Employment inflows do not include workers who are hired while employed at another job ("job-to-job" transitions). To make the employment inflows comparable to the JOLTS hiring rate, one would have to add these job-to-job transitions to the employment inflow estimate.[11] For this estimate to match the observed movement of the JOLTS hiring rate, the rate of job-to-job transitions would have to drop precipitously during 2001. Most people who leave one job and take another job separate from their previous employer by quitting; the JOLTS data exhibit a large fall in quits, suggesting there were fewer of these job-to-job transitions in 2001.

In chart 7, the JOLTS data show a large decline in the rate

Chart 6. **Worker and job flows into employment, quarterly, seasonally adjusted, percent of average employment**

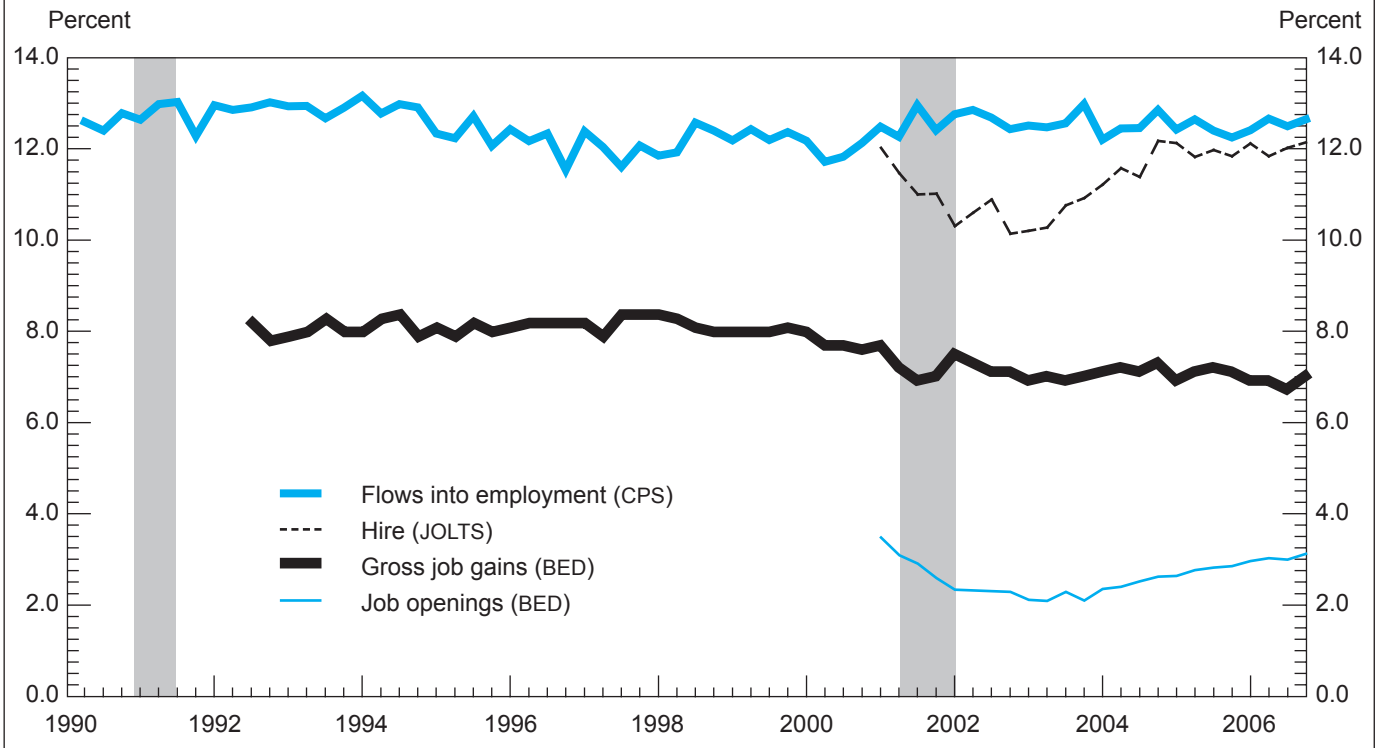
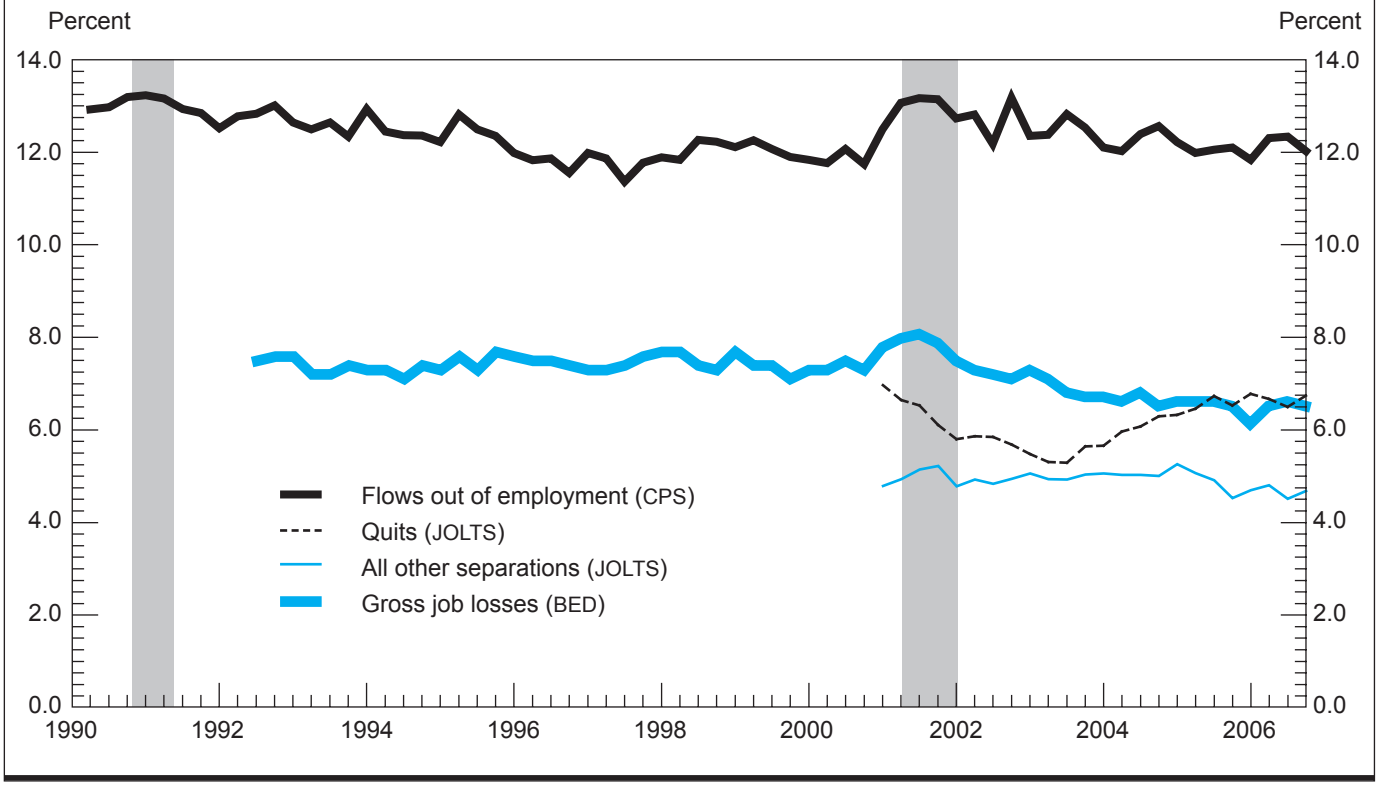


Chart 7. **Worker and job flows out of employment, quarterly, seasonally adjusted, percent of average employment**



of quits during the recession, comparable to the decline in hires shown in chart 6. Moreover, quits start to rise and reach their prerecession levels about the same times that hires do. Layoffs and other separations, on the other hand, rise modestly during the 2001 recession and then decline. They remain higher between 2002 and 2004 and decline again in 2005. Gross job losses also rise and then decline during the 2001 recession. Like the gross job gains, they continue to decline during the first half of 2006. Finally, employment outflows exhibit a pattern quite similar to layoffs and other separations, with a rise during the recession that declines somewhat after it ends, but doesn't completely fall to prerecession levels until 2005. Employment outflows exhibit a similar pattern during and after the 1990–91 recession. Unlike employment inflows, there is little disconnect between employment outflows and what is shown by the JOLTS data on layoffs and other separations and the BED gross job loss data show. This occurs for two reasons: first, unlike inflows, the outflow rate has employment as its initial stock, making it more comparable to the other estimates; and second, outflows from employment are more closely related to layoffs and job losses than they are to total separations, which include quits.

NEW DATA ON LABOR DYNAMICS recently released by the BLS complement the standard measures of the labor market, such as the employment and unemployment statistics provided in the monthly BLS employment report. The Job Openings and Labor Turnover Survey measures the number of workers who move into and out of jobs each month, distinguishes between those who quit or are laid off, and tracks the number of job openings businesses have open at a given point in time. The Business Employment Dynamics data decompose employment growth into the jobs gained at opening and expanding establishments and the jobs lost at contracting and closing establishments. Finally, labor force status flows data from the Current Population Survey measure the movement of individuals as their status changes between being employed, unemployed, or out of the labor force entirely. These new data track the rich dynamics that underlie movements in employment and unemployment and provide a better understanding of labor market changes. □

Notes

[1] For more about the JOLTS data see Kelly A. Clark and Rosemary Hyson, "New tools for labor market analysis: JOLTS," *Monthly Labor Review*, December 2001, pp. 32–37 and Kelly Clark, "The Job Openings and Labor Turnover Survey: what initial data show," *Monthly Labor Review*, November 2004, pp. 14–23. The JOLTS data are publicly available on the Internet at **http://www.bls.gov/jlt**.

[2] For more information on the Business Employment Dynamics (BED) data, see Timothy R. Pivetz, Michael A. Searson, and James R. Spletzer, "Measuring job and establishment flows with BLS longitudinal microdata," *Monthly Labor Review*, April 2001, pp. 13–20; and James R. Spletzer, R. Jason Faberman, Akbar Sadeghi, David M. Talan, and Richard L. Clayton, "Business employment dynamics: new data on gross job gains and losses," *Monthly Labor Review*, April 2004, pp. 29–42. The BED data are publicly available on the Internet at **http://www.bls.gov/bdm**.

[3] Using average employment in the denominator provides a symmetric growth rate and allows a symmetric treatment of changes at opening and closing establishments. This is the official BLS methodology, which is consistent with that of Steven J. Davis, John C. Haltiwanger, and Scott Schuh, *Job Creation and Job Destruction* (MIT Press, 1996).

[4] For an explanation of the Current Population Survey's coverage and concepts, see "Explanatory Notes and Estimates of Error," *Employment and Earnings* (Bureau of Labor Statistics, January 2007). For more on the concepts and estimation of labor force status flows data, see Harley J. Frazis, Edwin L. Robinson, Thomas D. Evans, and Martha A. Duff, "Estimating gross flows consistent with stocks in the CPS," *Monthly Labor Review*, September 2005, pp. 3–9 and Randy E. Ilg, "Analyzing CPS data using gross flows," *Monthly Labor Review*, September 2005, pp. 10–18. The CPS data are publicly available on the Internet at **http://www.bls.gov/cps**.

[5] The CPS has a specific definition of discouraged workers. They are individuals who wish to work and have looked for work sometime in the prior 12 months, but who are not currently looking for work specifically because they believe that no jobs are available for them.

[6] To make the CPS labor force status flows consistent with the reported stock estimates, the BLS developed a method that forces their reconciliation. In addition to the nine flows shown in the text table, there are adjustments that correct for all sources of discrepancies, so that implied changes in stocks derived from the flows match changes in CPS stock estimates. These adjustments account for changes in the working-age population and include net immigration, persons who just turned 16, and average death rates. For more information, see Frazis and others, "Estimating gross flows consistent with stocks in the CPS."

[7] Note that with the 1994 redesign of the CPS, it became possible to measure the job-to-job transitions that are contained within the EE estimate. Respondents are now asked whether their current employer is the same as their employer from the previous month. The publicly available data do not report these estimates separately, although research studying their behavior exists (for example, Bruce Fallick and Charles A. Fleischmann, "Employer-to-Employer Flows in the U.S. Labor Market: The Complete Picture of Gross Worker Flows," Federal Reserve FEDS Working Paper 2004–34). For more information on their measurement, see "Effects of Job Changing on Payroll Survey Employment Trends," available on the Internet at **http://www.bls.gov/ces/cesjobch.pdf**.

[8] By this notion, one could use the JOLTS microdata to estimate both job flows and worker flows.

[9] Although the official Business Employment Dynamics (BED) data begin in 1992, there exists firm-level BED data that begin in

1990. See Jessica Helfland, Akbar Sadeghi and David Talan, "Employment dynamics: small and large firms over the business cycle," *Monthly Labor Review*, March 2007, pp. 39–50; and R. Jason Faberman, "Job Flows over the Recent Business Cycle: Not all 'Recoveries' are Created Equal," BLS Working paper No. 391 (Bureau of Labor Statistics, 2005).

[10] As a result of the authors imposing this consistency on the data, the employment flow rates in charts 7 and 8 use a different denominator than the employment flow rates in chart 3.

[11] Note that this addition would also be necessary if one wanted to compare employment outflows with the JOLTS total separations rate. In addition, note that adding job-to-job transitions would make the CPS employment inflows considerably larger in magnitude than the JOLTS hiring rate. (See note 7 for more information about job-to-job transitions.) Understanding why such a difference in magnitudes exists is a topic of ongoing research.

Nominations Sought for 2008 Julius Shiskin Award

Nominations are invited for the annual Julius Shiskin Memorial Award for Economic Statistics. The award is given in recognition of unusually original and important contributions in the development of economic statistics or in the use of statistics in interpreting the economy. Contributions are recognized for statistical research, development of statistical tools, application of information technology techniques, use of economic statistical programs, management of statistical programs, or developing public understanding of measurement issues. The award was established in 1980 by the Washington Statistical Society (WSS) and is now cosponsored by the WSS, the National Association for Business Economics, and the Business and Economics Statistics Section of the American Statistical Association (ASA). The 2007 award recipient was Arthur Kennickell, Senior Economist and Head of the Microeconomic Surveys Unit at the Federal Reserve Board, for his leadership of the Federal Reserve's Survey of Consumer Finances and his achievements as an international expert on the design and implementation of household economic surveys.

Because the program was initiated many years ago, it is little wonder that statisticians and economists often ask, "Who was Julius Shiskin?" At the time of his death in 1978, "Julie" was the Commissioner of the Bureau of Labor Statistics (BLS) and earlier served as the Chief Statistician at the Office of Management and Budget (OMB), and the Chief Economic Statistician and Assistant Director of the Census Bureau. Throughout his career, he was known as an innovator. At Census he was instrumental in developing an electronic computer method for seasonal adjustment. In 1961, he published *Signals of Recession and Recovery*, which laid the groundwork for the calculation of monthly economic indicators, and he developed the monthly Census report *Business Conditions Digest* to disseminate them to the public. In 1969, he was appointed Chief Statistician at OMB where he developed the policies and procedures that govern the release of key economic indicators (Statistical Policy Directive Number 3), and originated a *Social Indicators* report. In 1973, he was selected to head BLS where he was instrumental in preserving the integrity and independence of the BLS labor force data and directed the most comprehensive revision in the history of the Consumer Price Index (CPI), which included a new CPI for all urban consumers.

Nominations for the 2008 award are now being accepted. Individuals or groups in the public or private sector from any country can be nominated. The award will be presented with an honorarium of $750 plus additional recognition from the sponsors. A nomination form and a list of all previous recipients are available on the ASA Web site at **www.amstat.org/sections/bus_econ/shiskin.html** or by writing to the Julius Shiskin Award Committee, Attn: Monica Clark, American Statistical Association, 732 North Washington Street, Alexandria, VA 22314–1943.

Completed nominations must be received by April 1, 2008. For further information contact Steven Paben, Julius Shiskin Award Committee Secretary, at paben.steven@bls.gov.