BED and JOLTS data are not explained until much later in the article, which was written for experts in the field. Do you find the tables and charts more challenging to understand because the data methodology is not explained?

Employment dynamics over the last decade

Business cycle movements in BED and JOLTS data suggest that the two series complement each other; during the onset of the 2007–2009 recession, BED gross job gains and JOLTS hires fell simultaneously while BED gross job losses and JOLTS separations diverged

Caryn N. Bruyere, Guy L. Podgornik, and James R. Spletzer

The 2007–2009 recession was the longest and most severe post-World War II recession. As dated by the National Bureau of Economic Research (NBER), the recession was 18 months long, lasting from December 2007 through June 2009. Prior to that, the longest post-World War II recessions were the 1973 and 1981 recessions, both 16 months long.

The employment losses associated with the 2007–2009 recession also were the largest of any post-World War II recession. Twenty-six months after the recession began, total private employment was 7.6 percent lower than it was at the start of the recession.[1] Prior to this recession, the largest employment loss in any post-World War II recession was 6.0 percent, posted 11 months after the start of the 1948 recession. Looking at the four most recent recessions reveals that the maximum total private employment losses were the aforementioned 7.6 percent for the 2007–2009 recession, 3.5 percent for the 1981 recession, 3.0 percent for the 2001 recession, and 1.8 percent for the 1990–1991 recession. The time series of total private employment for the 4 years following the onset of the most recent four recessions are presented in chart 1. The severity of employment losses in the most recent recession relative to other recent recessions is clear.

The text directs the reader to Chart 1, at the top of the next page.

This article examines the underlying dynamics of the employment losses associated with the 2007–2009 recession. The data graphed in chart 1 summarize the net employment losses that originate from the hiring, quit, and layoff decisions of more than 8.5 million establishments and more than 100 million workers in the private sector. One measure of the underlying employment dynamics is to simultaneously count how many jobs are being created by establishments that are opening or increasing their employment and how many jobs are being lost by establishments that are closing or decreasing their employment. The sum of these two statistics will be the net employment change. Another measure of the underlying employment dynamics is to simultaneously count how many workers are being hired and how many workers are leaving their current employer. Again, the sum of these two statistics will be the net employment change. Both of these measures of the underlying employment dynamics of the labor market can be examined with data from two programs conducted by the Bureau of Labor Statistics (BLS, the Bureau): the Business Employment Dynamics (BED) program and the Job Openings and Labor Turnover Survey (JOLTS).

BED data measure the gross job gains registered by expanding and opening establishments and the gross job losses posted by contracting and closing establishments. Gross job

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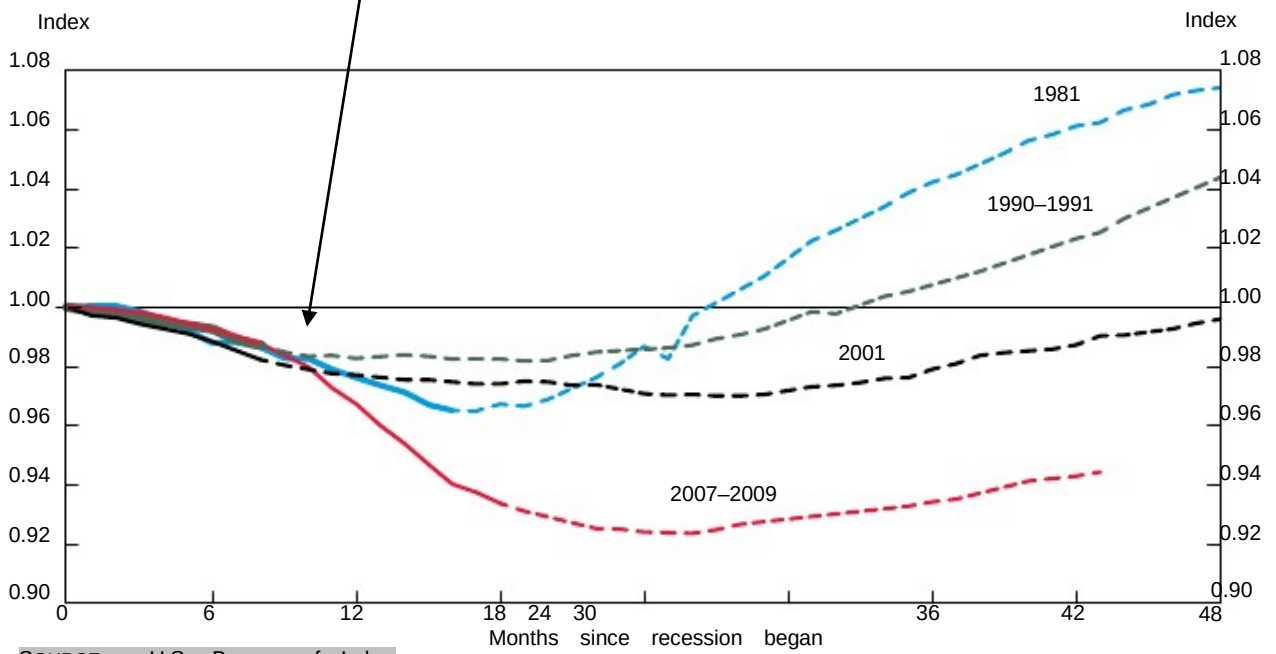
Do the writers explain what the broken lines indicate?

Chart 1. CES total private employment, previous four recessions, seasonally adjusted



SOURCE: U.S. Bureau of Labor Statistics.

The source of the chart is clearly identified.

gains and losses, also referred to as job flows, measure the establishment-level net changes in employment that underlie the single, economywide net-employment-change statistic. JOLTS data measure the number of workers hired into jobs and the number of workers separating from their employer. These hires and separations data, also referred to as worker flows, measure the underlying employment dynamics from the worker's perspective.

Measures of gross job gains and gross job losses from the BED statistics and measures of hires and separations from the JOLTS help explain why employment is increasing or decreasing. For example, labor market analysts often ask what portion of the job losses during the most recent recession was due to businesses laying off workers, as opposed to businesses not replacing workers who quit or retired. In addition, analysts are concerned that employment may not grow quickly as the economy emerges from the recent recession: is it because businesses are not hiring or because workers are still losing their jobs? The measures of employment dynamics from the BED statistics and the JOLTS are intended to answer this and other types of questions.

In what follows, levels and trends in gross job flows from the BED statistics are compared with levels and trends in worker flows captured by the JOLTS.[2] The analysis finds that both the BED statistics and the JOLTS measure large amounts of employment dynamics that underlie the single net-change statistic and that both the BED statistics and the JOLTS have business cycle properties. The most important finding, however, is that the BED statistics and the JOLTS data are complementary and measure different aspects of the labor market. For example, the rise in establishment-level employment losses that the BED statistics show in the early stages of the most recent recession reflect an initial decrease in hiring, followed several quarters later by a large increase in layoffs, as revealed by the JOLTS data. Analogously, the increase seen in the BED establishment-level employment gains following the trough of the most recent recession reflects primarily a decrease in the number of layoffs, as indicated in the JOLTS data.

Detailed explanation of the chart is located on the same page.

Employment dynamics data

This section describes (1) the gross job gains and gross job losses exhibited in the BED statistics and (2) the hires and separations data collected by the JOLTS. The next section compares and contrasts the BED job flows and the JOLTS worker flows.

The writers explain information that Chart 2 adds to Chart 1 when the chart is introduced.

Business employment dynamics. The BED microdata are constructed from the Quarterly Census of Employment and Wages (QCEW) microdata at the Bureau of Labor Statistics. The QCEW is the Bureau's business list, with employment and wage information for all establishments covered by State and Federal unemployment insurance laws. The 9-million-plus establishments that participate in the QCEW cover 98 percent of employees on nonfarm payrolls in the United States; thus, the QCEW is a near census of U.S. payroll employment. (Self-employed individuals are excluded.)

BED microdata are created by linking the establishments in the QCEW longitudinally across quarters. Establishments in the government sector and in the private household services industry are excluded from the BED data. Through the process of linking establishments between the previous and the current quarter, five categories emerge: opening establishments have positive employment in the current quarter, but either did not exist or had zero employment in the previous quarter; expanding establishments have positive employment in both quarters, with employment in the current quarter higher than employment in the previous quarter; contracting establishments have positive employment in both quarters, with employment in the current quarter less than employment in the previous quarter; and closing establishments had positive employment in the previous quarter, but either do not exist or have zero employment in the current quarter. A fifth category comprises establishments that have the same level of employment in both the current and the previous quarter. Gross job gains are defined as the number of jobs created by opening and expanding establishments, and gross job losses are defined as the number of jobs lost from contracting and closing establishments. The difference of gross job gains and gross job losses is the familiar net employment change statistic.[3]

The Bureau releases BED statistics quarterly. The core data elements in the release are gross job gains and gross job losses, along with the associated establishment counts, by industry, State, age, and size of firm. In the fourth quarter of 2010, the most recent period for which data are available, gross job gains were 6.954 million and gross job losses were 6.391 million, resulting in a net employment growth of 563,000 for the quarter.[4]

The time series of quarterly BED statistics starts in the third quarter of 1992. Seasonally adjusted gross job gains and gross job losses from 1992 to 2010 are presented in chart 2, and the resulting net employment change statistics (computed as gross job gains less gross job losses) are shown in chart 3.

The BED statistics reflect two major facts about the U.S. labor market. First, as seen in chart 2, there is a large amount of establishment-level churning that is not evident in the statistics on net employment change. To bring out this point more clearly, table 1 presents averages of the seasonally adjusted quarterly BED statistics for the years 2004–2007. In the average quarter of this period, there were 1.540 million establishments that were expanding, and these expanding establishments created 6.197 million jobs. Also during the average quarter of this period, there were 365,000 establishments that were opening, and these opening establishments started with 1.503 million jobs. The sum of these two statistics shows that, in the average quarter, there were 1.905 million establishments that created 7.700 million jobs which did not exist in the previous quarter. The gross job loss statistics are in the bottom half of the table, and they show a similar story: in the average quarter, there were 1.869 million establishments that were contracting or closing and 7.282 million jobs that existed in the previous quarter no longer existed in the next quarter. The net of gross job gains and gross job losses was 418,000 net new jobs created in the average quarter (during the years 2004–2007).

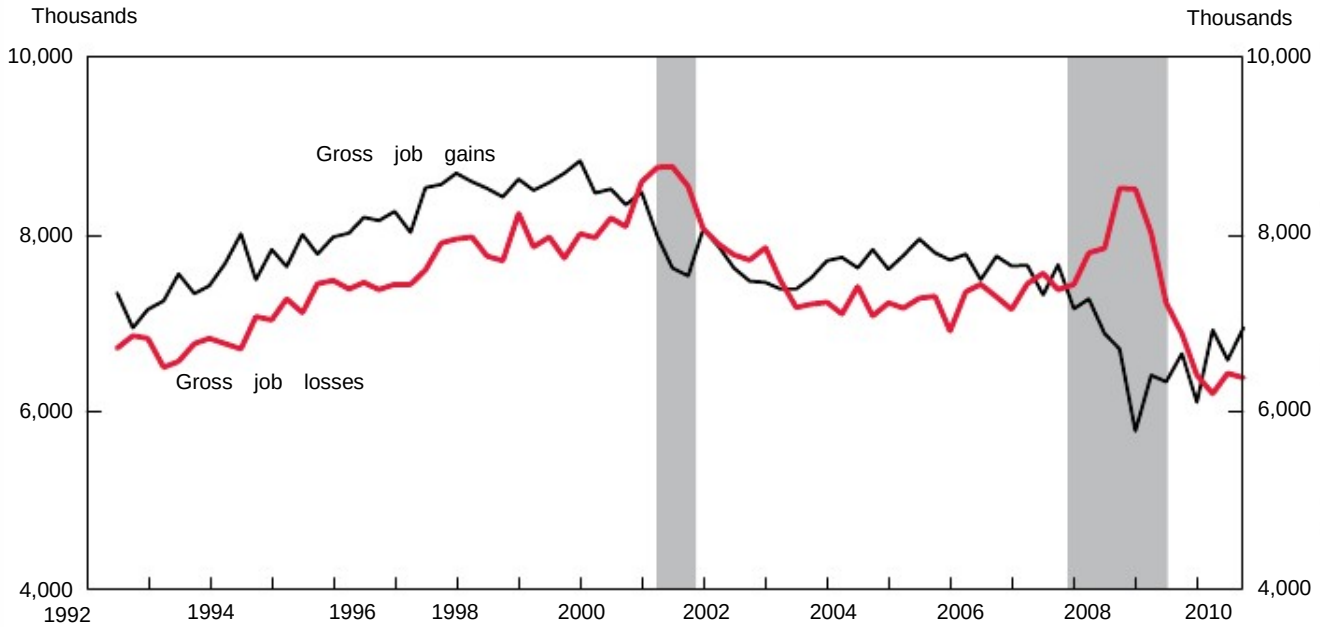
Digging somewhat deeper into gross job gains and gross job losses, chart 4 shows the decomposition of gross job gains into expansions and openings and the decomposition of gross job losses into contractions and closings. In the chart, the quarterly gross job gains and losses from expanding and contracting establishments are seen to be much larger than the quarterly gross job gains and losses from opening and closing establishments. Throughout the 18-year time series of the BED (from the third quarter of 1992 to the fourth quarter of 2010), 79 percent of quarterly gross job gains are from expanding establishments and 80 percent of quarterly gross job losses are from contracting establishments.

The second major conclusion to be drawn from the BED statistics is that gross job gains and gross job losses have interesting business cycle properties. As seen in chart 2, simultaneous sharp rises in jobs lost from contracting and closing establishments and drops in jobs gained from expanding and opening establishments occur during recessions. Examining chart 4 suggests that most of the interesting business cycle dynamics associated with gross job gains and gross job losses are concentrated in the expanding and contracting establishments, as opposed to the opening and closing establishments.

In addition to disseminating statistics on gross job gains and losses, the BED program publishes the number of establishments gaining and losing jobs. These establishment counts are presented in chart 5, which shows that, during

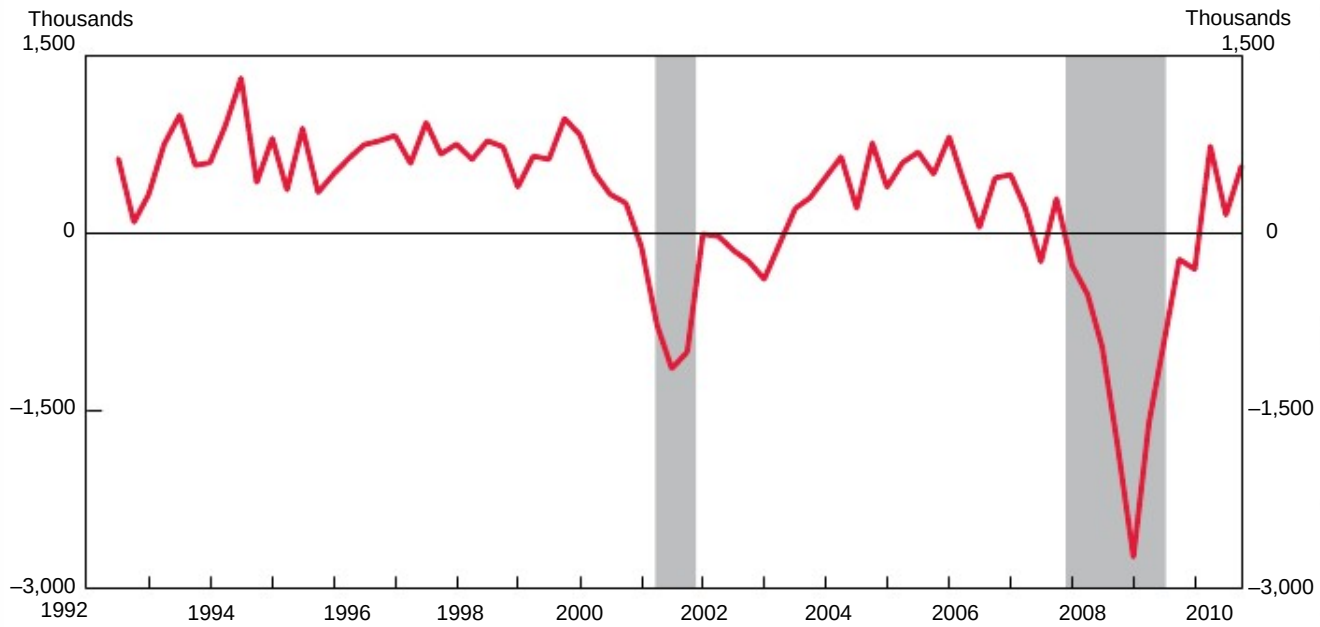
How does the data spacing affect the emotional impact of these two line graphs? Which looks the most troubling?

Chart 2. Quarterly BED gross job gains and losses, seasonally adjusted, 1992–2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

Chart 3. Quarterly BED net employment change, seasonally adjusted, 1992–2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

The writers reference Exhibit 1 two pages before it appears. How did that affect your ability to access and understand the material?

Table 1. BED statistics in the average quarter, 2004–2007

Statistic	Number of establishments	Number of jobs gained or lost
Expanding establishments	1,540,000	6,197,000 jobs gained
Opening establishments	365,000	1,503,000 jobs gained
Gross job gains	1,905,000	7,700,000 jobs gained
Contracting establishments	1,524,000	5,889,000 jobs lost
Closing establishments	345,000	1,393,000 jobs lost
Gross job losses	1,869,000	7,282,000 jobs lost
Net change in employment	...	418,000 net jobs gained

The table breaks down job loss by categories.

the most recent recession, the number of establishments gaining jobs declined and the number of establishments losing jobs increased. Further calculations (explained in the box on page 22) reveal that approximately two-thirds of the sharp decrease in gross job gains between the fourth quarter of 2007 and the first quarter of 2009 is attributable to a decrease in the number of establishments gaining jobs, with the remaining one-third attributable to a decrease in the average number of jobs created by job-creating establishments. These statistics suggest that the falling gross job gains are due both to establishments eliminating their hiring and to establishments cutting back on their hiring, with twice as much explanatory weight given to the former. Similar calculations show that approximately two-thirds of the sharp increase in gross job losses between the fourth quarter of 2007 and the first quarter of 2009 is attributable to an increase in the number of establishments losing jobs, with the remaining one-third attributable to an increase in the average size of jobs lost per declining establishment.

Job Openings and Labor Turnover Survey. The JOLTS is composed of a random sample of approximately 16,000 business establishments, of which approximately 10,500 provide data on a regular basis. The establishments are sampled from the BLS business universe: the QCEW. The JOLTS collects information on total employment, job openings, hires, and separations. The separations data are collected as quits, layoffs and discharges, and other separations. The key component of the JOLTS form is shown in exhibit 1.[5]

The JOLTS total employment estimates are benchmarked monthly to the employment estimates of the Current Employment Statistics (CES) survey, and the ratio of CES to JOLTS employment is used to adjust the levels for all other JOLTS data elements. After the benchmarking of the monthly employment levels, the JOLTS implied net employment change (hires minus separations) should be comparable to the CES net employment change. However, definitional differences, as well as sampling and nonsampling errors between the two surveys, historically have caused the JOLTS to diverge from the CES survey over time. To limit this divergence, and to improve the quality of the JOLTS hires and separations series, the Bureau implemented a monthly alignment method that applies the CES employment trends to the seasonally adjusted JOLTS implied employment trend, forcing them to be approximately the same. The CES series is considered a highly accurate measure of net employment change, owing to its very large sample size and annual benchmarking to universe counts of employment from the QCEW program.[6]

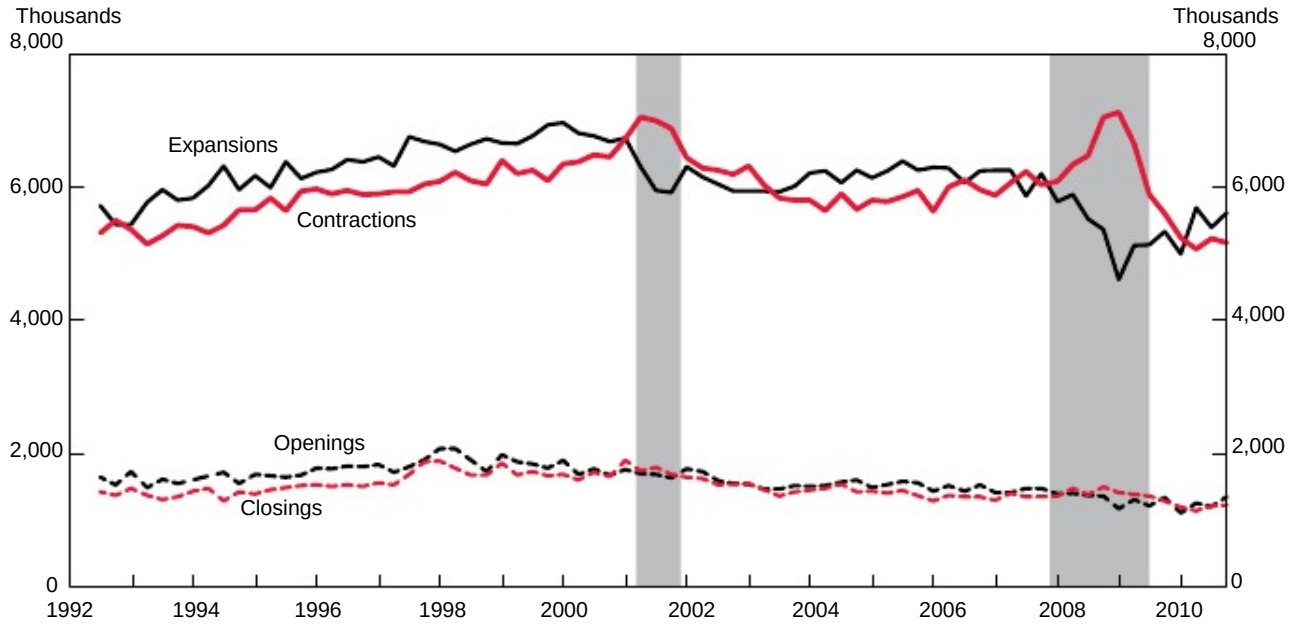
The JOLTS statistics released monthly by the Bureau include hires, separations, and job openings, by industry and region. In June 2011, the most recent period for which data are available, there were 4.051 million hires and 4.016 million separations, with a resulting net employment change of 35,000 jobs.[7]

The time series of monthly JOLTS statistics starts in December 2000. In everything that follows in this article, quarterly JOLTS data are created from the monthly data and the focus is on the private sector for the first quarter of 2001 through the fourth quarter of 2010. A time series of quarterly JOLTS data for the private sector allows for a straightforward comparison of the BED and JOLTS data. The measure of quarterly hires is created as the sum of three monthly hires, and the measure of quarterly separations is created as the sum of three monthly separations. The quarterly JOLTS hires and separations statistics for the private sector are presented in chart 6, and the resulting net employment change statistics (computed as hires less separations) are given in chart 7. The quarterly components of separations—quits, layoffs, and other separations—are shown in chart 8.

The JOLTS hires and separations statistics tell us two major facts about the U.S. labor market. First, there is a tremendous amount of worker churning in the labor market that is not evident in the net employment change statistics. To show this phenomenon more clearly, the following tabulation presents quarterly averages of the

In each of the line graphs, the writers shade the periods on the time line they are writing about. Do you find this helpful in interpreting the charts?

Chart 4. Quarterly BED gross job gains and losses, seasonally adjusted, 1992–2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

Chart 5. Quarterly BED number of establishments, seasonally adjusted, 1992–2010

NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

Gross job gains from the fourth quarter of 2007 to the first quarter of 2009: why the decrease?

The number of gross job gains in the fourth quarter of 2007 (G_{07}) was 7.670 million, calculated as 1.945 million establishments gaining jobs (E_{07}) times an average size of 3.94 jobs gained per establishment (S_{07}). The number of gross job gains in the first quarter of 2009 (G_{09}) was 5.783 million, calculated as 1.606 million establishments gaining jobs (E_{09}) times an average size of 3.60 jobs gained per establishment (S_{09}). During that period, both the number of establishments gaining jobs decreased (from 1.945 million to 1.606 million) and the average size of job gains in gaining establishments decreased (from 3.94 to 3.60). How much of the total decline in gross job gains (from 7.670 million to 5.783 million) was due to each of these components?

There are two ways to decompose the difference $G_{07} - G_{09}$. The first is

$$\begin{aligned} G_{07} - G_{09} &= E_{07}S_{07} - E_{09}S_{09} \\ &= E_{07}S_{07} - E_{09}S_{09} + E_{07}S_{09} - E_{07}S_{09} \\ &= E_{07}(S_{07} - S_{09}) + S_{09}(E_{07} - E_{09}). \end{aligned}$$

The term $E_{07}(S_{07} - S_{09})$ is referred to as the average-size effect and is computed as $1.945(3.94 - 3.60) = 0.666$. The term $S_{09}(E_{07} - E_{09})$ is referred to as the number-of-establishments effect and is computed as $3.60(1.945 - 1.606) = 1.221$. These two effects ($0.666 + 1.221 = 1.887$) sum to the total number of jobs gained ($G_{07} - G_{09}$) = (7.670 – 5.783) = 1.887. In this first decomposition, the average-size effect is 35.3 percent of the total effect and the number-of-establishments effect is 64.7 percent of the total effect.

The second way to decompose the difference $G_{07} - G_{09}$ is

$$\begin{aligned} G_{07} - G_{09} &= E_{07}S_{07} - E_{09}S_{09} \\ &= E_{07}S_{07} - E_{09}S_{09} + E_{09}S_{07} - E_{09}S_{07} \\ &= E_{09}(S_{07} - S_{09}) + S_{07}(E_{07} - E_{09}). \end{aligned}$$

The average-size effect $E_{09}(S_{07} - S_{09})$ is computed as $1.606(3.94 - 3.60) = 0.550$. The number-of-establishments effect $S_{07}(E_{07} - E_{09})$ is computed as 3.94 (1.945 – 1.606) = 1.337. These two effects (0.550 + 1.337) sum to the total number of jobs gained, 1.887. In this second decomposition, the average-size effect is 29.2 percent of the total effect and the number-of-establishments effect is 70.8 percent of the total effect.

Although the two different decompositions fail to give the exact same point estimates for the average- size effect (35.3 percent and 29.2 percent) and for the number-of-establishments effect (64.7 percent and 70.8 percent), it is clear that approximately two-thirds of the sharp decrease in gross job gains between the fourth quarter of 2007 and the first quarter of 2009 is attributable to a decline in the number of establishments gaining jobs, with the remaining one-third attributable to a decline in the average number of jobs created by job-creating establishments.

seasonally adjusted quarterly JOLTS statistics for the years 2004–2007:

Statistic	Number of jobs
Hires	14,821,000
Separations	14,387,000
Quits	8,158,000
Layoffs	5,301,000
Other	928,000
Net change in employment	434,000

As the tabulation shows, in this period's average quarter 14.821 million workers were hired into new jobs and 14.387 million workers were separated from their current jobs. Looking more closely at the separations data shows that, in the average quarter from 2004 to 2007, 8.158 million workers quit, 5.301 million workers were laid off, and 0.928 million workers were separated for other reasons, such as retirement. The net employment change resulting from the 14.821 million hires and the 14.387 million separations was 434,000 net new jobs created in the average quarter of the period.

The second major conclusion to draw from the JOLTS statistics is that hires and separations have business cycle properties. As seen in chart 6, both hires and separations fall during recessions, although hires fall faster. The growing divergence between the two series leads to the rising net employment losses evident in chart 7.[8] The decline

Exhibit 1. A key component of the JOLTS survey form

3 Please provide data for the time period indicated for each item. Enter "0" if none. Enter "NA" if data are not available. See the back of this page for explanations of the terms below.

	Employment	Job openings	Hires	Separations		
	Number of full- or part-time employees who worked or received pay for the pay period that includes the 12th of the month	A job is open if it meets all three conditions: • A specific position exists • Work could start within 30 days • You are actively seeking workers from outside this location to fill the position	A hire is any addition to your payroll, and: • May be a new hire or previously separated rehire • May be permanent, short-term, or seasonal • May be a recall from layoff	Quits (Except retirements)	Layoffs and Discharges • Layoffs • Discharges • Terminations of permanent, short-term, or seasonal employees	Other • Retirements • Transfers from this location • Employee disability • Deaths
Report for month of:	A Total Employment for the pay period that includes the 12th of the month	B Number of Job Openings on the last business day of the month	C Hires and Recalls for the entire month	D Quits	E Layoffs and Discharges	F Other Separations
				.....for the entire month.....		

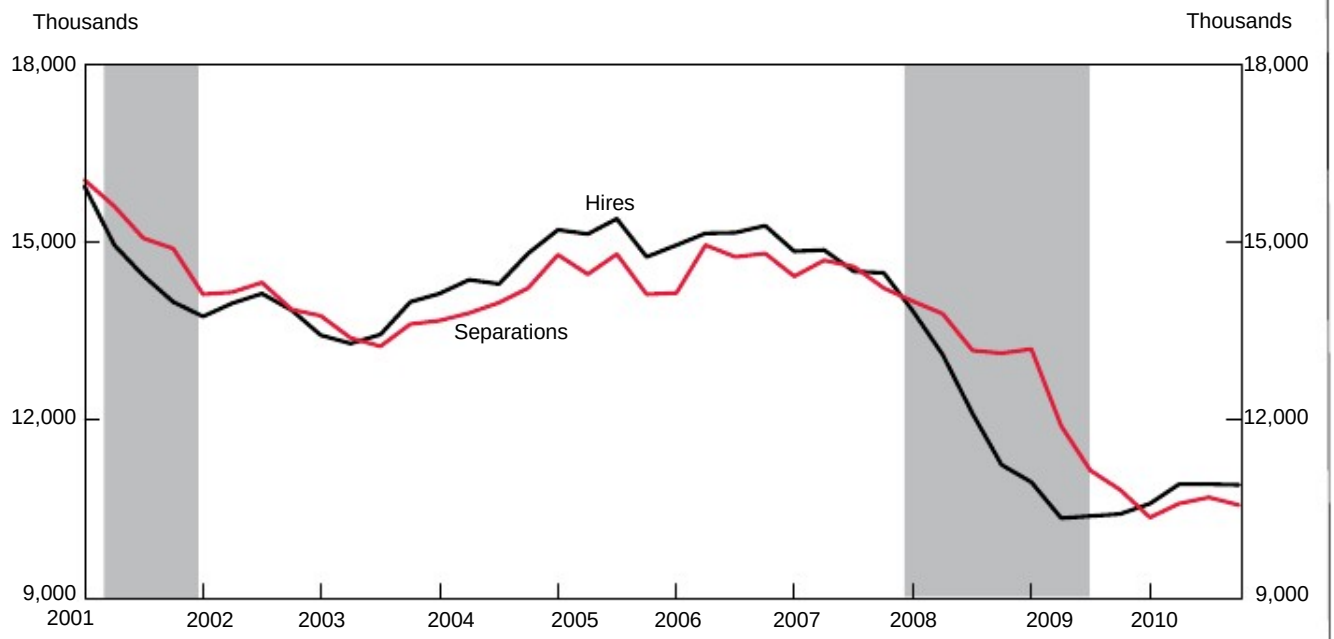
in separations during recessions is different from the increase in BED gross job losses during recessions, and this difference is one of the key results highlighted in the next section.

The decline in JOLTS separations during recessions masks different trends in the underlying quits and layoffs. As seen in chart 8, quits fell dramatically during the last two recessions and layoffs rose for some time during the latter half of the most recent recession. The behavior of these series suggests a general model according to which the levels of hires and the levels of job openings both fall during recessions as establishments cut back on hiring or implement hiring freezes. Workers see this decline in labor demand and stay in their existing jobs; thus, quits fall. As the recession deepens, and as establishments want to cut back further on employment, the only option left when workers fail to quit is for establishments to begin laying them off.

The business cycle properties of the hires and separations series also can be seen by looking at correlations of the JOLTS data elements.[9] The correlations of the quarterly JOLTS data elements, computed over the period from the first quarter of 2001 to the fourth quarter of 2010, are given in table 2. The correlation of 0.53 between hires and net change in employment indicates that the JOLTS hires series is procyclical: hires are growing when employment is growing (expansions), and hires are falling when employment is falling (recessions). Separations are mildly procyclical: the correlation of 0.14 between separations and net employment growth indicates that separations move somewhat together with net employment change. This mild procyclicality of separations is due to a procyclical quits series and a countercyclical layoffs series. Indeed, the correlation between layoffs and net employment growth is very strongly negative (–0.76).

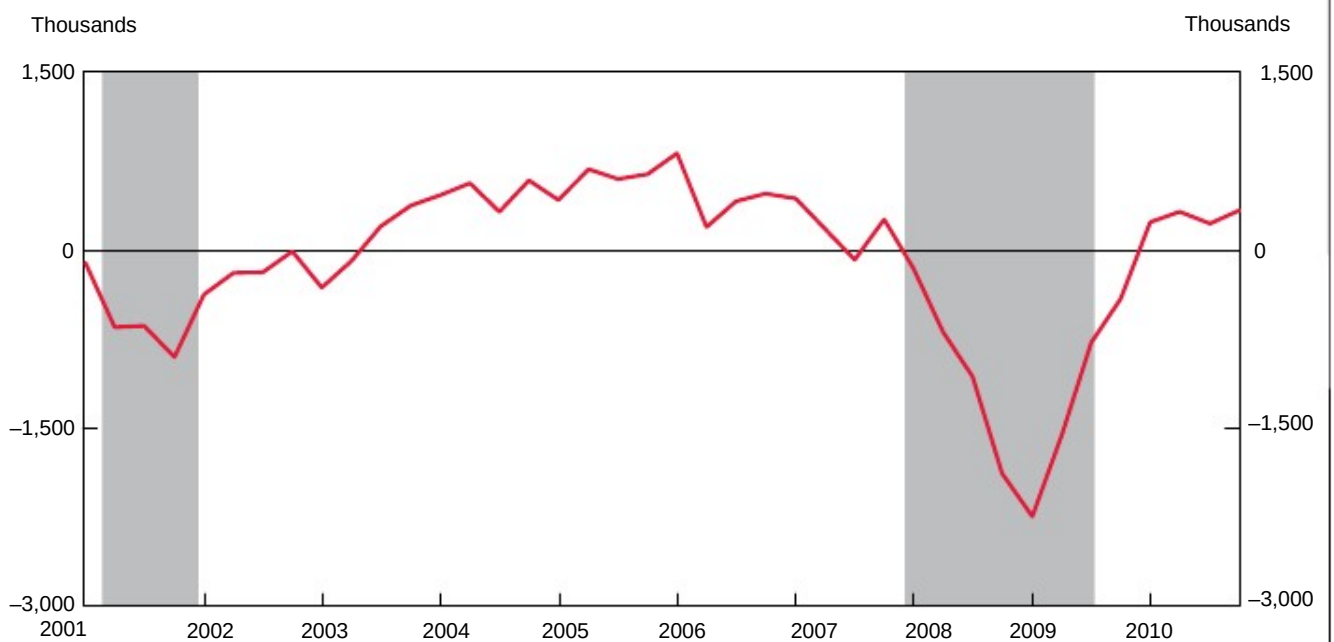
It is worth noting the extremely strong correlation (0.97) between hires and quits. When establishments are hiring, workers see these opportunities and are more likely to quit their current jobs. During recessions, when establishments are not hiring, such opportunities are limited and workers are less likely to quit the jobs they have. However, it is important to note that, even during the trough of the most recent recession, there were still a large

Chart 6. Quarterly JOLTS total private hires and separations, seasonally adjusted, 2001–2010



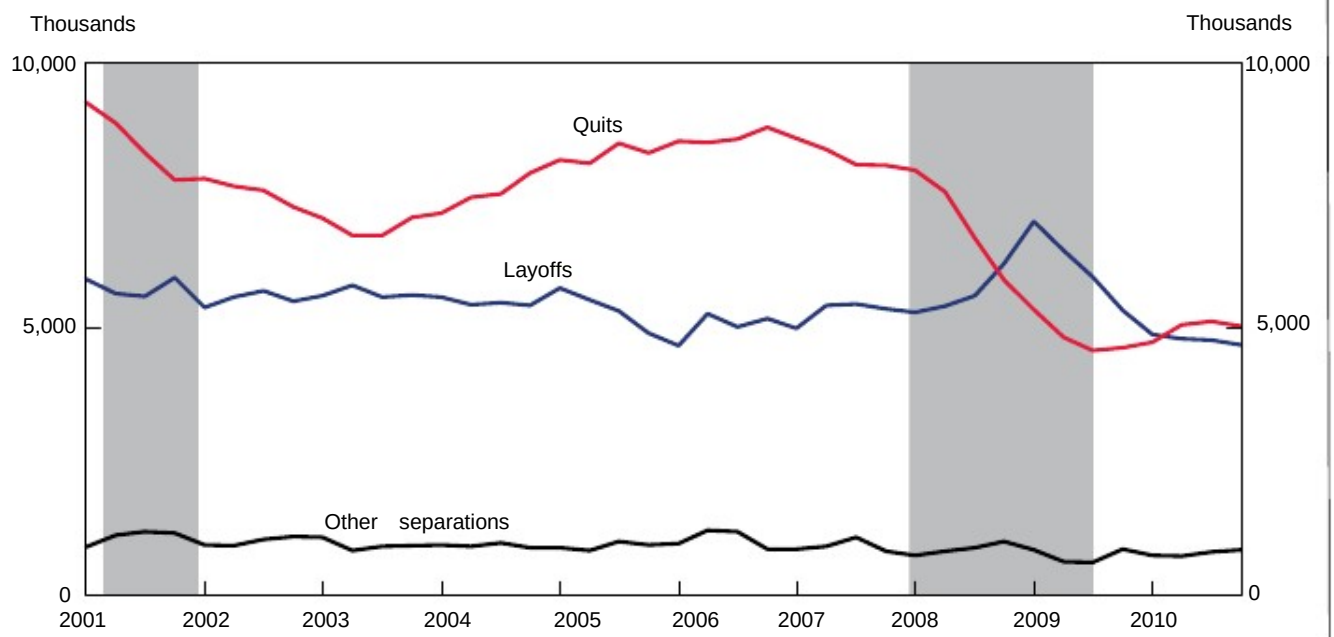
NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

Chart 7. Quarterly JOLTS total private net employment change, seasonally adjusted, 2001–2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

Chart 8. Quarterly JOLTS total private separations, seasonally adjusted, 2001–2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

number of hires and quits in the U.S. labor market. In the private sector, in the first quarter of 2009, when the number of jobs fell by 2.25 million (as measured by the JOLTS), there were still 10.9 million hires and 5.3 million quits. These statistics show that hires and quits did not come to a complete standstill during the most recent recession, although the respective numbers were certainly much lower than their average quarterly levels of 14.8 million hires and 8.2 million quits during the mid-2000s expansion. (See the tabulation on page 22.)

Employment dynamics during the last decade

This section compares and contrasts the BED and JOLTS statistics. Levels and trends during three periods are examined: the expansionary period of the mid-2000s, the onset of the most recent recession, and the quarters following the labor market trough of the recession.

The expansion. Chart 9 graphs BED gross job gains and gross job losses from the first quarter of 2004 through the fourth quarter of 2010, together with JOLTS hires and separations over the same period. As the chart shows, the BED and JOLTS series were relatively stable during calendar years 2004–2007. BED gross job gains have an average quarterly level of 7.7 million during this period, and BED gross job losses have an average quarterly level of 7.3 million. JOLTS average quarterly hires are 14.8 million over the same period, and JOLTS average quarterly separations are 14.4 million. The ratio of hires to gross job gains is 1.93:1, and the ratio of separations to gross job losses is 1.98:1.

The onset of the recession. The NBER dated the most recent recession as having begun in the fourth quarter of 2007. From then until the first quarter of 2009, the labor market worsened. Following a net employment gain of 210,000 in the fourth quarter of 2007 (as measured by the CES total private employment series), quarterly employment losses began and then increased every quarter, from –211,000 in the first quarter of 2008 to –2,349,000 in the first quarter of 2009. A vertical line in chart 9 marks the first quarter of 2009 as the labor market trough.

As documented in the previous section, declining employment levels during the onset of recessions are characterized by falling gross job gains and rising gross job losses. BED gross job gains fell from 7.670 million in the

Table 2. Hires and separations correlations from JOLTS quarterly data, first quarter, 2001, through fourth quarter, 2010

Statistic	Hires	Separations	Quits	Layoffs	Net change in employment
Hires	1.00	0.91	0.97	–0.16	0.53
Separations	…	1.00	.94	.19	.14
Quits	…	…	1.00	–.14	.40
Layoffs	…	…	…	1.00	–.76
Net change in employment	…	…	…	…	1.00

NOTE: Blank cells indicate that table is symmetric about the diagonal.

fourth quarter of 2007 to 5.783 million in the first quarter of 2009 (a 24.6-percent decline), and BED gross job losses rose from 7.384 million to 8.524 million over the same period (a 15.4-percent increase). The period also is characterized by falling hires and falling separations. The JOLTS measure of hires fell by 24.5 percent, from 14.472 million at the beginning of the period to 10.925 million at the end, and the JOLTS measure of separations fell by 7.3 percent, from 14.215 million to 13.173 million.

It makes sense that BED gross job gains and JOLTS hires fall simultaneously. Gross job gains measure establishment-level increases in employment, and the only way that an establishment can grow is to hire personnel. When hires decline dramatically, as they did in the NBER-defined recessionary period, it follows that gross job gains also decline. What is less intuitive is that BED gross job losses are rising while JOLTS separations are falling. Gross job losses measure establishment-level decreases in employment, so it may be initially puzzling how establishments can decrease their employment without an increase in worker separations.

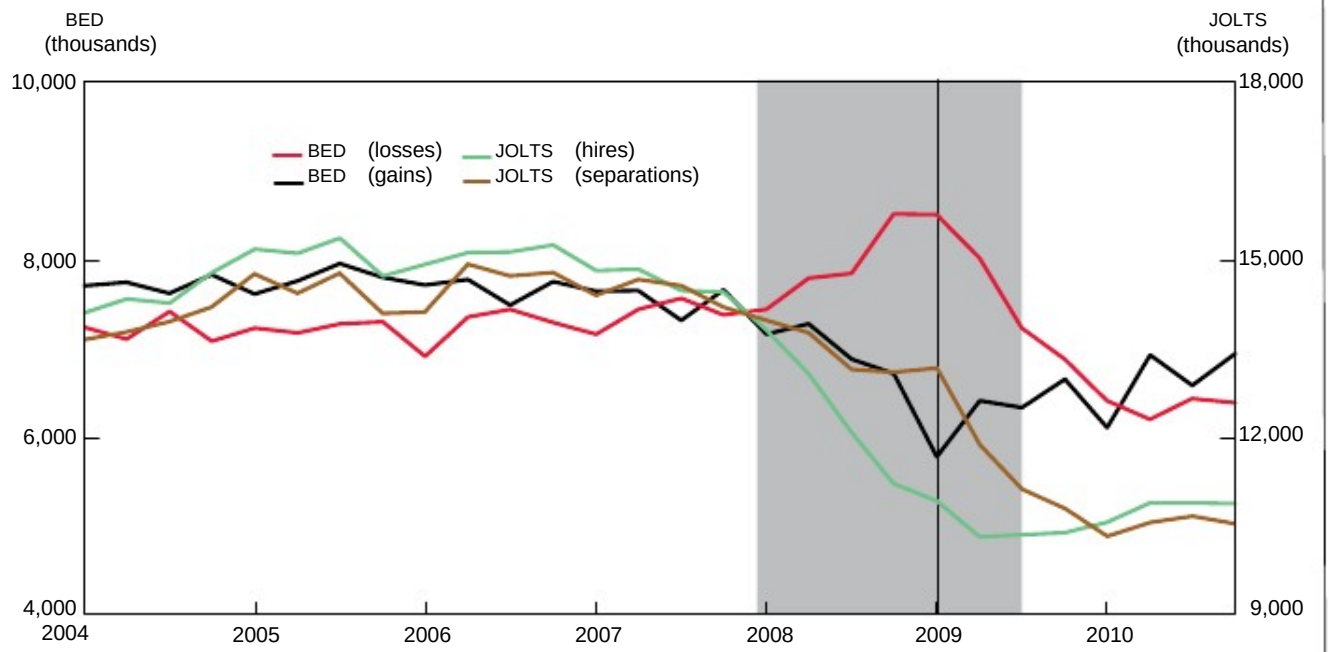
The explanation for this phenomenon is decreased hiring. Establishments can decrease their employment in two ways: by increasing separations (such as laying off workers or offering incentives for workers to retire) and by not hiring replacement workers for those workers who quit or retire. As documented earlier, there is a substantial number of separations (quits and layoffs) in both expansionary times and recessionary times. If separations remain at the same level or decrease mildly while the level of hires declines rapidly as establishments decide not to replace the workers who quit or retire, establishment employment will decrease and gross job losses will increase. This is a likely explanation for what happened during the recent recession.

But the story of what actually happened then is more complicated. The complexity becomes evident when one looks at chart 10, which graphs JOLTS quits and layoffs instead of separations. Quits and layoffs are two of the three components of separations; the third component, “other separations” (that is, retirements) is not graphed because, as seen in chart 8, it does not exhibit much cyclical variation relative to quits and layoffs.

Chart 10 shows some intriguing labor market dynamics during the onset of the 2007–2009 recession. The level of hires began falling considerably in the first quarter of 2008, and quits experienced a similar large decline one quarter later. The level of hires hit a trough in the second quarter of 2009, and the level of quits did so one quarter later. Layoffs were constant during the first several quarters of the recession and then spiked upward in the fourth quarter of 2008 and the first quarter of 2009. For the first time in the history of the JOLTS (which started in December 2000), the number of layoffs exceeded the number of quits (in the fourth quarter of 2008). It is interesting to note that the increase in layoffs roughly matches the decline in quits in the fourth quarter of 2008 and the first quarter of 2009, leaving total separations essentially flat during those quarters.

In terms of economics, the following scenario about establishments that were downsizing is plausible: During the first several quarters of the recession, both hires and quits were falling rapidly and large increases in layoffs had not yet started. The moderate rise in gross job losses during these quarters appears to be due to hires falling more rapidly than quits. Then, in the fourth quarter of 2008 and the first quarter of 2009, layoffs increased dramatically while hires and quits were still falling rapidly. This increase in layoffs signaled the point in the recession at which decreased hiring no longer appeared to serve as a viable tool through which establishments could reduce their employment levels. Further contraction in establishment-level

Chart 9. Quarterly BED gross job gains and gross job losses, and JOLTS total private hires and separations, seasonally adjusted, 2004–2010



NOTE: Shaded area denotes recession as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

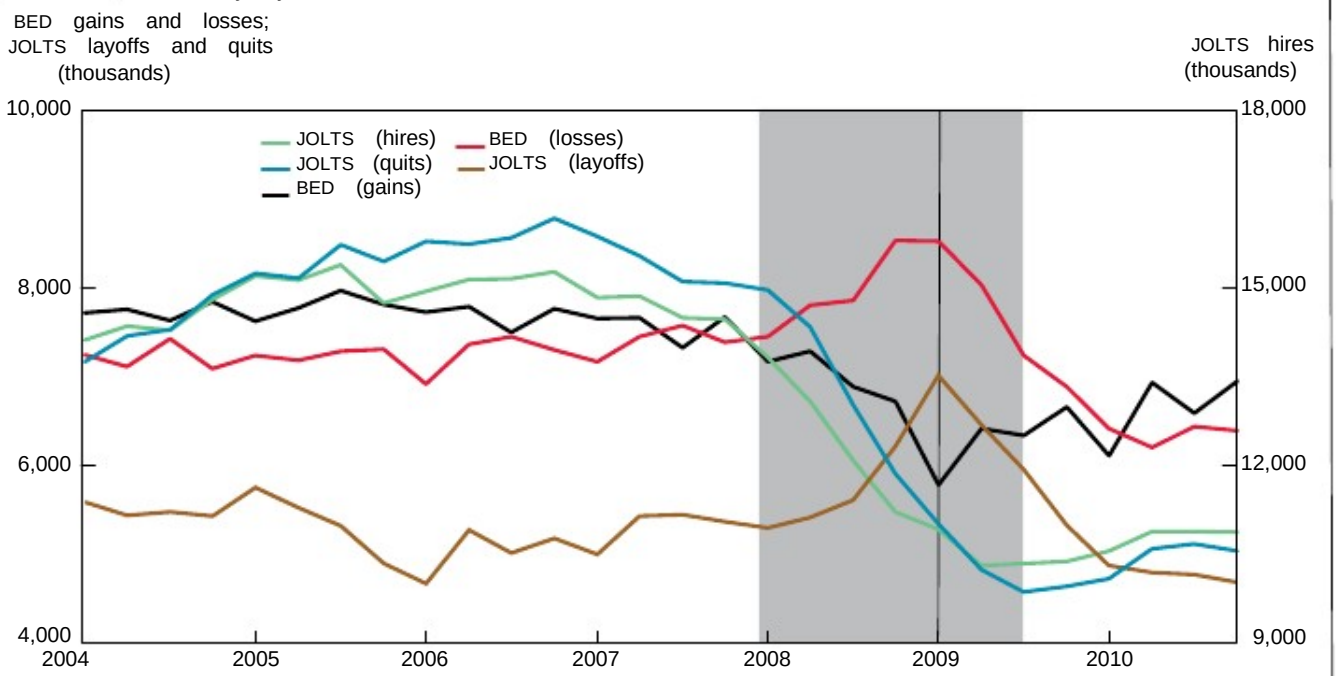
employment—the increase in gross job losses—was then driven by increased layoffs.

After the trough. Following the first quarter of 2009, the labor market began to improve. Quarterly net employment losses in the private sector, as measured by the CES, moderated in every quarter, from –2,349,000 in the first quarter of 2009 to –386,000 in the fourth quarter of that year. Quarterly net employment growth then turned positive in all four quarters of 2010.

The improving labor market during the period from the first quarter of 2009 to the second quarter of 2010 is characterized by a steep decline in gross job losses and a rise in gross job gains. (See chart 9.) During this period, BED gross job losses fell by 2.317 million (from 8.524 million to 6.207 million, a 27.2-percent decrease) and BED gross job gains rose by 1.152 million (from 5.783 million to 6.935 million, a 19.9-percent increase). The posttrough period from the first quarter of 2009 to the second quarter of 2010 is also characterized by falling separations and relatively stable hires. The JOLTS measure of separations fell by 19.8 percent (from 13.173 million to 10.566 million), and the JOLTS measure of hires fell by 0.4 percent (from 10.925 million to 10.886 million). The two BED measures and the quarterly JOLTS separations series appear to have been at turning points in the first quarter of 2009, whereas the quarterly JOLTS hires series reached its turning point one quarter later. Looking at the period from the second quarter of 2009 to the same quarter a year later, rather than at the period from the first quarter of 2009 to the second quarter of 2010 indicates that JOLTS hires grew by 5.5 percent (from 10.316 million to 10.886 million).

In terms of employment dynamics, the period from the first quarter of 2009 to the second quarter of 2010 has similarities to that from the fourth quarter of 2007 to the first quarter of 2009, but with key components of growth and decline reversed. During the onset of the recession, BED gross job gains and JOLTS hires—the two growth components of net employment change—fell simultaneously, whereas BED gross job losses and JOLTS separations—the two measures of decline in net employment change—diverged, with gross job losses increasing while separations fell. Following the trough of the recession, BED gross job losses and JOLTS separations fell simultaneously, whereas BED gross job gains and JOLTS hires diverged somewhat. After the trough, gross job gains increased by 1.152 mil-

Chart 10. Quarterly BED gross job gains and gross job losses, and JOLTS total private hires and separations, seasonally adjusted, 2004–2010



SOURCE: U.S. Bureau of Labor Statistics.

lion over the period from the first quarter of 2009 to the second quarter of 2010 while hires grew by 0.570 million over the period from the second quarter of 2009 to the second quarter of 2010.

It makes sense that BED gross job losses and JOLTS separations decline simultaneously. Gross job losses measure establishment-level decreases in employment, and separations are one of two ways that an establishment can contract (the other being attrition—not hiring to replace workers who quit or retire). When separations decline as dramatically as they did from the first quarter of 2009 to the first quarter of 2010, it follows that gross job losses also will decline. What is more difficult to understand is how BED gross job gains can rise significantly despite a much smaller increase in JOLTS hires.

The large absolute numbers of hires and separations at any point in time—even in deep recessions—are the key to understanding the somewhat divergent trends of BED gross job gains and JOLTS hires in the period from the first quarter of 2009 to the second quarter of 2010. As a simple example, consider an establishment with 100 employees, and assume that, historically, this establishment has averaged 10 quits or retirements every quarter and always has hired 10 new workers to replace these separations. If separations decline from 10 to 5, and the establishment still hires 10 workers, then the establishment has grown from 100 to 105, even though it did not increase its level of hires. With a steady positive level of hires, a decrease in separations leads to an increase in establishment-level employment and thus an increase in gross job gains. The BED and JOLTS data shown in chart 9 suggest that, following the labor market trough, establishments were expanding by keeping their hiring at a relatively steady level while simultaneously decreasing separations.

The large decrease in separations from the first quarter of 2009 to the first quarter of 2010 reflects primarily a decrease in layoffs. During that period, separations fell by 2.852 million and layoffs dropped by 2.138 million. As chart 10 shows, in calendar year 2010 layoffs fell to just under 5 million per quarter, a level below their prerecessionary average. Quits fell during the first three quarters of 2009, from 5.341 million in the first quarter of that year to 4.582 million in the third quarter; then they began to increase, rising to a level of 5.061 million in the second quarter of 2010. (See chart 10.)

The increase in quits during the first half of 2010 war-

rants further mention. Following the series low in the third quarter of 2009, quits rose by 424,000 during the first two quarters of 2010. This increase was undoubtedly spurred by an increase in job openings, which hit a series low of 5.828 million in the fourth quarter of 2009 and then grew by 1.361 million during the first two quarters of 2010. Furthermore, hires rose by 499,000 during the first two quarters of 2010. When establishments want to start hiring following a recessionary trough, they post job openings and begin hiring. Meanwhile, workers start quitting their current jobs when they are hired into the newly created jobs. The fact that the increase in job openings is much higher than the increase in both hires and quits suggests that establishments are posting job openings yet not hiring to fill them. Nevertheless, this simultaneous rise in job openings, hires, and quits suggests that the underlying components of employment growth dynamics were beginning to increase in 2010 after having recorded their recessionary lows in the last two quarters of 2009.

BED AND JOLTS DATA WERE FIRST PUBLISHED in 2003 and 2004, respectively. Both have informed analysts about the large amount of labor market churning that underlies the conventional net change in employment. BED and JOLTS data also exhibit business cycle properties, although the components of the BED and JOLTS series don't always move together during recessions. The business cycle movements in BED and JOLTS data suggest that the two series complement, rather than replicate, each other. Analyzed together, BED and JOLTS statistics increase our understanding of employment dynamics in recessions.

□

Notes

[1]The total private employment statistics in this paragraph are from the Current Employment Statistics (CES) data published by the Bureau of Labor Statistics. (See "Current Employment Statistics – CES (National)," http://www.bls.gov/ces (visited Aug. 10, 2011).)

[2]The analysis in this article builds on and expands the earlier comparison of the BED statistics and the JOLTS in Zhi Boon, Charles M. Carson, R. Jason Faberman, and Randy E. Ilg, "Studying the labor market using BLS labor dynamics data," Monthly Labor Review, February 2008, pp. 3–16, http://www.bls.gov/opub/mlr/2008/02/art1full.pdf (visited July 21, 2011). Another comparison of job flows and worker flows can be found in Steven J. Davis, R. Jason Faberman, and John Haltiwanger, "Labor Market Flows in the Cross Section and Over Time," unpublished manuscript, March 20, 2011, http://www.carnegie-rochester.rochester.edu/April11-pdfs/Davis_Faberman_Haltiwanger_April_2011_CR_Paper.pdf (visited Apr. 4, 2011).

[3]For a more complete description of the BED data, including details on the source data and the longitudinal linking algorithm, 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, http://www.bls.gov/opub/mlr/2001/04/art2full.pdf (visited July 21, 2011); 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, http://www.bls.gov/opub/mlr/2004/04/art3full.pdf (visited July 21, 2011).

[4]The fourth-quarter, 2010, BED statistics were released on August 2, 2011. The most recent BED news release is titled "Business Employment Dynamics—Fourth Quarter 2010" (U.S. Bureau of Labor Statistics, Aug. 2, 2011), http://www.bls.gov/news.release/pdf/cewbd.pdf (visited Aug. 10, 2011).

[5]To learn more about the JOLTS sample, definitions of variables, and survey forms, see "Job Openings and Labor Turnover Survey" (U.S. Bureau of Labor Statistics, updated monthly), http://www.bls.gov/jlt (visited July 25, 2011). The portion of the survey form presented in exhibit 1 is copied from "Job Openings and Labor Turnover Report" (U.S. Bureau of Labor Statistics, no date), http://stats.bls.gov/jlt/jltc1.pdf.

[6]The Bureau implemented the monthly alignment method with the release of January 2009 data, and all JOLTS historical series were revised to incorporate the new method. For further details regarding the improvements in methodology, see "Job Openings and Labor Turnover Survey: Improving JOLTS Methodology" (U.S Bureau of Labor Statistics, updated periodically), http://www.bls.gov/jlt/methodologyimprovement.htm (visited July 25, 2011).

[7]The June 2011 JOLTS statistics were released August 10, 2010. The most recent JOLTS news release is "Job Openings and Labor Turnover—June 2011" (U.S. Bureau of Labor Statistics, Aug. 10, 2011), http://www.bls.gov/news.release/pdf/jolts.pdf (visited Aug. 10, 2011).

[8]The hires, separations, and net employment changes shown in charts 6 and 7 represent quarterly data and are much smoother than the trend lines based on monthly data. The small sample size of the JOLTS data causes some volatility in the monthly data, sometimes making it difficult to discern underlying economic trends.

[9]The correlation coefficient quantifies how two data series move together through time. The correlation is +1 in the case of a perfect positive relationship, –1 in the case of a perfect negative relationship, and some value between –1 and +1 in all other cases, with 0 denoting no relationship between the two series. The closer the coefficient is to either –1 or +1, the stronger is the correlation between the variables.