

Job openings and hires show little postrecession improvement

JOLTS data show only modest labor market gains since the end of the 2007–2009 recession; the job openings and hires levels have been rising since mid-2009 but, at the end of 2010, were well below their prerecession levels

Katherine Bauer Klemmer and Robert Lazaneo

Job Openings and Labor Turnover Survey (JOLTS) data showed only slight improvement since June 2009, the end of the most recent recession.¹ The seasonally-adjusted number of job openings—a measure of labor demand—increased from 2.4 million in June 2009 to 2.9 million in December 2010. While the level shows improvement, it is still well below the 4.4 million posted for December 2007, the onset of the recession. The hires level—a measure of worker flows—increased from 3.6 million at the end of the recession to 3.9 million in December 2010. The separations level, another worker-flow measure, decreased from 4.1 million in June 2009 to 3.8 million in December 2010. (See table 1.)

The JOLTS program measures job openings, hires, and separations on a monthly basis by industry² and geographic region. JOLTS gauges labor demand by collecting data monthly from a sample of approximately 16,000 nonfarm business establishments. Published JOLTS data are available from December 2000 forward. Unless otherwise noted, JOLTS data used in this report are seasonally adjusted.

Job openings

Job openings reflected a contraction in labor demand during the most recent recession. Total private job openings leveled off and then began to decline in advance of the Jan-

uary 2008 peak in the Current Establishment Statistics³ (CES) total private employment estimates and before the official start of the recession.⁴ The rate of decrease in job openings accelerated at the start of the recession. The decline in job openings then slowed in the spring of 2009. In July 2009, the total private job openings level dropped to a series low of 1.8 million, which was 2.5 million below the March 2007 peak of 4.3 million. Since July 2009, job openings have climbed steadily. Job openings and employment tend to move in a similar pattern. Fluctuations or irregularities in the JOLTS data are generally attributable to its relatively small sample size and resultant sampling error. (See chart 1 for a comparison of JOLTS job openings and CES employment.)

Census effect. Job openings attributable to the 2010 decennial census are reflected in the JOLTS total nonfarm job openings estimates, while JOLTS total private job openings exclude government job openings. In chart 2, the number of government job openings is measured on the right axis and the total nonfarm and total private job openings are measured on the left axis. Some census-related job openings became available in late 2008. Then, in the spring of 2009, job openings for the first major hiring of the 2010 census became available. In spring 2010, the need for door-to-door follow-up interviews with households that hadn't responded to

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Table 1. Job openings, hires, and separations, selected months, seasonally adjusted
[In millions]

Category	December 2007 (recession start)	June 2009 (recession end)	Trough (T) or series low (L)	December 2010
Job openings	4.4	2.4	2.1 (T= July 2009)	2.9
Hires	5.0	3.6	3.6 (T= Oct 2009)	3.9
Separations	4.9	4.1	3.5 (L= Jan 2010)	3.8

the mailed census form or had not received one in the mail resulted in the posting of additional job openings for census workers.⁵

Job openings by region. Regional job openings showed trends similar to those for the nonfarm total. Job openings in each of the four regions trended downward before the beginning of the most recent recession. The West, South, and Northeast each experienced series troughs in July 2009, and the Midwest experienced its trough in April 2009. Job openings in each region trended upwards from the summer of 2009 through 2010. Job openings data for each region commenced downturns before downturns began in each region’s CES employment data.⁶ (See chart 3.)

Job openings and unemployment. Job openings generally move inversely to unemployment. An economic expansion typically is characterized by low unemployment and a high level of job openings. An economic contraction is likely to be marked by high unemployment and a low number of job openings. Since the end of the most recent recession, the gap between the unemployment rate and the job openings rate has narrowed slightly. The difference between the unemployment rate and the job openings rate was 7.2 percent in December 2010, down from a high of 8.3 percent in October 2009. (See chart 4.)

Dividing the level of unemployment by the number of job openings results in a ratio which shows the number of job openings per unemployed person. This ratio reached its most recent low in late 2006 through early 2007. The ratio then began to climb from the onset of the 2007–2009 recession until July 2009 when it reached a high of almost 7 unemployed persons per job opening. From July 2009 through April 2010, the ratio declined to 5 unemployed persons per job opening before leveling off throughout the remainder of 2010. (See chart 5.)

The Beveridge curve examines the inverse relationship between labor demand (as measured by the number of job openings) and labor supply (as measured by the number of unemployed people). Plotting the intersection of the

job openings rate and the unemployment rate over time produces the Beveridge curve. The curve is downward sloping and reflects the state of the economy through co-movement of these measures along their individual axes; there can be movements along the curve as well as shifts in the curve toward or away from the origin, which is at the intersection of the axes. (See chart 6.) High job openings and low unemployment result in a position high and to the left on the curve, and generally indicate a period of economic expansion. Low job openings and high unemployment result in a position low and to the right on the curve, and generally indicate a period of economic contraction.

Not only can points move along the curve, the curve itself can shift towards or away from its origin. Greater mismatch between available jobs and the unemployed because of skills mismatch or geographic disparity can cause the curve to shift away from the origin. Decreased job-matching efficiency results in both high unemployment and unfilled job openings. Improved matching of available jobs to unemployed people can cause the curve to shift towards the origin. Increased job-matching efficiency results in both lower unemployment and fewer unfilled job openings.

From the start of the recent recession in December 2007 through the middle of 2009, the economy’s position along the Beveridge curve moved lower and farther to the right as the job openings rate declined and the unemployment rate rose. The lowest points on the curve reflect the JOLTS job openings series lows during the spring and summer

JOLTS program developments

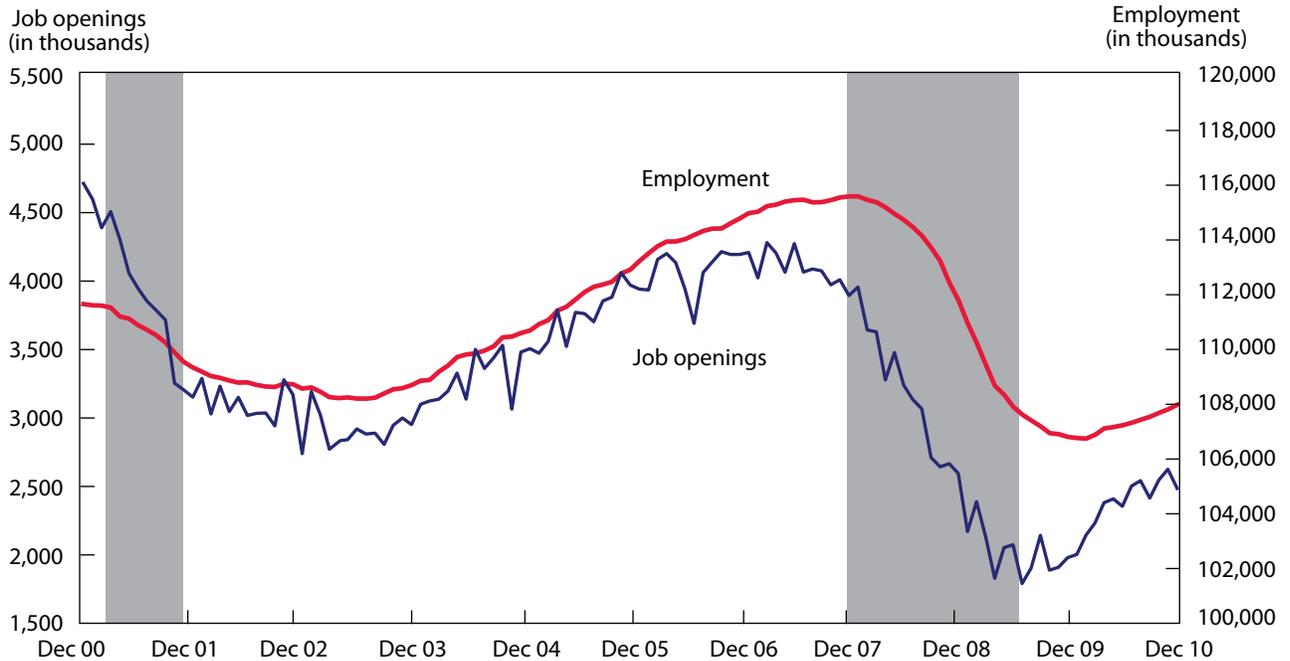
The following important developments took place in the JOLTS program in 2010:

- As of the publication of November 2010 estimates, the JOLTS program reached its tenth anniversary.
- The Bureau of Labor Statistics sponsored a JOLTS Symposium on December 10, 2010. Bringing together leading academic and policy users of JOLTS data, the symposium included the presentation of five research papers and concluded with a roundtable discussion of the program’s strengths and weaknesses, as well as recommendations for the future of the JOLTS program.¹
- The JOLTS program began producing experimental estimates by size of nonfarm business establishment as the result of an initial request from the Department of Treasury. Experimental size class estimates are now available upon request by establishment size and data element.²

¹Richard L. Clayton, James R. Spletzer, and John C. Wohlford, “Conference Report: JOLTS Symposium,” *Monthly Labor Review*, February 2011, pp. 41–47, <http://stats.bls.gov/opub/mlr/2011/02/art4full.pdf> (visited June 9, 2011).

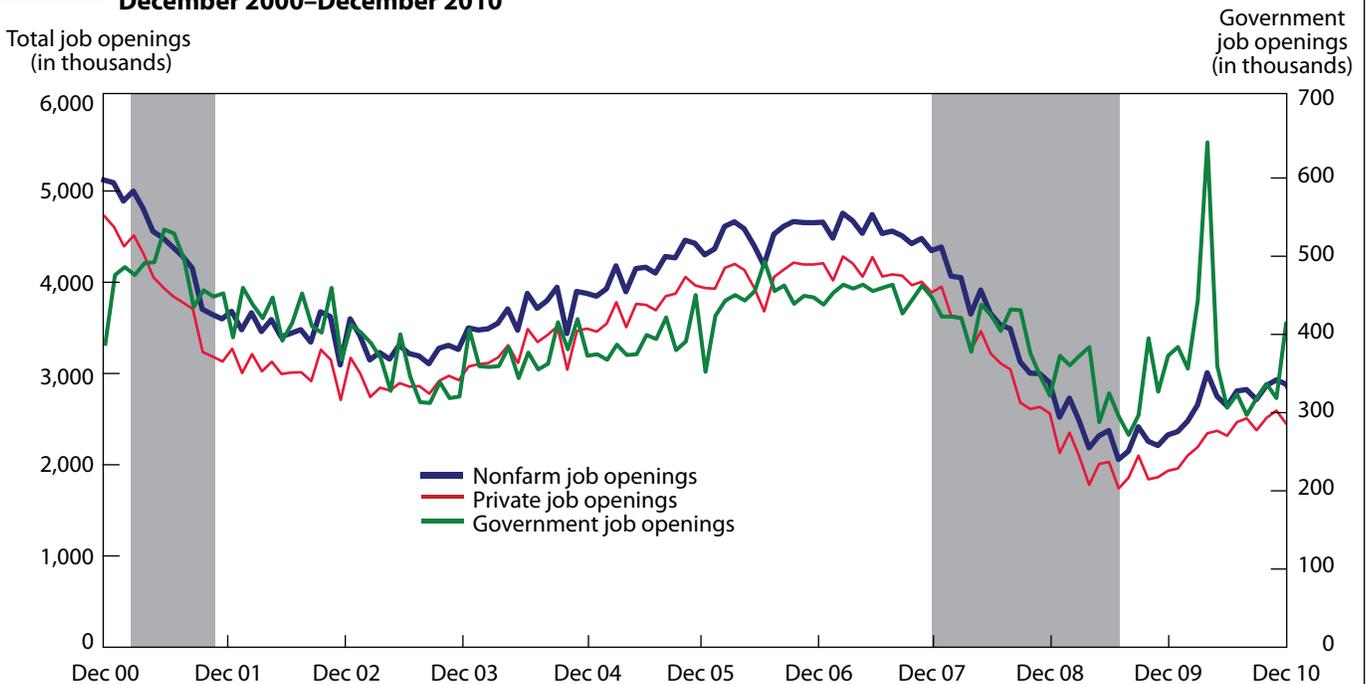
For more information, see “Experimental JOLTS Estimates by Establishment Size Class,” (U.S. Bureau of Labor Statistics, March 11, 2011), <http://stats.bls.gov/jlt/sizeclassmethodology.htm> (visited July 21, 2011).

Chart 1. JOLTS total private job openings rate and CES total private employment, seasonally adjusted, December 2000–December 2010



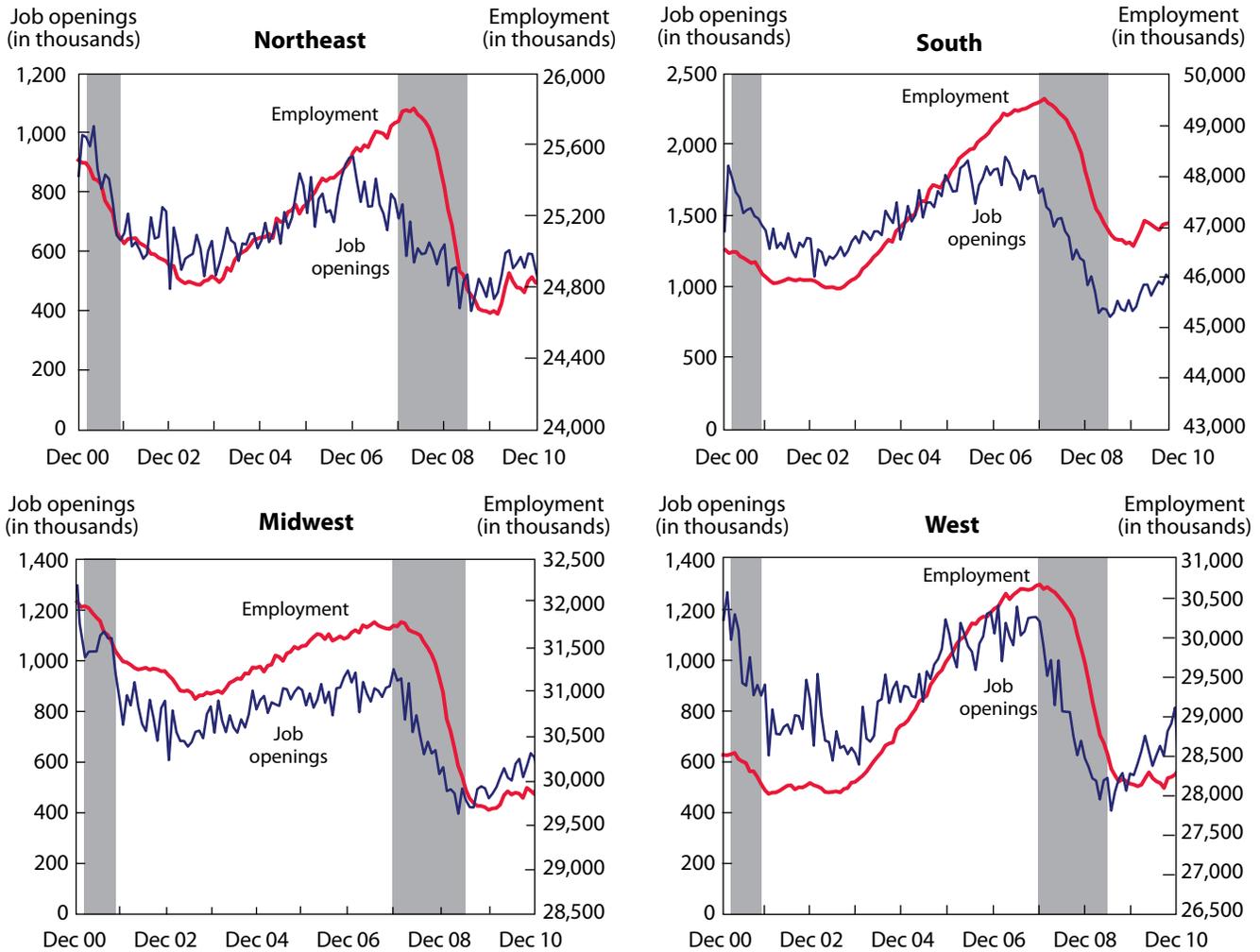
NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

Chart 2. JOLTS total nonfarm, total private, and government job openings, seasonally adjusted, December 2000–December 2010



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

Chart 3. Job openings and CES employment by region, seasonally adjusted, December 2000–December 2010



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

of 2009 in combination with high unemployment rates. During most of 2010, the points on the curve moved vertically as the job openings rate increased and the unemployment rate changed very little. Since mid-2010, however, the curve has moved erratically towards the left.

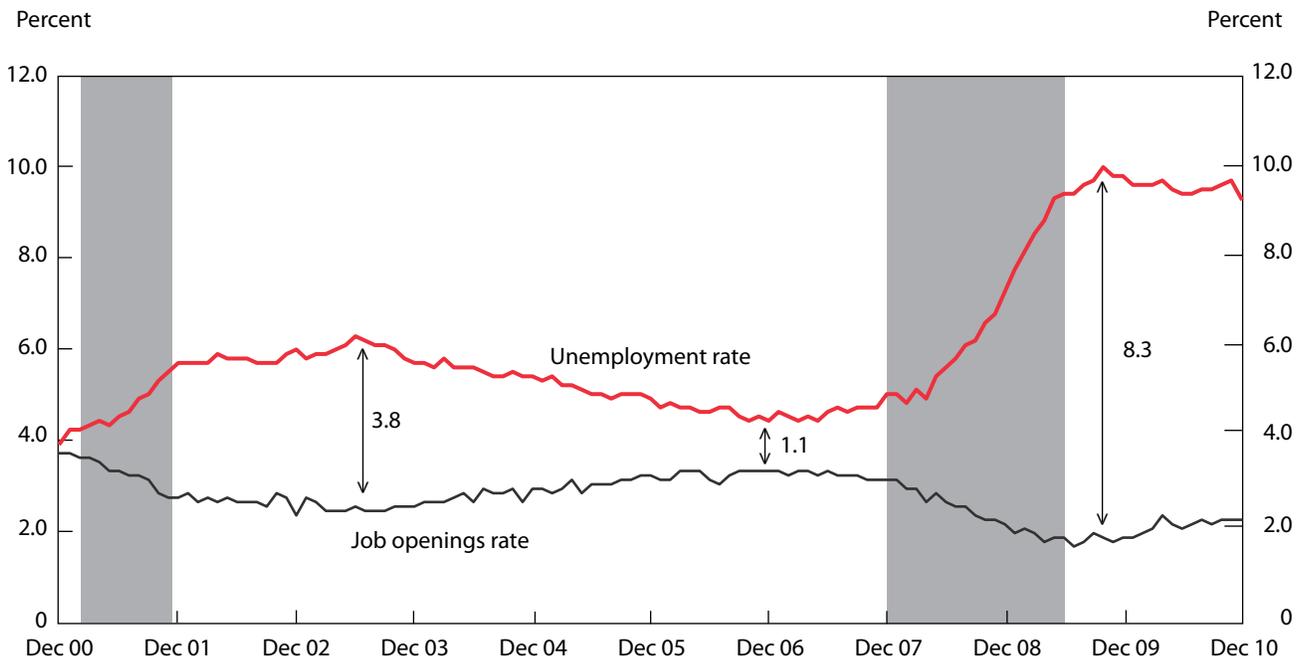
Analysis of the Beveridge curve has resulted in different theories about what the recent movements of the curve represent. The questions being asked are: Does the shape of the current Beveridge curve reflect structural changes or cyclical changes? Or, could these movements be a combination of both?

According to the cyclical viewpoint, movement of the economy along the Beveridge curve may have entered a circular pattern during the economic recovery. An article by Murat Tasci and John Lindner states that the economy

may take time to adjust to changes in job openings and unemployment as it may take longer for unemployment to decline than for job openings to increase. This will cause the curve to shift outward temporarily, as it has done during other recovery periods. The delay in the response of unemployment to an improving economy could in part be due to reentry into the labor force of jobseekers who had left when the economy was in decline. This could mean the Beveridge curve may appear to undergo a structural shift when the movement is actually a cyclical one.⁷

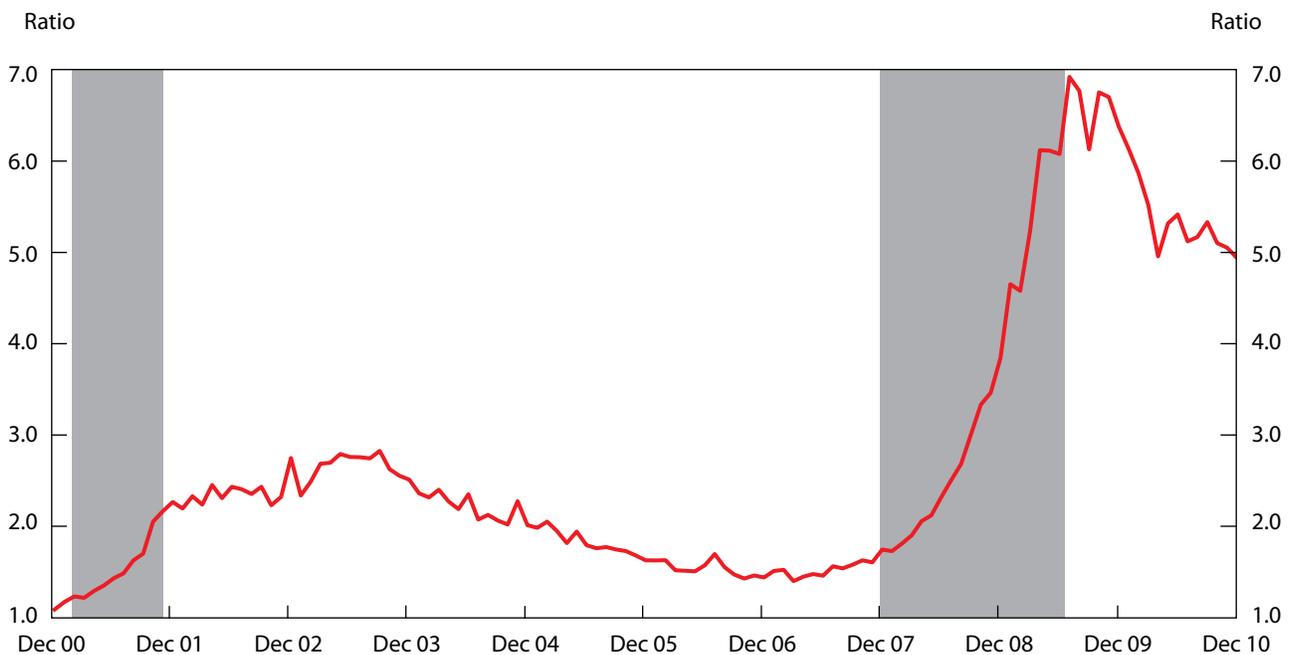
Those who interpret the movement as a structural shift in the Beveridge curve note that there are increasing levels of both job openings and unemployment.⁸ Structural shifts can be industry-related or geography-related. For example, with an industry-based structural mismatch,

Chart 4. JOLTS job openings rate and CPS unemployment rate, seasonally adjusted, December 2000–December 2010



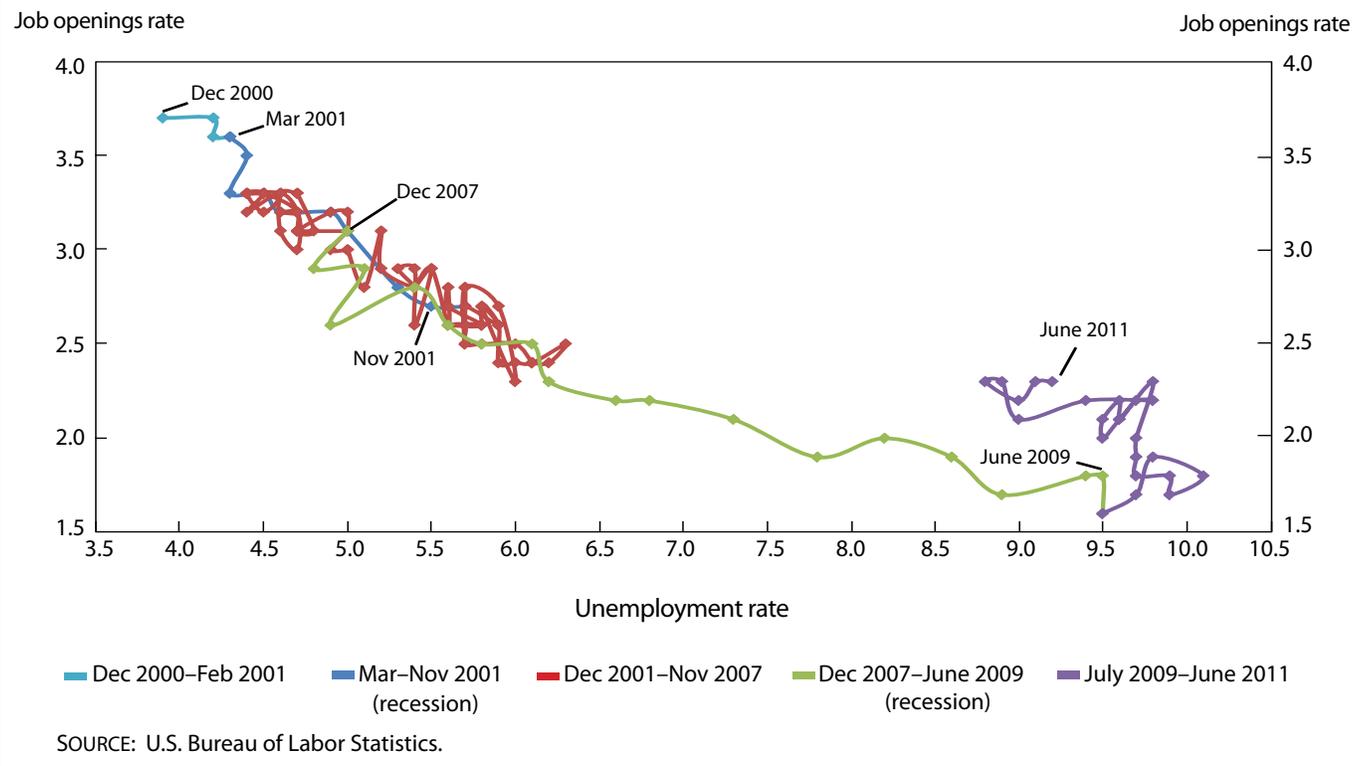
NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.
SOURCE: U.S. Bureau of Labor Statistics.

Chart 5. Unemployed persons per job opening, seasonally adjusted, December 2000–December 2010



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

Chart 6. The Beveridge curve (job openings rate versus unemployment rate), seasonally adjusted, December 2000–June 2011



there may be high unemployment in the construction sector but high demand for workers in the health care sector. The inability of jobseekers to sell a house in order to relocate to take a job could, on a large scale, create a geographic disparity; hence, high unemployment may persist because potential employees cannot move to fill positions.⁹

Rather than attribute the potential shift in the Beveridge curve to a skill mismatch at the sector level caused by oversupply (e.g., construction) or undersupply (e.g., health care), Dave Altig of the Federal Reserve Bank of Atlanta proposes that the potential shift may have been caused by changing needs at the business and individual industry level. While noting that substantiating data are scarce, Altig points to the possibility that productivity gains, which took place during the recession and into the recovery, have led to changes in business processes and hence the need for different skill sets.¹⁰

Alternatively, an article by Regis Barnichon, Michael Elsby, Bart Hobijn, and Aysegul Sahin suggests that vacancy yield deficits—that is, the relatively low level of hires per vacancy—are contributing to the possible shift in the Beveridge curve. While deficits in the vacancy yield were found across all industries, there are several industries that have particularly low yields. These industries are construction, transportation, trade, utilities, and

leisure and hospitality, with construction as the greatest contributor.¹¹ Possible explanations of the shortfall in the

Definitions of JOLTS terms

Job openings. Monthly job openings are defined as the number of openings on the last business day of the reference month.

Hires. Monthly hires are all additions of personnel to the payroll during the reference month, and annual hires are all additions to the payroll during a given year. The annual hires rate is calculated by dividing the total number of hires for the year by the average monthly employment for the year, and then multiplying the result by 100.

Total separations. Monthly total separations are defined as the number of employees separated from the payroll during the reference month, and annual total separations is the number separated during a given year. Separations are classified as quits, layoffs and discharges, and other separations. The annual total separations rate is calculated by dividing the number of total separations for the year by the average monthly employment for the year, and then multiplying the result by 100.

Quits. These are cases in which people left a job voluntarily but did not retire or transfer.

Layoffs and discharges. These are involuntary separations initiated by employers.

Other separations. These are defined as retirements, transfers, deaths, and separations caused by disability.

vacancy yield for these industries, according to the authors, are that there is a greater mismatch of occupation and location of the unemployed than in the past and firms may be recruiting less intensively to fill vacancies.

While some analysts cite cyclical movements and others cite structural shifts in the economy, it may be possible that the economy is moving from cyclical movement to structural mismatch,¹² or is experiencing a combination of both. If the economy were to move from cyclical movement to structural mismatch, it could be due to the lack of applicability of the skills within the unemployed labor pool. Cyclical movements on the Beveridge curve may also coincide with structural shifts in some sectors of the economy.¹³

Experimental estimates by size of establishment. The JOLTS program currently is generating an experimental size class series for research purposes. Following the approach used by Alan Krueger, job openings were aggregated into three categories: establishments with fewer than 50 employees, establishments with 50 to 249 employees, and establishments with greater than 249 employees.¹⁴ The job openings data, aggregated by size class, can be used to gauge the differing impact of economic cycles on small, medium, and large establishments.¹⁵ Chart 7 compares job openings through the use of the experimental size-class time series. Krueger notes that while job openings started to

fall in early 2007, the job openings level for the largest establishments experienced its greatest drop at the onset of the financial crisis in 2008.¹⁶

Industry data. At the sector level, all seasonally adjusted job openings trended down from the beginning of the recession and dropped to series lows in 2009. As shown in chart 8, every sector except construction and education and health services ended December 2010 with more job openings than at the end of December 2009. By December 2010, job openings had not reached the levels seen in December 2007 in any sector, although professional and business services, as well as arts, entertainment, and recreation, regained the most ground. Government job openings, which had experienced a relatively modest decline, were almost back to their December 2007 level.

Hires

The level of monthly hires hit a series low of 3.6 million in October 2009 before trending upward to reach 4.3 million in May 2010, its highest level in almost two years. Hires then declined and remained flat at 3.9 million during each month of the second half of the year. In contrast, at the onset of the recession in December 2007, the level was 5.0 million.

The annual hires rate in 2010 increased in all regions

Chart 7. Job openings by size of establishment, December 2000–December 2010

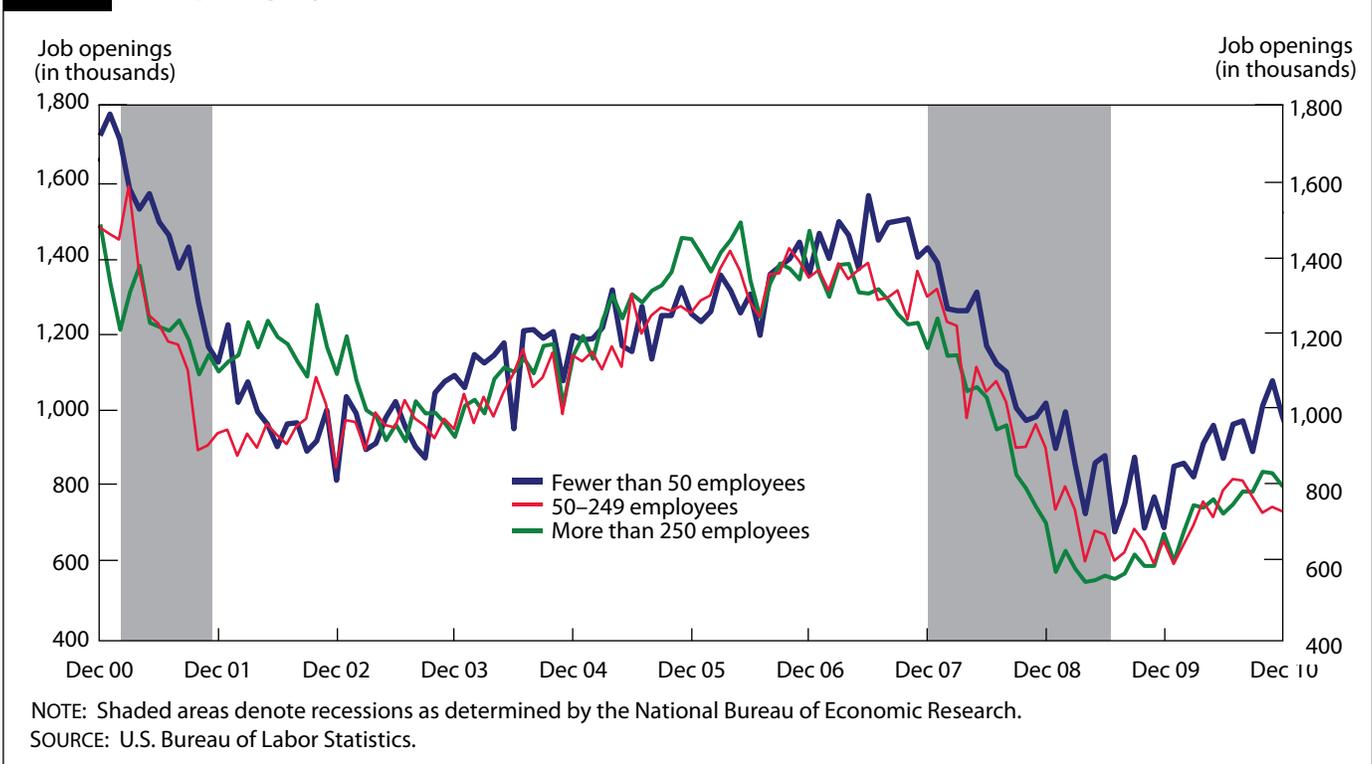
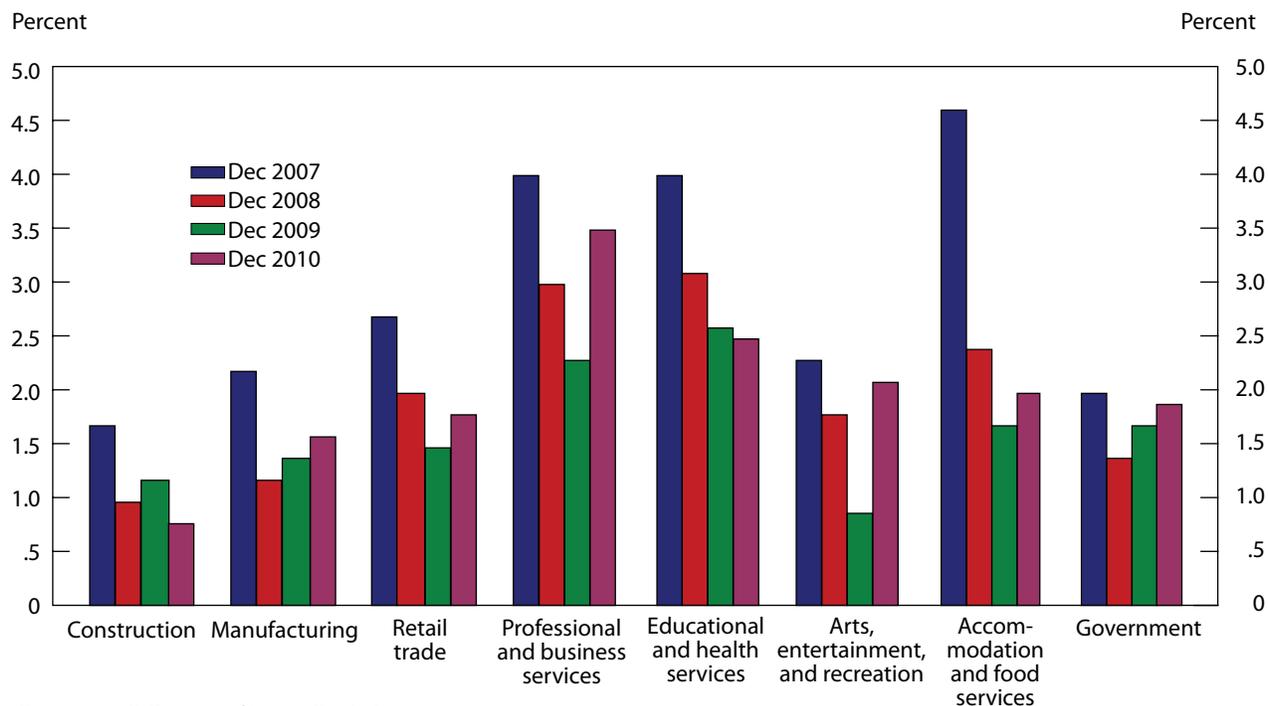


Chart 8. December job openings rate by sector, 2007–2010, seasonally adjusted



SOURCE: U.S. Bureau of Labor Statistics.

except the West, where it was unchanged at 36.1 percent. Annual total hires increased from 45.4 million in 2009 to 47.2 million in 2010 after three straight years of decline. As shown in chart 9, the hiring of temporary workers for the decennial census caused the largest over-the-month spike in government hires since the data series began. The sharp decline in government hires the following month was primarily the result of discontinuing the hiring of temporary census workers.

The number of total private hires and the average weekly hours of private employees both declined during the recession and have remained well below their prerecession levels.¹⁷ Total private average weekly hours have trended upwards since hitting a series low in June 2009. In contrast, total private hires remained practically flat in 2010, hovering between 3.3 million and 3.8 million. (See chart 10.) The reluctance of private companies to hire may have been due to weak demand in the economy. Weak demand may also have resulted in lower average weekly hours than before the recession.¹⁸

Hires by industry. Hires at the sector level show trends similar to the trend at the national level. Monthly data show that hires in most sectors increased during the first half of 2010. Hires in construction and retail trade re-

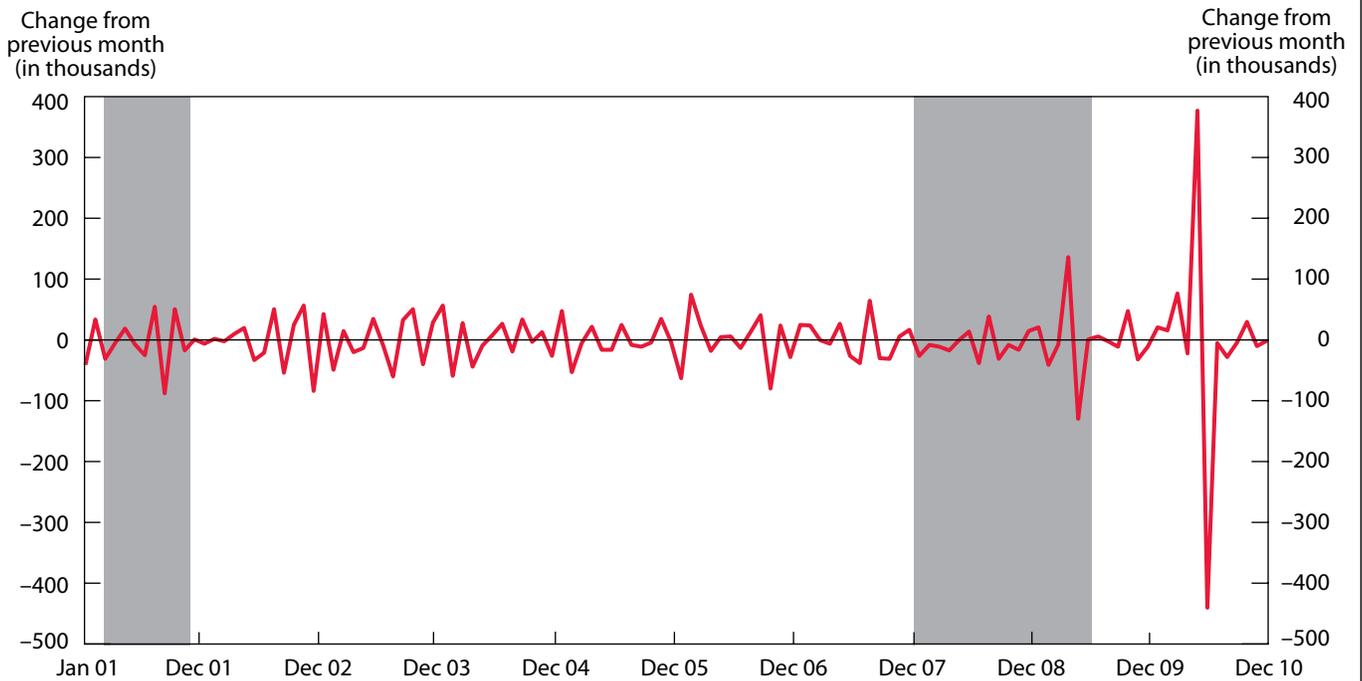
bounded in March 2010 to 382,000 and 618,000, respectively, their highest levels in more than a year. The upsurge in construction hires in March 2010 may be attributable to weather-related postponement of construction projects from the previous month. The increase in retail hires may reflect an increase in demand for workers in online sales.¹⁹ Education and health services peaked at 594,000 in January 2008 and reached a series low of 409,000 in January 2010. Annual hires data showed an almost even split of industries that experienced either a decline or an increase in hires for the year 2010.

Experimental estimates by size of establishment. Chart 11 compares hires by size of establishment. According to Alan Krueger, the divergence in hiring levels between large and small establishments was affected by the financial crisis in 2008. Smaller establishments initially reacted with layoffs and business closings. The first response of larger establishments was to freeze hiring.²⁰

Total Separations

Following the end of the recession in June 2009, the level of total separations continued its steep drop throughout the rest of the year. In 2010, monthly total separations

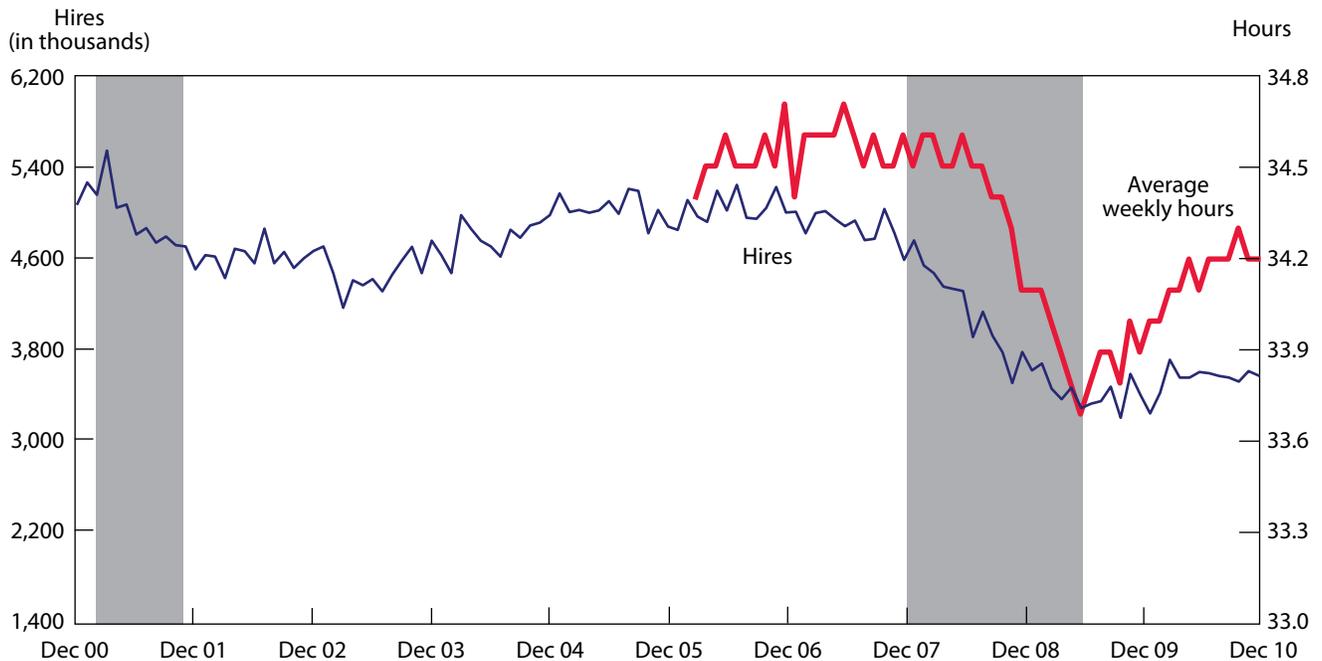
Chart 9. Month-to-month change in seasonally adjusted government hires, January 2001–December 2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.

SOURCE: U.S. Bureau of Labor Statistics.

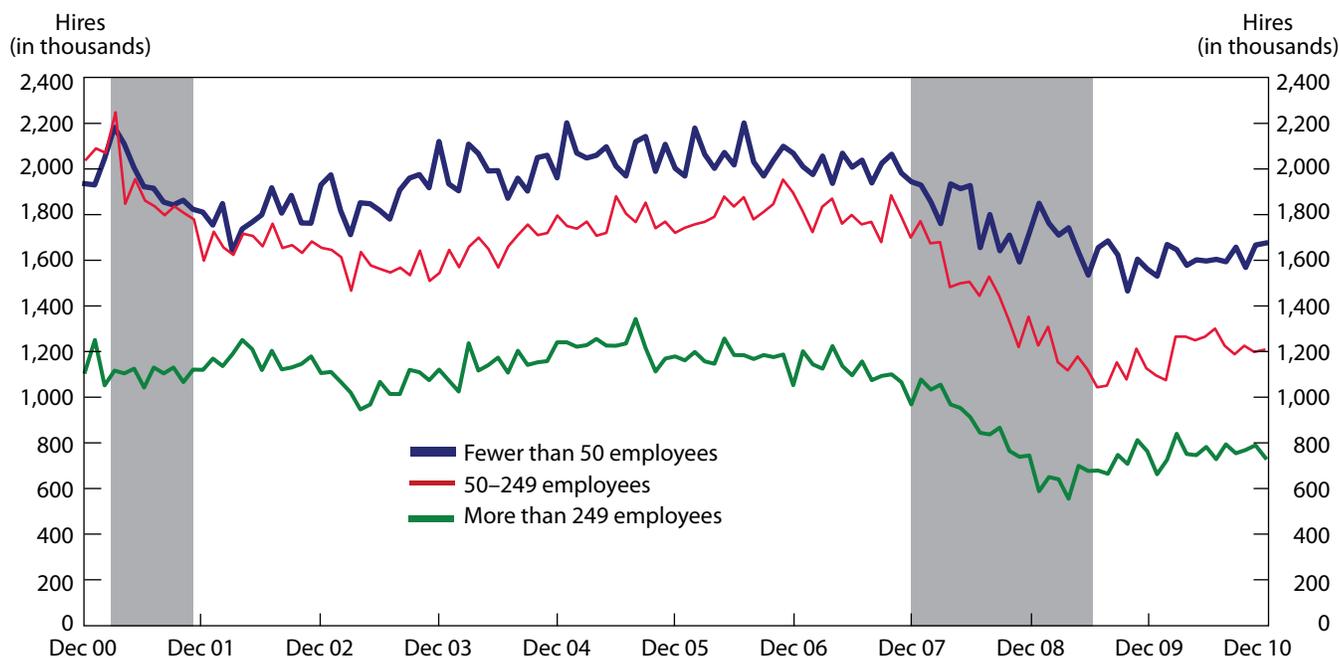
Chart 10. JOLTS total private hires and CES total private average weekly hours, seasonally adjusted, December 2000–December 2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.

SOURCE: U.S. Bureau of Labor Statistics.

Chart 11. Hires by size of establishment, December 2000–December 2010



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

rollercoasted from a series low of 3.5 million in January to a high of 4.2 million in June, but decreased to 3.8 million at the end of the year. The annual total separations rate declined for the fifth straight year, ending 2010 at 35.7 percent. Total separations in government reached a series high of 554,000 in June 2010 as employment of census temporary workers declined considerably.

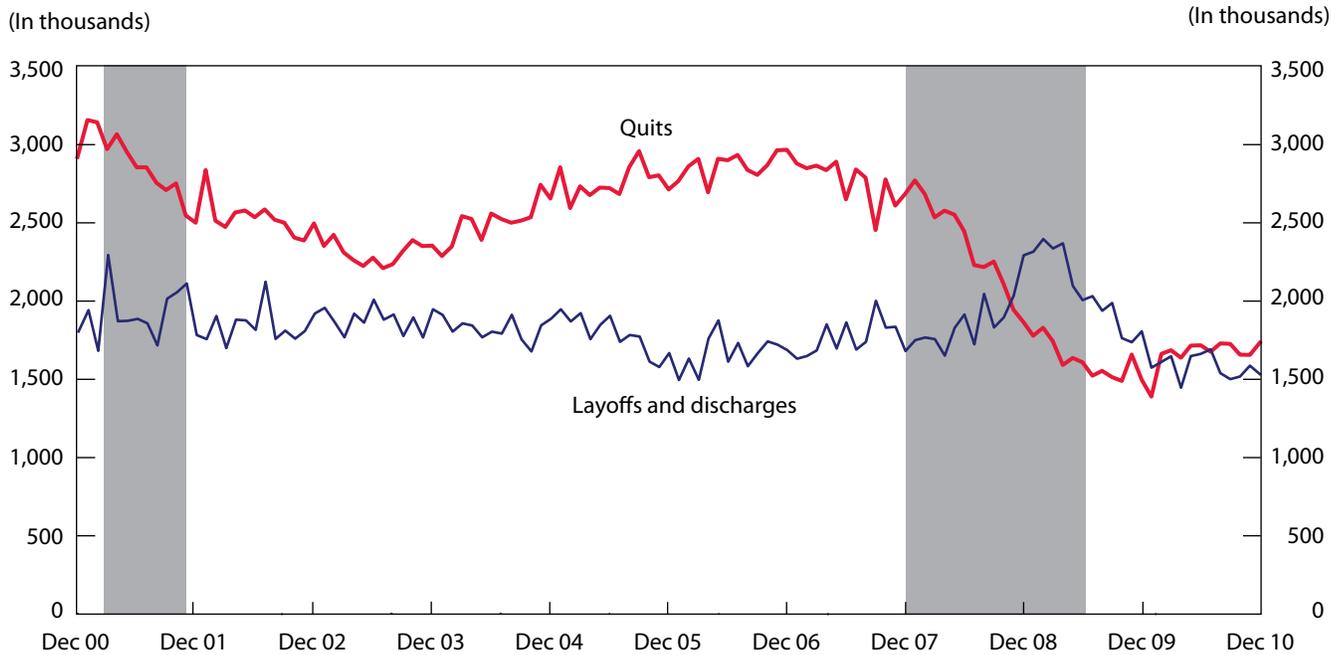
Components of total separations. Total separations are composed of quits, layoffs and discharges, and other separations. The gap between total private quits and total private layoffs and discharges consistently narrowed since the start of the recession until, by November 2008, there were fewer total private quits than total private layoffs and discharges for the first time ever in the JOLTS series. Total private quits again exceeded total private layoffs and discharges from February 2010 through the remainder of 2010 except for July, although the gap between the two series was minimal. (See chart 12.) By the end of 2010, total private quits had not yet returned to prerecession levels.

Experimental estimates by size of establishment. The trend of quits and of layoffs and discharges from establishments with fewer than 50 employees is quite similar to the trend

on the total private level. After the financial crisis that started in late 2008, layoffs and discharges for total private establishments as well as for those with fewer than 50 employees reached series highs during the first half of 2009 and declined steadily through 2010. Total private quits trended downward during the most recent recession, spiked briefly when the recession ended, and then remained practically flat throughout 2010. (See chart 13.)

The ratio of quits to layoffs and discharges can serve as a reflection of the general health of the labor market. The quits-to-layoffs ratio shown in chart 14 has trended with the job openings level for the duration of the JOLTS series. The ratio reached a series high of 1.9 in March 2006, the same time that job openings were near a series high. As more jobs began opening up, more people may have felt encouraged about quitting their job and finding a new one—in fact, the ratio indicates that almost twice as many people quit their jobs as were laid off. Conversely, as job openings plunged to new lows during the recession, the ratio decreased precipitously until reaching a series low of 0.7 in April 2009. With fewer job openings, more people may have tried to hang onto their jobs; this helped push the ratio to its lowest point ever. Both the ratio and job openings have trended upwards since then, but neither reached prerecession levels in 2010.

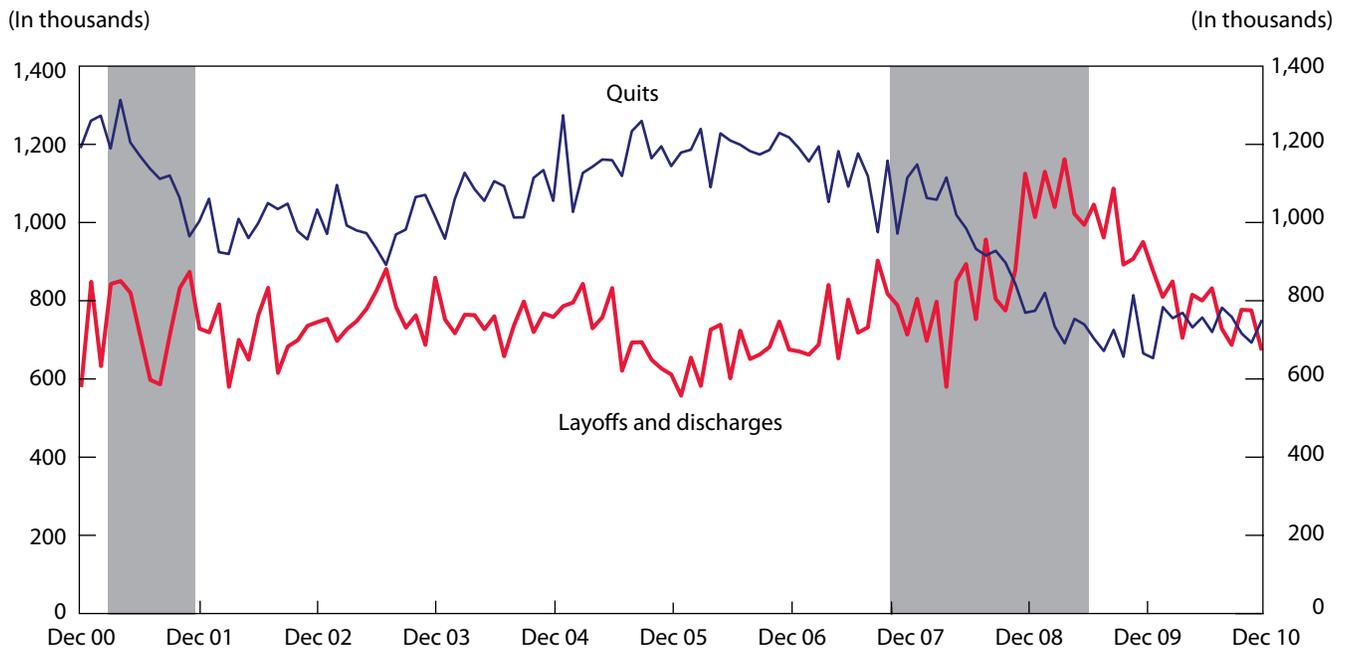
Chart 12. Total private quits and layoffs and discharges, seasonally adjusted, December 2000–December 2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.

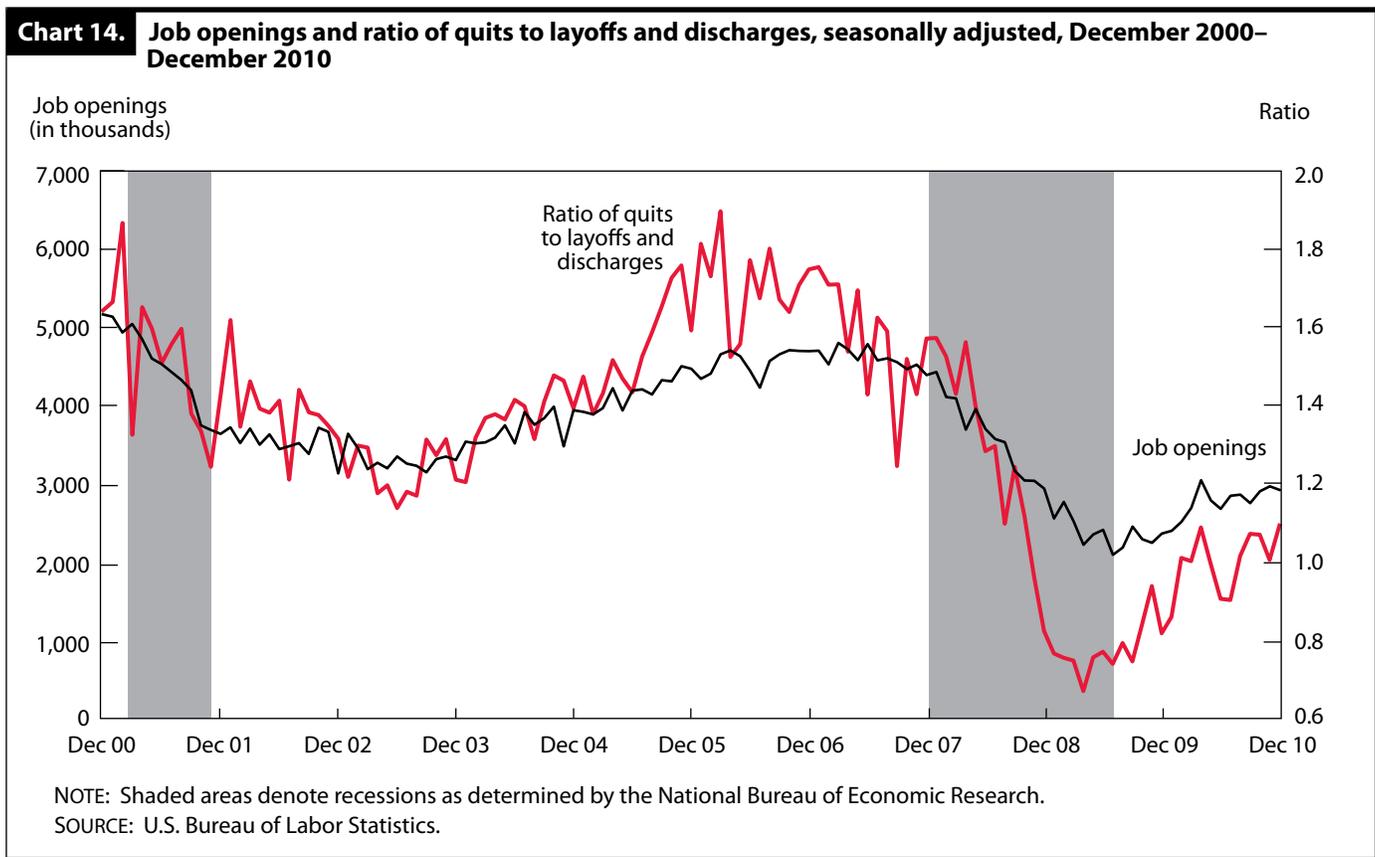
SOURCE: U.S. Bureau of Labor Statistics.

Chart 13. Quits and layoffs and discharges among establishments with fewer than 50 employees, December 2000–December 2010



NOTE: Shaded areas denote recessions as determined by the National Bureau of Economic Research.

SOURCE: U.S. Bureau of Labor Statistics.



After most sectors experienced an increase in the annual number of layoffs and discharges from 2008 to 2009, the annual number decreased in each sector from 2009 to 2010. In contrast, layoffs and discharges in government more than doubled from May to June 2010, primarily because the services of most of the temporary census workers were no longer needed. Posting a 25 percent increase, finance and insurance had the largest growth in the annual number of quits; information showed the largest decrease, 11 percent. All industries except for retail trade and education and health services ended December 2010 with more quits than a year earlier. As with job openings and hires, quits in every sector had yet to reach prerecession levels by year end.

JOLTS DATA SHOW THAT WHILE THE LABOR MARKET HAS IMPROVED since the most recent recession, gains have been small. Both the number of job openings and the number of hires declined from the months before the recession through the first half of 2009 and have since been climbing steadily but slowly. Total separations reached a series low at the onset of 2010 and, despite a brief upswing during the following months, ended the year at practically the same level as twelve months earlier. Levels for job openings, hires, and total separations did not meet prerecession levels through 2010 and have not met those levels as of the writing of this article. The impact of the 2010 decennial census on job openings, hires, and total separations was notable but brief. □

Notes

¹ See the September 20, 2010, report of the Business Cycle Dating Committee of the National Bureau of Economic Research, in which June 2009 was announced as a business cycle trough and the end of the recession that had begun in December 2007, <http://www.nber.org/cycles/sept2010.html> (visited June 9, 2011).

² The term “industry” can refer to a supersector, sector, or subsector,

depending on the context. In analyzing “industries,” the JOLTS program follows the North American Industrial Classification System.

³ Data on total private employment are available from the Current Employment Statistics program at <http://www.bls.gov/ces/> (visited June 23, 2011).

⁴ Richard L. Clayton, James R. Spletzer, and John C. Wohlford,

“Conference Report: JOLTS Symposium,” *Monthly Labor Review*, February 2011, pp. 41–47, <http://stats.bls.gov/opus/mlr/2011/02/art4full.pdf> (visited June 9, 2011). See section on page 44 entitled “Evaluating and comparing leading indicators for employment.”

⁵ Emily Richards, “The 2010 Census: the employment impact of counting the Nation,” *Monthly Labor Review*, March 2011, pp. 33–38, (visited June 14, 2011).

⁶ Census region employment levels were derived by aggregating employment data for states within their respective Census regions. For state and area data, go to <http://stats.bls.gov/sae/> (visited May 27, 2011).

⁷ Murat Tasci and John Lindner, “Has the Beveridge Curve Shifted?” *Economic Trends*, Federal Reserve Bank of Cleveland, August 10, 2010, <http://www.clevelandfed.org/research/trends/2010/0810/02labmar.cfm> (visited April 27, 2011).

⁸ Menbere Shiferaw and John Robertson, “Another view of the structural versus cyclical unemployment question” Federal Reserve Bank of Atlanta, June 11, 2010, <http://macroblog.typepad.com/macroblog/2010/06/another-view-of-the-structural-versus-cyclical-unemployment-question.html> (visited August 29, 2011).

⁹ Rob Valetta and Katherine Kuang, “Is Structural Unemployment on the Rise?” *Economic Letter*, Federal Reserve Bank of San Francisco, November 8, 2010, <http://www.frbsf.org/publications/economics/letter/2010/el2010-34.html> (visited April 27, 2011).

¹⁰ Dave Altig, “A curious unemployment picture gets more curious,” *Macroblog*, Federal Reserve Bank of Atlanta, July 16, 2010, <http://macroblog.typepad.com/macroblog/2010/07/a-curious-unemployment-picture-gets-more-curious.html> (visited June 20, 2011).

¹¹ Regis Barnichon, Michael Elsby, Bart Hobijn, and Aysegul Sahin, “Which Industries are Shifting the Beveridge Curve?” December 21, 2010 version, *Working Paper Series*, Federal Reserve Bank of San Francisco, <http://www.frbsf.org/publications/economics/papers/2010/wp10-32bk.pdf> (visited August 4, 2011), presented at the December

2010 JOLTS symposium.

¹² Brad DeLong, “A response to: Is America facing an increase in structural unemployment?” *The Economist* July 23, 2010, http://www.economist.com/economics/by-invitation/guest-contributions/yes_there_still_time_prevent_big_rise (visited April 27, 2011).

¹³ Valetta and Kuang, “Is Structural Unemployment on the Rise?”

¹⁴ “Written Statement by Alan B. Krueger, Assistant Secretary for Economic Policy and Chief Economist, U. S. Department of the Treasury, before the Joint Economic Committee, May 5, 2010,” http://jec.senate.gov/public/?a=Files.Serve&File_id=6f298a71-cac8-44fa-95cb-7a47fcae63ee (visited June 21, 2011).

¹⁵ For more information, see Alan B. Krueger and Sarah Charnes, “JOLTS as a timely source of data by establishment size,” *Monthly Labor Review*, May 2011, pp. 16–24, <http://www.bls.gov/opus/mlr/2011/05/art2full.pdf> (visited August 4, 2011).

¹⁶ Idem.

¹⁷ Data on average weekly hours of total private employees are available from the Current Employment Statistics program at http://data.bls.gov/pdq/SurveyOutputServlet?request_action=wh&graph_name=CE_cesbref2 (visited June 27, 2011).

¹⁸ John Shipman and Paul Vigna, “Hiring in the U.S. Still Trails Corporate-Profit Gains,” *The Wall Street Journal*, May 2, 2011, <http://online.wsj.com/article/SB10001424052748703655404576293301528822030.html> (visited June 20, 2011).

¹⁹ Christopher Rugaber, “Hiring jumps, while job openings edge up slightly,” *The Boston Globe*, May 11, 2010, http://www.boston.com/business/articles/2010/05/11/hiring_jumps_while_job_openings_edge_up_slightly/ (visited May 26, 2011).

²⁰ “Written Statement by Alan B. Krueger, Assistant Secretary for Economic Policy and Chief Economist, U. S. Department of the Treasury, before the Joint Economic Committee, May 5, 2010,” http://jec.senate.gov/public/?a=Files.Serve&File_id=6f298a71-cac8-44fa-95cb-7a47fcae63ee (visited June 21, 2011).