The Job Openings and Labor Turnover Survey: what initial data show

*Early results from these new data series show
trends that are in line with other surveys,
both private industry and government,
and allow for a more complete picture of the labor market*

Kelly A. Clark

Data on job openings and labor turnover are useful in understanding the U.S. labor market, the business cycle, and the economy in general. The Bureau of Labor Statistics (BLS) began publishing such estimates in July 2002. These data include a measure of unmet labor demand, which complements the broadest measure of excess labor supply, the unemployment rate, and yields a more complete picture of the labor market. Hires and separations, measures of labor turnover, track labor market movements over the course of the business cycle and allow individual businesses to compare their own turnover rates with the national rates.

This article provides an overview of the estimates from the Job Openings and Labor Turnover Survey (JOLTS).[1] It briefly describes the JOLTS program, highlights what job openings and labor turnover data reveal about the labor market and the economy, and compares and contrasts the JOLTS series with other comparable data series to understand and, in part, validate movements in the JOLTS data. Ongoing and future uses for these valuable new data series are also discussed.

The JOLTS program

BLS has collected both job openings and turnover information in several different surveys during the past 50 years. However, these sur-

veys were short-lived due to budget cuts, and the scope was limited to certain industries or States. The current JOLTS program began in 1999 as a comprehensive survey of job openings, hires, and separations at a time when new data were needed to allow further analysis into the U.S. labor market and movements in the economy.[2]

JOLTS collects monthly job openings, hires, and separations data from a nationally representative sample of 16,000 private and public business establishments. Job openings are collected as of the last business day of the month, serving as a snapshot of unmet labor demand for the month. Hires and separations are collected for the entire month and measure the flow of labor during the month. Total separations are the sum of three components: quits (or voluntary separations); layoffs and discharges (involuntary separations); and other separations resulting from retirements, deaths, and disability.

The job openings rate is designed to complement the unemployment rate. There are three conditions for an opening to be reported in JOLTS, just as there are three conditions for a person to be considered unemployed. To be considered a job opening, a job must be currently available, work for the job could start within 30 days, and an employer must be actively recruiting to find someone to fill the job. To be considered unemployed, a person must

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be available for work, could start work immediately, and must be actively searching for work.

JOLTS estimates were first released in July 2002, and monthly estimates are available beginning with December 2000. In addition to the national totals, seasonally unadjusted estimates are published for the private and public sectors, for 16 private industry divisions, and for 2 public industry divisions based on the North American Industry Classification System (NAICS). Estimates for four geographic regions also are available. Seasonally adjusted estimates are available for job openings, hires, total separations, and quits at the total nonfarm level as well as for the regions and selected industry sectors.[3] Neither layoffs and discharges nor other separations showed a strong seasonal component, but these data series, as well as the remaining unadjusted industry series, will be re-evaluated periodically to determine if and when seasonal adjustment is possible.

The JOLTS data series were first published as developmental because the estimates from the new program were subject to intense scrutiny and review, and BLS needed time to conduct a thorough methodological review before announcing the series as official BLS labor market statistics. In addition, the entire sample of establishments was not enrolled in the survey until January 2002, and collection methods were refined in March 2002 to help respondents more accurately report separations data.

In April 2004, the developmental status was lifted, and seasonally adjusted data series were first released along with monthly press releases, which provided some analysis of the estimates. Also, the production process was altered to allow preliminary, or first closing, estimates to be released; previously, final, or second closing, estimates had been released. Even throughout the period when the series were classified as developmental, the individual series showed movements that were in line with other economic indicators and with the cyclical movement of the economy. Although BLS advises caution when using estimates prior to March 2002, those estimates are useful in evaluating the state of both the labor market and economy in general during the recessionary period and the beginning of the recovery.
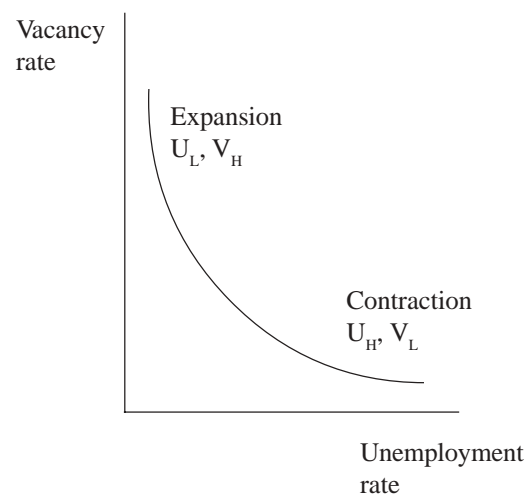
Labor demand and the Beveridge curve

Statistics on job openings are a necessary complement to the BLS unemployment data for a complete picture of the labor market; job openings data represent unmet labor demand and unemployment data represent excess labor supply. The parallel concept of these two data sources allows direct comparisons. In theory, job openings should move in the opposite direction of unemployment over the course of the business cycle. In good economic times, the labor market tends to be tight, with employers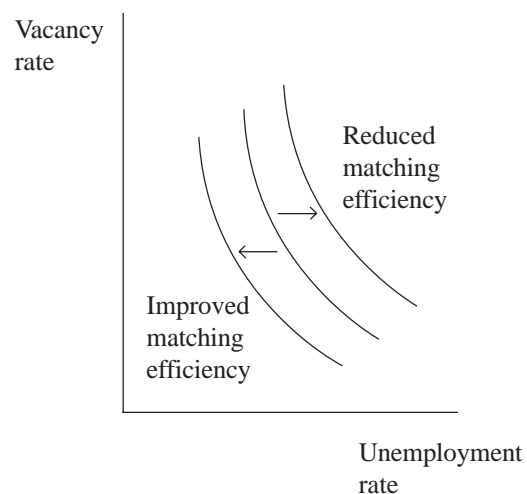 searching for employees, but most people who want a job already are employed. Unemployment tends to be low and openings tend to be high. However, when economic conditions worsen, employers are hesitant to post openings for "new" jobs, and the few openings for existing jobs tend to be filled quickly. Unemployment is usually higher due to reduced hiring and increased layoffs in response to weak demand.

The Beveridge curve is the depiction of the relationship between job openings and unemployment over time, shown as an inverse relationship between the two rates, with movements along the curve distinguished from shifts of the curve itself. (See illustrations below.)

Movement along the Beveridge curve

Vacancy rate

Expansion
U_L, V_H

Contraction
U_H, V_L

Unemployment rate

A shift in the Beveridge curve

Vacancy rate

Reduced matching efficiency

Improved matching efficiency

Unemployment rate

Movements along the curve are generally related to changes in the business cycle and the cyclical fluctuations of the demand for labor. Shifts of the curve are due to changes

in the efficiency with which workers match with open jobs. These movements are based on changes in structural and frictional unemployment as the labor force changes and as industry and geographic trends influence the distribution of jobs. As matching efficiency changes, the curve moves closer to or further away from the origin. Even though the two movements are not independent, it is possible to distinguish them when graphing the Beveridge curve over long periods of time.[4]

Although the JOLTS job openings series is rather short, a preliminary look at the Beveridge curve shows the expected inverse relationship between the job openings and unemployment rates. (See chart 1.) The correlation between the two series, at –0.80, is negative and significant, as expected. The chart shows that early 2001 was a period of low unemployment and high job openings. As the economy moved into recession, unemployment increased and job openings decreased. In the post-recessionary period, unemployment dropped slightly while job openings increased slightly. It appears as though there have been only movements along the curve (indicating changes in labor demand), rather than significant shifts in the curve (indicating changes in the efficiency with which open jobs match with workers), but a longer time series will be able to better distinguish the movements and yield more insight into the labor market changes

during this period.

The short time series also does not allow much analysis of the job openings rate prior to the start of the 2001 recession. Research has predicted job openings lead at business cycle peaks and lag at troughs. When sensing an economic downturn, employers generally first reduce job openings and hires before separating current employees, and as conditions improve, it is less costly to recall workers from layoffs than to begin recruiting and training new employees. The National Bureau of Economic Research (NBER) dated the most recent recession as having started in March 2001, and with the job openings series beginning in December 2000, it is impossible to determine the number of months that the job openings rate dropped before the official start of the recession. However, NBER declared the recession over in November 2001, and it appears that job openings did not rebound strongly in 2002 or 2003, indicating lagging at the business cycle trough. Chart 1 shows that the Beveridge curve may be looping back along itself in 2004, showing that job openings have begun to increase as unemployment has decreased.

Job openings and unemployment levels

When examining the unemployment and job openings esti-

Chart 1. The Beveridge Curve, seasonally adjusted
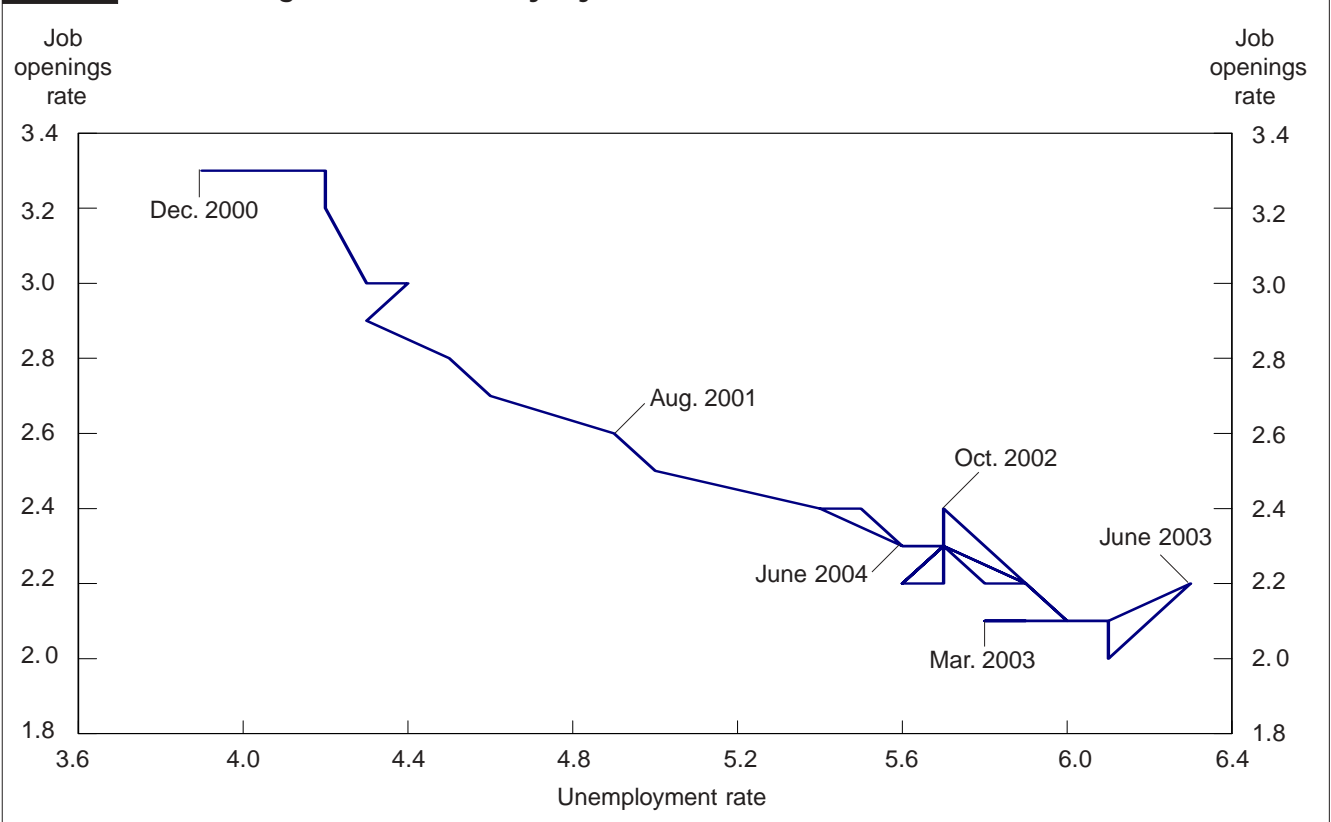
mates, it is easy to see that the two series are at different levels, and another way to analyze the data series is to compare the two levels over time. Long before the United States had a representative survey such as JOLTS to collect job openings data, Katharine Abraham suggested that the number of persons unemployed is much larger than the number of job openings.[5] Her research showed the number of unemployed persons was indeed greater than the number of job openings at any given time, but the ratio did shift over time. In the mid-1960s, the ratio of unemployed persons to one job opening was approximately 2.5, which shifted to 4.0 in the early 1970s and then increased to 5.0 in the late 1970s. These ratios can be used in determining the "tightness" of the labor market. The ratio using the JOLTS job openings data ranges from below 2.0 unemployed persons for every job opening throughout the first half of 2001, when the labor market was perceived as being relatively tight, to 3.3 in August 2003, when the labor market was seen as lagging the general economic recovery.

Because of these types of direct comparisons, there already has been talk of a "jobs deficit," or the difference between the number of unemployed persons and the number of job openings.[6] It is important to remember that even with carefully constructed parallel definitions, the reference periods are both snapshots, but different: the week of the 12th for unemployment, compared with the last business day of the month for job openings. Job openings that first become open and are filled at any time before the end of the month are not included in the job openings estimates. In addition, the JOLTS definition of a job opening requires that a job be unfilled to be counted. Experience suggests that some companies post openings and fill jobs while the departing employee is still working, in order to train the new employee, and these openings would not be included in the JOLTS estimate. Another requirement for a job opening to be counted is that work could begin within 30 days. For industries such as education that tend to fill jobs well in advance of when work will actually begin (posting jobs and hiring in the spring for work to begin when school opens in the fall), these openings will not be reflected in the JOLTS estimate. Furthermore, the survey that measures unemployment, the Current Population Survey (CPS), has a different scope than the JOLTS program. The CPS is a household survey that includes agricultural workers, unpaid family workers, domestic workers in private households, and the self-employed, all of whom are not covered by establishment surveys such as JOLTS. It is therefore better to compare the ratio of unemployed to job openings over time rather than focusing on how the levels compare at any one point in time.

In addition, Abraham was careful to note that it is not necessarily optimal for there to be a one-for-one relationship between unemployment and job openings.[7] There are social costs involved with unemployment (for instance, a 10-percent unemployment rate would not be considered optimal, even with a 10-percent job openings rate), and even if there were a one-for-one relationship at a point in time, the people looking for work may not meet the qualifications needed to fill the job openings, or the job openings may not be in the same location as the people looking for work. These frictions in the labor market (the source of frictional unemployment) keep job openings from being filled instantaneously.
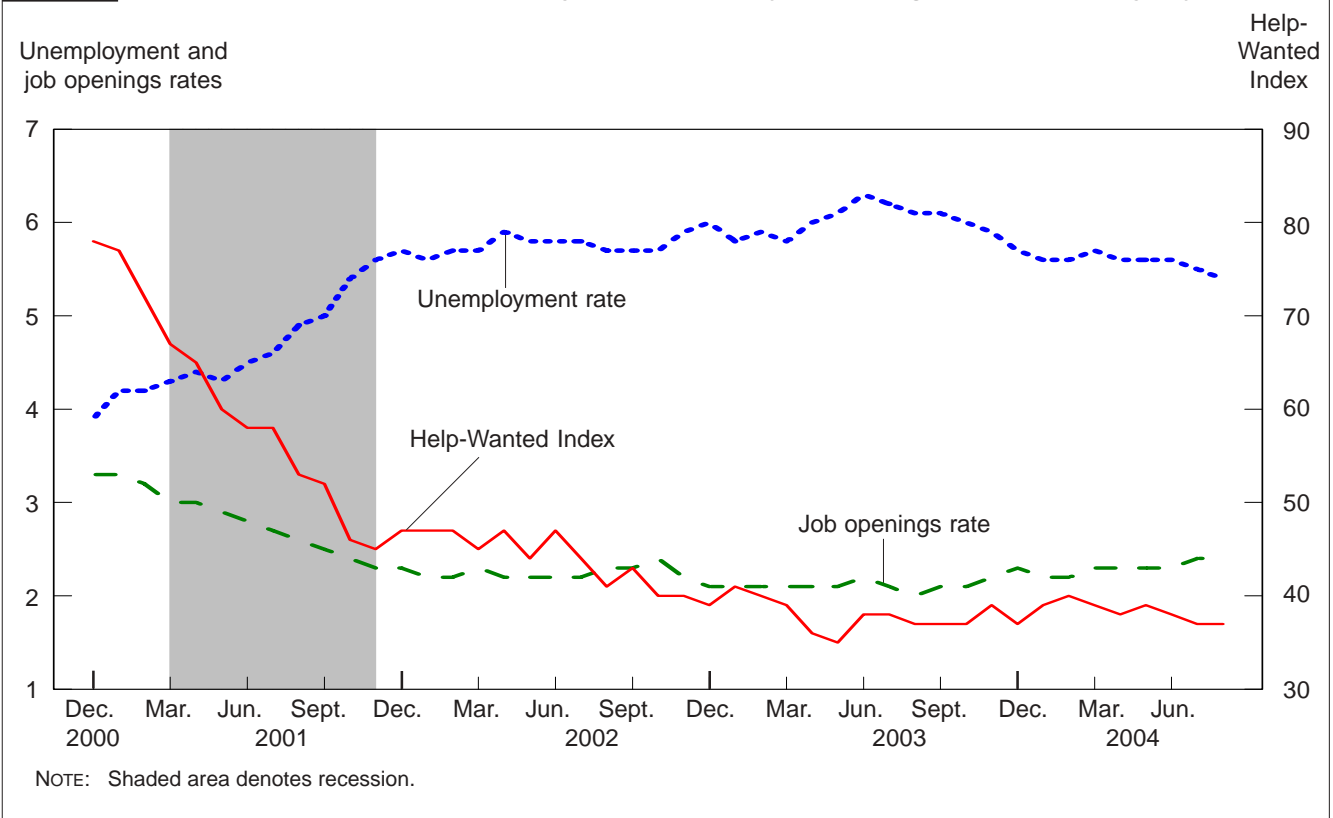
Job openings and the Help-Wanted Index

From the beginning, the JOLTS program has tracked each data series against other available series to help analyze the validity of both long-term trends and month-to-month movements. The only other existing national measure of excess labor demand is the Conference Board's Help-Wanted Advertising Index (Help-Wanted Index).[8] With some manipulation, the Help-Wanted Index has been used in Beveridge curve analysis in the past. As a measure of the volume of help-wanted advertising in major newspapers from across the country, this index has been a good indicator when compared with unemployment. The job openings rate and the Help-Wanted Index, have trends that are roughly similar. (See chart 2.) However, the decrease from December 2000 to November 2001 was much sharper for the Help-Wanted Index, which experienced a drop of 42 percent, compared with a drop of 30 percent in the job openings rate. The differences in scope and definition between the Help-Wanted Index and the job openings rate may account for some of this difference. A change in the way employers advertise open positions also may help to explain; for example, if a large number of employers stopped posting advertisements in the newspaper in favor of advertising on one of the many Internet sites, the decline in the Help-Wanted Index would not represent an economic movement. In addition, JOLTS estimates from December 2000 through 2001 had larger measures of error than the 2002 and later estimates.

Employers who place help-wanted advertisements in newspapers may not be representative of the national economy, as ads tend to vary by skill level, education level, and job type. Also, the growth of the Internet's popularity for job postings may have affected the number of newspaper advertisements in the long run. The Conference Board has investigated ways to take account of advertising on the Internet, but has not made any adjustments to the Help-Wanted Index.

The various job search sites on the Internet are new options for employers seeking workers, but no single site is comprehensive enough to be used as an indicator of labor demand. Issues of coverage, scope, the existence of multiple positions per ad, and fees for postings are obstacles in using

Chart 2. The Help-Wanted Index, unemployment rate, and job openings rate, seasonally adjusted

Unemployment and
job openings rates

Help-
Wanted
Index

NOTE: Shaded area denotes recession.

these sites as indicators.

The Help-Wanted Index is not adjusted to account for multiple positions per ad, and there are no limitations on the types of ads placed in newspapers, some of which may be placed to gather resumes for future hiring. Neither JOLTS nor the Help-Wanted Index differentiates between full- or part-time openings, and neither includes occupational information or a measure of "good" jobs versus "bad" jobs or for low-wage versus high-wage positions. As the JOLTS program expands, questions related to these issues may be added to the survey.

Labor turnover and the business cycle

Thus far, the job openings data series has confirmed much of what previous research has suggested. However, some observers have been surprised by what the JOLTS hires and separations data series show, especially the amount of churning in the labor market each month. Net employment changes tend to be small from month to month, but there are millions of hires and millions of separations occurring each month at U.S. businesses. During the past decade, the annual employment change has averaged approximately plus or minus 2.2 million, but nearly 50 million hires and 50 million separa-

tions occur during any 12-month period in the past 3 years. These numbers dwarf the annual net employment change and help show the dynamism of the labor market. Information about labor market flows can therefore shed more light on how the economy works.

Hires and separations estimates can be used along with other economic indicators in examining movements in the business cycle. Hires are procyclical, increasing when the economy strengthens and decreasing when the economy weakens. In examining employment and the hires rate, there is a significant correlation between the two series. This indicates that employers tend to control their employment level by altering their hiring patterns, as there are significant costs associated with separations.[9] When economic times are good, employers hire to replace employees who have separated and may hire for newly created jobs. During recessions, employers may hold back on hiring to replace separated workers until business conditions improve, rather than increase separations overall. There is a close trend movement between the unadjusted series of employment and the hires rate and the related movement of the quits rate, the largest part of total separations. (See chart 3.) In fact, the correlations between hires and employment and quits and employment are positive and significant.[10] As quits tend to behave

Chart 3. Employment, hires, and quits, not seasonally adjusted

Hires and quits
(in thousands)

Employment
(in thousands)

NOTE: Shaded area denotes recession.
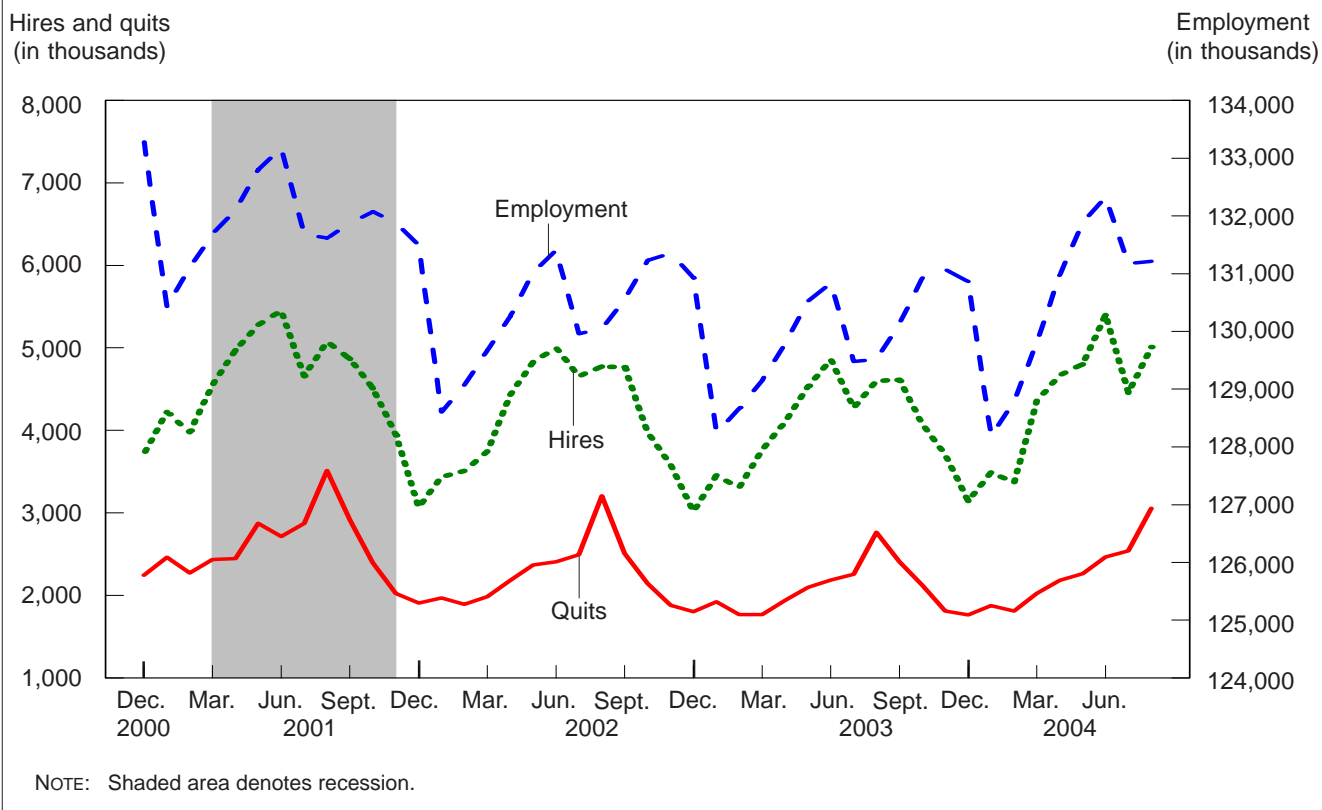
procyclically, increasing when the economy is strong (and thus as employment increases), the correlation with employment is positive.

The movement of the separations rate is dominated by quits. In fact, quits have ranged from 51.3 percent of total separations in June 2003 to more than 60 percent in early 2001 and have averaged 54.7 percent over the course of the published data series. This is an important fact in examining how separations data move with the business cycle. Intuitively, separations would seem to be countercyclical; as economic conditions deteriorate, employers lay off workers. However, because of the dominance of quits among the three components of total separations, separations have behaved procyclically. Total separations have decreased during the current recessionary period, largely because of the decrease in quits over that period and despite the uptick in layoffs and discharges. (See chart 4.)

Layoffs and discharges did increase during the recession, especially from June to October 2001, but perhaps not as much as media reports would indicate. Often, companies report a target number of "layoffs," but some companies may actually decrease their workforce through attrition and by decreased hiring during worsening economic conditions. Other companies may lay off workers in their factories over-

seas before cutting jobs at U.S. plants. In other cases, planned layoffs never materialize.

The other separations rate, which includes retirements, deaths, separations due to disability, and transfers to other locations of an establishment, has remained relatively stable over the course of the published series, fluctuating between 0.2 percent and 0.3 percent. A large proportion of other separations is thought to be retirements, and thus the demographic shift in the composition of the labor force may affect the other separations rate in coming years. As the baby-boom generation moves into retirement years, the result may be an increase in the other separations rate over time.

## Turnover estimates and other economic indicators

As stated earlier, quits tend to decrease during recessions because workers' outlook toward finding another job worsens with deteriorating economic conditions. [11] As economic conditions worsened throughout 2001 and 2002, consumer confidence plunged, and fewer people quit their jobs than at the same time the prior year. (See chart 5.) The seasonally adjusted quits series shows a decrease throughout the published series, and the consumer confidence index exhibits the same downward trend as the quits rate over the course of the

Chart 4. Breakouts of total separations, seasonally adjusted
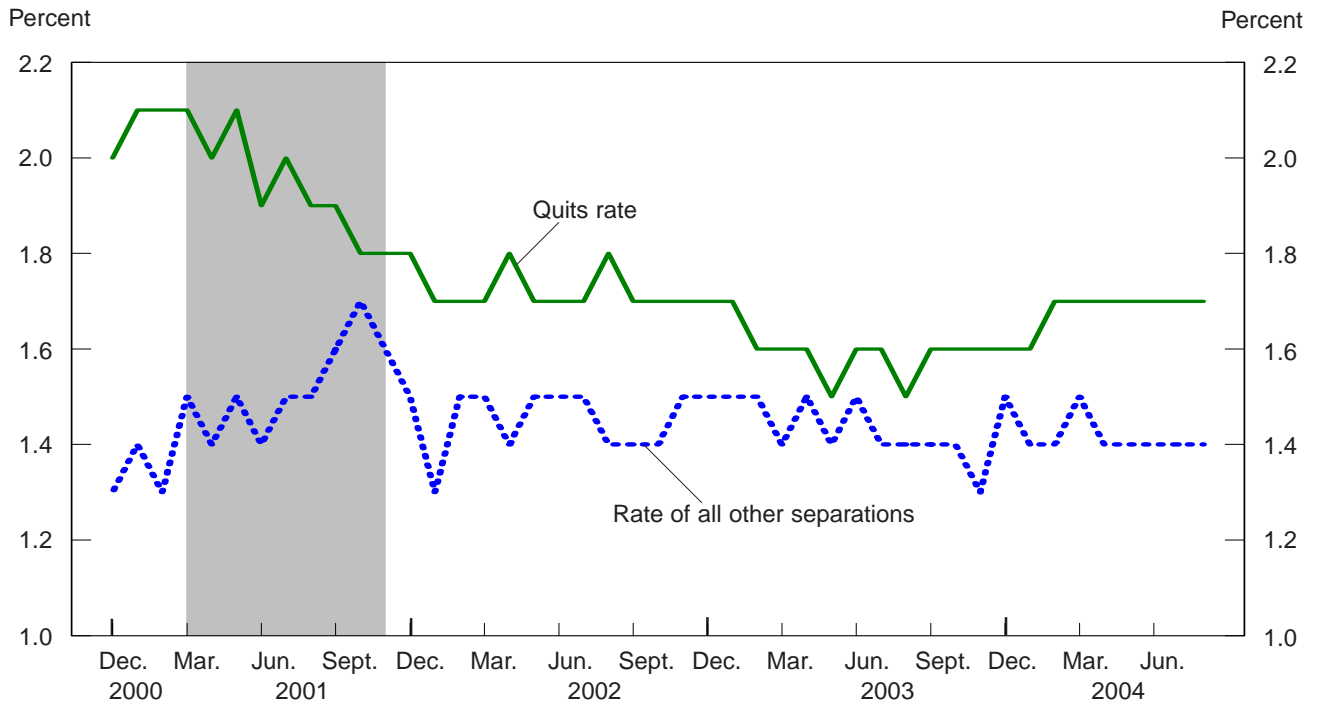
NOTE: Shaded area denotes recession. The "all other separations" series is derived by subtracting quits from total separations. The layoffs and discharges and other separations series are not seasonally adjusted.

Chart 5. The Consumer Confidence Index and the quits rate, seasonally adjusted
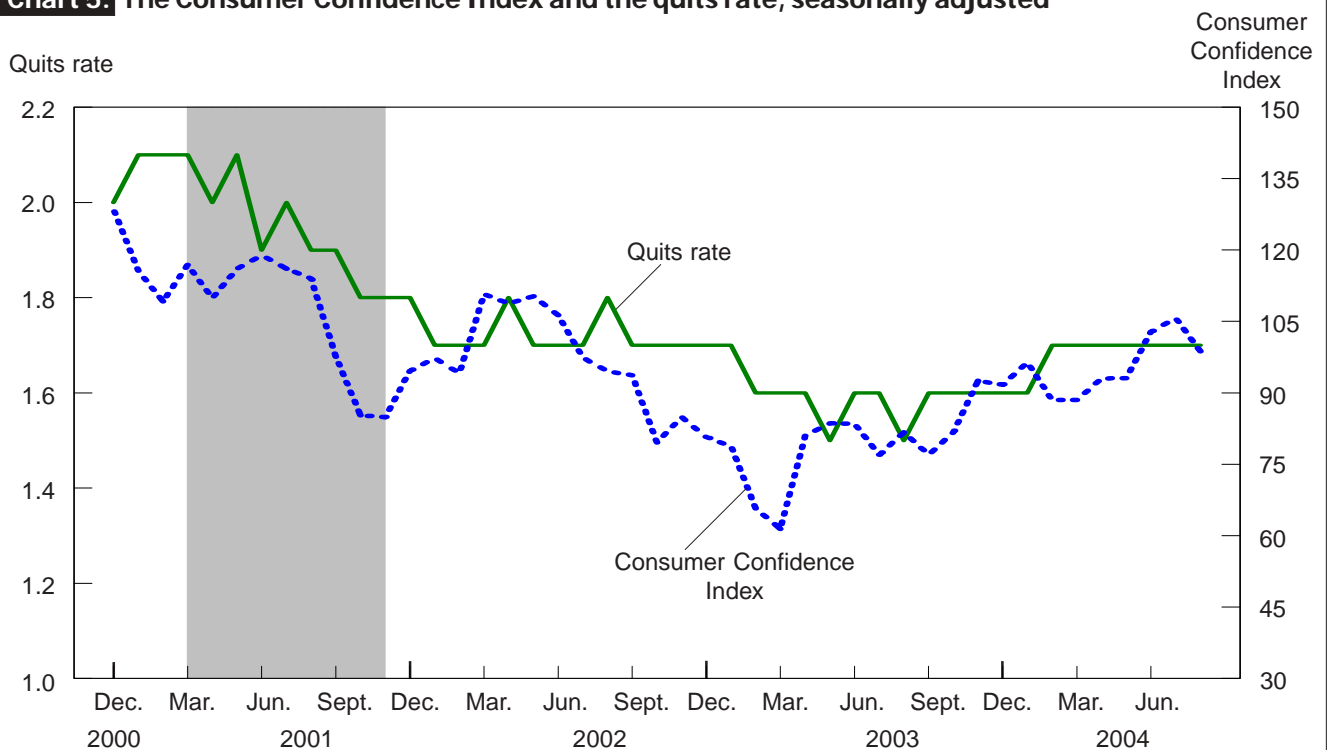
NOTE: Shaded area denotes recession.

series. The consumer confidence series shows something of a rebound in late 2003 and early 2004, perhaps signaling that quits may be expected to increase even further in late 2004. The correlation of quits and consumer confidence is 0.80, which is positive and significant.

One of the only other data series providing a national turnover rate has been the Bureau of National Affairs (BNA) quarterly Job Absence and Turnover report.[12] This long-running series provides results from approximately 300 U.S. member companies surveyed. The JOLTS total separations data trend with the BNA turnover series, but at a higher level partly because BNA does not include layoffs, job eliminations, or departures of temporary staff, whereas JOLTS includes all types of separation during the reference month. (See chart 6.)

Although the BNA report provides a long time series for turnover estimates, the JOLTS program provides a timely and nationally representative indicator of turnover for both hires and separations. In addition, with a much larger sample size and a more inclusive definition of turnover, the JOLTS statistics are more reliable and useful. With the larger sample size, JOLTS is able to publish more industry detail. However, the BNA report publishes turnover rates by establishment size class, which JOLTS may pursue in the future because turnover rates appear to vary by establishment size.

In mid-2003, BLS once again added to the national statisti-

cal framework with data series showing what underlies net employment changes, the Business Employment Dynamics (BED).[13] Quarterly statistics on gross job gains and gross job losses also prove an interesting comparison to hires and separations flows. (See chart 7.) These series track net employment changes at the establishment level. A preliminary analysis has shown JOLTS total private hires and separations, summed for each quarter, have outpaced the gross job gains and gross job losses, which is as expected. The gross job gains and gross job losses are computed by comparing the employment level of the third month of each quarter. JOLTS measures each individual hire and separation that occurs during every month, and thus the data series are, by definition, higher than the gross job gains and losses series. For example, if an establishment's employment level was 10 in the third month of the first quarter and 10 in the third month of the second quarter, there would be no employment change and thus no effect on the gross job gains or losses. However, there may have been three hires and three separations in between those two points, which JOLTS data would reflect.

Along with JOLTS, the Business Employment Dynamics statistics on gross job gains and gross job losses are additional tools to use in labor market analysis. The JOLTS data series will continue to be tracked against all of these data series over time. As with job openings, the JOLTS series of hires and

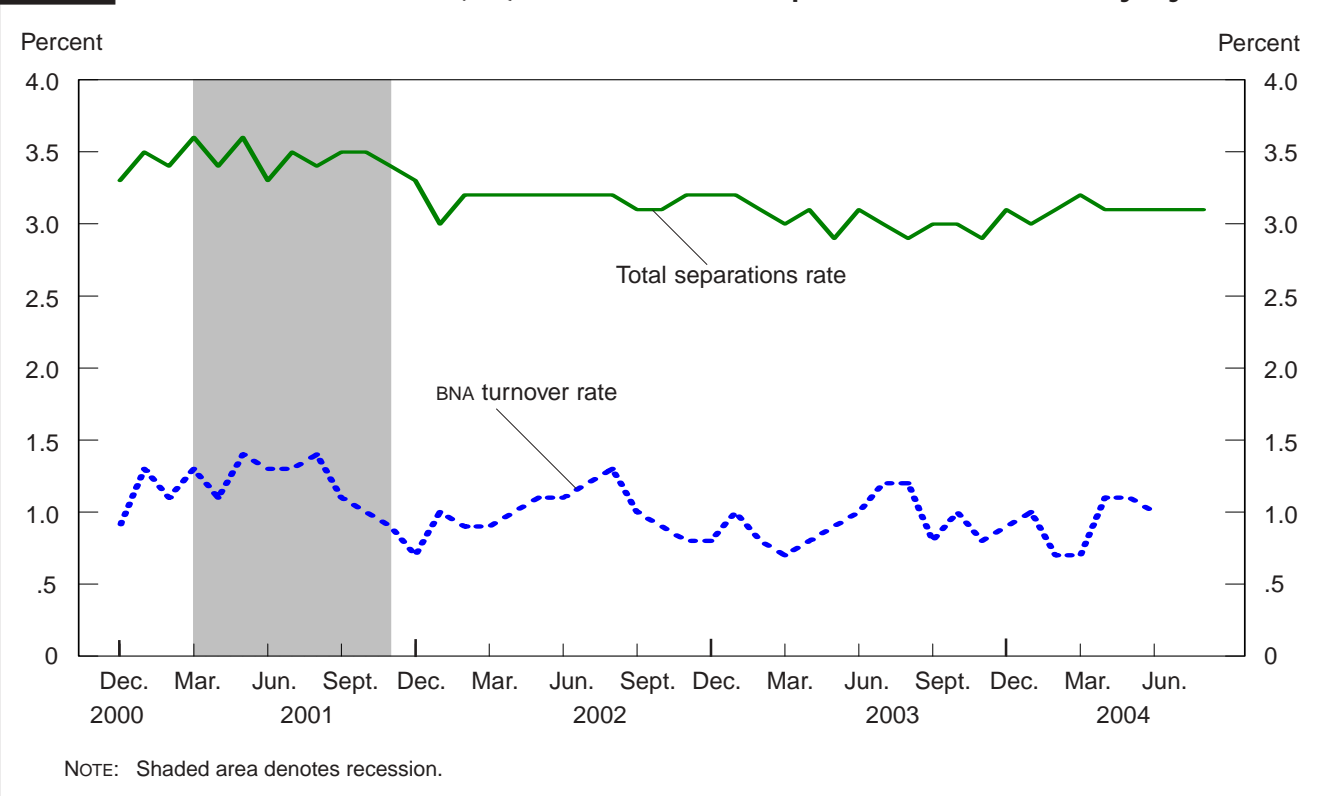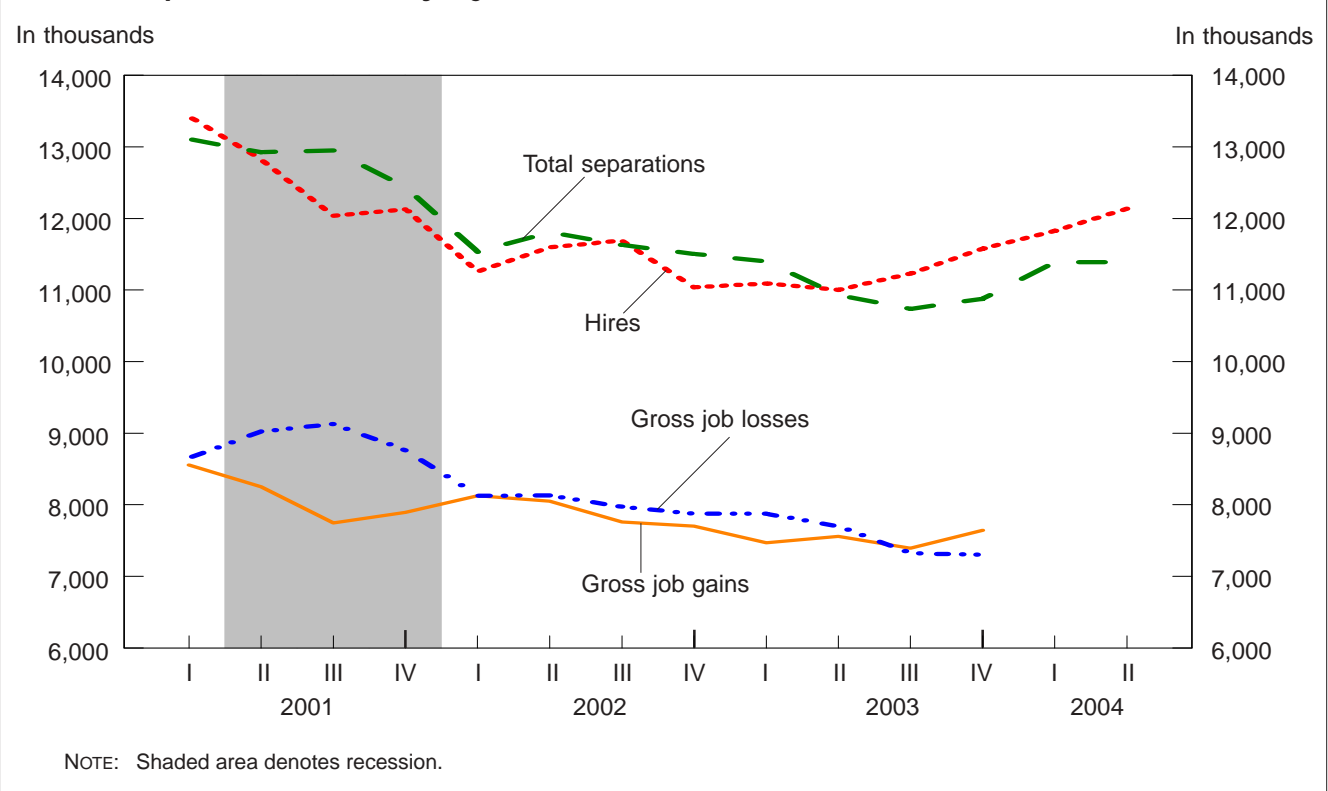**Chart 6.** **Bureau of National Affairs (BNA) turnover and total separations rates, seasonally adjusted**

NOTE: Shaded area denotes recession.

Chart 7. **Quarterly Business Employment Dynamics gross job gains and losses and hires and total separations, seasonally adjusted**

In thousands | In thousands

NOTE: Shaded area denotes recession.

separations are more comprehensive and statistically reliable measures than other series currently available. However, because the data are collected from businesses, it is not possible to track employment flows of individuals. For example, if a person quits, there is no way of telling if they quit to move into another job, become unemployed, or leave the labor force. Surveys that track labor force flows over time, such as the BLS National Longitudinal Survey or the gross flows statistics from the BLS Current Population Survey, are more appropriate for those types of analysis. Combining these indicators with JOLTS statistics allows a more complete picture of the labor market for study and analysis.

Future uses of JOLTS estimates

Although the JOLTS program was designed to provide national economic indicators, there are several things the estimates do not provide. There is a demand for job openings by occupation and establishment size class, duration of vacancies, and openings at the State and metropolitan area level. Some industry or occupational associations have estimates of job openings, and several States are conducting a job vacancy survey, but there is no single comprehensive and statistically reliable source for this type of information. The JOLTS pro-

gram is currently investigating the feasibility of developing estimates by establishment size class and estimates for the total metropolitan and nonmetropolitan areas.

Another future use for JOLTS estimates concerns analysis of wages. Using data serving as a proxy for job openings, researchers have found that job openings may be a better indicator of wage inflation than is unemployment.[14] This certainly should be an area for research once the JOLTS job openings series develops further. Econometric analysis involving wages (with data from the BLS Current Employment Statistics program), unemployment, and job openings, including other factors, will be required to investigate the strength and validity of the relationships.

The job matching function has been of interest to researchers for several years, and wages also play a role in this analysis. The matching function relates the flow of new matches (hires) to the number of jobseekers (unemployed persons) and job openings. The results of job matching are easily observable from month-to-month changes in the job openings and unemployment data, but how jobseekers and employers with open jobs actually find each other is quite complicated. Factors such as wages, as well as external factors such as demographics, educational structure, and geographic concentration of industries all influence how open jobs and

jobseekers are matched.[15] As proxies of job openings had been used in previous studies, analysis using the JOLTS job openings data will help further this area of research.

It is apparent that there is a long list of research topics that job openings and turnover data can be used to investigate. Alone or in combination with other national economic indi- cators, the new JOLTS data series already have yielded valu- able information about the U.S. labor market and economy in general. The estimates have shown similar trends as other national economic series, and they will continue to be tracked over time as a validation exercise and as a research and analy- sis tool. □

Notes

[1] Job openings and labor turnover data, along with a brief analysis, are released monthly in a press release, on the Internet at: **http://www.bls.gov/ jlt**/. Selected data also appear in the Current Labor Statistics department of this publication each month.

[2] For additional information about the development of the program, see Kelly Clark and Rosemary Hyson, "New tools for labor market analy- sis: the Job Openings and Labor Turnover Survey," *Monthly Labor Re- view*, December 2001, pp. 32–37.

[3] Natural resources and mining, information, financial activities, and other services did not show strong seasonal patterns when seasonal ad- justment diagnostics were first evaluated.

[4] See Katharine G. Abraham, "Help-Wanted Advertising, Job Vacan- cies, and Unemployment," *Brookings Papers on Economic Activity*, no. 1, June 1987, pp. 207–48; and Hoyt Bleakley and Jeffrey C. Fuhrer, "Shifts in the Beveridge Curve, Job Matching, and Labor Market Dynamics," *New England Economic Review*, September/October 1997, pp. 3–19.

[5] See Katharine G. Abraham, "Structural/Frictional vs. Deficient De- mand Unemployment: Some New Evidence," *American Economic Review*, 1983, vol. 73(4), pp. 708–24.

[6] See *Economic Snapshots*, The Economic Policy Institute, Oct. 2, 2002.

[7] See Abraham, "Structural/Frictional," p. 708–24.

[8] For additional information about the Help-Wanted Advertising In- dex, see The Conference Board's website at **www.conference-board.org**

[9] See Daniel S. Hamermesh, Wolter H.J. Hassink, and Jan C. van Ours, "Job Turnover and Labor Turnover: A Taxonomy of Employment Dynam- ics," *Annales D'Economie et de Statistique*, no. 41/42, 1996, pp. 21–40, for their work concerning Dutch establishments; and John M. Abowd, Patrick Corbel, and Francis Kramarz, "The Entry and Exit of Workers and the Growth of Employment: An Analysis of French Establishments," *The Review of Economics and Statistics*, 81(2), May 1999, pp. 170–87, for their work concerning French establishments.

[10] The correlation coefficient for hires and employment is 0.51 and for quits and employment is 0.44; both are significant at the 95 percent con- fidence level.

[11] See Hoyt Bleakley, Ann E. Ferris, and Jeffrey C. Fuhrer, "New Data on Worker Flows During Business Cycles," *New England Economic Re- view*, July/August 1999, pp. 49–76 and Patricia M. Anderson and Bruce D. Meyer, "The Extent and Consequences of Job Turnover," *Brookings Papers: Microeconomics*, 1994, pp. 177–248.

[12] For additional information about the Job Absence and Turnover Report, please see the Bureau of National Affairs' website at **www.bna.com**

[13] For additional information about the business employment dynamics, see 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.

[14] See Katharine G. Abraham and James L. Medoff, "Unemployment, Unsatisfied Demand for Labor, and Compensation Growth in the United States, 1956–1980," National Bureau of Economic Research Working Paper Series, no. 781, October 1981.

[15] See Barbara Petrongolo and Christopher A. Pissarides, "Looking into the Black Box: A Survey of the Matching Function," *Journal of Eco- nomic Literature*, June 2001, pp. 390–431.