Conference Report: JOLTS Symposium

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

The Job Openings and Labor Turnover Survey (JOLTS) program has reached the milestone of publishing 10 years of monthly data, and the JOLTS data are increasingly used by the academic and policy communities. In light of these two achievements, the Bureau of Labor Statistics (BLS) sponsored a JOLTS Symposium on December 10, 2010. The purpose of the Symposium was to bring together leading academic and policy users of JOLTS. Five research papers using JOLTS data were presented, and the Symposium concluded with a roundtable discussion of the strengths, weaknesses, and recommendations for the future of the JOLTS program. This conference report summarizes the JOLTS Symposium.

The JOLTS Program

The Job Openings and Labor Turnover Survey (JOLTS) is a monthly survey that produces data on job openings, hires, and separations. The measure of job openings is a 1-day snapshot at the end of the month, while the hires and separations measures represent flows of workers into and out of jobs over the course of the full calendar month. The separations data are collected as quits, layoffs and discharges, and other separations (such as retirements).

The JOLTS survey is composed of a relatively small random sample of approximately 16,000 business establishments, of which approximately 10,500 provide data on a regular basis. The JOLTS survey covers all nonagricultural industries in the public and private sectors for the 50 States and the District of Columbia. JOLTS estimates are benchmarked monthly to the employment estimates of the Current Employment Statistics (CES) survey.

The job openings data serve as demand-side indicators of labor shortages. Prior to JOLTS, there was no economic indicator of the unmet demand for labor with which to assess the presence or extent of labor shortages in the United States. The number of unfilled jobs and the unemployment rate, a measure of the excess supply of labor, complement each other. When the most recent recession began, the number of unemployed persons per job opening was 1.8. When the recession ended, there were 5.8 unemployed persons per job opening.[1] JOLTS data show that the cyclical downturn in job openings preceded the cyclical downturn in employment.[2] The next section of this report will describe research that documents the leading indicator properties of the job openings series.

Data on hires and separations from JOLTS have played a key role in analysis of the 2007–09 recession. The number of hires decreased by 23 percent between the beginning of the recession in December 2007 and its low point in June 2009 (the end of the recession).[3] The number of separations fell by 20 percent between the beginning of the recession in December 2007 and its low point in February 2010. The data also indicate that the number of quits exceeded the number of layoffs and discharges for the early and mid-2000s. However, this relationship changed during the most recent recession as layoffs and discharges outnumbered quits from November 2008 through January 2010.[4]

Another tool that was used extensively by participants at the JOLTS Symposium is the Beveridge curve. The Beveridge curve maps out the relationship between the job openings rate on the vertical axis and the unemployment rate on the horizontal axis.[5] Using data for the monthly job openings rate from JOLTS and the monthly unemployment rate from the Current Population Survey (CPS), the Beveridge curve can shed light on the relationship between the two. During the early and mid-2000s, the Beveridge curve is clearly defined, with job openings between 2 and 4 percent and unemployment between 4 and 6.5 percent. From the start of the recent recession in December 2007 until October 2009, the economy's location on the Beveridge curve moved lower and further to the right as the job openings rate declined and the unemployment rate rose. During the period from October 2009 through December 2010, the economy's location on the Beveridge curve moved up and only slightly to the left, as the job openings rate increased and the unemployment rate decreased slightly.

Richard L. Clayton is Division Chief of the Division of Administrative Statistics and Labor Turnover; John C. Wohlford is Branch Chief in the Job Openings and Labor Turnover Branch; and James R. Spletzer is a Senior Research Economist; all are in the Office of Employment and Unemployment Statistics, Bureau of Labor Statistics. E-mail: Clayton.Rick@bls.gov; Spletzer.Jim@bls.gov; Wohlford.John@bls.gov

Research Presentations at the JOLTS Symposium

Five research papers were presented at the JOLTS Symposium. These five papers are listed in the accompanying text box. The first paper uses confidential JOLTS microdata, which are available to researchers at the BLS national office.[6] The next three papers use publicly available JOLTS statistics available from the BLS Web site. The fifth paper uses experimental size-class tabulations, which are available upon request.[7]

The establishment level behavior of vacancies and hiring. The paper by Steven J. Davis, R. Jason Faberman, and John C. Haltiwanger uses the JOLTS microdata to assess, develop, and calibrate search-and-matching models.[8] Search-and-matching models are important in labor economics. The 2010 Nobel Prize in economics was awarded to three economists (Peter Diamond, Dale Mortensen, and Christopher Pissarides) who initially developed these models.

This paper focuses on the "vacancy yield," which is defined as the number of hires during the current month divided by the number of job openings at the end of the previous month. The vacancy yield has an average of 1.3, which implies that, on average, an establishment hires 13 persons during the current month for every 10 vacancies they reported on the last day of the previous month. This average of 1.3 varies by characteristics such as industry and establishment size, and also varies depending upon whether the establishment is contracting or expanding. The empirical results show that vacancies yield about one hire per month for establishments that are contracting, but the vacancy yield increases with the growth of expanding establishments. For example, establishments that are growing by 10 percent yield about 3 hires per vacancy, and establishments growing by 25 percent yield over 5 hires per vacancy. These results for expanding establishments imply that the average vacancy duration is very short or that much hiring is not mediated through vacancies as measured in the JOLTS data. This implication is further supported by analysis of the JOLTS microdata, which shows that 42 percent of hires occur at establishments that report no vacancies.

One issue with trying to understand these empirical results is that the vacancy yield relates the flow of hires over an entire month to the stock number of vacancies at the end of the previous month. The authors propose a time-aggregation model of daily hiring dynamics to deal with this difference in reference periods. Hires (h_t) on any given day t equal the daily job-filling rate (f_t) times the number of vacancies on the previous day (v_{t-1}): $h_t = f_t v_{t-1}$. With some assumptions, the authors estimate the average daily job-filling rate (f_t) to be 0.05, and this job-filling rate is countercyclical: employers find it easier to recruit in weak labor markets.

The daily job-filling rate (f_t) is an important parameter because the average vacancy duration is calculated as ($1/f_t$). The average duration of vacancies is estimated to be 20 days, and ranges from a low of 8.3 in construction to a high of 35.4 in health and education. The estimated vacancy duration is procyclical: durations are shorter during weak labor markets.

The authors then conduct a variance

Papers presented at the JOLTS Symposium:

The Establishment-Level Behavior of Vacancies and Hiring
Steven J. Davis, University of Chicago
R. Jason Faberman, Federal Reserve Bank of Philadelphia
John C. Haltiwanger, University of Maryland

What drives movements in the unemployment rate? A decomposition of the Beveridge curve
Regis Barnichon, Federal Reserve Board of Governors
Andrew Figura, Federal Reserve Board of Governors

Which Industries are Shifting the Beveridge Curve?
Regis Barnichon, Federal Reserve Board of Governors
Michael Elsby, University of Michigan
Bart Hobijn, Federal Reserve Bank of San Francisco
Ayşegül Sahin, Federal Reserve Bank of New York

Evaluating and Comparing Leading Indicators for Employment
Gad Levanon, The Conference Board

JOLTS as a Timely Source of Data by Establishment Size
Alan Krueger, Princeton University
Sarah Charnes, U.S. Department of the Treasury

decomposition and find that vacancies account for half or less of the cross-sectional variance in log hires. The authors conclude that recruiting intensity per vacancy accounts for about 35 percent of movement in aggregate hires, where recruiting intensity is defined as employer actions such as increasing advertising or search intensity per vacancy, screening applicants more quickly, relaxing hiring standards, improving working conditions, and offering more attractive compensation to prospective employees. The authors, as well as participants in the afternoon roundtable, suggested that the JOLTS questionnaire should elicit information about recruiting methods.

What drives movements in the unemployment rate? A decomposition of the Beveridge curve. The paper by Regis Barnichon and Andrew Figura uses JOLTS and CPS data to study variations in the unemployment rate across time.[9] The framework in this paper is based on the Beveridge curve, which captures the downward sloping relationship between the unemployment rate and the job vacancy rate. Movements along the Beveridge curve are typically interpreted as cyclical movements in labor demand. However, shifts in the Beveridge curve are difficult to interpret. While they are sometimes seen as indicating movements in the level of equilibrium or structural unemployment, shifts in the Beveridge curve can be caused by a number of diverse factors such as changes in the intensity of layoffs and quits, changes in labor force participation, or changes in the efficiency of matching workers to jobs. The authors decompose movements in the unemployment rate into three categories: changes in labor demand, changes in labor supply, and changes in the efficiency of matching unemployed workers to jobs.

The authors find that the secular decline in the unemployment rate that occurred since 1976 appears to originate in changes in labor supply (in particular, the aging of baby boomers and the increase in women's labor force participation), while changes in labor demand account for most of the cyclical fluctuations in unemployment. Changes in matching efficiency—how efficiently unemployed workers are matched to vacant jobs—generally have a small impact on the equilibrium unemployment rate, but there is a marked decrease in matching efficiencies in the aftermath of the 1982 peak in unemployment and during the 2007–09 recession. The authors conclude that matching efficiency declined during the 2007–09 recession, and this added about 1.5 percentage points to the unemployment rate during that recession. Participants in the afternoon roundtable offered suggestions for how to interpret this matching efficiency and how it might be measured by adding additional questions to the existing JOLTS survey form.

Which industries are shifting the Beveridge curve? As noted earlier, the economy's location on the Beveridge curve appears to be shifting up since October 2009, as vacancies have increased while unemployment has remained high. In October 2010, the vacancy rate was 2.5 percent and the unemployment rate was 9.7 percent. During the economic expansion of the mid-2000s, the unemployment rate was in the range of 5.7 percent to 6.3 percent when the vacancy rate was 2.5 percent. This difference between the October 2010 unemployment rate and the unemployment rate implied by the mid-2000s Beveridge curve—at the same vacancy rate of 2.5 percent—is approximately 3.7 percent (calculated as 9.7 percent minus 6.0 percent). This 3.7-percent difference is referred to as the "Beveridge curve gap." The paper by Regis Barnichon, Michael Elsby, Bart Hobijn, and Ayşegül Sahin decomposes this Beveridge curve gap into the contributions resulting from hires, quits, and layoffs, as measured by the JOLTS, and flows into and out of the labor force, as measured by the CPS.[10]

The authors begin by noting that the unemployment rate is in a steady state whenever the growth rate of the labor force equals the growth rate of employment. By definition, the growth of the labor force is given by the number of people who enter the labor force minus the number of people who exit the labor force. Both of these flows can be measured with the CPS gross flows data. The growth of employment equals hires minus quits and layoffs, which can be measured using JOLTS. With this underlying structure, the authors empirically estimate a steady-state Beveridge curve with CPS and JOLTS data from December 2000 to November 2007. The estimated Beveridge curve provides a good fit for the vacancy and unemployment rate observations during the December 2007–June 2009 recession. The vacancy and unemployment data from 2010 are above the steady-state Beveridge curve, and this results in the Beveridge curve gap.

The authors use their model of the steady state Beveridge curve to decompose the Beveridge curve gap into the contributions resulting from five labor market flows: hires, quits, layoffs, and flows into and out of the

labor force. The authors find that the current quits and layoffs rates are less than the levels predicted by the model, but these separation flows cannot explain the Beveridge curve gap. On the other hand, the current level of hires per vacancy (the same vacancy yield measure used by Davis, Faberman, and Haltiwanger) is about 28 percent less than predicted by the estimated model, and low levels of vacancy yields should be associated with higher unemployment rates. In the authors' decomposition, this large shortfall in the vacancy yield more than fully explains the Beveridge curve gap. Pushing the model further, the authors find that the construction industry contributes most to the Beveridge curve gap.

The authors then describe potential causes for the low number of hires per vacancy. One potential cause is a mismatch between job openings and the unemployed. Mismatch occurs if the skills or location of vacant jobs don't match the skills or location of unemployed persons. To understand this mismatch, the authors recommend that JOLTS collect more information about the location, the occupation, and the experience and skills required for the posted job openings. A second possible reason for the shortfall in hires per vacancy is that proposed by Davis, Faberman, and Haltiwanger: perhaps firms' recruiting intensity to fill their open vacancies has declined. The authors suggest that JOLTS should consider collecting information about the time establishments spent on recruitment per job opening or on the number of job offers made for a given vacancy. The authors propose several other explanations for the estimated shortfall in the vacancy yield, such as a changing composition of the unemployed or a changing search intensity by the unemployed. The participants in the afternoon roundtable also focused on the recent decline in the vacancy yield and recommended other ways for the JOLTS program to measure this.

Evaluating and comparing leading indicators for employment. The paper by Gad Levanon evaluates alternative data series for their ability to be leading indicators of employment. This topic is of interest to the Conference Board, where Dr. Levanon is employed, since the Conference Board produces widely used indexes of economic indicators such as the Leading Economic Index™, the Consumer Confidence Index™, and the Employment Trends Index™. The Employment Trends Index is an important tool for forecasting employment trends.

Evaluating the JOLTS job openings data as a leading indicator of employment is difficult since JOLTS data are only available from December 2000 forward. Thus, the first step in the analysis is to link the current JOLTS job openings data with the historical Help Wanted Index (HWI). The HWI was created in 1951 by the Conference Board, and measures the lines of help-wanted classified ads from over 50 major U.S. newspapers. The HWI was discontinued in 2008 because employers increasingly post their vacancies on the Internet instead of in newspapers. (The Conference Board now publishes the Help Wanted Online index, which measures the number of new online jobs posted on the Internet.) The author links the current JOLTS data to the historical HWI to create a vacancy series running from 1951 to the present. Using a variety of statistical methods, the author finds that the linked HWI-JOLTS job openings series is the best single leading indicator of employment. The job openings series is a better leading indicator than other measures such as manufacturing and trade sales, initial claims for unemployment insurance, GDP, industrial production, and many others.

JOLTS as a timely source of data by establishment size. The paper by Alan Krueger and Sarah Charnes uses the experimental size-class data from the JOLTS to examine the economic performance of small businesses following the financial crisis of 2008. The U.S. Treasury Department asked the BLS to produce tabulations of JOLTS hires and separations by size class; these tabulations provided policy makers with the only timely government source of evidence on employment trends by establishment size. The JOLTS tabulations by size class were used in testimony by the Chief Economist of the U.S. Treasury (at the time, Alan B. Krueger) to the Joint Economic Committee (JEC) on May 5, 2010.[11] The JOLTS size-class data, regularly updated to include recent months of data, are available to the public through the JOLTS Web site.[12]

The authors' analysis of the JOLTS size-class data shows that employment in small establishments was particularly hard hit during the recession, and that employment continued to contract at small establishments in the early phase of the recovery, whereas employment was increasing in the early phase of the recovery at medium and large establishments. This finding is consistent with the authors' hypothesis that the financial crisis has had a more adverse impact on small businesses.

The authors then examine the quality of the JOLTS size-class data by comparing employment trends in

the JOLTS series with employment trends in other series, most notably the Business Employment Dynamics (BED) data produced by the BLS. The BED size-class data are tabulated from the BLS business universe of establishments, but these BED data are published with an approximately 8- month lag. This 8-month lag is too long for timely policy analysis. It is important to note that the JOLTS size-class data are tabulated by establishment size whereas the published BED data are tabulated by firm size, but the authors show that the correspondence between the BED and JOLTS data by size is fairly strong. The authors conclude that there is no evidence from the available BED data that one would have reached dubious conclusions by relying on the JOLTS data to infer comparative job growth trends by business size category. Furthermore, an important benefit of the JOLTS size-class data is that they can be produced with much less of a lag than the BED size-class data.

The authors state that given the timeliness of the JOLTS data and the apparent reliability of the data, there would be considerable value to data users if BLS produced the experimental JOLTS series by establishment size on a regular basis. This assertion is reinforced by the minimal costs involved because the JOLTS data are already being collected, and tabulations by establishment size should only require changes in the processing system. However, the authors also express a note of caution and recommend that the JOLTS staff research alternative ways of benchmarking and aligning the experimental JOLTS size-class data. This issue arises because the JOLTS data by establishment size cannot be benchmarked to CES employment estimates because the CES data are not available by establishment size. There is ongoing research by the BLS into the best way to benchmark JOLTS size-class tabulations.

Roundtable

The final session of the JOLTS Symposium was the roundtable. The goal of the roundtable was to receive input and gain insight into ways to improve the JOLTS program. The authors of the research papers presented in the morning, as well as Professor Robert Hall of Stanford University, were invited to make short presentations at the roundtable. They were asked to identify issues and research opportunities, and to prioritize improvements that would position JOLTS to better serve the research and policymaking communities. In addition, people who registered to attend the JOLTS Symposium were also invited to submit their ideas, concerns, and recommendations for the JOLTS program.

The comments received from the authors of the research papers and from the audience fell into three categories: (1) what could be done within the existing program, (2) what could be done with a larger sample, and (3) what could be done if more questions were on the survey form.

Improvements within the existing program. With regard to what could be done with no additional sample and with no changes to the questionnaire, three specific suggestions were offered. The first, building on the Krueger and Charnes paper, was that the BLS research the size-class benchmarking issue and publish the JOLTS size-class estimates every month. Several participants, and particularly those involved with real-time analysis of the U.S. labor market, suggested that JOLTS establishment-based size-class statistics would be an important addition to the monthly data available to policy makers.

The second suggestion offered was that the labor market dynamics statistics published by the BLS be integrated. The BLS publishes three broad sets of labor market dynamic statistics from establishment data—the monthly net employment change measure from the Current Employment Statistics (CES) program, the monthly hires and separations data from the JOLTS program, and the quarterly gross job gains and losses data from the Business Employment Dynamics (BED) program. The specific suggestion here is that BLS compute gross job gains (expansions, but not openings) and gross job losses (contractions, but not closings) from the monthly CES and align the expansions and contractions data that could be calculated from the JOLTS microdata to the CES expansions and contractions data. Currently, the JOLTS monthly net employment change, computed as hires minus separations, is aligned with the CES monthly net employment change; this suggestion proposes aligning the distribution of monthly net employment change from the JOLTS to the distribution of monthly net employment change from the CES. With such an integration, the BLS could publish monthly measures of net employment change, gross job gains and losses (expansions and contractions, not openings and closings), and hires and separations that are timely and consistent with each other.

The third suggestion for what the JOLTS program could do with current resources was that BLS create public-use microdata. For decades, BLS and Census have made CPS

microdata (without key identifying information) available to researchers. The availability of CPS microdata has advanced many topics in empirical labor economics, such as our understanding of wage inequality, gender wage differentials, employment polarization, and the returns to education. However, because of the lack of publicly available establishment and firm-level datasets, research into understanding businesses has lagged behind research into understanding individuals. Statistical agencies do not release microdata collected from businesses because respondents to government surveys are promised confidentiality, and it is relatively easy to identify businesses in survey microdata. Business surveys are certain to include nearly all very large businesses and there are only a limited number of very large businesses in many industries. BLS needs to do further research on the costs and benefits of preparing business level microdata for public release—for example, by determining the costs and benefits of removing identifying information such as industry and State from public use microdata, or adding "noise" to key data elements such as employment and wages in order to disguise respondent identity.

Improvements requiring more sample. Almost everyone who spoke at the roundtable or submitted suggestions in advance mentioned the advantages of greater industry detail and greater geographical detail in the JOLTS published statistics. The only way to obtain greater detail in published output is to have a larger sample, and a larger sample would require additional funding for the JOLTS program.

Many persons who suggested greater industry and geographical detail put their suggestion in the context of the Beveridge curve. The recent upward movement in the Beveridge curve is causing concern among economists and policy makers. The position of the Beveridge curve is determined by the efficiency of the labor market, and a greater mismatch between available jobs and the unemployed in terms of industry or location would cause the curve to shift outward. This outward shift, with the associated interpretation of declining matching efficiency, was the subject of several of the research papers presented at the JOLTS Symposium. There is also a possibility that the Beveridge curve is "looping" as the economy emerges from the severe 2007–09 recession; "looping" refers to the possibility that the economy's location may eventually return to the Beveridge curve as mapped out by the early and mid-2000's data points. But trying to distinguish between this temporary "looping" hypothesis, versus a sustained outward shift in the Beveridge curve as a result of geographical or industrial mismatch in the labor market, motivated the suggestion by the roundtable participants for more industrial and geographical detail from the JOLTS.

Improvements requiring more questions on the survey form. There were many suggestions by the roundtable participants and the Symposium attendees for adding additional questions to the JOLTS survey form. Many of the suggestions were motivated by an effort to understand the increased mismatch (or equivalently, the decreased matching efficiency) that might explain the recent outward shift in the Beveridge curve.

The roundtable participants offered many suggestions that would result in more detailed data about job openings. There was great interest in the skill level associated with the vacancies. If the JOLTS survey form asked about the occupation or education associated with vacancies, and if we assume that skill can be measured by either occupation or education, then analysts could create Beveridge curves by skill level. (The CPS tabulates counts of the unemployed by occupation and education.) Following up on the Davis, Faberman, and Haltiwanger paper, many roundtable participants suggested that the JOLTS collect information about employer's recruiting intensity. There were also several suggestions that the JOLTS collect information on the duration of job openings, or how many of the job openings posted on the last day of the month are new in that month and how many are continued from the previous month.

There also were quite a few suggestions by the roundtable participants for expanding the amount of information collected about new hires. For example, what are the occupations of the new hires, and what are the basic demographic characteristics (age, race, gender, and education) of the new hires? What is the wage being paid to the new hires? Are these hires for a permanent position, or for a seasonal or temporary position? Where did the new hires come from—from unemployment or from a different job? How many of the new hires are to replace workers who quit or retired, versus how many of the new hires are filling new positions to meet the demands of a growing business? And following up on the empirical result that the average vacancy yield exceeds one (one vacancy yields more than one hire), several of the roundtable participants want to know how many of the new hires resulted from formal vacancy postings as opposed

to how many were informally hired without a posted vacancy.

There were also several suggestions that the JOLTS obtain additional information about separations. One of the findings from the research papers presented at the Symposium is that matching efficiency is procyclical: it is easier to match unemployed workers to vacant jobs during expansions. Is this because much of the turnover during expansions, when both quits and hires are high, results from job changing among high-turnover workers in high-turnover jobs? A similar question is that, during recessions, when both quits and hires are low, are employers more focused on creating long-term, high-productivity matches? Several of the roundtable participants suggested that the JOLTS survey inquire about the tenure, occupations, and demographics of the workers involved in quits and layoffs.

The roundtable discussion concluded with two topics about how to implement any possible changes to the questionnaire. First, it was recommended that the BLS conduct an employer record check to determine if the suggested data elements are easily accessible to the person filling out the JOLTS questionnaire, and what is the reliability of the available information. Second, the BLS, in cooperation with data users, should prioritize all of the suggested new questions and make recommendations about which ones could be added to the monthly survey form and which ones could be asked occasionally in a supplement. These recommendations should take into account employer burden and the possibility of lower response rates.

Conclusion

The purpose of the December 10th 2010 JOLTS Symposium was to bring together leading academic and policy users of JOLTS. Five research papers using JOLTS data were presented, and there was a roundtable discussion of the strengths, weaknesses, and recommendations for the future of the JOLTS program. The Symposium clearly demonstrated that the JOLTS data are playing a fundamental role in understanding the most recent recession: vacancy yields and Beveridge curves are empirical constructs now in the tool kit of economists and policy makers, the JOLTS data have been shown to have leading indicator properties, and timely JOLTS data on the employment growth of small versus large establishments assisted in policy creation. The Symposium also resulted in many suggestions for improving the JOLTS program and positioning the JOLTS program as a key economic indicator for understanding the U.S. labor market. □

Notes

[1] See JOLTS Graphs and Highlights, Chart 1, p. 1, on the Internet at **http://www.bls.gov/jlt/jolts_dec2010_supp_toc.htm**.

[2] Ibid. Chart 2, p. 2.

[3] Ibid. Chart 3, p. 3.

[4] Ibid. Chart 4, p. 4.

[5] Ibid. Chart 5, p. 5.

[6] For more information, see Researcher Access to Confidential Data Files at the Bureau of Labor Statistics, on the Internet at **http://www.bls.gov/bls/blsresda.htm**.

[7] For more information, see Experimental JOLTS Estimates by Establishment Size Class, on the Internet at **http://www.bls.gov/jlt/sizeclassmethodology.htm**.

[8] An earlier (August 2010) version of the Davis, Faberman, and Haltiwanger paper can be found on the National Bureau of Economic Research Web site at **http://www.nber.org/papers/w16265** (accessed February 4, 2011).

[9] An earlier (August 2010) version of this paper can be found at the Board of Governors of the Federal Reserve System Web site at **http://www.federalreserve.gov/pubs/feds/2010/201048/201048pap.pdf** (accessed February 4, 2011).

[10] The December 2010 version of this paper can be found online at the Federal Reserve Bank of San Francisco Web site at **http://www.frbsf.org/publications/economics/papers/2010/wp10-32bk.pdf** (accessed February 4, 2011).

[11] A transcript of this testimony can be found on the U.S. Congress Joint Economic Committee Web site at **http://jec.senate.gov/public/?a=Files.Serve&File_id=6f298a71-cac8-44fa-95cb-7a47fcae63ee** (accessed February 4, 2011).

[12] See Experimental JOLTS Estimates by Establishment Size Class, on the Internet at **http://www.bls.gov/jlt/sizeclassmethodology.htm**.