

## **DEVELOPING A NEW BUSINESS SURVEY: JOB OPENINGS AND LABOR TURNOVER SURVEY AT THE BUREAU OF LABOR STATISTICS**

**Charlotte Mueller and John Wohlford, BLS  
John Wohlford (Wohlford\_J@BLS.GOV)  
Bureau of Labor Statistics  
Suite 4840, 2 Massachusetts Avenue, NE  
Washington, DC 20212**

### **Abstract**

The U.S. has had an indicator of labor supply, the unemployment rate, for decades. However, there has been no parallel labor demand measure. In 1999, the Bureau of Labor Statistics began developing this indicator, the Job Openings and Labor Turnover Survey (JOLTS). JOLTS will measure job openings, hires, and separations from a sample of 16,000 establishments. This paper discusses survey goals, concepts, sampling procedures, collection techniques, estimation, and publication plans. It also reviews research conducted in the development of JOLTS. An important goal for JOLTS is providing job openings estimates comparable to the unemployment rate from the Current Population Survey.

**Keywords: Labor Demand, Job Openings, Hires, Separations, Labor Turnover**

All opinions expressed in this paper are those of the authors and do not constitute policy of the Bureau of Labor Statistics

### **1. INTRODUCTION**

For decades, the United States has had a strong economic indicator of excess labor supply, the unemployment rate. Until now, however, there has been no parallel measure of U.S. labor demand. The Bureau of Labor Statistics (BLS) has developed this long-needed indicator to assist economic policy makers in making decisions about the national economy. This new Job Openings and Labor Turnover Survey (JOLTS) measures job openings, hires, and separations in business and government. This information can help policy makers assess the state of the labor market and determine imbalances between the supply of and demand for labor (Clark, et al 2000). Abraham (1983) observed that the means necessary to remedy structural and frictional unemployment are different from those needed to combat deficient employment demand. Structural unemployment occurs when the structure of the economy changes and the composition of the labor force does not respond quickly or completely to the new structure of job opportunities (McConnell 1984). Frictional unemployment reflects people who are looking for their first job, or are “between jobs” due to voluntary job changes or such things as temporary layoffs due to seasonal factors or model changeovers (McConnell 1984). To determine the sources of existing unemployment, a measure of unmet labor demand is necessary. JOLTS data can also assist in detecting upward pressure on wages, and may help to predict an economic downturn. Armknecht (1974) argued that movements in the rate of job openings should act as a leading indicator of economic activity at the peak of the business cycle, and as a lagging indicator at the trough.

### **2. GOALS**

The goal of JOLTS is to produce monthly measures of unmet labor demand, in the form of rates and numbers of job openings. In addition, to aid in interpreting the job openings estimates, JOLTS will generate associated labor turnover data in the form of rates and numbers of hires and separations. The separations data will be broken out between voluntary and involuntary separations. In order for the labor demand measure produced by JOLTS to be comparable to the existing measure of labor supply (the unemployment rate), BLS has worked wherever possible to keep JOLTS consistent with the Current Population Survey (CPS), the source of the U.S. unemployment rate.

### **3. DEVELOPMENT HISTORY**

BLS began the JOLTS effort with a review of existing research on the subject of job openings and labor turnover, including past BLS efforts (BLS 1991; BLS 1981), and recent experience by Statistics Canada (Gower 1970). After developing a conceptual framework, BLS contracted with Westat for a feasibility study to test the concept. The study began with visits to several firms to build knowledge of employer concepts and practices (Levin, et al 1998).

Next, a pilot survey was commissioned. The pilot survey included several panels to test various aspects of the problem, such as appropriate reference periods, availability of data, variation by industry, and employer understanding of definitions and concepts. The pilot surveys began in late 1998 and continued through the early autumn of 1999. The test panels in the pilot survey covered over 300 single and multi-establishment firms (Levin, et al 2000).

Following the pilot survey, BLS circulated the resulting questionnaire and instructions to a group of distinguished economists across the country, to obtain their input and guidance on data elements, definitions, concepts, and reference periods.

BLS staff then conducted a series of personal visits to selected pilot survey respondents. The purpose of these visits was to debrief the respondents (Goldenberg and Phillips, 2000). These respondent debriefings were used to clarify our understanding of how respondents track, store, and report data, to help us identify problem areas in our instructions, and to help us finalize the design of the JOLTS questionnaire (Goldenberg and Phillips, 2000).

Our final phase of development consisted of practice interviews run out of the BLS JOLTS data collection center in Atlanta, Georgia. These interviews allowed us to enhance interviewer training materials, collection techniques, and survey management tools in a live collection environment.

#### 4. DATA ELEMENTS AND CONCEPTS

JOLTS collects six data elements, as follows:

##### Employment

Employment includes all persons on the payroll of a sample unit who worked or received pay for the pay period that includes the 12th of the month. It includes full- and part-time employees, permanent, short term and seasonal employees, salaried and hourly workers, and employees on paid vacation or other paid leave. Employment does NOT include proprietors and partners of unincorporated businesses, unpaid family workers, employees on strike for the entire pay period, employees on leave without pay for the entire pay period, or employees of temporary help agencies, employee leasing companies, outside contractors, or consultants.

##### Job Openings

The count of job openings includes all vacant positions for which the following three conditions apply: 1) A specific position exists and there is work available for that position. The position can be full-time or part-time, and it can be permanent, short-term, or seasonal, and 2) The job could start within 30 days independent of the availability of a suitable candidate, and 3) The employer is actively recruiting workers from outside the reporting unit. Not included in the count of job openings are: 1) positions open only to internal transfers, promotions or demotions, or recall from layoff; 2) openings for positions with start dates more than 30 days into the future; 3) positions for which employees have been hired but have not yet started to work; or 4) positions to be filled by employees of temporary help agencies, employee leasing companies, outside contractors, or consultants.

##### Hires

The count of hires covers all additions to the sample unit's payroll during the entire month, including newly hired and rehired employees. Also included are on-call or intermittent employees who returned to work after being formally separated, workers who were hired and separated during the month, transfers from other locations, and employees who were recalled to a job from a layoff lasting more than seven days. Not included as hires are transfers or promotions within the sample unit, employees returning from strikes, or employees of temporary help agencies, employee leasing companies, outside contractors, or consultants. The original JOLTS concept called for separate collection of new hires and rehires, in order to separate people newly hired from those being recalled from layoff. We discovered in our research and pilot studies, however, that the concept of employees who are laid off and subsequently rehired was outdated. We learned that the term "layoff" is no longer limited to temporary separations with intent to rehire, but is now applied to most employer-initiated separations, including permanent ones. Severing

the link between layoffs and rehires greatly limited the value of rehire data, so BLS decided not to attempt to capture a separate measure of rehires.

## Separations

There are three types of separations, as follows:

Quits, or "voluntary separations:" Employees who left voluntarily (except for retirements or transfers, which should be reported with "other separations").

Layoffs and discharges, or "involuntary separations:" Separations initiated by the employer, including layoffs with no intent to rehire, discharges because positions were eliminated, discharges resulting from mergers, downsizing, or plant closings, firings or other discharges for cause, termination of seasonal employees (regardless of whether they are expected to return next season), and layoffs lasting or expected to last more than seven days.

Other separations: Separations not included above, such as retirements, transfers to other locations, deaths, or separations due to employee disability.

## 5. REFERENCE PERIODS

We will collect employment for the pay period that includes the 12th of the month, consistent with the Office of Management and Budget (OMB) standard for federal government employment data (OMB 1981). The Current Employment Statistics program, which is the source of our target employment levels used in benchmarking, also uses this employment reference period. In our early research, we considered using an end-of month employment figure, but decided that the benefits did not justify switching from a well-known reference period. The major problem with an end-of-month employment figure was the delay in the availability of the data. For example, a firm with a biweekly pay period that began at the end of the reference month would not be able to report employment data for the reference month until that pay period ends, in the middle of the following month.

Job openings are measured as a one-time observation each month (a snapshot of the "stock" of openings). This observation takes place as of the last business day of the month. We considered taking a mid-month snapshot of job openings to remain consistent with the mid-month employment measure, but our pilot studies revealed that the job openings data were not always readily available during the middle of the month (Levin, et al 2000).

Hires and separations are measured as flows rather than as stocks. That is, these items are observed over a given period of time, the entire calendar month. This coincides with the job openings snapshot that is taken as of the last business day of the month. We considered measuring the flow of hires and separations over the first half of the month, but our preliminary research suggested that this measure would not be representative of the entire month. JOLTS staff analysis of the new hires data being reported as part of a new requirement from the U.S. Department of Health and Human Services (HHS), Office of Child Support Enforcement, shows that hires are not evenly distributed across the month. In fact, they are concentrated at the beginning of each week and month.

## 6. SAMPLING PROCEDURES

The JOLTS sample will be drawn from the Bureau's internal business establishment list, a product of the ES-202 Covered Employment and Wages program. The sample is designed to be representative of the 50 States and the District of Columbia. All nonagricultural industries except private households are within the scope of the survey. Within agriculture, only agricultural services will be included. In addition to the private sector, we are collecting public sector data from local, State, and Federal government units (Crankshaw and Stamas, 2000). The sample frame is supplemented with a list of railroads, since the ES-202 program does not comprehensively cover the railroad industry.

The JOLTS sample includes approximately 16,000 establishments, divided into one virtual certainty panel and 18 noncertainty panels. Establishments in the virtual certainty panel have been selected with nearly 100% probability and will remain in the sample through the course of the survey or until another JOLTS sample is selected from an updated frame. Each noncertainty panel, when combined with the virtual certainty panel, represents the entire

universe (Crankshaw and Stamas, 2000). In March 2000, BLS began enrolling one noncertainty panel in the survey each month, meaning that after eighteen months all of the noncertainty panels will be active. To maintain a manageable workload, we are spreading the enrollment of the virtual certainty panel over five months, beginning in April 2000. After 18 months in the survey, one noncertainty panel will be rolled out of the sample each month and replaced by a new noncertainty panel.

## 7. DATA COLLECTION TECHNIQUES

BLS is collecting all JOLTS data from our Data Collection Center (DCC) in Atlanta. Sample units are assigned to specific interviewers, who first "refine" the addresses of the sample units. Address refinement is the process of locating a current mailing address, physical location, and telephone number for the sample unit. Next, the interviewer contacts a "gatekeeper" by telephone. The gatekeeper is someone, usually in the human resources office, who can provide the name of a contact person who can report JOLTS information. Once the name and title of the likely contact person are obtained and the mailing address is verified, the interviewer mails an enrollment package to the contact person. The enrollment package includes a cover letter, a form with instructions, and some informational material about JOLTS. Several days after mailing the package, the interviewer telephones the contact person to obtain participation in JOLTS. Once the unit is successfully enrolled, an appointment is made for the first data collection call. Enrolled sample units are then collected via Computer Assisted Telephone Interviewing (CATI) for six months. Reported data are edited interactively during the collection call, and potential outliers are identified for the collection of additional explanatory information. At the end of each data collection call, an appointment is established for the next month's data collection call. Sample units remain the responsibility of the assigned interviewer throughout the survey. After six months of CATI collection, respondents are then moved to Touch-tone Data Entry (TDE) for the remainder of their time in the sample (generally another twelve months). In exceptional circumstances, units may remain in CATI collection for the entire collection period, or may choose to provide their data via fax. In addition, some units may mail their data to us on paper or through alternate media. All data that are obtained through means other than CATI are keyed into a standard format, and then loaded into the CATI system database in a batch process. This is done for data editing purposes. Units with reported data that fall outside our edit parameters are reviewed, and if necessary recontacted by the original interviewer using the CATI system.

The DCC staff sends reminder postcards to TDE respondents, asking them to report their data in a timely manner. Interviewers also follow up on nonrespondents through a combination of telephone calls and reminder postcards.

Data are gathered during a relatively short collection window each month. A closing date is established each month, at which time data must be in the system in order to be included with that reference month's initial estimates. Every attempt is made to collect the data from each sample unit during this data collection window. In the event that a sample unit does not report during the collection period for a given month, the DCC will still try to collect the data for use in subsequent estimates for that reference month. A revised estimate is released one month after the initial estimate. Each month's press release will include the initial estimates for the most recently completed reference month, and the revised estimates for the previous reference month.

Since a panel is introduced each month, the refinement and enrollment processes are ongoing. Refinement and enrollment take place during the reference month, and data collection takes place as soon as the reference month is over. For example, a sample panel with an initial reference month of June will be introduced into the CATI system in mid-June. The members of that sample panel will be refined and enrolled prior to the end of June. Collection of these units can then begin on the first working day of July, when the reference periods for the job openings, hires, and separations have ended.

## 8. SYSTEMS ENVIRONMENT

The JOLTS software environment includes four basic subsystems: sampling, data collection, estimation, and publication. The sampling system was developed in SAS, and uses the Bureau's internal business establishment list as a sampling frame. The data collection system consists of a CATI system written in Blaise, a CATI/CAPI development tool developed by Statistics Netherlands. Surrounding the Blaise CATI system are applications for printing, FAX, high-speed key entry, and TDE. These surrounding applications are generally developed in the standard BLS software environment, using Visual Basic for interface applications and Sybase as a database. The TDE application is written in C/C++. The estimation system is being developed in SAS, and the publication process

will include the BLS-developed Table Producing Language (TPL). BLS is currently evaluating off-the-shelf data analysis tools that may be able to assist us during the data review and analysis portion of the estimation and publication phases.

The JOLTS hardware environment includes two mirrored production servers in “Redundant Array of Inexpensive Disks” (RAID) configuration. RAID protects against the failure of a disk drive by having two duplicate (redundant) disk drives maintain the same information. In the event one of the drives fails, the other drive takes over. In the meantime, the failed drive is replaced while the system continues to function. The two production servers are mirrored to protect against the failure of an entire server. In addition to the production servers, there are separate servers set aside for handling TDE and FAX chores. All of the servers are backed up to tape on a regular schedule, and the production servers are used at night to update the national database in BLS-Washington. For security reasons, all of the JOLTS hardware except for one server is protected behind the BLS “firewall.” The firewall is a security measure that prevents unauthorized users from intruding on the internal BLS network. The lone TDE server mentioned above is placed outside the firewall to field incoming TDE calls, making it unnecessary for incoming calls to penetrate the firewall. Servers inside the firewall poll the TDE server on a regular basis and draw the collected TDE data inside.

## 9. ESTIMATION PROCEDURES

The basic formula for developing point estimates of rates consists of the estimated characteristic divided by total employment (Crankshaw and Stamas, 2000). The estimates for the numbers of each characteristic will be developed by applying the same adjusted weights and benchmark factors to the reported characteristics totals. For both rates and numbers, each characteristic will be weighted. Certain weight adjustments will take place prior to the generation of the estimates. For example, units that are determined to be outliers may undergo weight adjustments, as will units that report back to us in a manner different from that in which they were selected. Certain missing data elements will be imputed, and adjustments will be made for nonresponse at the establishment level. All estimates will be benchmarked each month to current employment levels using BLS Current Employment Statistics (CES) data.

## 10. PUBLICATION PLANS

BLS will release estimates that include both rates and numbers for job openings, hires, and separations. Top level estimates (all industries, all ownerships) will be released for the nation as a whole, and for four Census regions. We will break out the national estimates into public vs. private sector, and the national private sector will be further subdivided into 9 combined industry sector breakouts. All estimates will be released based on the North American Industry Classification System (NAICS). While there is a great deal of interest in job openings data by occupation, by wage level, and by finer industry and geographic detail, collecting this additional detail would require both a larger sample and increased respondent burden.

After a sufficient amount of sample has been introduced, an experimental series of JOLTS estimates will be released to the public. In 2001 we will begin issuing a monthly press release providing initial estimates for the current reference month and revised estimates for the prior reference month. In the future we will also release an annual bulletin. The press release schedule has not been finalized.

Information about JOLTS is available on the BLS website at [WWW.BLS.GOV](http://WWW.BLS.GOV) or from the JOLTS Information Line at (202) 691-5870. You may also contact the JOLTS information staff at [JOLTSINFO@BLS.GOV](mailto:JOLTSINFO@BLS.GOV).

## 11. REFERENCES

Abraham, K., (1983), “Structural/Frictional vs. Deficient Demand Unemployment: Some New Evidence.” *American Economic Review*, September 1983, 73(4), pp. 708-724.

Armknacht, P., (1974), “Job Vacancies in Manufacturing, 1969-73.” *Monthly Labor Review*, August 1974, pp. 27-33

BLS, (1991), *Employee Turnover and Job Openings Survey: Results of a Pilot Study on the Feasibility of Collecting Measures of Imbalances of Supply and Demand for Labor in an Establishment Survey*, Bureau of Labor Statistics, Washington, D.C., 1991

BLS, (1981), *Job Openings Pilot Program: Final Report*, Bureau of Labor Statistics, Washington, D.C., 1981

Clark, K. A., Cohen, J., and Hyson, R., (2000), "Measuring the Demand for Labor in the United States: The Job Openings and Labor Turnover Survey," Joint Statistical Meetings, August 2000.

Crankshaw, M., and Stamas, G. (2000), "Sample Design in the Job Openings and Labor Turnover Survey," Joint Statistical Meetings, August 2000.

Goldenberg, K., and Phillips, M. A. (2000), "Now That the Study is Over, What Did You Really Tell Us? Identifying and Correcting Measurement Error in the Job Openings and Labor Turnover Survey Pilot Test," International Conference on Establishment Surveys - II, June 2000.

Gower, D., (1970), "Undercount of Vacancies caused by New Establishments," unpublished report, Dominion Bureau of Statistics

Gower, D., (1970), "An Analysis of the Industry Coding of the Job Vacancy Survey," unpublished report, Dominion Bureau of Statistics

Gower, D., (1970), "Reliability of 3-Month Average Vacancy Estimates," unpublished report, Dominion Bureau of Statistics

Gower, D., (1970), "Comparison of American and Canadian Job Vacancy Rates, Spring 1970," unpublished report, Dominion Bureau of Statistics

Gower, D., (1970), "The Effect of the Interview Phase," unpublished report, Dominion Bureau of Statistics

Gower, D., (1970), "An Attempt at Confirmation of the Vacancy Levels, First Half, 1970," unpublished report, Dominion Bureau of Statistics

Gower, D., (1970), "Comparison of U.S. and Canadian Vacancy Rates, Summer 1970," unpublished report, Dominion Bureau of Statistics

Gower, D., (1970), "Reporting of Future Starting Date Vacancies as Revealed by the Interview Phase," unpublished report, Dominion Bureau of Statistics

Gower, D., (1970), "The Effect of the Reference Date on the Job Vacancy Estimates," unpublished report, Dominion Bureau of Statistics

Levin, K., Gimbel, C., Hagerty, T., Heltemes, S., Becher, A., and Kydonieffs, L. (1998), *Job Openings and Labor Turnover Statistics (JOLTS) Feasibility Study; Report of Site Visit Findings*. Westat, Rockville, MD, October, 1998.

Levin, K., Hagerty, T., Heltemes, S., Becher, A., and Cantor, D. (2000), *Job Openings and Labor Turnover Study (JOLTS) Pilot Study: Final Report*, Westat, Rockville, MD, January, 2000.

McConnell, C. R., (1984), *Economics: Principles, Problems, and Policies*, 9<sup>th</sup> edition, New York: McGraw-Hill

Mueller, C. and Phillips, M., (2000), "The Genesis of an Establishment Survey: Research and Development for the Job Openings and Labor Turnover Survey at the BLS," Joint Statistical Meetings, August 2000.

OMB, (1981), "Standard Definition of Payroll Periods for Employment Reports, Statistical Policy Directive No. 12, 1981