

# RECONCILING LABOR TURNOVER AND EMPLOYMENT STATISTICS

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

## Introduction

The Current Employment Statistics (CES) survey, with 350,000 sample units is the Bureau's largest monthly sample survey. The CES survey collects information on employment, hours worked, and earnings from the payroll records of employers. The CES produces data at the national, State, and major metropolitan area levels. The payroll statistics from the CES program are among the earliest economic indicators available each month and measure the health of the U.S. economy in terms of job creation, average earnings, and average workweek. These data serve as direct input into other major U.S. economic indicators including the Index of Leading Economic Indicators, the Index of Coincident Economic Indicators, the Personal Income estimates, the Industrial Production Index, and productivity measures.

The Job Openings and Labor Turnover Survey (JOLTS), with a sample size of 16,000 units, is the Bureau's newest monthly sample survey, and will become an important monthly economic indicator. JOLTS provides monthly national measures of job openings (labor demand) by broad industry groups; these measures compliment the unemployment data, which measure labor supply. JOLTS began publishing data in July 2002; data published include levels and rates for job openings, hires, and total separations, as well as three subtypes of separations: quits, layoffs and discharges, and other separations. These data also are provided for four regions. Thus policy makers and analysts will have a better understanding of the imbalances between the demand for and the supply of labor, and improved tools for assessing the presence of labor shortages in the U.S. labor market. These data also provide evidence of pressure on wage rates.

## Expected movements

Since the CES counts persons on payrolls and JOLTS counts persons as they move onto and off of payrolls, there would be an expectation that on a monthly basis the CES and the JOLTS should move together and provide a consistent picture of labor market change during the month. Conceptually, one could start with the CES employment level for a given month, add the JOLTS hires for that month and subtract the JOLTS separations for that month, and arrive at the CES employment level for the following month. Put another way, the change in CES employment for a given month should equal the net JOLTS hires minus JOLTS separations for that month.

However, there were known definitional and reporting issues which would affect this simple relationship, along with

empirical data from the Bureau's Labor Turnover Survey (LTS) conducted from 1954 to 1982, which suggested there could be significant differences in the monthly trends. One of the major issues was that the reference periods in the two surveys were different. The employment observation in CES targets the pay period that includes the 12<sup>th</sup> of the month while the JOLTS hires and separations are counted for the entire month. This means that JOLTS turnover occurring in the first half of the month is reflected in the mid-month CES employment observation, while JOLTS turnover in that latter part of the month is not reflected in the CES employment observation until the following month.

Over time, the net JOLTS turnover was expected to track well with the CES employment change, but due to the reference period effect, significant month-to-month differences could be expected. Based on the reference period problem, the initial design of the JOLTS did not include edits to control for the relationship between net turnover and employment change, since it was anticipated that a large number of records would fail these types of edits each month. Failure of such an edit does not imply that the reported data are in error, and this might provide an awkward interviewer/respondent issue during data collection. A decision was made to re-evaluate the feasibility of incorporating edits for this issue as more data became available.

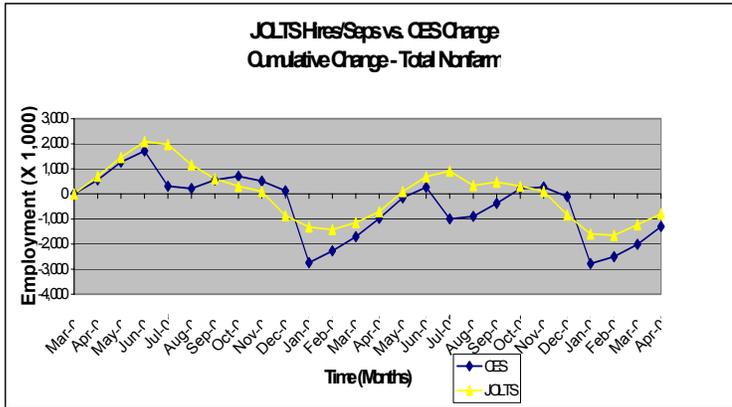
## Initial movements

In July of 2002, the first JOLTS estimates were released. The release provided monthly estimates of hires and separations for a period of 18 months beginning in December of 2000 and extending through May of 2002, with ongoing monthly estimates thereafter. Analysis of the JOLTS hires and separations data in relation to the CES employment change revealed a larger than anticipated divergence between the two series. For example, JOLTS measured 53,248,000 hires and 54,368,000 separations in total non-farm employment for the twelve months beginning March 2001 and ending February 2002, indicating an expected net employment decrease of 1,120,000. However, CES reported February 2001 employment level of 130,990,000 and a February 2002 employment level of 129,310,000 for an over-the-year decrease of 1,680,000. JOLTS appeared to have missed a large number of separations; almost one half percentage point when measured against total non-farm employment. (Note that the JOLTS and CES data discussed in this paper are not seasonally adjusted.)

When examined in more detail, the net JOLTS hires and separations data showed significant variation by month and by industry division, but often showed a consistent pattern (Table 1). The CES unadjusted employment figures show two pronounced drops in employment which were not fully replicated in JOLTS. The total non-farm employment showed a major decrease between the December 2001 and January

2002 observations (which would be consistent with a release of temporary holiday workers), and a smaller but still significant fall between the June and July observations. There were also some significant differences by industry, ranging from 3% higher than annual CES change in Retail Trade to 5% lower in Nondurable Goods Manufacturing. Further, there appeared to be some discernable patterns in this divergence within some industries.

Table 1



While it had been anticipated that there could be significant month-to-month differences between CES and JOLTS, it was expected that over the course of a year the monthly differences would net to a small annual difference. However, the first year's results clearly indicated the potential for an undercount of JOLTS separations (and also potentially of hires), so a full review of definitions, procedures, edits, and interviewer training was undertaken.

**Controls**

The first step in the process included an evaluation of the data provided by the respondents. Sample units coded out-of-business (OOB) were reviewed. Approximately 250 units coded OOB were researched using the Establishment Business Survey (EDB), and it was discovered that a number of units had been coded out-of-business without accounting for all of the employment in the separations count. The JOLTS database was adjusted to account for these separations. The JOLTS sample (at that point already 36 months old) was matched against the Longitudinal Database (LDB) to determine if any current JOLTS long-term nonrespondents were in fact OOB. Approximately 85% were still active on the file.

The next step involved a comparison of CES and JOLTS data at the major industry division level. The net JOLTS hires and separations were compared to the CES employment change, and then each major industry division was examined to see where the problems occurred.

As part of ongoing data evaluation, JOLTS staff met with staff from the Health and Human Services' Office of Child Support Enforcement to review "new Hires" data. (This mandatory report is required from all employers within 20 days of any new hire.) Although hires data had been tracking well, there was some divergence in the two series. Major definitional

differences were identified between the two series, and stricter enforcement by HHS also accounted for some of the divergence.

During this same time, JOLTS data were re-benchmarked to revised CES levels. All JOLTS edit failures were reviewed, and cases with lingering edit failures were contacted and in some instances data were corrected. New outlier detection and estimation procedures were introduced with these retabulations.

One hundred random reporters were selected for a more detailed review. Microdata and notes from the selected cases were reviewed to get a feel for the reported data. Nine units with very odd reporting patterns were identified, and a phone Response Analysis Survey was conducted. Based on these contacts, it was determined that an additional on-line edit was needed in the JOLTS Computer Assisted Telephone Interview (CATI) system.

Almost to a person, the respondents agreed that theoretically over the life of a firm all hires and separations should be accounted for, however in many cases, they would never be identified. Some firms, such as a symphony, might report erratic employment with no separations merely based on the schedule of their performances. Some firms reported that there was a lag in entering separations to their automated personnel systems, while other firms noted that due to the different reference periods of the data elements, hires and separations could take up to three months to catch up with the employment level changes. Several large employers explained that they were reporting data based on output from computer runs, and that they would never be able to reconcile these counts.

The next step was to build edits into the CATI system that would provide a quick reference for the interviewers to evaluate the reported data. The screen was modified to include columns that showed the over-the-month change in employment, the difference between reported hires minus separations, the difference between the hires minus the separations and the employment change, and a cumulative tally of these differences. A column also was included for the interviewer to enter a comment code (dubbed Re-Edit code) related to these monthly changes. The Re-edit codes covered most of the situations encountered during the RASs, including a code for "did not ask a question" for those units where the difference between the hires minus the separations and the employment changes was within an acceptable range.

The national office JOLTS staff developed a training package for the interviewers, and each interviewer received individual training. The training included a review of the JOLTS concepts and the reference periods for each data element. It must be noted that in many cases, the reference periods were the reason for the differences. It was stressed to the interviewers that just because the employment change did not equal the difference between the reported hires and separations, this did not necessarily indicate that the data were wrong. The timing of a firm's hires and separations was everything. Selected units collected by the individual interviewer were reviewed and suggestions were made as to

the type of questions the interviewer might ask of the respondent.

Over the next month, an informational sheet was developed and faxed to approximately 12,000 sample members. This material discussed the employment change versus the difference between hires and separations issue that was being addressed. When CATI firms were contacted, the interviewers reiterated the message included on the faxed sheets. Specific data clarification questions were developed for use when the reported data did not add up. Firms were targeted when changes between reported hires minus separations were not reflected in their over-the-month employment changes. In many cases, it was recognized that these differences would never be resolved. Oftentimes, the respondent had a part-time workforce where not all persons work every week, or persons were on LWOP for family or maternity leave but were not separated from the establishment, or the numbers only were available from printouts and could not be resolved.

These units are monitored each month; listings and screen shots are reviewed and forwarded to the Atlanta DCC. At best, units are reviewed if they are found to have a difference between hire minus separations and employment change of greater than or equal to plus/minus 100. In any given month, there are 150-180 of these units. Approximately 50% of these units report employment of over 5,000. Again, in most of these large firms or aggregated multi unit establishments, the respondent is getting the JOLTS data from the end of a personnel roster rather than a payroll listing, so there is little hope of resolving these differences.

### Impact of the Controls

These controls that relate hires and separations more closely with employment change have had a significant beneficial effect. As noted earlier, in the March 2001-February 2002 time period JOLTS showed 1,120,000 more separations than hires -compared to the CES decrease of 1,680,000. The two series' diverged by 560,000 or almost one half percentage point of total non-farm employment.

One year after the corrective measures were taken, this divergence was considerably reduced. From March 2002-February 2003, JOLTS measured 50,000,000 hires and 50,229,000 separations, indicating an expected net employment decrease of 229,000. For the same period, CES reported an over-the-year decrease of 230,000. JOLTS virtually eliminated the divergence at the total-nonfarm level.

Below the total level, eight of the eleven industry divisions showed improvement, ranging from 7% in Services to 82% in Retail Trade. Construction, Transportation, and Wholesale Trade are the three industries that did not show much improvement. While these three industries will be closely examined, it is important to point out that the 2002 annual average employment of these industries combined makes up only 15% of total employment. In the six largest industries (Services, Retail Trade, State and Local Government, Durable Goods Manufacturing, Finance, Insurance and Real Estate, and Nondurable Goods Manufacturing), comprising 82% of

total employment, the divergence was reduced by amounts ranging from 7% (Services) to 82% (Retail).

### Reasons for differences

The controls put in place in the JOLTS program have resulted in a marked reduction in the difference between over-the-month CES employment change and JOLTS net flow of Hires/Separations. Differences, however, remain. Where do these differences come from, and can they be controlled?

Part-time workers – A major potential source of difference between the two surveys can be traced to part-time workers. Depending on their schedules, these employees may move in and out of the employment count for CES while never changing their employment status for JOLTS because they are still on the employee roster. The same can be said of “on-call” workers. A part-time worker at a retail establishment is an excellent example of this issue. If the part-timer is not working during the pay period that includes the 12<sup>th</sup> of the month, he or she does not appear in the CES employment count. The employee was not separated, so the JOLTS net hires/separations does not show a corresponding decrease.

Payroll vs. Human Resources – Another explanation for differences between the two surveys concerns the source of the data for each survey. The CES data are generally collected from the payroll records of the sampled establishment, whereas the JOLTS data, depending upon the size and automation level of the firm, may come from the human resources office, payroll reports, the memory of the timekeeper, etc.

Hired vs. working – A closer look at the definitions of the CES and JOLTS programs shows that while the JOLTS data should be expected to approximate the CES, JOLTS is not counting employment in the CES definition. JOLTS counts hires and separations which are generally assumed to be reflected in employment. However, a closer look at the data indicates this is not necessarily so. An excellent example of this relationship can be found in State and Local government. (See Table 2)

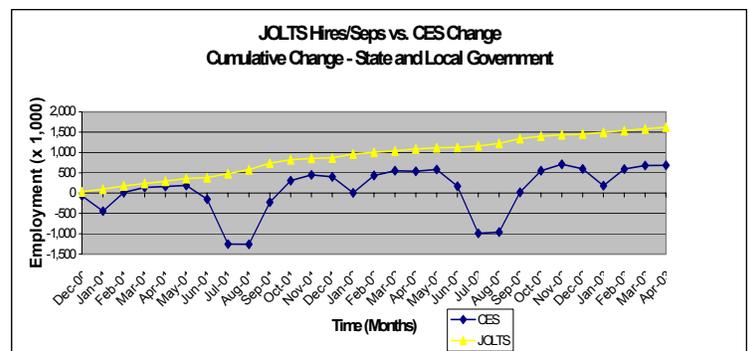
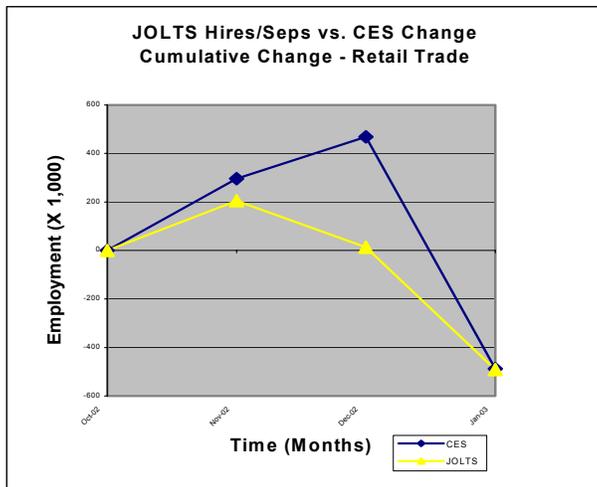


Table 2

The CES employment level reflects people who worked or received pay for the reference pay period, and shows the expected drop in employment when school lets out for the summer and the winter holiday season. (While the CES

counts teachers as employed all year, the rest of the school staff such as the teachers aides, school secretaries, etc. don't work, and their absence is reflected in the CES employment level.) For JOLTS, these workers were not formally separated in June nor were they rehired in August, so no hires or separations data are reported.

Table 3



Reference Periods – A simple explanation of divergence between the two surveys for a given month can be found by examining the reference periods for each survey. The employment observation in CES targets the pay period that includes the 12<sup>th</sup> of the month. The JOLTS hires and separations, however, are counted for the entire month. This means that JOLTS turnover occurring in the first half of the month is reflected in the mid-month CES employment observation, while JOLTS turnover occurring in the latter part of the month will not be reflected in the CES employment observation until the following month. An excellent example of this effect can be seen in the retail trade comparison, for the months of October 2002 through January 2003. (See Table 3.)

The employment estimate garnered from the net JOLTS hires/separations data for October 2002 is very close to the CES employment for October 2002. In November, both programs reflect the surge in hires that takes place prior to the Christmas holiday. However, in December, the CES jumps upward while the net JOLTS change drops, opening up a large divergence in the two series. In January, the net JOLTS change shows another large drop, but the CES employment level drops even faster, catching up to (and actually passing) the JOLTS data. This shows the effect of the reference period on the data. Starting from rough equilibrium in November, CES shows the mass hiring that takes place in Retail Trade prior to Christmas. Immediately after Christmas, however, many firms begin laying off their Christmas help. The December mid-month CES observation reflects only the build-up of employment. The JOLTS hires and separations reflect the entire month and catch the end-of-month separations. In January 2003, the CES picks up the end-of-December employment movement, and the two surveys are once again in rough balance.

Payroll practices – Payroll practices also account for a share of the divergence between the two data series. While the number of employees who worked or received pay for a given pay period is a straightforward concept, the issue of separations from payroll is more difficult to capture. For instance, Temporary Help firms amass large numbers of workers on their rosters, but these workers are not necessarily all working in any given pay period. Temporary Help firms in some cases report employees as hired as soon as they are put on the roster, whereas they are unlikely to report these employees as being paid until they actually work. These same firms can also have problems with reporting separations. They may not even be aware an employee has quit until they attempt to send him or her on assignment. Upon discovering that an employee “quit” months ago, they may report the separation as a current separation. Other firms appear to conduct a periodic cleaning of their rosters, at which point inactive employees could be considered separated. In these cases JOLTS might receive a large number of separations all at once, or perhaps no separations at all.

Another potential issue involves employers who keep separated employees on their rosters until W-2 forms are mailed the following January.

### Future research plans

As a result of this project, several areas were identified for ongoing monitoring and future research. The primary task is to strengthen the interviewer training and make sure that respondents are aware of our concern for quality reporting. As noted earlier, units with a net difference of plus/minus 100 are targeted for re-review each month by the DCC staff. In an average month, this means taking an in-depth look at approximately 150-180 establishments. Of these, approximately 31% are not questioned about the reason for the difference (usually less than 2% of the total employment) or indicate that the information comes off the end of a print-out and can not be reconciled. Nearly 43% of the respondents note that they use part-time, on-call, or seasonal workers which causes the employment difference, or they indicate that the data would resolve itself within 1-3 months. An analysis by industry shows that 54 % of the problem units are in federal, state or local government. A quick review of the interviewer notes will identify those respondents or interviewers who don't understand the concepts.

Another outcome of the project pointed to the need for interviewers to become industry specialists. This entailed targeting industries with special reporting issues and assigning units coded in those industries to specific interviewers. Based on information available in the national office and written comments provided by the interviewers, special industry training was developed and delivered to the DCC staff. With the introduction of the next set of sample panels, these specialists will be handling selected industries from enrollment through collection and follow-up. This should cut down on the data problems, because the interviewer will know what questions to ask specific to the industry.

Of the units mentioned above, it should be noted that approximately 70% of these units report via touchtone data

entry (TDE) or fax. We plan to implement procedures that identify problems in real time or closer to when the data are reported. On a current basis, the interviewers do not try to contact employers until several days after their data were faxed or phoned into the system. We need a daily monitor, so these respondents can be contacted as soon as possible after the data are submitted. Also, there are additional problems associated with trying to track down fax and TDE respondents for follow-up phone calls. They have been out of CATI for awhile, so many of the original contacts have changed jobs or companies.

A bigger challenge identified by this project is to decompose the remaining divergence. This involves identifying specific firms by major industry division by region which contribute to the difference – either by weight or size-of-firm. The graphs presented in this paper are a start in that direction. Many questions will have to be answered, such as why a few firms in a particular industry exhibit strange reporting events or why all firms in selected industries behave in a specific manner at certain times of the year. With this type of in-depth research, we will be better able to analyze and explain the disparity in the CES employment trend and the sum of the difference between JOLTS hires and separations. We must make certain all data users are aware that the goal of the JOLTS program is not to measure over-the-month employment change, but to produce estimates of monthly churning of the ever-changing labor force.