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St. Louis Employment: A Tale of Two Surveys

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St. Louis Employment in 2004: A Tale of Two Surveys*

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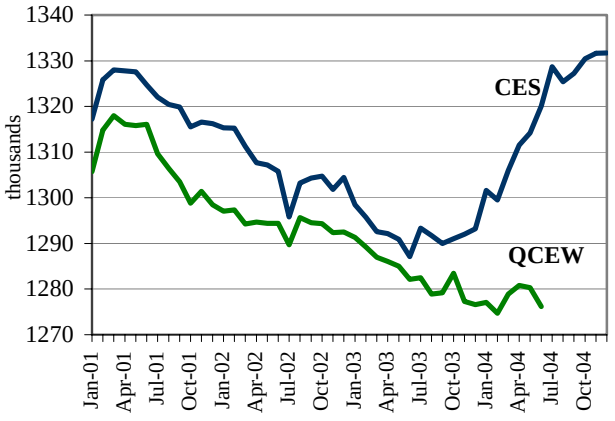
On January 25, 2005, the Bureau of Labor Statistics (BLS) released data on nonfarm employment from its Current Employment Statistics (CES) survey. According to this release, the level of nonfarm employment in the St. Louis MSA for December 2004 was 1342.9 thousand. This level represents an increase of 38.8 thousand jobs over December 2003, making 2004 the best year for jobs in St. Louis since 1994 and the first year of net positive job growth since 1999. As shown by the blue line in Figure 1, which uses seasonally adjusted versions of the BLS's raw numbers, the rapid rise in CES employment in 2004 meant that St. Louis had recovered all of the jobs it had lost during and after the recession of 2001. It is also worth noting that most (about 70 percent) of the employment gains reported for the year occurred in the first half of the year: In Figure 1 the blue line is noticeably flatter after July 2004.

The sectors accounting for the largest shares of the increase in 2004 were professional and business services (35 percent), trade and transportation (20.1 percent), leisure and hospitality (16.8 percent), and education and health (14.9

Figure 1. St. Louis MSA Employment (seasonally adjusted)



* The views expressed are those of the author and do not necessarily represent official positions of the Federal Reserve Bank of St. Louis or the Federal Reserve System.

percent). In addition, strong growth was indicated for the goods-producing sectors (9.5 percent), which include natural resources, mining, construction, and manufacturing.[1] Because the manufacturing subsector saw a small decline in employment over the period, more than 100 percent of the increase in the goods-producing sectors as a whole was accounted for by the natural resource, mining, and construction subsector.

The sunny employment picture painted above has been clouded by other data released by the BLS, which are based on the Quarterly Census of Employment and Wages (QCEW) and are preliminary. The seasonally adjusted QCEW data for total employment in the St. Louis MSA are illustrated by the green line in Figure 1. As is clear from the figure, the two surveys provide starkly different pictures of the performance of the St. Louis labor market. According to the QCEW, the first half of the year saw a decrease of 440 in St. Louis MSA employment, rather than the estimated increase of about 27 thousand from the CES.[2]

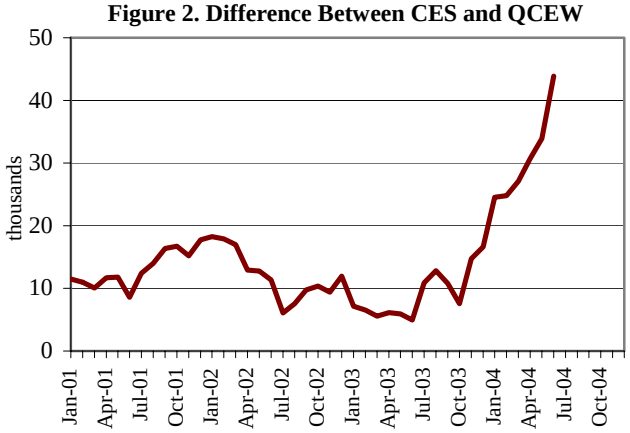
As its name suggests, the QCEW is a census of employment, meaning that is a head count of the number of people with jobs at covered establishments, of which there were 8.4 million nationwide in 2003. In contrast, the CES is a survey, meaning that its data are based on a monthly sampling from about 400,000 nonfarm establishments around the country. The BLS obtains aggregate nonfarm employment data for industries and areas by applying benchmark weights to the results of their monthly sample. These benchmark weights are obtained using data from the QCEW. Because the QCEW counts jobs at a much larger number of establishments than does the CES, it is produced with a much longer lag. The data released in late December 2004 were for the first six months of 2004 and are only preliminary numbers.

[1] Because we want to compare the results of two different employment surveys, we consider the goods-producing sectors as a whole rather than its two subsectors—(i) manufacturing and (ii) natural resources, mining, and construction—separately.
[2] These numbers are based on seasonal adjustments of the raw data from the BLS.

Although the QCEW and the CES are both produced by the BLS and are closely related to one another, they do not cover the same establishments or the same employment. For just one example, while the CES data is for nonfarm employment, the QCEW tends to pick up nearly one-half of agricultural workers. Also, the QCEW is a headcount of employment in 98-99 percent of all establishments, while the CES is an estimate of employment 100 percent of nonfarm establishments. Thus, ignoring differences in coverage of agricultural and other workers, the estimates of employment from the CES will be higher than those from the QCEW. In addition, because QCEW data are not subject to nearly as much measurement error, revisions to them are relatively small, meaning that the final QCEW data probably will not differ a great deal from the preliminary data that has been released. For a more-detailed discussion of the differences between the CES and the QCEW, please refer to the appendix.

The increasing divergence between the seasonally adjusted levels of employment suggested by the two surveys is illustrated in Figure 2. As is clear from the figure, fluctuations in the gap between the two employment measures is quite normal, and might have something to do with the stages of the business cycle. The most recent increase in the gap, however, is unprecedented in the short period for which monthly QCEW data are available at the metro area level.[3] At the national level, the gap between CES employment and QCEW employment is typically about 1.3 percent. Using this rate, the difference between the two employment series for St. Louis should

Figure 2. Difference Between CES and QCEW



[3] For 1997-2000, QCEW employment data are yearly. Since 2001 the data are monthly.

be about 15 to 16 thousand jobs, on average. By June 2004, however, the difference stood at just under 44 thousand.

Industry Disaggregates

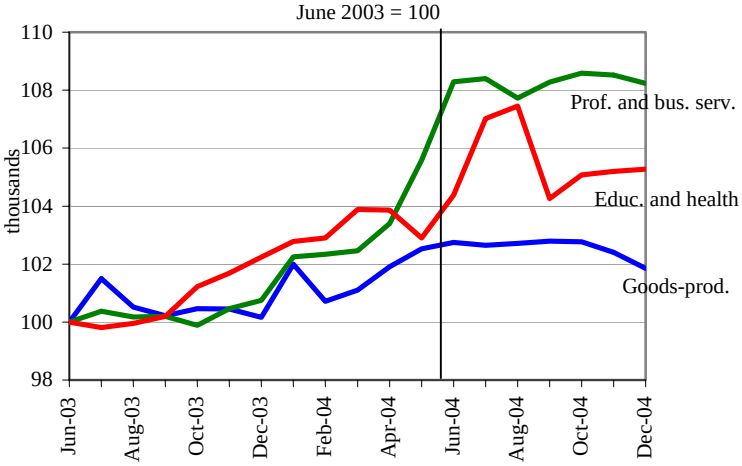
As with the CES, the QCEW provides employment levels disaggregated to broad industry classifications. Unfortunately, because of non-disclosure requirements, the QCEW does not provide complete time series for all sectors. It is possible, however, to allocate the divergence between the two surveys among broad industry classifications on a year-over-year basis for the latest data available.

According to the CES, total employment in the St. Louis MSA rose by 33.5 thousand between June 2003 and June 2004, representing an increase of 3 percent. In contrast, according to the QCEW, total employment in the St. Louis MSA fell by 6.1 thousand over the same period, a decrease of just less than 0.5 percent. The differences between the two surveys were far from uniform across industry classifications, and greater than 70 percent of the difference of 39.6 thousand jobs arises from three industry classifications: goods-producing, professional and business services, and education and health. In fact, about 45 percent of the difference between the two surveys can be attributed to professional and business services. A further 15.7 percent can be attributed to goods-producing firms and 15.2 percent to education and health.

In other words, nearly one-half of the gap between the two surveys can be accounted for by the gap between the numbers for one sector—professional and business services. As noted above, this sector also happened to be the sector that, according to the CES, was by far the fastest growing sector in the first half of 2004. Another 31 percent of the gap can be accounted for by two other sectors—goods-producing and education and health—that the CES data also had

indicated were relatively fast growing during the period. Figure 3 illustrates the CES data for these three sectors for June 2003 to June 2004.

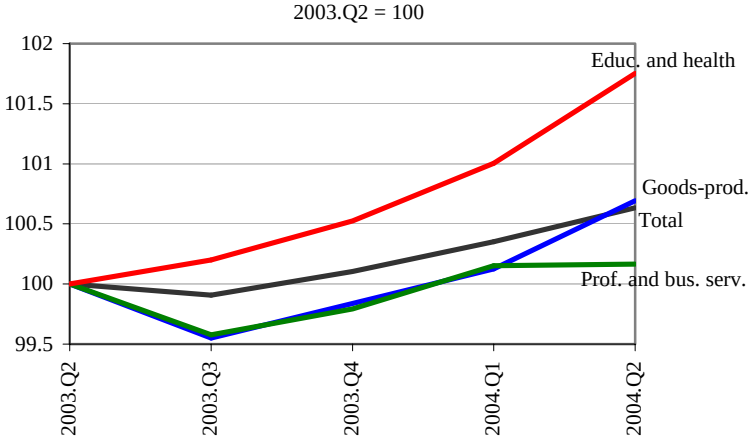
Figure 3. CES data for selected industries (seasonally adjusted)



As is obvious from Figure 3, just about all of the employment growth reported for the professional and business services sector for 2004 occurred in the first half of the year. In fact, there was a huge run-up in the two months from April to June that alone accounted for about 65 percent of the employment growth for the entire year. To a lesser extent, this pattern was exhibited for the goods-producing and education and health sectors also: Employment growth was relatively rapid during the first half of 2004, but was flat for the second half of 2004.

The implication is that much of the increase in the gap between total employment growth from the CES and QCEW surveys is likely due to an overestimate of CES employment growth for these sectors during the first half of 2004. A significant part of this overestimate probably can be traced to an overestimate of the growth in the number of professional and business services establishments for the period. According to the QCEW and as illustrated by Figure 4, the total number of establishments in St. Louis, as well as the number of goods-producing and education and health establishments,

Figure 4. QCEW number of establishments (seasonally adjusted)



grew in each quarter between the third quarter of 2003 and the second quarter of 2004. The number of establishments in professional and business services, however, remained effectively unchanged during the second quarter of 2004, precisely the period when the CES data shows a dramatic increase in employment in this sector. It appears, therefore, that when applying weights to their CES survey results for the second quarter of 2004, the BLS assumed that the number of professional and business service establishments had continued to rise rather than stagnate, as subsequently has been indicated by the QCEW.

This potential source of overadjustment of the CES survey results is not as obvious for either the education and health or the goods-producing sectors. According to the QCEW, both sectors saw steady growth in the number of establishments, with a pickup in the rate of growth in the second quarter of 2004. Even so, this growth in the number of establishments in the first half of 2004 was probably slower than the BLS had anticipated when applying weights to their CES survey results. Because the number of establishments grows relatively slowly, even small differences between the assumed and actual numbers of establishments can have large effects on the accuracy of CES employment data.

Is There a Bottom Line?

Assuming that the preliminary QCEW data for St. Louis are not revised by much, what, if anything, can we conclude about the performance of the St. Louis labor market in 2004? The rather unsatisfying answer to this question is that, at this stage, we cannot conclude anything about 2004. On the other hand, we don't have to wait very long for a better answer because revisions of all St. Louis MSA CES employment data back through 1990 are scheduled to be released by the BLS on March 10. Three sources of revision will be rolled into these new data.

The first source applies only to the December 2004 data and is the usual revision to a month's preliminary data that occurs when the next month's preliminary data are released. The second source of revision is the usual benchmarking that occurs this time of year and will affect data for part of 2003 and all of 2004. The third source of revision is the addition of three Illinois counties—Bond, Calhoun, and Macoupin—to the St. Louis MSA. Data for these counties will be added to all post-1990 data for the St. Louis MSA.

Even after the new data are provided in March we will not be able to draw a line under 2004 because much of the data for 2004 will be revised yet again by yearly benchmarking that will occur in March 2006. At that time, assuming that there are no new counties added to the St. Louis MSA, we will have a relatively final picture of what really happened to the number of jobs in 2004.

Because of the wide gap between the CES and QCEW data for St. Louis, it's quite reasonable to expect a downward revision to the estimated job growth for 2004. It is very difficult, however, to predict the size of the revision, or even its permanence. Recall that each yearly job growth number is subject to three revisions (and, in the event that the MSA definition changes, a fourth): The first revision occurs one month after the preliminary December data are released, while the second and third revisions result from yearly benchmark changes that occur in March of each year. In the past, these revisions have led to sizable changes in the CES employment estimates for St. Louis.

The pattern of recent revisions for the St. Louis MSA make clear how careful one needs to be when using employment data. The table below shows how the picture of job growth in the St. Louis MSA for any year can change dramatically over time. Each row contains estimates of yearly job growth for 1999-2004 beginning with the release of preliminary data for December

(which is usually released in January of the following year). Each column provides the estimate of the December-to-December job growth that is current at a particular data release date.

Yearly Changes in St. Louis MSA CES Employment

	Release Month											
	Jan. 2000	April 2000	Jan. 2001	April 2001	Jan. 2002	April 2002	Jan. 2003	April 2003	Feb. 2004	April 2004	Jan. 2005	March 2005
1999	14.4	11.2	11.2	22.6	22.6	22.6	22.6	22.5	22.5	22.5	22.5	?
2000			8.0	5.7	5.7	-14.7	-14.7	-14.7	-14.7	-14.7	-14.7	?
2001					-21.6	-14.7	-14.7	-12.3	-12.3	-12.3	-12.3	?
2002							-19.8	-17.6	-17.6	-11.9	-11.9	?
2003									-4.5	-11.3	-11.3	?
2004											38.8	?

Notice that the preliminary data for December 1999 indicated that the number of jobs in the St. Louis MSA had risen by 14.4 thousand during 1999. But following the benchmark revision in 2000, the estimated job gain had fallen to 11.2 thousand. This downward correction was itself reversed by the benchmark revision in 2001, which indicated that 1999 job growth was actually 22.6 thousand. The estimates for 2000 job growth given in the second row experienced a similar roller coaster ride. Preliminary data reported in January 2001 had suggested that the number of jobs in the St. Louis MSA had grown by 8 thousand between December 1999 and December 2000. This number was revised down to 5.7 thousand following the benchmarking in 2001. Following the 2002 benchmarking, this modest job growth became a fairly large job loss of 14.7 thousand.

The estimates for job growth in 2001 and 2002 were also greatly affected by revisions. Initial data had indicated large job losses for the year, but subsequent revisions had reduced estimated job losses by 40 percent. The estimate of job growth for 2003 has moved in the opposite direction: Having undergone only one benchmark revision so far, the current estimate is that 11.3 thousand jobs were lost in the St. Louis MSA in 2003, which is more than two and one-half times the original estimate.

The last column of the table is a reminder that estimates of several years of employment performance are subject to revision, including the estimates for 2004. Despite the enormous efforts that many smart and dedicated people put into the production of employment data, it is important to remember that these data are simply estimates. Although they are the best information available at any time, they only describe one point within a range of many possibilities.

Appendix: Comparing the QCEW and CES methodologies

Quarterly Census of Employment and Wages (QCEW)

The QCEW is based on cooperative arrangements between the BLS and State Employment Security Agencies (SESAs) – the Covered Employment and Wages Program (or ES-202). Employers covered by state unemployment insurance (UI) or the Unemployment Compensation for Federal Employees (UCFE) program submit reports to state agencies each quarter. The SESAs, along with the BLS, then produce monthly estimates of employment and quarterly estimates of total pay for detailed industries at the county, metropolitan area, and state levels.

Coverage: In the year 2003, data were collected from 8.4 million establishments covering 127.8 million jobs or about 122.9 million workers (adjusting for multiple job holders). This coverage represented 96.6 percent of civilian wage and salary employment and approximately 95 percent of the wage and salary component of GDP. While mostly nonagricultural, the QCEW estimates do pick up about 47 percent of all workers in agricultural industries. Generally, all workers (part-time or full-time) who worked or, at least, were paid in the pay period including the 12th of a month are counted.

Among the important exclusions (from 2001) were 100,000 wage and salary agricultural workers; 1.2 million self-employed farmers; 8.6 million self-employed nonfarm workers; 400,000 domestic workers; 100,000 unpaid family workers; 400,000 state and local government employees; and 200,000 railroad workers. The extent to which workers are excluded seems to depend on UI coverage, which varies from state to state.

Sampling unit: establishment (i.e., a single physical location where economic activity takes place). The sampling unit usually corresponds to a single employer, although some employers operate more than one establishment. In these instances, employers submit multiple worksite reports (MWRs) to the state agencies to specify the locations of each establishment.

Adjustments: Adjustments are made annually for corrections to the industry or location reported for an establishment

Current Employment Statistics (CES) program

The CES is also a BLS-SESA joint program in which states are responsible for producing state and metropolitan area estimates of employment, hours worked, and earnings—whereas the BLS produces national estimates of these series.

Coverage: A sample of roughly 400,000 nonfarm establishments, representing on the order of 160,000 businesses and government agencies, is surveyed each month. The sample is selected from the QCEW administrative records. Data from the QCEW are used to set benchmark weights which are then applied to the CES samples to produce aggregate industry and area estimates.

There are, unlike in the QCEW, some non-UI employers covered here as well, including religious organizations, private schools, interns and trainees in hospitals, and railroads. Since sampled employers tend to be large (all establishments employing 1000 or more employees are asked to participate; only a sample of smaller establishments are asked to do so), the payroll survey actually covers a reasonably large fraction of total nonfarm employment. The BLS claims that the CES covers approximately one third (to maybe 40 percent) of all nonfarm payroll workers.

Jobs are counted in the same manner as in the QCEW. Positions that receive pay in a month (regardless of full-time/part-time status or whether a worker is actually present on the job) are counted.

Sampling unit: establishment

Adjustments: The benchmarks are updated early every year as the QCEW estimates are produced and refined. Recently, these revisions have been released in February along with the January employment estimates. It should be noted that state and metropolitan area estimates sometimes involve sizable changes owing to these adjustments. The March 2002 revisions, for example, involved changes (in percentages of total employment) ranging between -4.7 percent and 5 percent (with an absolute average revision of 1.3 percent) among 274 metropolitan areas. For states, the range was -2.1 percent to 2.1 percent, with an average absolute change of 0.9 percent.[4] Standard errors for state and area employment estimates from the CES are provided by the BLS at www.bls.gov/sae/790stderr.htm.

Assessment: The coverage is not quite the same across the two surveys; although it seems to be close. There are some non-UI covered workers included in the CES (again, religious organizations, private schools, interns and trainees in hospitals, railroads) who do not appear in the QCEW. At the same time, the QCEW covers a reasonably large fraction of agricultural employment (the statistic above was nearly 50 percent) that the CES does not. Job growth in these sectors, naturally, would add to one data series but not the other. Differences generated by these compositional issues, however, are likely to be small.

The primary difference between the statistics generated from these two data sets appears to stem from the fact that one is a sample (CES); whereas the other is a (near) census (QCEW). Applying the mean readjustment rate above, 1.3 percent, to a figure of 1.2 million workers (a rough estimate of total St. Louis employment) implies 15,600 jobs. This purely hypothetical figure represents a large fraction of the discrepancy discussed above.

For further information, see the *BLS Handbook of Methods* at www.bls.gov/opub/hom/homtoc.htm.

[4] See Brian Dahlin, "Revisions in State Establishment-Based Employment Estimates Effective January 2003" at www.bls.gov/sae/790tables4_5_6.pdf.