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Howard Wall

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Improved Estimates of St. Louis Metro Employment

Howard J. Wall

Director, Institute for the Study of
Economics and the Environment

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Summary

Official employment data for the St. Louis metro area produced by the Bureau of Labor Statistics (BLS) are often unreliable and usually misleading. A major reason for this problem is that the BLS does not make full use of the data at its disposal. To address this, the Institute for the Study of Economics and the Environment (ISEE) at Lindenwood University has developed an alternative employment measure that makes better use of available data. More specifically, the ISEE employment series for the St. Louis MSA undergo rolling benchmark revisions four times a year as data become available. This is in contrast with official benchmark revisions, which occur only once per year despite the release throughout the year of newer and more-accurate information.

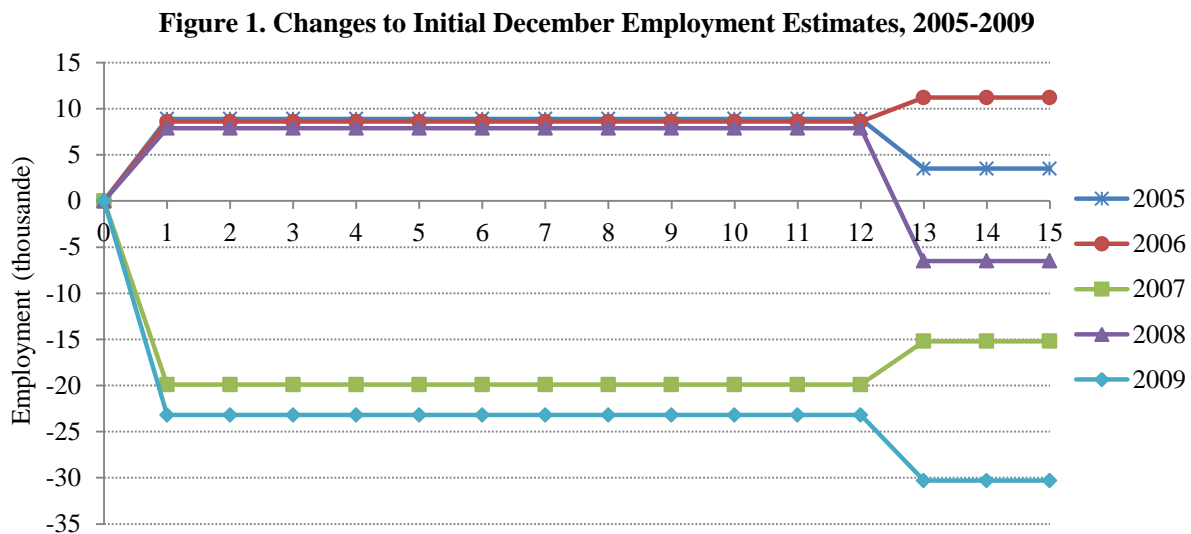
The methodology used to produce the ISEE series was tested using vintage data. According to these tests, if the ISEE series had been produced during the period from 2006-2009, it would have reduced the errors in the official data by more than 80 percent for many months of the year. The improvements would not have been as large for the most up-to-date months, however. Even so, the ISEE series would have been the most accurate estimates of St. Louis metro employment during those years, and should be the most accurate estimates available today.

Introduction

Every month, the Bureau of Labor Statistics (BLS) releases its most-recent estimates of metropolitan-area nonfarm payroll employment. In contrast to the media cacophony following analogous data releases for the United States as a whole, crickets can be heard chirping in the background when these metro area data are released. One reason for this near-universal indifference is that, for someone wishing to know the current and/or recent condition of a local economy, local-level employment data are frequently misleading and often useless.

A major reason for the problem is that local payroll employment data are subject to yearly benchmark revisions. The details of these benchmark revisions are described below, but, for now, note that annual benchmark revisions occur in March and can affect every month's estimate of payroll employment from April of nearly two years earlier through December of the previous year. If these revisions were a simple matter of tidying up the data, as with the relatively minor revisions that occur one month after an initial release, then we wouldn't be terribly concerned. But for St. Louis, as for many metro areas, these revisions have tended to matter a great deal.

Figure 1 follows the employment estimates for several recent Decembers during the 15 months following their initial release. For each December except December 2010, the first benchmark revision led to a change of at least five thousand, and the second benchmark revision typically led to another change of five thousand or more. The estimate for December 2008, which fell by 30 thousand between the initial release and final revision, were the most affected.



Source: Bureau of Labor Statistics

Table 1, which provides the changing estimates of employment growth over recent calendar years (December-to-December changes), looks at the issue from a slightly different angle. The first column of Table 1 provides the initial estimate of the change in payroll employment over a calendar year (December to December), and is available in January of the following year. The results of a benchmark revision are released in March and affect data for 21 months (the last of which is the most recent December). The second column provides the estimates of the calendar-year change in employment following this benchmark revision. The picture of job generation for this calendar year is still not complete, however, because the final 8 months of the year are subject to a second benchmark revision in a year's time. The results of these revisions for the estimates of annual job growth are provided in the final column of Table 1.

Table 1. December-to-December Changes in St. Louis Employment (thousands)

	Initial release of December, year t, data (January, year t+1)	First benchmark revision (March, year t+1)	Second benchmark revision (March, year t+2)
2001	-21.6	-14.7	-12.3
2002	-19.8	-17.6	-11.9
2003	-4.5	-11.3	13.8
2004	38.8	12.2	11.6
2005	6.2	15.7	12.1
2006	-0.4	13.6	16.2
2007	24.5	2.0	6.7
2008	-23.0	-19.8	-34.2
2009	-33.8	-42.6	-49.7
2010	3.5	?	?

Source: Bureau of Labor Statistics

As one can see from the Table, the picture of job growth for any year can change a great deal over the course of two rounds of benchmark revisions. For example, the series of estimates for 2003—which initially indicated a small decrease in employment, then a large decrease, and finally a healthy increase—were too fluid to have been useful. Misleading estimates were also provided for 2004 and 2007, years that were initially estimated to have been boom years but were ultimately found to have been only so-so ones.

This purpose of this short paper is to outline a new methodology developed by the ISEE to provide new and improved estimates of payroll employment for the St. Louis MSA. In short, the

ISEE methodology takes more-timely advantage of other data that are ignored by the BLS in between the official benchmark revisions. As such, the ISEE series is the most-reliable estimate of payroll employment in the St. Louis metro area.

A Source of the Problem

Before going into the methodology employed by the ISEE to construct its series, it is necessary to get at the source of the large revisions described in the previous section. Estimates of payroll employment—the number of jobs—are produced by the Current Employment Statistics (CES) program of the BLS. According to the BLS, each month it surveys “about 140,000 businesses and government agencies, which cover approximately 440,000 individual worksites,” from around the United States. Of these, perhaps only 3,500 of the over 70,000 establishments in the St. Louis MSA are surveyed in a given month.

Assuming that the surveyed establishments are representative of the entire population of establishments, the estimate of total employment can be obtained by extrapolating the survey results. For example, if, in a given month, there are 63,000 employees at the 3,500 establishments in the survey, total employment can be obtained by multiplying 63,000 by the number of establishments divided by 3,500. The catch, of course, is that the BLS doesn’t know exactly how many establishments there are when the survey is done, so they must estimate the number of establishments. It is the difficulty in doing this that accounts for the sometimes-large revisions to the CES data.

To estimate the number of establishments, the BLS relies on another of its data sets, the Quarterly Census of Employment and Wages (QCEW). The QCEW is a tabulation of employment information for workers covered by state and federal unemployment insurance programs. The definitions of employment under the QCEW and CES are not exactly the same, so the BLS must adjust the QCEW numbers to match the CES definition. Each year, in March, the BLS uses data from the QCEW to establish a benchmark for the level of employment and the number of establishments. Because of its comprehensive nature, data from the QCEW cannot be produced as quickly as data from the CES. For example, when new benchmarks are set in March of every year. The data used to make these revisions are the most-recent QCEW data available, which are the preliminary estimates for April, May, and June of the previous year. Data for

those months are based on these very accurate, nearly comprehensive benchmarks. Data for all following months are projected from these benchmarks and rely on estimates of establishment growth. In fact, all employment estimates until the next rebenchmarking in another 12 months will be based on these benchmarks. When new benchmarks are set, employment estimates for all of these months will be revised. In addition, the preliminary estimates of the original April, May, and June benchmarked data will have been revised and finalized, thus affecting an additional three months of employment estimates. These revisions are, however, relatively minor.

Put simply, one of the reasons that the annual benchmarks revisions to St. Louis MSA employment data are so large is that, for a given month's estimate, the original data are projected from benchmarks set for periods between 6 to 18 months prior. The methodology outlined in the next section is designed to ameliorate this problem by providing rolling benchmarks every three months, rather than relying solely on the yearly benchmark revisions from the BLS.

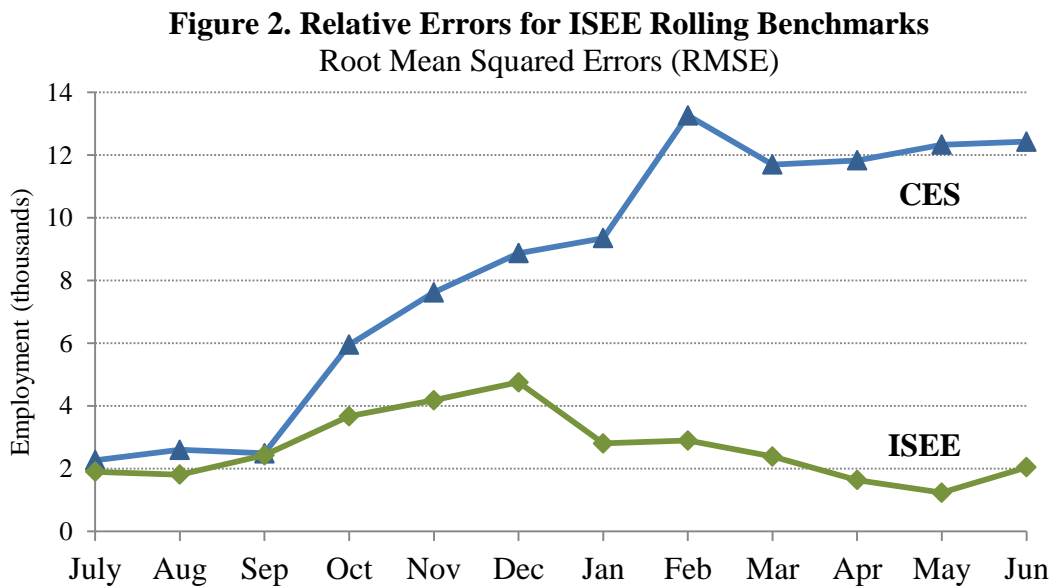
ISEE Solution 1.0

The ISEE has developed an alternative estimate of nonfarm payroll employment for the St. Louis MSA that makes better use of the official data that are available. In short, whereas the BLS revises its benchmark once per year, the ISEE series will be constructed using rolling benchmarks that are updated quarterly as new QCEW data become available. The rolling benchmarks are estimates of the eventual official benchmarks and are based on the historical relationship between the QCEW and the final, unrevisable payroll employment data available at the time. In determining this relationship, the most-recent suitable five years of data are used, and statistical controls are used to account for ongoing trends and month-specific differences between the two series.

The advantage of the ISEE series is that makes use of all QCEW data as they become available. In contrast, only in early March, when the BLS releases data using the latest official benchmark, are the CES estimates based on all of the QCEW data that are available. In fact, by the end of that same month, QCEW data for the third quarter of the previous year are released, making the CES estimates outdated within weeks of their release. ISEE nonfarm payroll employment data, on the other hand, are updated with a new rolling benchmark whenever there are new QCEW

data, which occurs roughly every three months. For months not yet covered by the QCEW, the ISEE data are projected from the ISEE rolling benchmarks using the CES monthly growth rates.

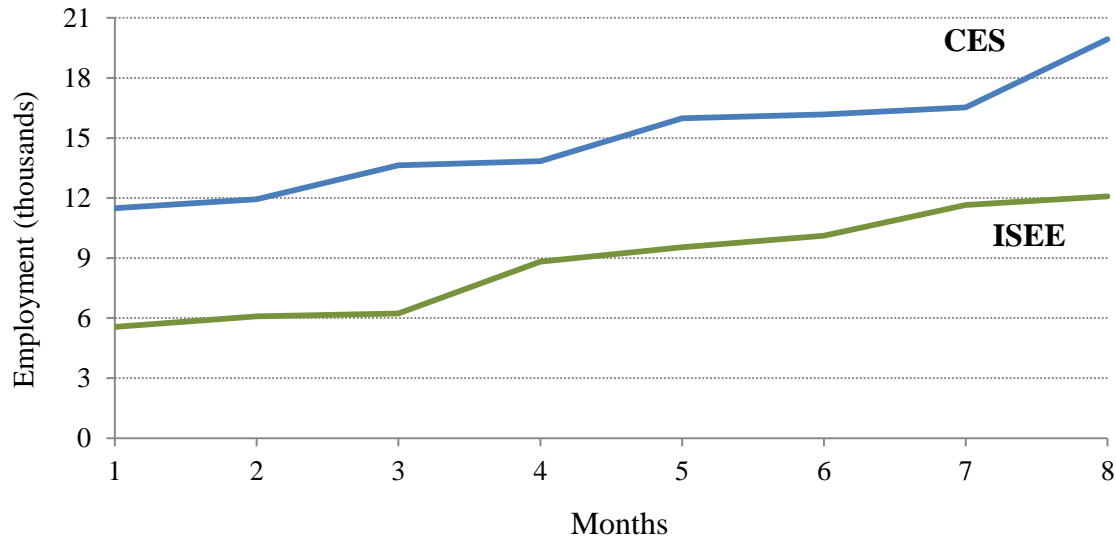
Because the ISEE rolling benchmarks are statistical estimates of the eventual official benchmarks, they are subject to statistical error. They do, however, amount to significant improvements relative to concurrent BLS data. Specifically, Figure 2 illustrates the relative scale of the errors from the BLS and ISEE series if the ISEE rolling benchmark procedure were replicated for 2007-2009 using real-time data (i.e., the CES and QCEW data available at that time). As is clear from the figure, the difference between the two series was greatest the further the CES series was from its annual benchmarking to the June QCEW. For estimates of January through June, the ISEE series would have produced average errors of 2 thousand, about one-fifth to one-sixth the error in the CES series for the same months. Note that the higher average errors for October through December were driven by anomalous differences between the QCEW and CES series for those months in 2009 and should not be a regular feature of the ISEE series.



The difference between the CES and ISEE series are not as stark for months for which the ISEE data are projections from the rolling benchmarks. This is to be expected given that these projections are calculated using the CES monthly growth rates. Nonetheless, because of the improvements due to the rolling benchmarks, the ISEE data for these months are more accurate. Figure 3 shows that the further the ISEE data are from the most recent rolling benchmark, which

can be as many as eight months, the less accurate the data are. Typically, however, this error is less than 60 percent the error from the CES series.

**Figure 3. Relative Errors for ISEE Projections from Rolling Benchmarks
(Root Mean Squared Errors)**



Conclusions and Caveats

As demonstrated by Figures 2 and 3, if the ISEE series had been produced during 2006-2009, it would have meant significantly more accurate estimates of St. Louis MSA payroll employment than the official data from the BLS. Note, however, that the improvement in accuracy differs between those months for which the ISEE series is a rolling benchmark and those for which it is a projection from a rolling benchmark. As such, releases of the ISEE series will make clear the distinction between the two types of observations.

This short paper outlines only the first in a series of improvements to be done by the ISEE to improve estimates of St. Louis metro employment. Hence, the ISEE data series for nonfarm payroll employment outlined above is version 1.0 and should be followed by even more accurate versions in the future.