Analysis of JOLTS Research Estimates by Size of Firm October 2012

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Abstract
The Job Openings and Labor Turnover Survey (JOLTS) program of the Bureau of Labor Statistics recently produced firm size estimates for research purposes. For each of the 3 firm size classes, data series were produced at the total private level for job openings, hires, total separations, quits, layoffs and discharges, and other separations from December 2000 through December 2011. For this paper, firm size classes are compared to each other, to national level JOLTS data, Business Employment Dynamics net employment growth, and to Current Employment Statistics by firm size. Differences in the movements of the time series before, during, and after the most recent recession are analyzed with respect to size of firm. The impact of the economic cycle on larger versus smaller firms is discussed as are other factors that potentially contribute to the time series behavior of the different size classes.

Key Words: firm size class, research data, recession

1. Introduction

The Job Openings and Labor Turnover Survey (JOLTS) program of the Bureau of Labor Statistics measures job openings, hires, and separations on a monthly basis by industry and geographic region.[2] The JOLTS program gauges labor demand by collecting data monthly from a sample of approximately 16,400 nonfarm business establishments.

In 2010, the JOLTS program began producing a research data series by *establishment size* for research purposes. An establishment is defined as an economic unit, such as a factory, mine, store, or office that produces goods or services. Generally, an establishment is at a single location and is engaged predominantly in one type of economic activity. For each of six establishment size classes, research data series were developed for job openings, hires, total separations, quits, layoffs and discharges, and other separations from December 2000 forward. More recently, the JOLTS program began development of *firm size* data. A firm can be defined as an aggregation of establishments under common ownership. (Okolie 2004, 3-12) A firm can consist of one to many establishments.

While there are uses for both establishment size class data and firm size class data, there are several factors which the JOLTS program took into account when deciding which type of size class data to produce. These include sample size considerations (the JOLTS sample consists of 16,400 establishments), methodological considerations (including the difficulty in benchmarking the establishment size class data), and size class placement considerations. (Butani et al. 2012) The JOLTS sampling frame is derived from a universe of over 9 million establishments of the Quarterly Census of Employment and

[1] The views expressed are those of the author and do not represent official positions of BLS.
[2] The JOLTS program follows the North American Industrial Classification System and the term "industry" can refer to a supersector, sector, or subsector, depending on the context. Census region descriptions can be viewed at: http://www.bls.gov/eag/.

Wages, the Unemployment Compensation for Federal Employees, and the Federal Railroad Administration. Establishments are sampled from nonagricultural industries, all 50 states and the District of Columbia, private sector and government, and all establishment size classes. It was determined that with a sample size of 16,400 establishments, it would be feasible to produce three firm size classes. Firm size classes are categorized based on employment from 1-49, 50-499, and 500+. With the firm size class data, it is also possible to improve over the methodology used for the production of establishment size class data. The firm size class data can be estimated with techniques similar to the estimation methodology used for published JOLTS estimates including independent population controls and alignment at the industry level. Finally, in establishment size class data, small establishments belonging to large firms are classified with smaller establishment size classes. In firm size class data, small establishments belonging to larger firms are classified based on the firm size class. An establishment within a large firm will be classified as part of the large firm size class.

This paper discusses the initial results from the development of JOLTS firm size data. Reasonableness of the firm size class data is analyzed by comparing the summed firm size class data to published JOLTS data at the total private level. Firm size class data are also compared to Business Employment Dynamics (BED) data, Current Employment Statistics (CES) firm size class data, and the three size classes are compared to each other. Differences in the movements of the firm size class time series of the economic cycle are analyzed with respect to size of the firm. The impact of the economic cycle on larger versus smaller firms is discussed as are other factors that potentially contribute to the time series behavior of the different firm size classes.

2. JOLTS Data Elements Defined

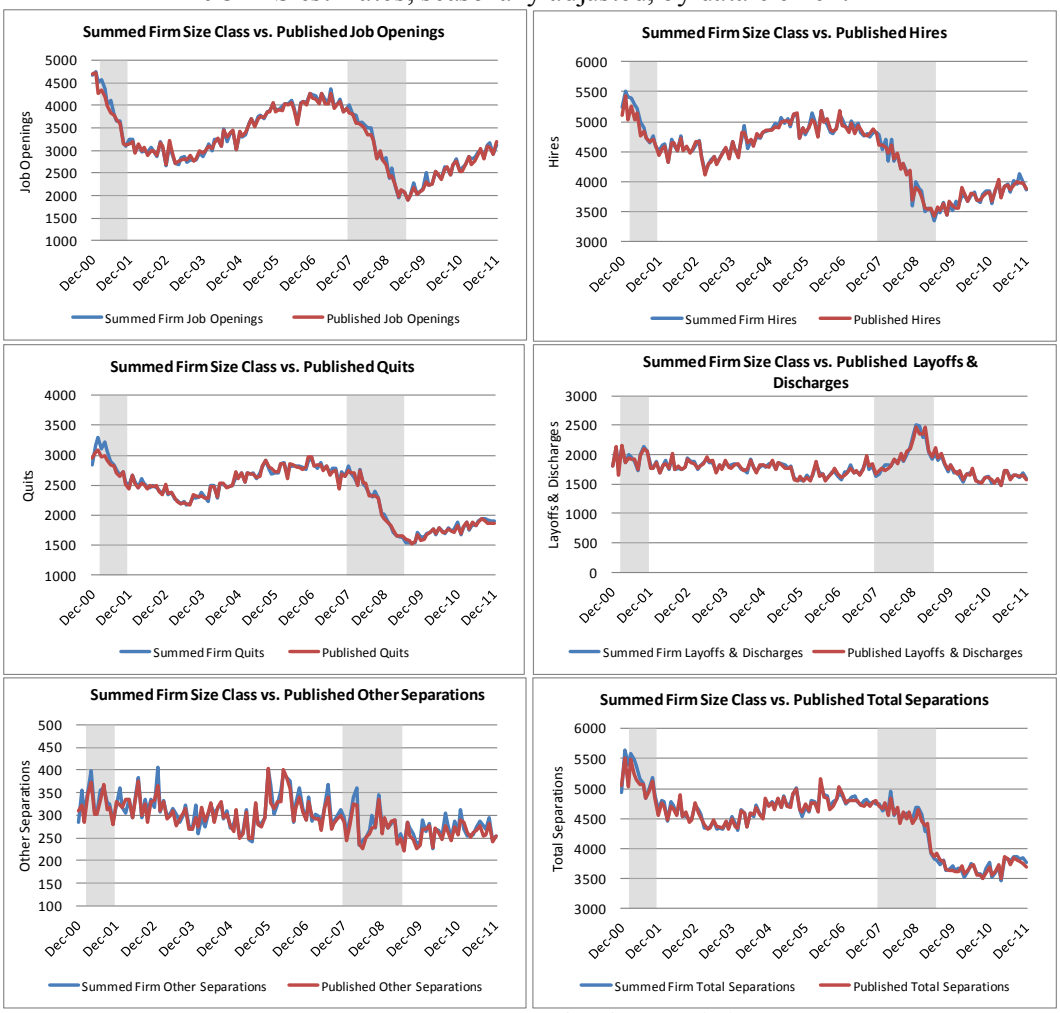
Firm size class data were calculated for private sector job openings, hires, and total separations including quits, layoffs and discharges, and other separations. The firm size class time series were produced monthly for the period of December 2000 to December 2011. Job openings are collected as of the last business day of the month (stock measure). A job is considered open if a position exists and work is available, the employer is actively recruiting from outside the establishment, and the job could begin within 30 days. Hires are collected for the entire month (flow measure). Hires include new hires, rehires, and recalls from layoffs lasting more than 7 days. Total separations are collected for the entire month (flow measure) and include quits, layoffs and discharges, and other separations. Quits are voluntary separations, layoffs and discharges are involuntary separations, and other separations consist of separations that do not fit either of the first two categories such as retirements and deaths. JOLTS also collects, but does not publish employment levels by establishment. 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.

3. JOLTS Firm Size Estimates Compared to JOLTS Summed Published Estimates

The initial step in analyzing the accuracy of the new firm size class data series was to compare the summed firm size class data to published JOLTS data at the total private

level. Data from the three firm size classes were summed and compared to top level published JOLTS estimates. While there are some variations between the summed firm size classes and the published data, these are minor. Summed firm size class data behaved similarly to the JOLTS published data throughout the economic cycle. Job openings, hires, and quits all showed downturns prior to the onset of the most recent recession. Layoffs and discharges began to climb after the beginning of the recession. This behavior mirrors the published total private times series. Chart 1 shows the comparison graphically between the two data series.[3]

Chart 1. Summed firm size class data, seasonally adjusted, compared to published JOLTS estimates, seasonally adjusted, by data element



Source: U.S. Bureau of Labor Statistics

4. JOLTS Firm Size Estimates Compared to BED Firm Size Data

JOLTS firm size class data were also compared to Business Employment Dynamics (BED) firm size class data. The BED program produces statistics generated from the Quarterly Census of Employment and Wages. Employment changes are tracked at the

[3] For Charts 1, 3, and 4, shaded areas denote recessions as determined by the National Bureau of Economic Research.

establishment level and then aggregated to produce gross job gains from opening and expanding establishments and gross job losses from closing and contracting establishments by industry and firm size class.

BED employment gains and losses data are complementary to the JOLTS hires and separations data. Net gains can be attributed to declining layoffs or increasing hires while net losses can be attributed to continued separations or lack of hiring. (Bruyere, Podgornik, and Spletzer 2011, 16-29) This makes the universe-based BED data a primary source of comparison for the new JOLTS firm size class estimates.[4]

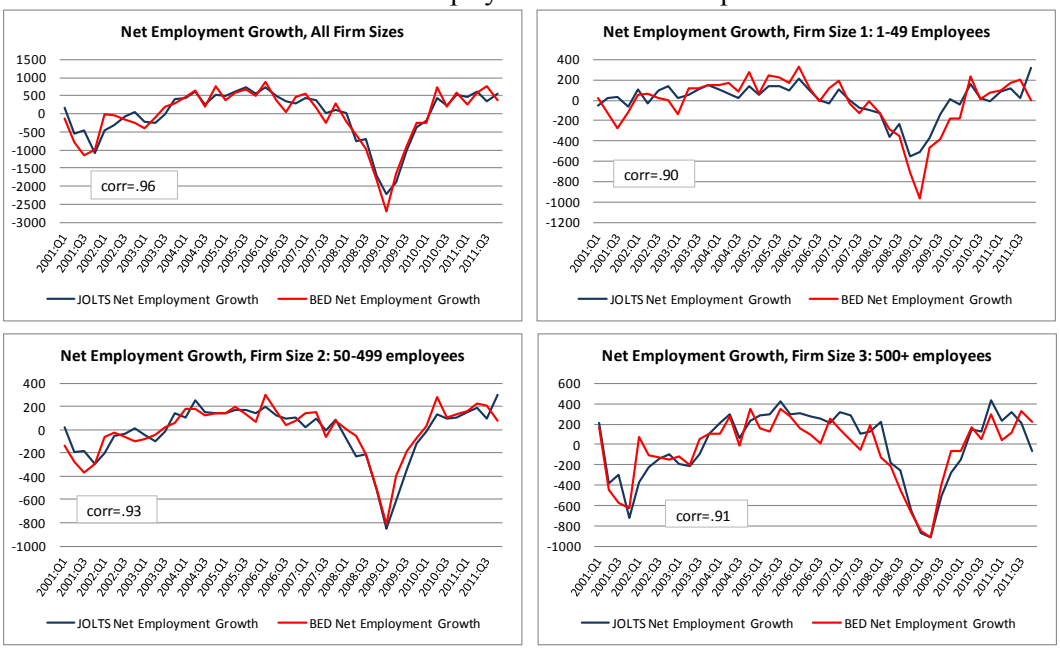
In an original unpublished comparison of *establishment size* class data by James R. Spletzer, BED microdata were tabulated by establishment size and compared to the JOLTS *establishment size* class data aggregated to a quarterly basis. (Spletzer 2010, 1-11) His findings indicated that the smallest JOLTS establishment size class data had too few hires and separations. While this finding is being examined, it highlights another area of weakness in the experimental establishment size class data.

BED data is published by *firm size* class, so with the availability of JOLTS *firm size* class estimates, it is no longer necessary to tabulate BED microdata by establishment size. For comparison purposes, BED firm size classes were combined to correspond with the three JOLTS firm size classes. JOLTS firm size class data were aggregated by quarter for comparability with BED quarterly data. While there are definitional differences between BED data and JOLTS data including the sizing technique used and the fact that BED is a universe and JOLTS is sample-based, the comparison is still useful for analysis purposes.

To compare net employment growth of the two series using firm size class estimates, JOLTS net employment change was calculated by subtracting separations from hires and BED net employment change was calculated by subtracting BED losses from BED gains. Correlations were computed for the net employment growth series. The results show that the smallest firms' net employment growth series have the lowest correlation at .90 while the correlation for midsize firms was .93 and for large firms was .91. The correlation for net employment growth for all firm size classes summed was .96. The correlation results indicate similar patterns over the two time series.

[4] For an overview of the Business Employment Dynamics program, visit the BLS website at http://www.bls.gov/bdm/bdmover.htm.

Chart 2. Net Employment Growth Comparison



Source: U.S. Bureau of Labor Statistics

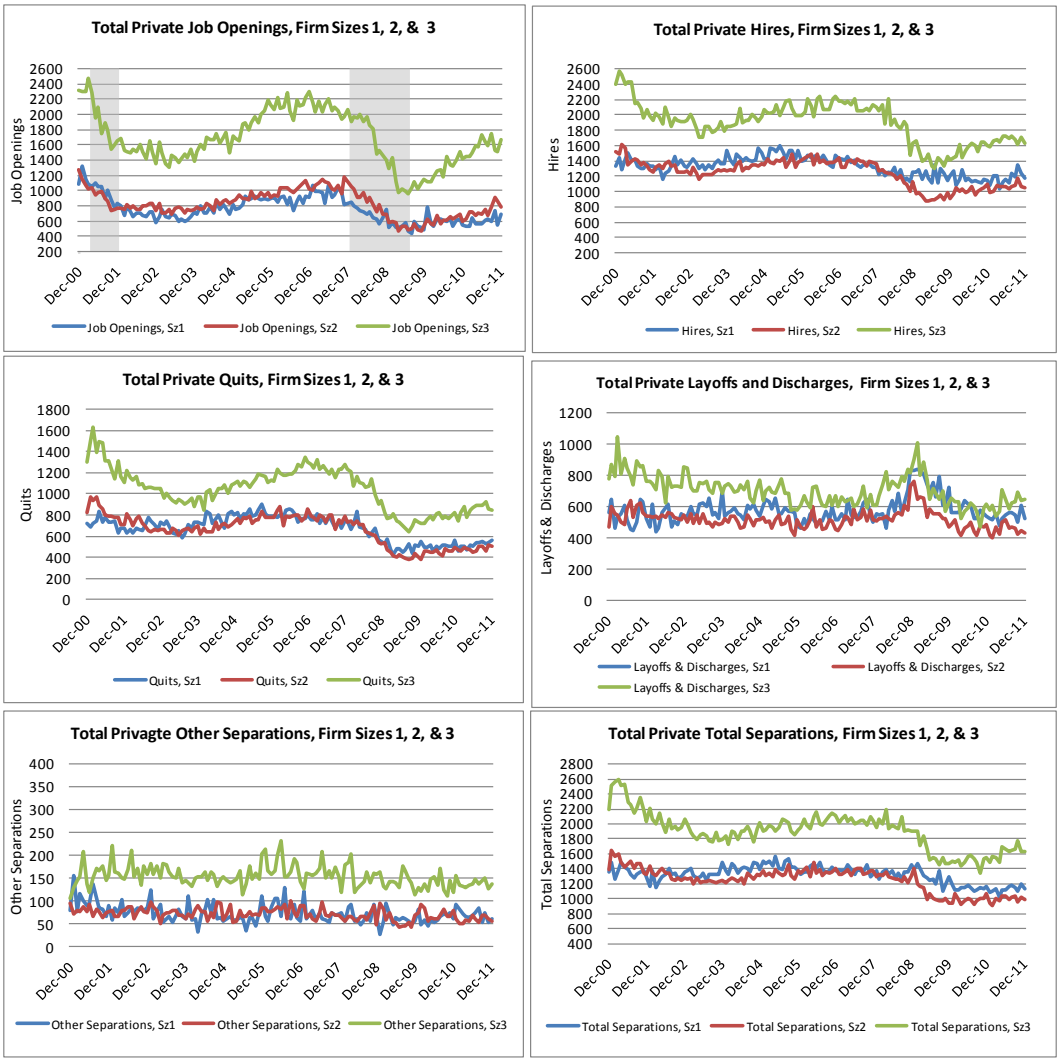
5. Comparison of Firm Size Classes 1, 2, & 3

During Alan Krueger's testimony before the Joint Economic Committee in May 2010, he used JOLTS *establishment size* class research data to analyze employment trends in the U.S. labor market with regards to small, medium, and large businesses by aggregating the establishment size classes into three categories: less that 50, 50-249, and 250 and greater employment. (U.S. Senate 2010) Krueger stated that "To better understand the dynamics behind the dramatic loss in employment that we have experienced in the past two years, we can examine data on job openings, hires, and separations." He noted that while job openings started to fall in early 2007, the job openings level for the largest establishments experienced its greatest drop at the onset of the financial crisis that started in late 2008. According to Krueger, the divergence in hiring levels between large and small establishments was also affected by the financial crisis in 2008. While smaller establishments initially reacted with layoffs and business closings, the first response of larger establishments was to freeze hiring. Krueger states that part of this response was due to the limited access small businesses had to bank financing compared to larger firms. Quits and layoffs and discharges from establishments with fewer than 50 employees followed a trend similar to that of the total private level. After the financial crisis, layoffs and discharges for total private establishments as well as for those with fewer than 50 employees reached significant highs during the first half of 2009 and then declined steadily through 2010.

Similar to the analysis done by Krueger using establishment size class data, three *firm size* class time series were compared to each other by data element. During the most recent recession, job openings for large firms showed the largest drop during 2008. None of the firm size classes have recovered pre-recession levels of job openings, however, post-recession recovery in job openings is most prevalent for large firms.

Midsize and large firms cut back on hiring more so than smaller firms. Layoffs and discharges for small and midsize firms increased over the course of the recession while quits fell for all three firm size classes. During the recession, job openings, hires, and quits dropped while layoffs and discharges increased. Following the recession, large firms appear to make a quicker recovery overall. (Krueger and Charnes 2011, 16-24)

Chart 3. Comparison of Firm Size Class 1, 2, and 3 Data, seasonally adjusted



Source: U.S. Bureau of Labor Statistics

6. JOLTS Firm Size Estimates Compared to CES Firm Size Estimates

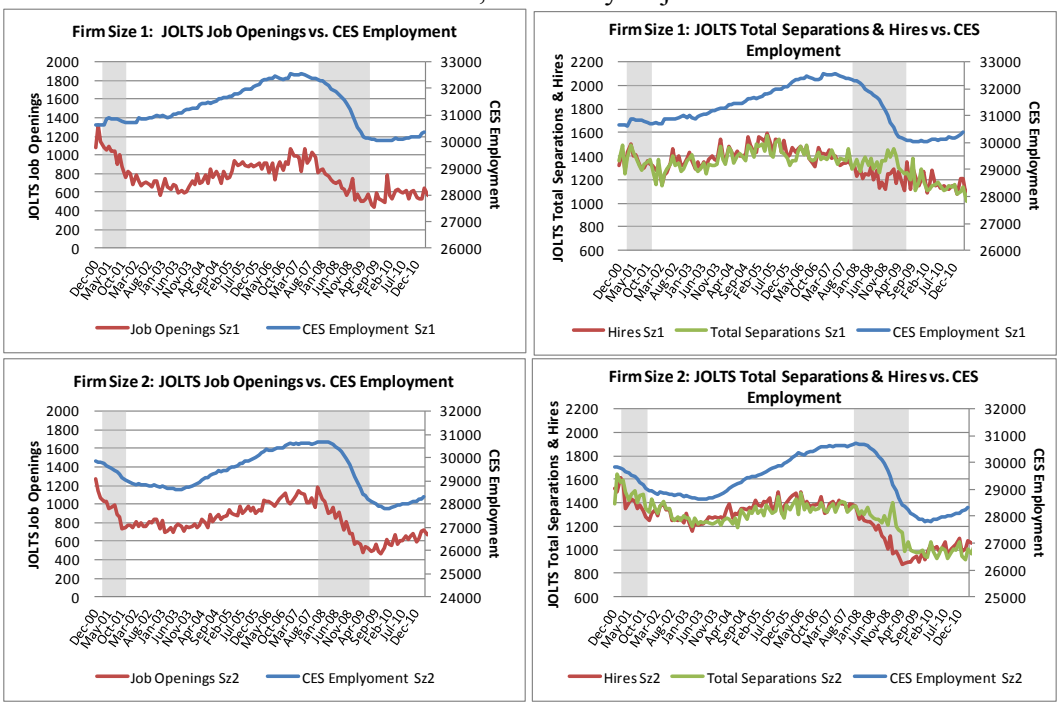
CES total private data is frequently used for comparisons to the published JOLTS total private data. The CES program produces monthly estimates of nonagricultural employment and has a sample size of approximately 140,000 businesses covering approximately 440,000 individual worksites. Because the CES program also recently published firm size class research series, it is possible to compare those data to the

JOLTS firm size class research series.[5] The JOLTS firm size class data appear to be consistent with the CES firm size class trends at the total private level. See Chart 4.

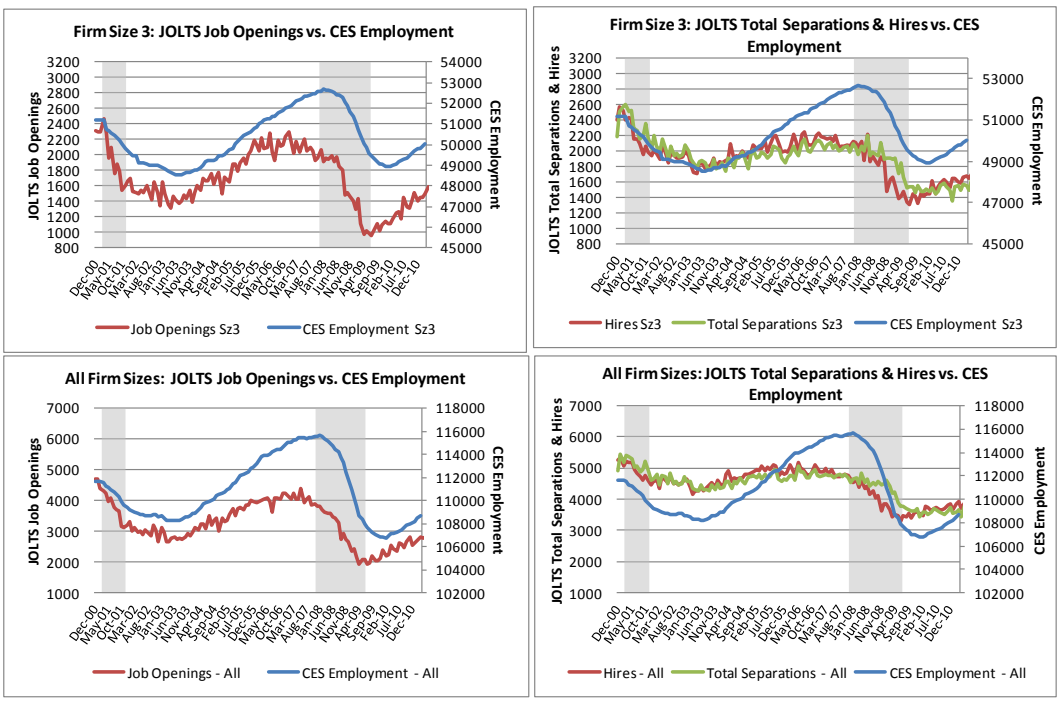
The summed firm size classes very closely mirror the published data of the two series. For large firms, job openings level off in advance of the recession and in advance of the CES large firm employment level data. For midsize firms, job openings started to decline at the beginning of the recession and employment declined soon after. Job openings and employment levels recovered more rapidly post-recession for large firms than for the midsize and small firms.

Hires in all classes leveled off and began their declines prior to December 2007 even while employment at the firm size class levels continued to grow. Total separations levels for all three firm size classes exceeded hires while employment declined during the recession.

Chart 4. JOLTS Firm Size Classes 1-3 Compared to CES Firm Size Classes 1-3, Total Private Level, Seasonally Adjusted



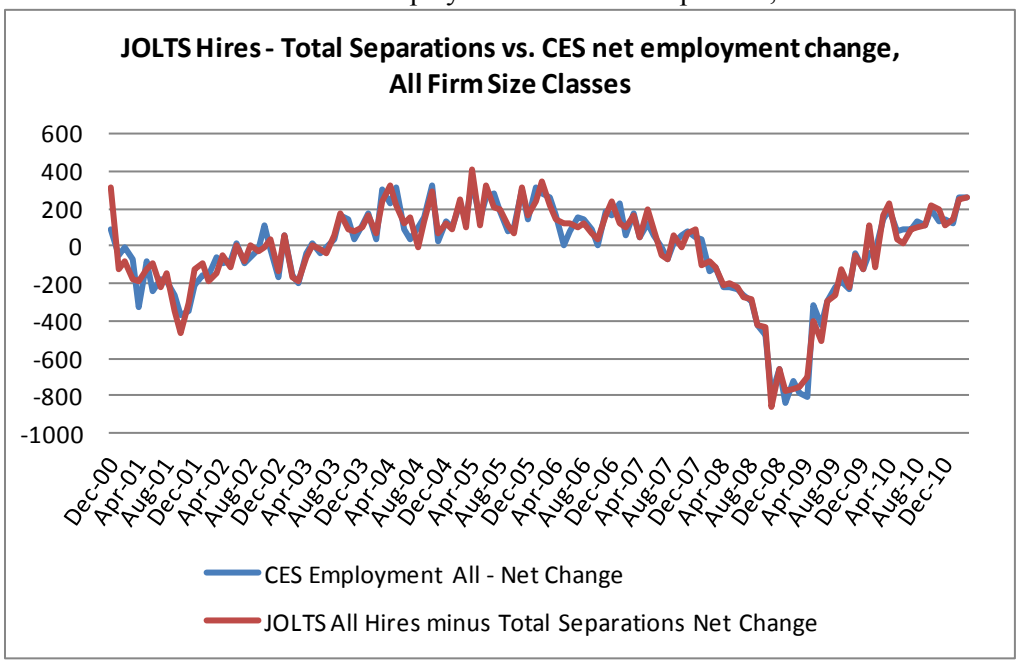
[5] For more information about CES firm size data see "Experimental Size Class Employment, Hours, and Earnings Series from the Current Employment Statistics Survey" at http://stats.bls.gov/ces/cessizeclass.htm.



Source: U.S. Bureau of Labor Statistics

Subtracting CES previous month employment from current month employment will result in the net change in employment between periods. This value can be compared to JOLTS hires minus separations and over time these values should be similar. The JOLTS estimation process uses the CES employment change to align differences in the JOLTS hires minus separations data. The correlation between the two summed firm size class series is .97.

Chart 5. JOLTS and CES Net Employment Growth Comparison, Total Private Level



Source: U.S. Bureau of Labor Statistics

7. Future Firm Size Research

In the future, it may be possible to publish firm size class data as part of the JOLTS regular production process but this will depend upon available internal resources and demand for the firm size data. While the JOLTS program currently plans to provide data at the total private level only, the reliability of industry level firm size class data is being investigated for possible future release.

8. References

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