JOLTS as a timely source of data by establishment size

Following the financial crisis of 2008, unofficial tabulations of Job Openings and Labor Turnover Survey (JOLTS) data were the most timely government source of information on employment trends by establishment size; this article discusses how JOLTS data can be used to shed light on employment patterns among small businesses and also evaluates the accuracy of the JOLTS data on small establishments

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Economic downturns following financial crises tend to be more severe and last longer than other downturns.[1] One possible reason for this tendency is that small businesses, whose economic activity tends to be highly procyclical (meaning that it tends to move strongly with the overall business cycle), are disproportionately harmed by financial crises because they are more dependent on bank financing than large businesses are, and bank credit tends to be constrained following financial crises. Unlike large companies, small businesses do not have access to corporate debt markets. Small business' spending is constrained by their balance sheets, which means that small businesses cannot invest as much during a credit crunch, regardless of the underlying fundamentals.[2] In addition, small businesses rely on relationship lending, particularly from small banks, and relationships are destroyed when banks close.[3]

A key issue for policymakers following the financial crisis of 2008 was whether small businesses were disproportionately affected because of credit constraints. The lack of timely, comprehensive data on the performance of small businesses was a hindrance to policy development. Business Employment Dynamics (BED) data, for example, are quarterly and are available only with a lag of around 9 months. Unofficial tabulations of monthly Job Openings and Labor Turnover Survey (JOLTS) data prepared by BLS were the most timely government source of information on employment trends by establishment size.[4] As chart 1 shows, the JOLTS data indicate that small business employment was particularly hard hit during the recession, and that employment continued to contract at small businesses in the early phase of the recovery while it was increasing at medium-size and large establishments. If this finding is robust, the differing trend in employment in small businesses compared with that in large businesses is consistent with the view that the financial crisis has had a more adverse impact on small businesses.

This article discusses how JOLTS data can be used to shed light on patterns of hiring and separations in establishments of various sizes. In addition, the accuracy of the JOLTS data on small establishments is evaluated by comparing trends in the unofficial JOLTS series with trends in other widely used series containing data on job growth for small companies. Finally, the article concludes with recommendations for how to improve the JOLTS program with regard to improved methods, new methods, and new research.

Chart 1. Average monthly job growth as a share of initial employment, by establishment size, Dec. 2007–June 2009 and July 2009–Nov. 2010

Percent   Percent

■ Dec. 2007–June 2009   ■ July 2009–Nov. 2010

1–49 employees   50–249 employees   250 employees or more

SOURCE: Unofficial Job Openings and Labor Turnover Survey data from the Bureau of Labor Statistics.

The experimental JOLTS series

Following a request by the U.S. Treasury Department, BLS used JOLTS data to calculate monthly hires, quits, layoffs, job openings and other statistics for six establishment size categories of private sector employers in May 2010.[5] This unofficial, experimental series was updated in February 2011, and it covers the period from December 2000 through November 2010. JOLTS data contain information on establishment size but not company size. The process BLS used to calculate and seasonally adjust the experimental JOLTS series by establishment size is similar to the process it uses to compute industry-level and region-level data, except that the JOLTS data cannot be benchmarked to the employment estimates from the Current Employment Statistics (CES) survey in the exact same manner because the CES data are not available by establishment size.[6] Consequently, BLS benchmarked the data to the overall CES employment series. Likewise, the alignment procedure was based on the aggregate across size categories, rather than on the totals within individual establishment size categories. Therefore, the difference between hires and separations (summed across all size categories) is constrained to equal the monthly change in

employment from the CES series, but the difference may not equal the actual change in employment in a given establishment size category.

The inability to perform the alignment and benchmarking procedures at the level of establishment size categories is a potential limitation of the unofficial JOLTS data by establishment size. However, the survey should still provide some information about how the numbers of hires and separations in small businesses compare with those in large businesses. Moreover, the use of the same alignment and benchmarking factors for establishments of all sizes is likely to decrease any differences between small and large establishments, so the variation among the trends in chart 1 is even more noteworthy.

To summarize job market trends, the experimental JOLTS data were aggregated into three categories—establishments with fewer than 50 employees (representing about 40 percent of private sector employment); establishments with 50 to 249 employees (representing about a third of private sector employment); and establishments with at least 250 employees (representing about a quarter of private sector employment). The first panel of chart 2 displays gross numbers of hires, quits, and layoffs for small establishments, the second panel does the same for

Chart 2. **Monthly levels of hires, quits, and layoffs, by establishment size, seasonally adjusted, Dec. 2000–Nov. 2010**
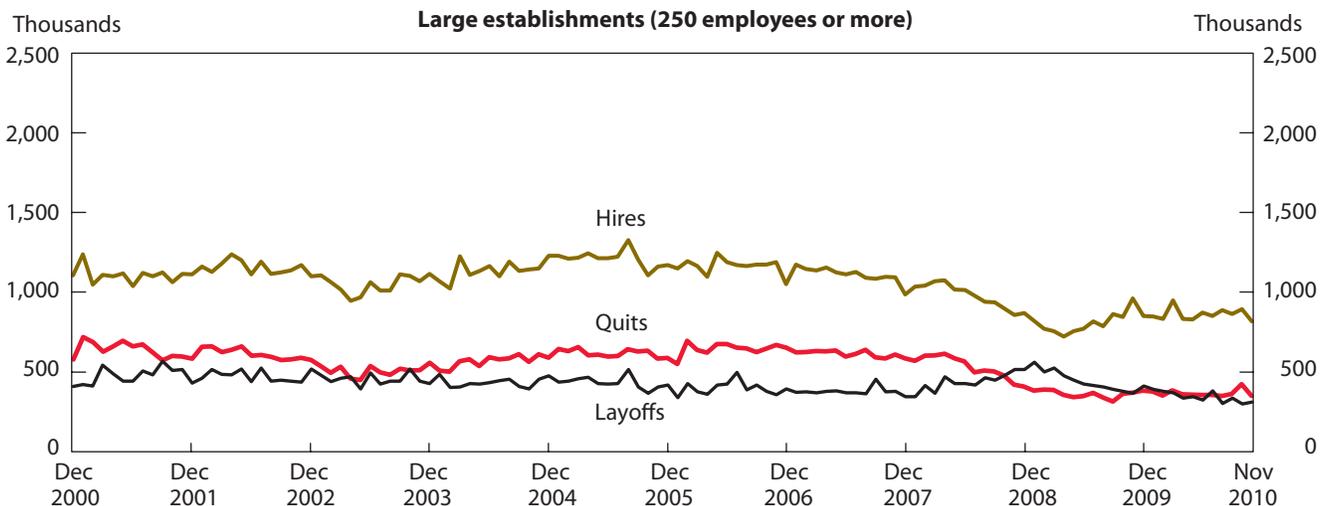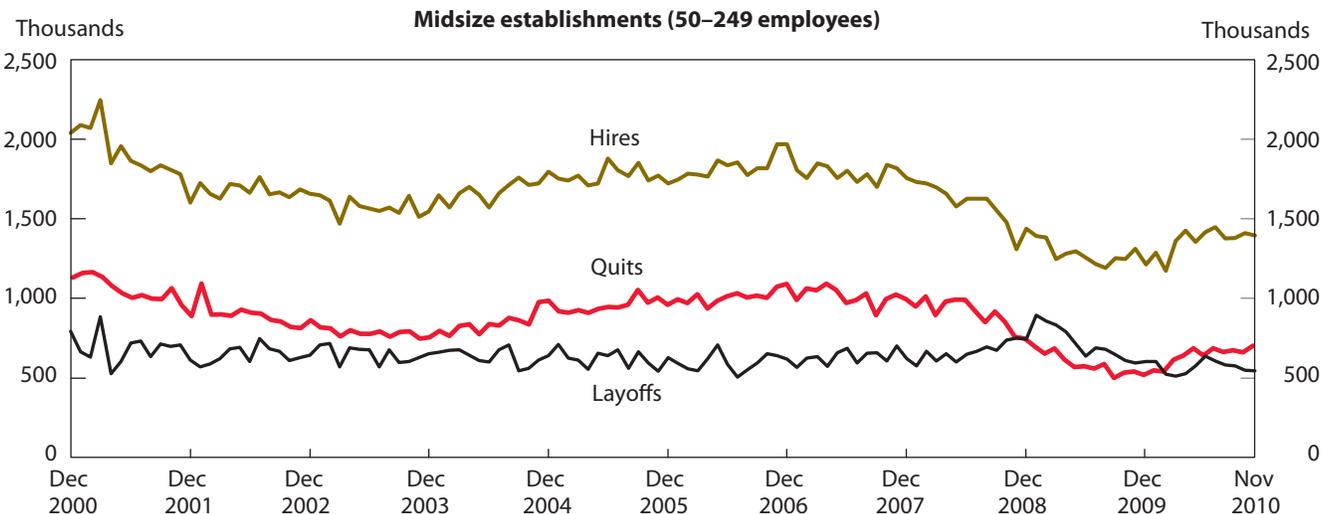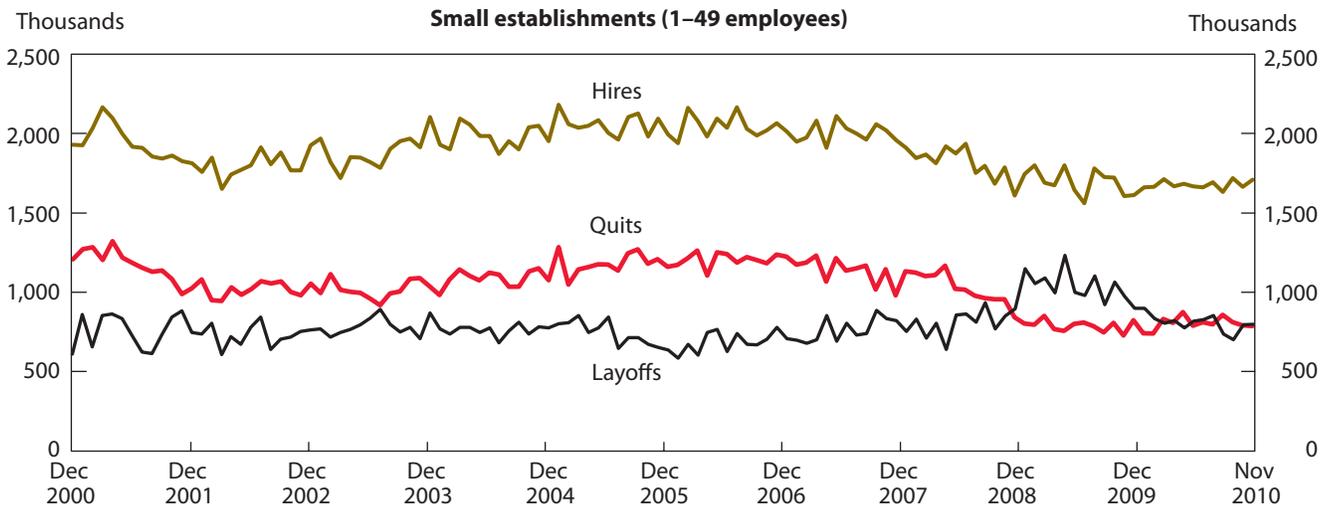
Small establishments (1–49 employees)

Midsize establishments (50–249 employees)

Large establishments (250 employees or more)

SOURCE: Unofficial Job Openings and Labor Turnover Survey data from the Bureau of Labor Statistics.

midsize establishments, and the third panel does the same for large establishments. Shortly after the financial panic reached its peak in September 2008, a large number of workers were laid off from small establishments. The level of layoffs by small establishments peaked in April 2009, after which layoffs began to trend down. From the start of the recession to the fall of 2009, hiring by small businesses declined at a moderate but persistent pace, and the pace did not accelerate during the financial crisis.

The experiences of midsize and large establishments around the time of the financial crisis were notably different. Midsize establishments and large establishments responded by sharply cutting back on hiring in the months immediately after the crisis, and although they also increased the number of employees they laid off, the increase was not as large as that effected by the small establishments. Of course, the net effect is that total employment contracted severely across establishments of all sizes in the months following the crisis. Hiring started to increase at medium-size and large companies around the time that the recovery began in 2009, but remained low for small establishments. The job openings rate (not shown) declined precipitously for the large companies starting in September 2008, and when it began to rebound after the spring of 2009, it rebounded more strongly for large companies than for small companies.

JOLTS data versus BED data

BED data are based on data from the Quarterly Census of Employment and Wages and consist of gross job gains and gross job losses from expanding and contracting companies. The BED data by size class of employer differ from the JOLTS size-class data in a number of respects: the BED data are available by firm size, not establishment size; the BED data represent net movements in employment of individual firms, whereas the JOLTS data consist of gross flows (hires and separations) from which net employment changes can be derived; and the BED data are derived from the universe of covered employers, whereas the JOLTS data are estimated from a sample of 16,000 establishments. Despite these differences, to the extent that employment changes by business size in the JOLTS and BED data are similar, the two data sources reinforce each other.

The most recent available BED data as of this writing are displayed in chart 3, where the periods used are again the recession and a period following the recession. The chart shows net employment changes for three categories

Chart 3. Average monthly job growth as a share of initial employment, by firm size, fourth quarter 2007 through second quarter 2009 and third quarter 2009 through third quarter 2010

Legend: 4th quarter 2007–2nd quarter 2009 ; 3rd quarter 2009–3rd quarter 2010
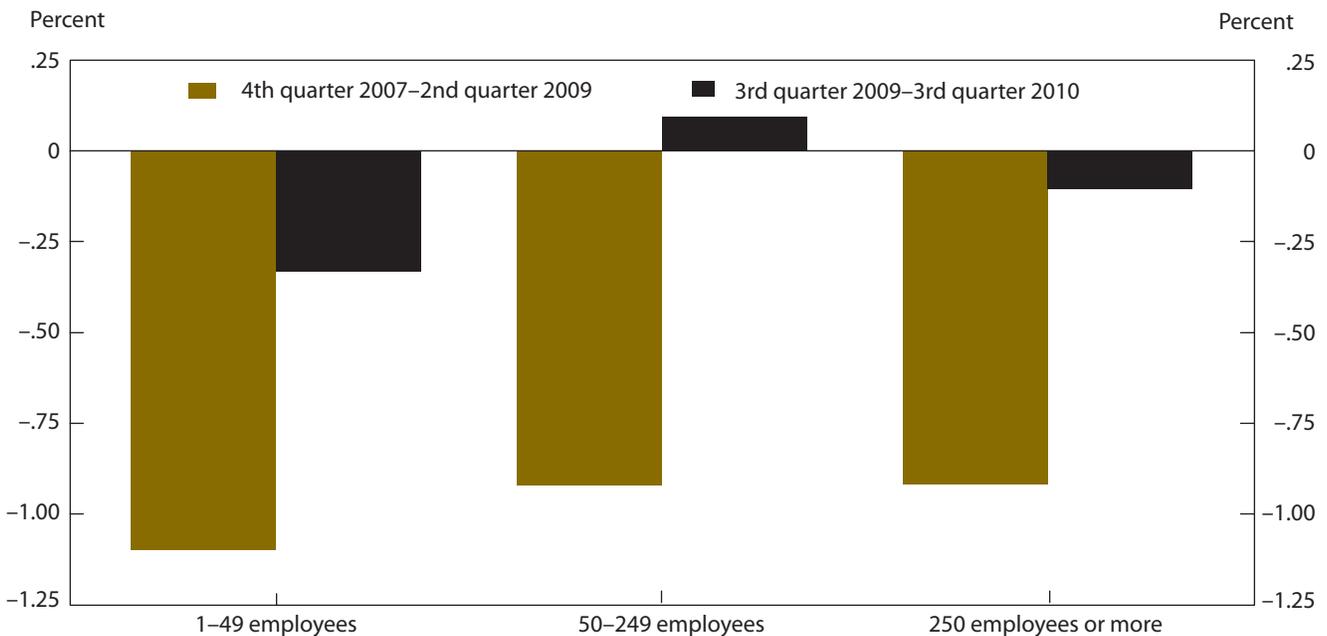
SOURCE: Business Employment Dynamics data from the Bureau of Labor Statistics.

of firm size. Like the JOLTS data, the BED data show that employment contracted by a greater percentage in small companies than in big companies during the recession. The BED data show employment still contracting in the first five quarters of the recovery, although it contracted more for the small companies than for larger companies, consistent with the weaker performance of small establishments in the JOLTS data (shown in chart 1).

Chart 4 shows quarterly movements in the JOLTS data by establishment size and the BED data by firm size for early 2001 to late 2010. Both the JOLTS and BED data tend to move closely together in each of the size categories, although the BED data show a considerably steeper decline in employment during the recession among companies with 250 or more employees than is evident in the JOLTS series for establishments with 250 or more employees. One possibility is that small establishments that belonged to large companies contracted sharply during the recession, causing the difference between the two series in the largest size category.

The following text tabulation shows the correlations between the BED and experimental JOLTS series for the first quarter 2001–third quarter 2010 period:

	JOLTS, small	JOLTS, medium	JOLTS, large
BED, small........	.85	.87	.73
BED, medium...	.83	.79	.88
BED, large	.87	.78	.83

The correspondence between the BED and JOLTS data by size is fairly strong. The correlation in quarterly net job growth over 10 years between the JOLTS and BED data for employers with fewer than 50 employees, for example, is 0.85. The correlations are similarly strong across size categories and within them, however, which suggests that job-market-wide trends are dominant in the data or that the JOLTS data are insufficiently sensitive to size-specific movements, perhaps because of the crudeness of the benchmarking and alignment procedure. The fact that, within the JOLTS data the correlation in job growth between small and large establishments is 0.49, whereas within the BED data the correlation in job growth between small and large companies is 0.86, weighs against the latter interpretation.

Overall, there is no evidence from the available BED data that one would have been led astray by relying on the JOLTS data to infer comparative job growth trends by business size category, and the fact that the JOLTS data can be produced with much less of a lag than the BED data is

an important benefit of the JOLTS data. If the pattern of job growth by business size in the JOLTS data holds in the BED data, one would expect to see stronger job growth in the BED data among the largest companies when the next quarter of data becomes available.

JOLTS data versus NFIB survey data

Since 1973, the National Federation of Independent Business (NFIB) Research Foundation has conducted a regular survey of its members on economic trends. The NFIB's key employment question is, "During the last three months, did the total number of employees in your firm increase, decrease, or stay about the same?" The NFIB subtracts the number of firms that reported a decrease from the number that reported a increase and divides the difference by the total number of firms in the sample that respond to the survey. The NFIB sample size has varied from 380 firms to 2,114 firms per month over the past 5 years; in the October 2010 survey, the response rate was 18 percent.[7] According to the NFIB, its typical member has about 10 employees, so it seems appropriate to compare the NFIB data with data from the JOLTS small-establishment category. The NFIB indicator has the advantage of being timely, as it is released shortly after the survey is conducted.

There are many important differences between the experimental JOLTS data and the NFIB survey data: the NFIB sampling frame is its membership of primarily small companies, while the JOLTS sample frame is small establishments; the NFIB data reflect only the net percentage of companies expanding in employment as opposed to contracting or remaining unchanged, not the magnitude of employment changes; the NFIB data pertain to the past 3 months, whereas the JOLTS data pertain to the past month; and the NFIB sample size is considerably smaller than the JOLTS sample size, even for small businesses, so the NFIB figures are likely to reflect considerably more sampling variability. Nevertheless, one would have more confidence in an experimental JOLTS series that is reasonably highly correlated with the NFIB employment measures.

To compare the JOLTS series with the NFIB series, we averaged the JOLTS data for establishments with fewer than 50 employees over the preceding 3 months. Chart 5 shows that the JOLTS and NFIB employment measures tend to move together, although there is considerable volatility in the NFIB series. The correlation between the two series is 0.78, which is impressive given the discrepancies between the constructs measured by the two series and the high sampling variability (especially in the NFIB series). Interestingly, the correlation with the NFIB data weakens

Chart 4. Net employment at firms (quarterly BED data) and hires less separations at establishments (quarterly averages of JOLTS data), by size, first quarter 2001 through fourth quarter 2010
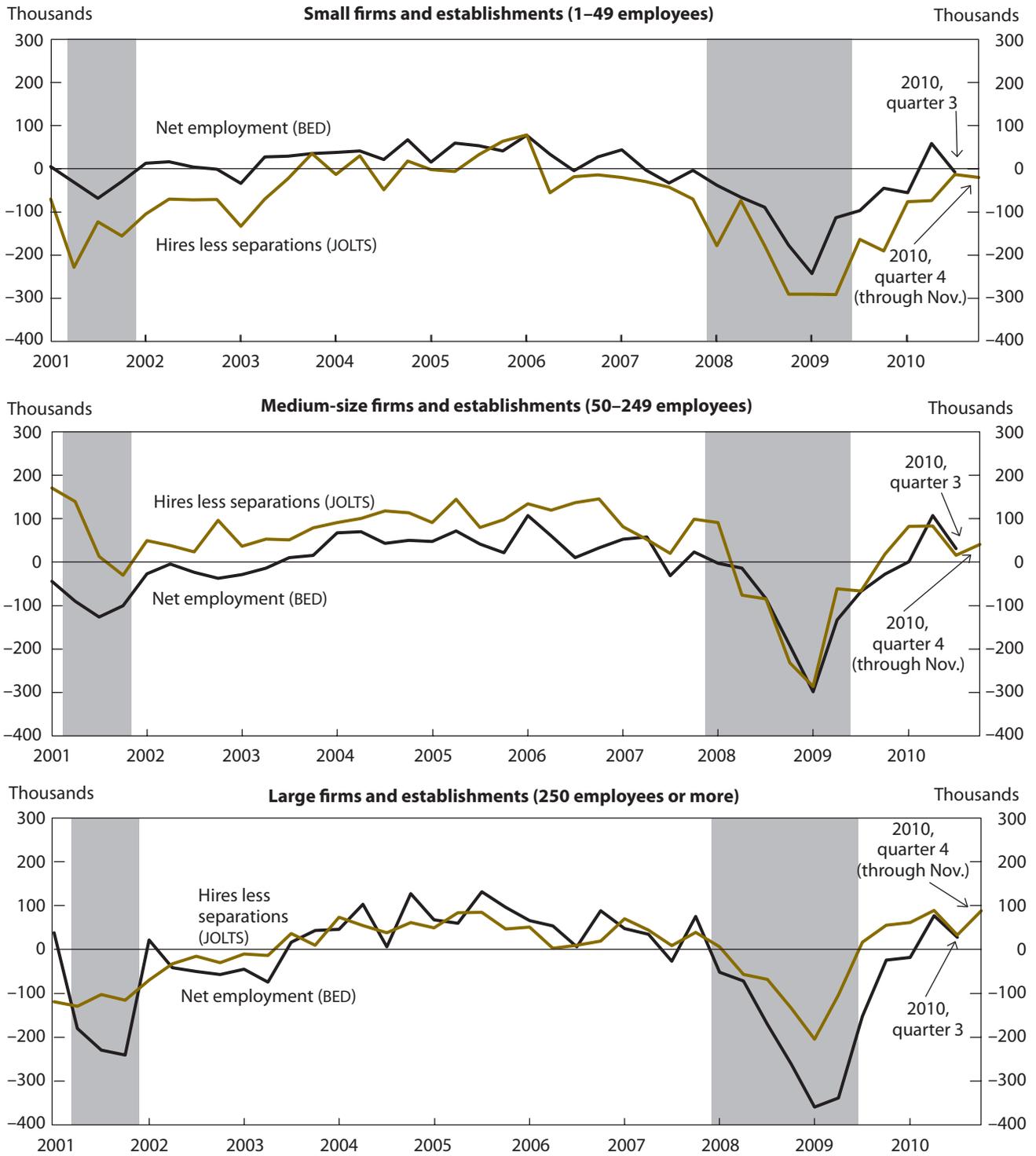
Small firms and establishments (1–49 employees)

Medium-size firms and establishments (50–249 employees)

Large firms and establishments (250 employees or more)

NOTE: The shaded bars denote National Bureau of Economic Research (NBER)-designated recessions.

SOURCES: The net employment data on small firms are from the Business Employment Dynamics program, and the hires-less-separations data are unofficial data from the Job Openings and Labor Turnover Survey.

if the JOLTS series for medium-size establishments (r = 0.70) or large establishments (r = 0.50) is used in place of the series for small establishments, which suggests that the JOLTS data for small businesses are indeed reflecting trends specific to the small business sector.

Another question in the NFIB survey asks companies if they expect to increase employment, decrease employment, or keep it about the same in the next 3 months. The bivariate correlation between the net percentage expecting to increase employment according to the NFIB survey and the average employment change over the next 3 months according to the experimental JOLTS series is 0.73. Thus, the NFIB survey data series does appear to have some predictive power for future movements in the JOLTS series.

JOLTS data versus other indicators

This article also compares the experimental JOLTS series with two other employment series: the ADP (Automatic Data Processing, Inc.) National Employment Report and the Intuit small business employment series. The ADP data are developed and produced on a monthly basis by Macroeconomic Advisers, LLC. Macroeconomic Advisors estimates employment by using an econometric model based on the performance of the payroll processing company ADP's private sector clients as well as recent CES data. ADP data are available for three size classes: small businesses (1–49 employees), medium businesses (50–499), and large businesses (500 or more).[8]

The correlation between the monthly change in ADP's employment measure for small businesses and the experimental JOLTS data for small establishments is 0.81 over the period from February 2001 to November 2010. For medium-size businesses the correlation between the ADP and JOLTS series is 0.77, and for large businesses the correlation is 0.82. These correlations are in the same ballpark as those cited earlier between the BED data and the JOLTS data.

The Intuit data series is based on Intuit's small business online payroll clients and was developed by the economist Susan Woodward together with Intuit. The Intuit series is available only starting in 2007, so the comparison is based on an extremely short time-series, which should be taken with a grain of salt (although the period covered by the series encompasses a business cycle peak, a recession, and the start of a recovery). The micronumerosity

Chart 5. **Hires less separations at small establishments (monthly JOLTS data)[1] and percent net employment change in the past 3 months at small businesses (monthly NFIB data),[2] Jan. 2001–Apr. 2011**

Thousands of *hires less separations*   Net employment change, in percent
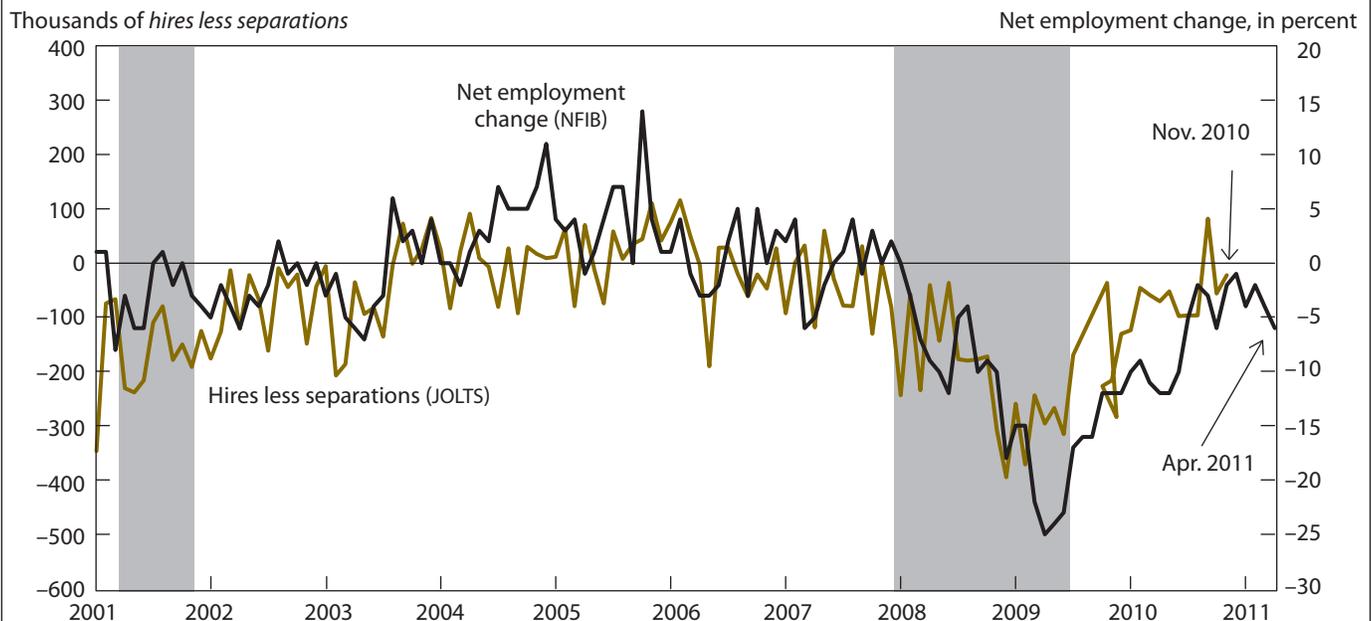
[1] "Small" establishments are defined as those with 1–49 employees.

[2] The businesses represented by the NFIB data average about 10 employees.

NOTE: The shaded bars denote National Bureau of Economic Research (NBER)-designated recessions.

SOURCES: Unofficial Job Openings and Labor Turnover Survey data from the Bureau of Labor Statistics and data from the National Federation of Independent Business.

(shortage of data) concern notwithstanding, the correlation between monthly hires less separations for establishments with fewer than 50 employees in the JOLTS data and the monthly change in "equivalent jobs" in the Intuit series from February 2007 through November 2010 is 0.68.[9] Although both the Intuit and JOLTS data show that employment declined more at small businesses than at other businesses during the 2007–09 recession, the Intuit data suggest a much stronger rebound in employment for small businesses than do the JOLTS or BED data.

THE ANALYSIS IN THIS ARTICLE SUGGESTS that the experimental JOLTS estimates by establishment size move together with other indicators of small, medium-size, and large business job growth. Moreover, the JOLTS data reveal an interesting pattern indicating that small businesses were particularly hard hit by the recession from 2007 to 2009 and were slower than large businesses to increase hiring once the recession ended. Given the timeliness of the JOLTS data and the apparent reliability of the data, it seems that it would be worthwhile for BLS to produce the experimental JOLTS series by establishment size on a regular basis and to continue to pursue its research program on job openings, hires, and separations by establishment size. This conclusion is reinforced by the low costs involved, given that the JOLTS data are already being collected to compute aggregate, regional-level, and industry-level statistics.

One priority for the JOLTS research program would be to explore ways of benchmarking and aligning the JOLTS data that are more sensitive to establishment size. For example, the CES data on employment in individual firms by State could be tabulated by employer size to benchmark and align the JOLTS data by establishment size.[10] This may be a better alternative than benchmarking and aligning the data to aggregate CES employment figures. In addition, BLS could use the same dynamic sizing method for business births and deaths in calculating JOLTS data that it uses in calculating BED data.

A related research topic concerns the difference between hires and separations and the change in employment as recorded in JOLTS. In principle, these measures should be equal (apart from definitional differences in employment), but in practice BLS has found that they are different, and that they are different from job growth as measured by CES estimates. This article's analysis utilized *hires less separations* as a measure of job growth because that indicator is likely to reflect labor market developments more accurately, given that the gross flows pertain to the same establishments whereas the employment figures are for an evolving set of respondents. Nevertheless, it would be a worthwhile research project to explore whether, and if so, how, the direct employment reports in JOLTS could be used to understand performance by establishment size.

Finally, the experimental JOLTS data offer an exciting opportunity to understand how small and large employers respond to economic shocks, and to study other labor market phenomena. For example, Krueger speculates that small businesses responded differently to the financial crisis and subsequent recovery because they had lower fixed costs associated with hiring and laying off workers than large employers, and because small companies had less access to credit.[11] Others have used the JOLTS data to infer structural shifts in the job market from movements in the Beveridge curve. Data on job openings by establishment size can lead to a deeper understanding of reasons for movements in the Beveridge curve. Any theory of shifts in the Beveridge curve, for example, should take account of the fact that job openings rose substantially more for large establishments than for small ones. Continued development and production of the experimental JOLTS estimates by establishment size will help researchers conduct tests of important hypotheses concerning the labor market. □

Notes

[1] See, for example, Carmen M. Reinhart and Kenneth S. Rogoff, *This Time is Different: Eight Centuries of Financial Folly* (Princeton, NJ, Princeton University Press, 2009).

[2] See Mark Gertler and Simon Gilchrist, "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms," *Quarterly Journal of Economics*, May 1994, pp. 309–40.

[3] Allen N. Berger, Nathan H. Miller, Mitchell A. Petersen, Raghuram G. Rajan, and Jeremy C. Stein, "Does function follow organizational form? Lending practices of large and small banks," *Journal of Financial Economics*, spring 2005, pp. 237–69.

[4] JOLTS data from the time of the financial crisis were cited in Alan Krueger's testimony before the Joint Economic Committee on May 7, 2010; in "The perils of being small," *The Economist*, May 13, 2010; and in *The 2010 Joint Economic Committee Report* (Washington, DC, U.S. Government Printing Office, 2010).

[5] To reduce sampling error and facilitate comparisons, for the purposes of this article, the size categories are collapsed into three groups:

small establishments (1–49 employees), medium-size establishments (50–249 employees), and large establishments (250 or more employees).

[6] A description of the methods used in calculating the experimental series is available at **http://www.bls.gov/jlt/sizeclassmethodology. htm** (visited May 2, 2011).

[7] The sample size is larger in the first month of each quarter; see page 19 of **http://www.nfib.com/Portals/0/PDF/sbet/sbet201011. pdf** (visited May 3, 2011) for the sample size each month over the past 5 years.

[8] ADP's sample is the company's customers, which are described as "separate business entities." This group of entities is probably a mixture of establishments and firms, given that the ADP National Employment Report says, "In some cases, small and medium-size payrolls belong to businesses employing more workers than indicated by the size group."

[9] If the same period is used to calculate the correlation in small business job growth between JOLTS data and ADP data, the correlation is 0.80.

[10] Estimates of births and deaths of businesses are incorporated into the experimental JOLTS series by using a birth and death model to account for business births and deaths that may not be captured by the survey. This is performed at the size-class level. We propose that the CES program incorporate the birth and death model in a similar manner, after collecting size-class data.

[11] See the testimony cited in note 4.