Some Thoughts on How to Improve the Job Openings And Labor Turnover Survey

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Slides to Accompany Remarks at The Bureau of Labor Statistics Washington, DC 19 June 2014 (Small edits on 21 June)
Two Topics

1. Strengthening the JOLTS sample
2. Enhancing the JOLTS survey instrument
   - Additional core questions
   - Special modules
Three Related Points about the JOLTS Sample

1. It over weights stable establishments, yielding too little tail mass in the (employment-weighted) C-S distribution of establishment growth rates and too little mass near zero.

2. This weakness is only partly due to missing births and deaths.

3. This weakness was not fully resolved by the 2009 improvements to the JOLTS sample design.
### Table 2. Cross-Sectional Growth Rate Distributions, 2001 to 2006

<table>
<thead>
<tr>
<th>Growth Rate Interval</th>
<th>Monthly, Full Sample</th>
<th>Monthly, Restricted Sample</th>
<th>Quarterly, Restricted Sample</th>
<th>Quarterly, All Observations</th>
<th>Quarterly, Continuous Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2.0 (exits)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.7</td>
<td>---</td>
</tr>
<tr>
<td>(-2.0, -0.20]</td>
<td>1.6</td>
<td>1.5</td>
<td>4.3</td>
<td>7.5</td>
<td>7.6</td>
</tr>
<tr>
<td>(-0.20, -0.05]</td>
<td>7.1</td>
<td>7.0</td>
<td>13.2</td>
<td>16.5</td>
<td>16.7</td>
</tr>
<tr>
<td>(-0.05, -0.02]</td>
<td>7.9</td>
<td>7.8</td>
<td>9.5</td>
<td>9.6</td>
<td>9.7</td>
</tr>
<tr>
<td>(-0.02, 0.0)</td>
<td>14.7</td>
<td>14.6</td>
<td>11.6</td>
<td>7.6</td>
<td>7.8</td>
</tr>
<tr>
<td>0.0</td>
<td>33.6</td>
<td>34.1</td>
<td>17.1</td>
<td>15.4</td>
<td>15.7</td>
</tr>
<tr>
<td>(0.0, 0.02)</td>
<td>16.5</td>
<td>16.6</td>
<td>13.1</td>
<td>7.9</td>
<td>8.0</td>
</tr>
<tr>
<td>[0.02, 0.05)</td>
<td>9.2</td>
<td>9.1</td>
<td>11.7</td>
<td>9.9</td>
<td>10.0</td>
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<tr>
<td>[0.05, 0.20]</td>
<td>7.9</td>
<td>7.8</td>
<td>15.1</td>
<td>16.7</td>
<td>16.9</td>
</tr>
<tr>
<td>[0.20, 2.0)</td>
<td>1.6</td>
<td>1.5</td>
<td>4.5</td>
<td>7.5</td>
<td>7.6</td>
</tr>
<tr>
<td>2.0 (entrants)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.7</td>
<td>---</td>
</tr>
</tbody>
</table>

**Note:** Table entries report employment shares for the indicated establishment growth rate intervals in JOLTS and BED micro data from 2001 to 2006. Calculations on JOLTS data make use of the JOLTS final sample weights described in Section II.A. Each column in the table reports results for a different data set or sample. See the text for a detailed explanation of how the data sets and samples differ.

The Missing Tail Mass Is Only Partly Due to Establishment Births (Entry) and Deaths (Exit)

Figure 3. Cross-Sectional Densities for Establishment Growth Rates, 2001-2006

Notes: The densities are constructed as smoothed histograms of quarterly employment growth rates using establishment-level observations in JOLTS (restricted sample) and BED (all observations) from 2001Q1 to 2006Q4. Histograms are constructed over the full growth rate distribution, but the figure zooms in on growth rates from -25 to 25 percent per quarter. Histogram bins are narrower for smaller growth rates and allow for mass points at growth rates of -2.0 (exit), 0 (no change) and 2.0 (entry).

Sources of Missing Tail Mass and Over Weighting of Stable Units

1. Missing births and deaths

2. Missing young establishments
   – Very young establishments are much more volatile than older units

3. Survey nonresponse rates that vary systematically with establishment growth rates (and, hence, with rates of hires, separations, and job openings)
   – The main concern here is lower response rates among rapidly shrinking units.
Why It’s Essential to Get the C-S Growth Rate Distribution Right

Source: Davis, Faberman and Haltiwanger (2012a) using JOLTS micro data pooled over 2001Q1-2010Q2. Employment-weighted averages within narrow growth rate bins, allowing for mass points at -2 (exit), 0 (no change) and +2 (entry).
Zoom-Out of the Previous Chart

Reproduced from the web appendix to Davis, Faberman and Haltiwanger (2012a).
Why It’s Essential to Get the C-S Growth Rate Distribution Right

Reproduced from Davis, Faberman and Haltiwanger (2013).

**Figure IV**

Vacancies and Establishment Growth in the Cross Section, JOLTS Data
Unresolved Weaknesses in the JOLTS Sample

“[A]t any given time the JOLTS sample is constructed from panels from three different sampling frames, the most current being slightly over one year old and the oldest being slightly over three years old.” (Quoting BLS at http://www.bls.gov/jlt/methodologyimprovement.htm.)

A. Thus, the sampling frames used to construct the JOLTS sample exclude youngest establishments.

B. Very young establishments are much more volatile than older establishments.

C. Even conditional on growth rate, the youngest establishments have high worker turnover.
Capturing Younger Units in the JOLTS Sample

Again quoting BLS at

http://www.bls.gov/jlt/methodologyimprovement.htm:

To better reflect the impact of younger establishments in the JOLTS sample, BLS has modified the JOLTS sample design in the following ways. First, when a new set of panels is selected each year, the birth units in the sample (those not in existence on the previous year’s frame) will be initiated for collection first, rather than waiting until their associated panel is initiated. Second, each quarter the newly updated LDB will be reviewed to identify birth establishments and a supplemental sample of these units will be drawn and added to the survey; at the same time, out-of-business units will be dropped from the sample on a quarterly basis. Thus, the JOLTS sample will be refreshed quarterly rather than annually. Third, the entire sample of old plus new panels will be poststratified and re-weighted annually to represent the most recent sampling frame; at present, this is not done for sample drawn from earlier frames. This procedure will make the sample more efficient than at present.

Clearly a step in the right direction …
Capturing Younger Units in the JOLTS Sample

... But it’s not clear to me what the quarterly sample refreshment means for the (average) lag between establishment birth and sample inclusion. It appears that a substantial lag remains (>1 year?).

Annual, rather than quarterly, post-stratification and re-weighting is also a source of concern.

Moreover, this process yields no direct information on the extent of job openings and worker flows at new and very young establishments.
Correcting for Missing Tail Mass and the Over Weighting of Stable Units

Reweight the JOLTS micro data so the C-S distribution of growth rates matches that of the BED

Updating from Davis, Faberman, Haltiwanger and Rucker (2008), applying their methodology using JOLTS and BED micro data.
Correcting for Missing Tail Mass and the Over Weighting of Stable Units

Updating from Davis, Faberman, Haltiwanger and Rucker (2008), applying their methodology using JOLTS and BED micro data.
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Percent of Employment

Quits (Monthly Avg)

Published Quits (Monthly Avg)
Correcting for Missing Tail Mass and the Over Weighting of Stable Units

Why does the correction matter less for quits than for hires and layoffs? Because (a) the quits-growth relation is flatter, as shown on slide 6, and (b) conditional on own establishment growth rate, quits vary more over time than other worker flows. See Davis, Faberman and Haltiwanger (2012a).

Updating from Davis, Faberman, Haltiwanger and Rucker (2008), applying their methodology using JOLTS and BED micro data.
Notes on DFHI (2008) Methodology

The correction methodology developed and implemented by Davis, Faberman, Haltiwanger and Rucker (2008) is designed to address the three sample weaknesses summarized on Slide 5 above.

Their methodology does not address the issue noted in Point C on Slide 9. The upshot is that even the DFHI-corrected worker flows and job openings are too low.
Re the JOLTS Business Birth/Death Model


“The birth/death model also uses historical JOLTS data to estimate the amount of “churn” (hires plus separations) that exists in establishments of various sizes. The model then combines the estimated churn with the projected employment change to estimate the number of hires and separations taking place in these units that cannot be measured through sampling.”

But size is a poor basis for imputing churn (and job openings) to young establishments for two reasons:

- Size does not adequately proxy for age as a determinant of business volatility – i.e., young units exhibit much greater dispersion in growth rates, even conditional on size.
- Young units, by construction, have low-tenure workers → Even conditional on growth rate, young units have high rates of churn and a greater propensity for openings to meet their high need for replacement hires.
Job Creation and Destruction Rates are **Much Greater at Very Young Units**, Conditional on Size

![Graph showing job creation at the establishment level](image-url)

Reproduced from Figure W.10 in Haltiwanger, Jarmin and Miranda (2012), who use the Longitudinal Business Database, which contains annual observations on nonfarm employers.
Job Creation and Destruction Rates are Much Greater at Very Young Units, Conditional on Size

Reproduced from Figure W.10 in Haltiwanger, Jarmin and Miranda (2012), who use the Longitudinal Business Database, which contains annual observations on nonfarm employers.
The very young units missing from the JOLTS sample frame have even greater job creation and destruction rates than shown for the “1-2” years category in the previous two charts.
Why Does It Matter? Because Worker Flows Closely Track Job Flows in the C-S

Figure 6. Worker Flow Rates as a Function of Establishment-Level Growth

Reproduced from Davis, Faberman and Haltiwanger (2012a).

Source: Authors’ calculations using JOLTS establishment data pooled over 2001Q1 – 2009Q2. Estimates are employment-weighted averages of the establishment-level growth rates within intervals that increase in width with the absolute value of the growth rate. Save for the endpoints and zero growth point, estimates are smoothed using a 3-bin moving average.
Again quoting BLS at http://www.bls.gov/jlt/methodologyimprovement.htm:

“Additionally, job openings for the modeled units are estimated by computing the ratio of openings to hires in the collected data and applying that ratio to the modeled hires.”

But the ratio of openings to hires varies greatly with the growth rate of establishments. In particular, rapidly growing establishments exhibit a much greater vacancy yield than the average unit, i.e., a much lower ratio of openings to hires. See the chart on the next slide.

Of course, new establishments have very high growth rates. So it makes sense to impute their ratio of openings to hires based on the experience of other units with very high growth rates.
Vacancy Yields in the C-S of Growth Rates

Reproduced from Davis, Faberman and Haltiwanger (2013).

Figure V

Vacancy Yields and Establishment Growth in the Cross Section
Suggestions for Improvement

1. Periodic revisions to JOLTS statistics should be based on reweighting the JOLTS sample to match the C-S distribution of growth rates in the Bureau’s Longitudinal Database (LDB).

2. Develop direct observations on worker flows and job openings in new and very young units.
   – Retrospective surveys of young units as soon as they are captured by the JOLTS sample frame.
   – Near real-time surveys of new and young units using samples of convenience.
Suggestions for Improvement

3. Replace current imputation values in JOLTS birth/death model with values based on rates in actual new units from 2.
   – Absent data from 2, impute worker flows and openings for entrants and exits based on average values among units with most positive and negative growth rates. See DFHI (2008) for details.

4. Use new data from 2 to impute rates of worker flows and job openings to young units in the “gap” period prior to their capture in the JOLTS sample frame. Absent such data, impute based on growth rate as in DFHI (2008).
Suggestions for Improvement

5. Investigate how survey nonresponse rates vary with employer growth rates in the C-S.
   – Easily done by merging the JOLTS sample (including non-respondents) with the LDB.
   – Lower response rates for exits and sharply contracting units imply that average rates in region-industry-size cells understate separations (esp. layoffs) and overstate hires and openings.
   – Because the C-S growth rate distribution moves over time, this source of bias has a potentially important cyclical component. See DFHI (2008).
   – A special study of non-respondents would also be helpful.
     • Key question: Is it sufficient to condition on growth rates (in addition to size, industry, region) when imputing worker flows and job openings to non-respondents?
Enhancing the JOLTS Survey Instrument

1. Suggestions for new core survey questions
2. Additional suggestions, perhaps for special modules
New Questions for the Core Survey

For units that report job openings >0, questions pertaining to minimum qualifications. Example:

Q1: How many of your job openings require at least a high school diploma or GED? How many require at least a four-year college degree?

There is also much value in questions tailored to specific industries that elicit information about licensing and certification requirements for open job positions.

Motivation:
• There is great interest in the educational and other qualifications required for open job positions. Journalists frequently pose questions on this topic.
New Questions for the Core Survey

Q2: How many new job positions became open after the last business day of the previous month and were filled before the last business day of the current month?

The precise wording of this question would benefit greatly by field testing, evaluation, and refinement. The goal is to elicit information about the flow of new openings during the month that are filled before the end of the month.

Motivation:
• A large flow of new vacancies are filled within the month. Davis, Faberman and Haltiwanger (2013) show how to infer this flow from JOLTS data, but it would be useful to have more direct evidence to more accurately track vacancies and their relationship to hiring.
New Questions for the Core Survey

For units that report job openings >0:

Q3: How many of your job openings are new this month, and how many carried forward from the previous month?

Motivation:

• Stock-flow matching models posit that the stock of unemployed workers (stock of vacant jobs) matches with the flow of new vacancies (flow of new job seekers). See, e.g., Coles and Smith, (1998), Petrongolo and Pissarides (2001, section 3.5) and Ebrahimy and Shimer (2010).

• Whether stock-flow matching explains hiring behavior better than a standard matching function is a fundamental question about the nature of the job-finding and hiring processes in the labor market.
New Questions for the Core Survey

Motivation (Continued):

• To investigate stock-flow matching directly, and to evaluate its performance relative to a standard matching function, it would be highly informative to have direct observations on the stocks and flows of job seekers and job openings.
  • The CPS yields data on the stocks and flows of unemployed workers.
  • The JOLTS currently provides data on the stock of job vacancies. The missing ingredient is data on the flow of new job vacancies.
• If one maintains the standard matching function as the correct model, data on the flow of new vacancies provide the grist for a straightforward specification test.
Q4: Did you make any hires this month into positions that were not previously the subject of a job opening at your establishment?

If yes, then it would be helpful to consider follow-up questions (perhaps in special modules) that probe the circumstances of such hires:

• How many such new hires were of workers previously leased from a temp agency, who then converted to employee status?
• How many such new hires were converted from independent contractor status?
• How many were opportunistic hires based on the unanticipated availability of an attractive job candidate?
• Why were these new hires not previously the subject of a job opening?
New Questions for the Core Survey

Motivation

• Davis, Faberman and Haltiwanger (2013) develop evidence that many hires are not mediated through job openings, as the concept is defined and measured in the JOLTS. Currently available data sources provide no direct evidence on the frequency, cyclicality and industry mix of hires not mediated through vacancies. There is a large missing hole in our knowledge of how these hires take place, and how many occur.

• Faberman and Menzio (2010) report that 20% of all hires in the Employment Opportunity Pilot Project Survey involve no formal vacancy or recruiting time by the employer. It seems unlikely that these hires would generate job openings as the concept is defined and measured in the JOLTS.
New Questions for the Core Survey

For units that report job openings >0:

Q5: Which of the following methods did you use in the past 30 days to recruit workers into your open job positions? Check all that apply.

Include a check list of employer search and recruiting methods. Examples of possible items for the check list:

- Screening of unsolicited applications
- Using word of mouth to attract applicants
- Encouraging referrals from existing employees
- Help-wanted advertisements in print media
- Help-wanted advertisements on TV or radio
- Use of online job postings
- Use of employee recruiting agencies
- Participating in job fairs
- Interviewing job applicants
- Extending one or more job offers
Check list results can be used to construct an index of recruiting intensity per vacancy, and to explore its variation by employer size and industry and over time.

**Motivation**

- Davis, Faberman and Haltiwanger (2012b, 2013) develop strong evidence that employers rely on other recruiting instruments and methods (in addition to vacancy numbers) to vary the rate of new hires.

- They also show that movements in effective recruiting intensity per vacancy (a) account for a large share of movements in aggregate hires, (b) improve on the performance of the standard matching function in tracking the job-filling rate of vacancies, (c) improve the tracking of job-finding rates for unemployed workers, (d) yield a more stable Beveridge Curve, and (e) help explain the post-2007 breakdown of the standard matching function.
New Questions for the Core Survey

For units that report job openings >0:

Q6: In the past 30 days, have you increased compensation levels for actual or prospective new hires because of tight labor market conditions, or because it is otherwise hard to attract suitable workers?

Motivation:
• There is intense interest in developing better leading indicators for wage pressures. See, for example, Hilsenrath and McGrane (2014).
• The relationship between labor market tightness/slack and wage pressures is a fundamental one for monetary policy, macroeconomics and labor economics.
• By inquiring directly about the connection between perceived labor market tightness and wage pressures, questions like this one would be highly informative.
New Questions for the Core Survey

For units that report job openings >0:

Q7: In the past 30 days, have you relaxed qualification requirements for prospective or actual new hires? If yes, have you done so because of difficulties in attracting applicants who met your previous qualification requirements?

Motivation:
• There is intense interest in whether and how “skill shortages” influence hiring and job creation. This question gets directly at that issue.
Suggested Topics and Questions for Special Survey Modules

1. Collect detailed data on employer search, recruiting and screening methods for the last $n$ job openings and/or last $n$ hires.
2. Collect detailed data about the job qualification requirements and worker qualifications for the last $n$ hires or job offers.
3. Of the last $n$ job offers made, how many were accepted? How many were declined?
4. Of the last $n$ hires (or offers), how many were presented with take-it-or-leave-it wage offers? How many involved bargaining over compensation before or after the (formal) offer? See Hall and Krueger (2012).
Suggested Topics and Questions for Special Survey Modules

• One way to keep the respondent burden to a reasonable level is to ask questions related to 1-4 only about the most recent $n$ job openings, offers, or hires, where $n$ is a small number, possibly 1.

• The German Job Vacancy Survey uses this approach to good effect. See Davis et al. (2014) for an overview of the German survey and references to detailed descriptions in other papers.
5. A job opening gets “filled” according to JOLTS when an offer for the open position is accepted. Typically, there is also a lag between the fill date and the new employee's start date on the new job. This “start lag” may be a few days or several weeks or more.

- To the best of my knowledge, no evidence on start lags is available for the United States.
- Davis et al. (2014) develop evidence for Germany. Start lags average 19 working days, more than half as large as the average recruitment duration (analog to the JOLTS vacancy duration concept).
- Data on start lags, and how they vary over time, would provide useful information about frictions in the hiring process and a new window into labor market slack.
References


References


