

Job Flows

A. Introduction

1. Many economic concepts, including employment, can be analyzed from a flow perspective
2. At a minimum, the level of employment depends on flows into and out of employment
3. Each of these flows may react differently to alternative types of economic conditions and environments
4. Some policies apply to specific types of flows
 - a. economic incentives to entice a plant to locate or relocate to an area
 - b. plant modernization tax credits
5. Analysis of flows is also important to understanding business cycle dynamics and longer-run processes like deindustrialization

B. Concepts and measurement

1. Consider discrete time intervals and in particular the period from $t-1$ to t
2. Will describe flows for sectors but could examine specific firms or aggregate up to the entire employment figure
3. Job creation in sector s , C_{st}

- a. sum of all employment gains experienced by all business units in that sector that expand or start up over the period
 - b.
$$C_{st} = \sum_{e \in S^+} \Delta EMP_{est}$$
 - c. job creation can be further divided into components associated with business expansions and start-ups
4. Job destruction in sector s , D_{st}
- a. sum of all employment losses experienced by all business units in sector s that contract or shut down over the period
 - b.
$$D_{st} = - \sum_{e \in S^-} \Delta EMP_{est}$$
 - c. destruction can be further divided into business contraction and shut-down components
5. Net employment change
- a. this is just the difference between job creation and job destruction
 - b. this figure is widely reported
6. Job reallocation
- a. sum of all business unit employment gains and losses (sum of job creation and destruction)
 - b.
$$R_{st} = \sum_{e \in S} |\Delta EMP_{est}| = C_{st} + D_{st}$$
 - c. measure of turnover or volatility
7. Excess job reallocation

- a. sum of all business unit employment gains and losses beyond those needed to achieve net employment changes
- b. within-sector excess reallocation: $R_{st} - |NET_{st}|$
- c. aggregate excess reallocation can be written and decomposed

$$R_t - |NET_t| = \left(\sum_s |NET_{st}| - |NET_t| \right) + \sum_s (R_{st} - |NET_{st}|)$$

- 1) first term on RHS is between-sector shifts
 - 2) second term on RHS is within-sector shifts
8. Definitions above are stated in terms of filled jobs; however, they could be redefined in terms of particular worker-job matches; when this definition is used, we refer to them as *worker flows*

C. Measurement issues

- 1. Because each of the measures compares employment at two periods of time, the measures require longitudinal data
- 2. Business units
 - a. the best business units seem to be establishments (physical locations where work takes place) rather than firms
 - b. firms can encompass many establishments
 - c. the composition of firms can change through mergers and split-offs; this would add an

establishment to one firm and subtract it from another leading to more apparent job flows

- d. because establishments have a particular physical location, they are simpler to track over time (though there are some difficulties)

3. Time periods

- a. typically depend on the availability of data
- b. can range from quarterly (e.g., ES-202 data), to annual (Survey of Manufacturers, LRD), to every five years (e.g., Census of Manufacturing)

4. Rates

- a. flows are usually described in terms of rates
- b. some problems associated with the choice of a base
 - 1) if $t-1$ is used, it will be difficult or impossible to form rates for start-up firms; will also exacerbate regression-to-the-mean problems
 - 2) if t is used, it will be difficult to form rates for closing firms
- c. hybrid measure, the average employment between time $t-1$ and t , is typically used
 - 1) measure is symmetric around zero
 - 2) bounded by the range -2 to 2
- d. let $Z_{st} = (EMP_{s,t-1} + EMP_{s,t}) / 2$, then the job construction rate is $c_{st} = \frac{C_{st}}{Z_{st}}$; other rates would be similarly defined

- e. some of the awkwardness (arbitrariness) here arises because we are using discrete-time measures for something that is actually a continuous-time, discrete-unit process

5. U.S. data sets

a. Longitudinal Research Database (LRD)

- 1) company-level database originally designed to investigate R&D issues
- 2) universe is manufacturing establishments with at least 5 employees
- 3) primary sources are Census of Manufacturers (universe of plants every five years) and Annual Survey of Manufacturers (universe for large plants, probability sample for smaller plants)
- 4) data form an unbalanced, replenished panel
- 5) special statistical procedures need to be used to address the introduction and deletion of plants from the database

b. Business Employment Dynamics

- 1) source of data is the Unemployment Insurance records in the ES-202 program
- 2) quarterly employment data on all UI-covered establishments, except government employees, private households, and establishments without any employees
- 3) monthly statistics reported by BLS

c. Job Openings and Labor Turnover Survey (JOLTS)

- 1) survey of 16,000 business establishments
- 2) “collects data on total employment, job openings, hires, quits, layoffs & discharges, and other separations”
- 3) monthly reports from BLS

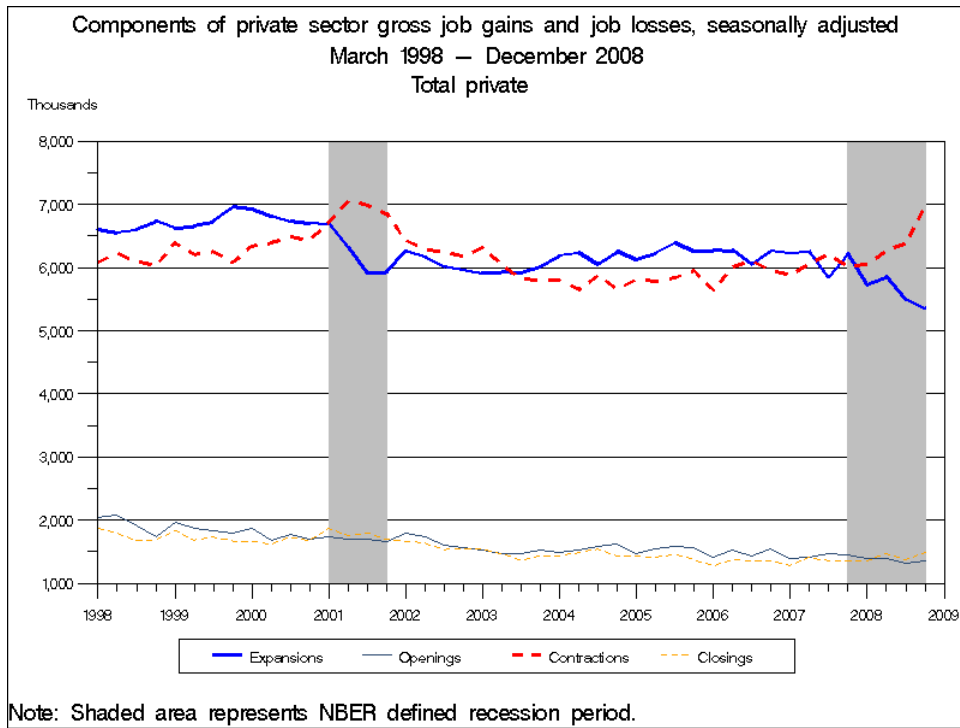
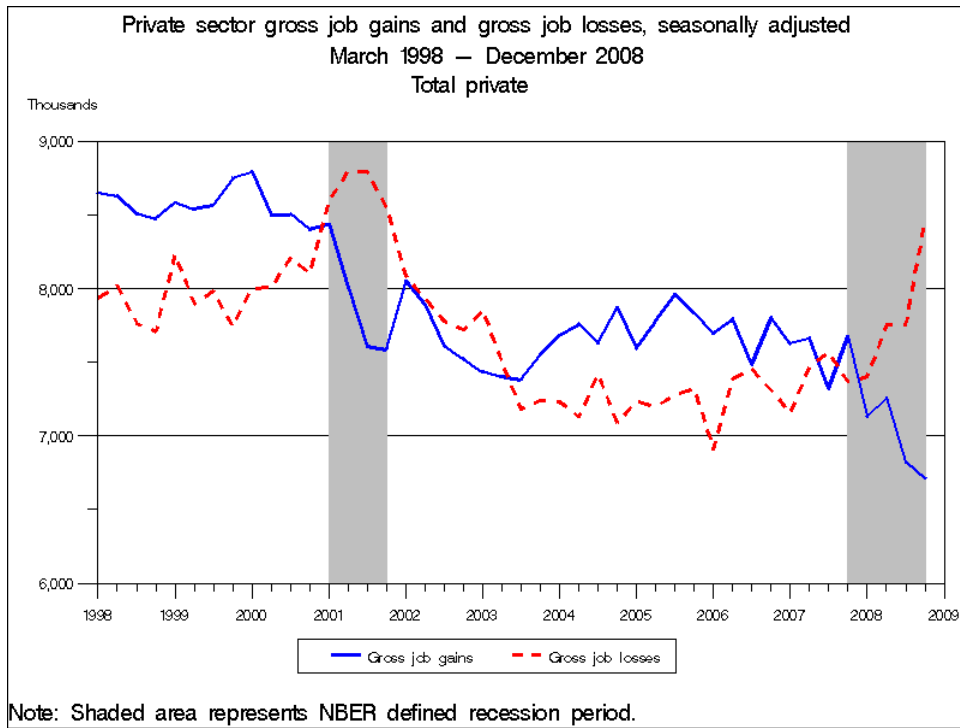
D. Empirical findings

1. Magnitude of job flows

- a. evidence from several different studies suggests that the *annual* rates of job creation and destruction in the U.S. are each roughly 10 percent; *quarterly* rates are closer to 6-7 percent
- b. net jobs in manufacturing establishments in the U.S. have generally been declining by a little over one percent per year, while net jobs in all private sector establishment have been growing
- c. reallocation is substantially larger than net job flows—that is, there is lots of excess reallocation
- d. data from the BED indicate that reallocation rates have been trending downward in recent years; decrease has occurred in all flows
- e. international evidence also indicates that reallocation is substantially larger than net job flows
- f. similar patterns appear within countries for specific industries, though magnitudes differ across industries

2. Persistence

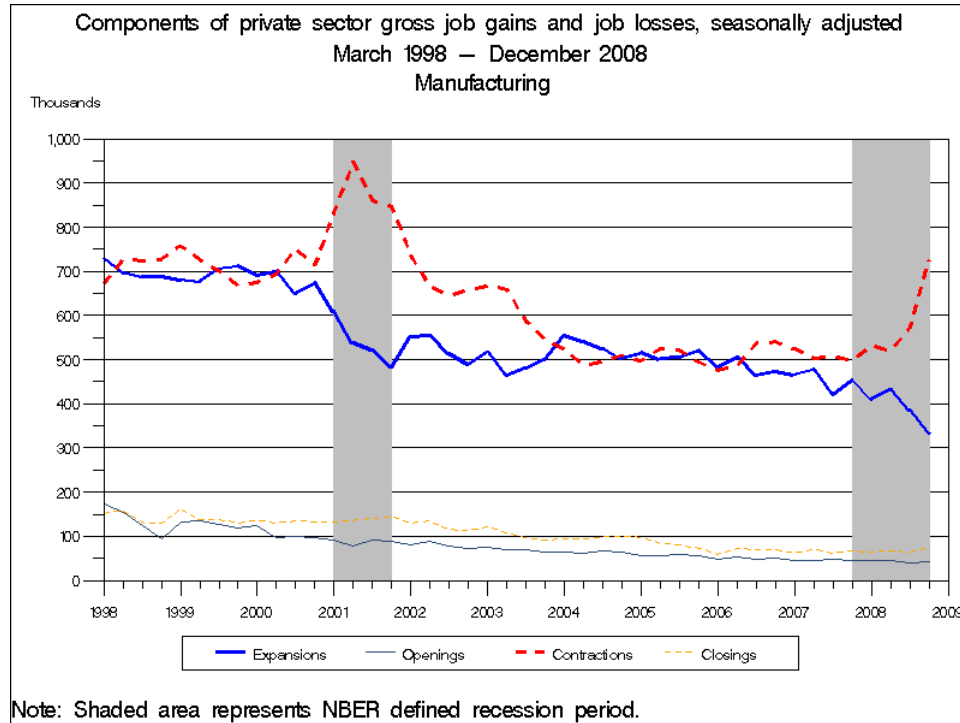
- a. can consider two definitions of persistence
 - 1) percentage of newly created jobs that remain filled for N periods
 - 2) percentage of newly destroyed jobs that do not reappear through N periods
 - b. roughly 70 percent of new jobs in the U.S. last at least a year, and just over half last at least two years
 - c. nearly $5/6$ s of newly destroyed jobs in the U.S. fail to reappear within a year, and roughly $3/4$ s are still empty two years later
 - d. figures are very similar across developed countries
3. Distribution of flows
- a. substantial proportion of flows are concentrated at the extreme ends of the distribution—that is, are associated with births and deaths of plants
 - b. most other flows are clumped near the middle of the distribution—that is, are associated with modest expansions and contractions
4. Cyclical elements
- a. job creation and destruction in manufacturing vary considerably over time
 - b. association is negative but weak
 - c. job destruction in manufacturing is much more volatile than job creation
 - d. quarterly data from BED for all private jobs shown on next page



Source: BLS, “Business Employment Dynamics: Fourth Quarter 2008” news release (Aug. 2009).

5. Variation by employer characteristics in U.S.
 - a. excess job reallocation decreases with employer size

- b. utilities and manufacturing are currently the least volatile industries while natural resource and mining is the most volatile



E. Why should different types of flows vary?

1. There are considerable differences (asymmetries) in the behavior flows
 - a. surprisingly little volatility in flows associated with openings and closings
 - b. more volatility in flows associated with expansions
 - c. most volatility in flows associated with contractions
2. Fixed costs associated with different actions may explain these patterns (see, e.g., Hamermesh 1993)
3. Model of establishment openings

- a. assume that potential entrepreneurs all face a potential profit function that depends on output prices p , wages w , and capital costs r such that

$$\pi = \pi(p, w, r)$$

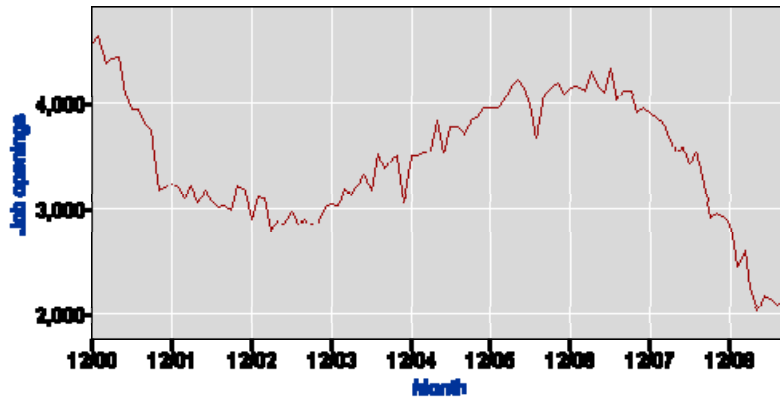
- b. each entrepreneur has her own “reservation profit,” π_i^* and opens an establishment if $\pi > \pi_i^*$
 - c. reservation profit implies that the entrepreneur also has reservation output and factor prices
 - d. assume that production is characterized by
 - 1) fixed costs
 - 2) decreasing, then increasing marginal costs
 - e. under some output and factor price conditions for some potential entrepreneurs, it will not make sense to open a plant
 - f. under other conditions, opening a plant is reasonable
 - g. no “small” openings because of fixed costs
 - h. behavior associated with opening an establishment
 - 1) varies with output and factor prices, but
 - 2) does so in a way that’s different from incumbent establishments
4. Fixed costs and frictions with other decisions
- a. establishment closings
 - 1) costs associated scrapping/selling capital
 - 2) costs associated with the loss of firm-specific human capital

- 3) opportunity cost of being able to continue participating in market (high fixed costs of reopening)
 - b. expansions
 - 1) search costs and delays
 - 2) training costs
 - 3) capital changes
 - c. contractions
 - 1) loss of firm-specific capital
 - 2) however, jobs can be terminated almost immediately
 - 3) capital changes (but lower than expansion)
5. In general, we expect that the fixed costs associated with
 - a. opening and closing establishments will be relatively high
 - b. expanding establishments will be lower
 - c. contracting establishments will be lower still

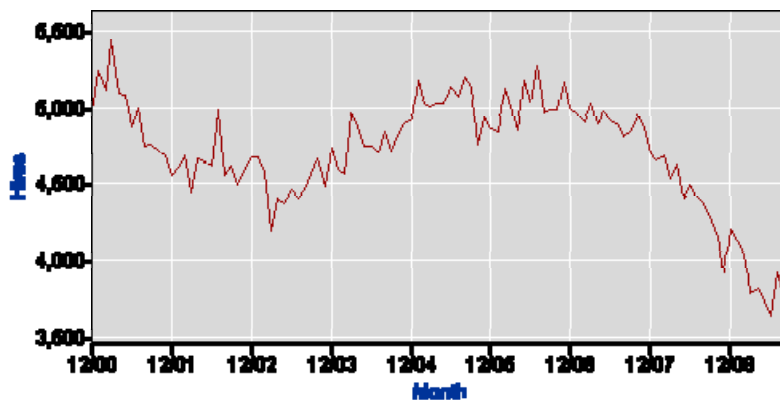
F. Worker flows

1. Worker reallocation is defined as the number of people who either change employers or change employment status in a given period
2. Estimates indicate that it is substantially larger than job reallocation; review by DH indicates that worker reallocation is
 - a. roughly 25 percent of employment per quarter and

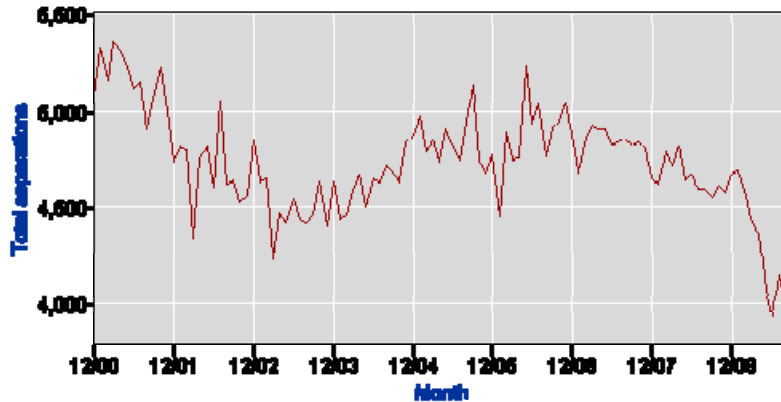
- b. 37 percent of employment per year
 - c. some differences in the specific estimates depending on how employment changes are measured
3. JOLTS estimates
- a. openings



- b. hires



c. separations



4. Linked employer-employee data allow us to examine how worker flows are related to job flows
 - a. most worker reallocation involves accessions or separations from existing job slots rather than flows into or out of newly created or destroyed jobs
 - b. nevertheless, job creation and destruction are substantively important, and job destruction is associated with some job loss for workers (“is not accommodated by normal worker attrition”)
 - c. job loss rates are highly correlated with cumulative job destruction rates
 - d. again estimates are sensitive to data issues

References

Davis, Steven, and John Haltiwanger. "Gross Job Flows." In Orley Ashenfelter and David Card, eds. *Handbook of Labor Economics*. Vol. 3B. Amsterdam: Elsevier Publishers, 1999.

Davis, Steven, John Haltiwanger and Scott Schuh. *Job Creation and Destruction*. Cambridge, MA: MIT Press, 1996.

Hamermesh, Daniel. *Labor Demand*. Princeton, NJ: Princeton, University Press, 1993, chapter 4.