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**Article**

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# Labor Market Flows, Business Dynamics, and Unemployment

Steven J. Davis\*

Measured from establishment-level data on employment gains and losses, job creation and destruction average nearly 8 percent of employment per quarter in the U.S. private sector. Worker flows in the form of establishment-level hires and separations are more than twice as large.<sup>1</sup> These facts summarize the remarkable extent of job and worker flows in U.S. labor markets. They provide powerful motivation for theories of frictional unemployment.

In recent research with several coauthors, I explore the relationship of job flows to worker flows, develop methods to improve the measurement of worker flows, investigate job loss and business volatility trends, and provide new evidence on the determinants of long-term movements in the unemployment rate.

## Job Flows and Worker Flows in the Cross Section

Data from the Job Openings and Labor Turnover Survey (JOLTS) display a very tight link between job flows and worker flows in the cross section of employers. In Figure 1 we see that hires rise a bit more than one-for-one with establishment-level job creation. Separations rise a bit more than one-for-one with job destruction.<sup>2</sup> Further investigation reveals that layoffs are the main margin of employment adjustment for establishments with high job destruction rates, while both quits and layoffs are important margins at moderate destruction rates. Many studies find, not surpris-

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ingly, that layoffs are much more likely than quits to result in unemployment spells.<sup>3</sup> Thus, higher rates of job destruction bring higher layoff rates and greater worker flows into unemployment.

## Pitfalls in Measuring Worker Flows from Employer Survey Data

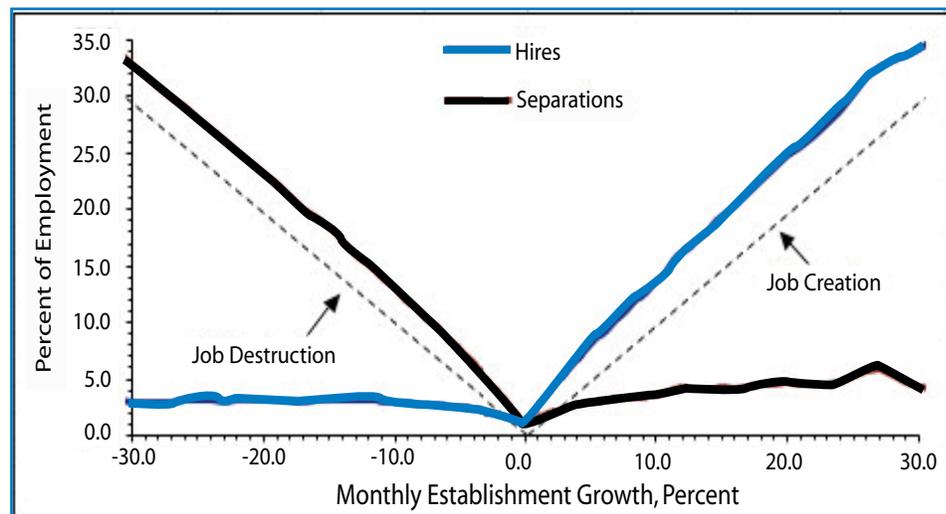
A striking feature of Figure 1 is the highly nonlinear relationship of hires and separations to employer growth rates. These relations exhibit pronounced kinks at zero, steep slopes moving away from zero in one direction, and mild slopes with an opposite sign in the other direction. Similar patterns hold for quits and layoffs.

These highly nonlinear relations create potential pitfalls in the measurement of worker flows from survey data. To see the issue, observe that aggregate hires, for example, are the weighted sum of hires at establishments with different growth rates, with weights given by the amount of

employment at each growth rate. In order to accurately measure aggregate worker flows, it is necessary to combine good estimates for the type of cross-sectional relations in Figure 1 with an accurate measure of the (weighted) cross-sectional distribution of employer growth rates.

Using survey data to construct an accurate measure of the growth rate distribution is challenging for two reasons. First, employer surveys typically capture new establishments with a considerable lag. Entrants account for a disproportionate share of hires and, more generally, newer establishments exhibit a *much* higher incidence of extreme growth rates.<sup>4</sup> Second, survey response rates are correlated with employer growth rates in the cross section. More to the point, and borrowing a line from Robert Hall: the first employee let go from a declining establishment is the person who fills out government surveys. For both reasons, employer surveys tend to produce growth rate distributions with too little mass in the tails. Inspecting Figure 1, it is easy to see why missing tail

Figure 1 — The Relationship of Hires and Separations to Establishment Growth



Source: JOLTS micro data from 2001 to 2006

mass generates a downward bias in worker flow estimates.

My coauthors and I study this issue in the JOLTS program, a leading source of information about worker flows and job openings for the U.S. economy.<sup>5</sup> We verify that the growth rate distribution generated by the JOLTS sample has much less tail mass than that implied by the comprehensive Business Employment Dynamics (BED) database. We also develop a method to correct the problem. The key idea is to reweight the cross-sectional distributions of employment *growth rates* in JOLTS to match the corresponding distributions in the comprehensive BED.

Our adjusted statistics for hires and separations exceed the published statistics by about one third. The adjusted layoff rate is more than 60 percent greater than the published layoff rate. Our adjustments significantly alter time-series properties as well. Aggregate hires are 50 percent more variable than separations in published JOLTS statistics, as measured by the variance of quarterly rates, but 20 percent less variable according to our adjusted statistics. Quarterly quit rates are more than twice as variable as layoffs in published statistics but equally variable according to our adjusted statistics.

### **Secular Declines in Job-Loss Rates before the Great Recession**

American workers faced lower risks of job loss in the years leading up to the Great Recession of 2007–9 than ten, twenty, or thirty years earlier. I review some of the evidence for this claim in “The Decline of Job Loss and Why It Matters.”<sup>6</sup> There, my attention centers on “unwelcome” job loss: employer-initiated separations that lead to unemployment, temporary or persistent drops in earnings, and other significant costs for job losers. Since there is no fully satisfactory statistic for the incidence of job loss, I consider several measures and data sources.

New claims for unemployment benefits as well as employment-to-unemployment flows in the Current Population Survey show dramatic declines in the risk of job loss since the 1970s and early

1980s. Job destruction measures from various sources also point to large declines in the risk of job loss, with a generally downward drift since the 1970s.<sup>7</sup> The much-studied Displaced Worker Survey is an outlier in suggesting that essentially the entire long-term decline in the risk of job loss reflects a recovery from the deep recession of the early 1980s. Other measures point to continuing declines in the risk of unwanted job loss long after the early 1980s. All of this evidence pertains to the period before the Great Recession. Whether job loss rates will return to relatively quiescent levels in the near future remains to be seen.

### **Business Volatility Trends: Privately Held Versus Publicly Traded Firms**

Declining rates of job destruction in the decades leading up to the Great Recession appear puzzling when set against evidence that publicly traded firms became more volatile over the same period.<sup>8</sup> My coauthors and I tackle this puzzle using the Longitudinal Business Database (LBD).<sup>9</sup> This comprehensive database contains annual employment observations for all nonfarm establishments and firms in the U.S. private sector. The LBD enables us to extend the study of business volatility to privately held firms and, together with COMPUSTAT data, to distinguish publicly traded from privately held firms.

We first use LBD employment data to confirm that business-level volatility trended upward for publicly traded firms, rising more than 50 percent from 1978 to 2001. Our central finding, however, is a large secular decline in the cross-sectional dispersion of business growth rates and in the average magnitude of business volatility. This result holds whether we define “businesses” in terms of firms or establishments. Using the same measure as in previous research, the employment-weighted mean volatility of firm growth rates fell by more than 40 percent from 1982 to 2001.

Resolution of the puzzle turns on a remarkable finding: the large upward

trend in volatility among publicly traded firms is overwhelmed by a large downward trend in volatility among privately held firms. It turns out that widespread perceptions of deteriorations in employment stability placed too much weight on developments at publicly traded firms. Privately held firms, hitherto little studied in this context, account for more than two-thirds of U.S. private-sector employment, and they dominate the overall volatility trends.

Digging deeper, we find that two basic patterns hold across major industry groups. First, the volatility and dispersion of business growth rates are much greater among privately held firms. As of 1978, the average standard deviation of firm-level employment growth rates is 3.7 times larger for privately held than for publicly traded firms. This volatility ratio ranges from 2.3 in Services to 6.3 in Transportation and Public Utilities. Second, volatility and dispersion decline sharply among privately held businesses in the period covered by the LBD, and they rise sharply among publicly traded firms. The overall private-public volatility ratio falls to 1.6 by 2001, and it drops sharply from 1978 to 2001 in every major industry group. In other words, there was a pronounced “volatility convergence” between privately held and publicly traded firms.

Employment shifts toward older businesses account for more than a quarter of the volatility decline among privately held firms. The story for publicly traded firms is very different. There was a large influx of newly listed firms after 1979, with about 10 percent of listed firms new each year from 1980 to 2001. Newly listed firms are much more volatile than seasoned listings. Moreover, firms newly listed in the 1980s and 1990s exhibit greater volatility on an age-adjusted basis than earlier cohorts.

These observations point to a major evolution in the economic selection process governing entry into the set of publicly traded firms. Indeed, we find that simple cohort dummies for the year of first listing account for 67 percent of the volatility rise among publicly traded firms from 1978 to 2001. Other researchers find that later cohorts of publicly traded

firms are riskier in terms of equity return variability, profit variability, time from IPO to profitability, and business age at time of first listing.<sup>10</sup>

## Implications for Unemployment

In the canonical equilibrium model of search and matching in the labor market, less job destruction means fewer job-losing workers, smaller unemployment inflows, and lower unemployment rates.<sup>11</sup> It is natural to ask—motivated by the trend declines in business volatility and job destruction—whether this simple mechanism played a significant role in the downward drift of U.S. unemployment rates after the early 1980s.

To address this question, my coauthors and I investigate the low-frequency relationship of unemployment inflows to job destruction and business variability measures.<sup>12</sup> At the aggregate level, the secular decline in these measures roughly coincides with a marked decline in the magnitude of unemployment flows. Inflows, for example, fell from 4 percent of employment per month in the early 1980s to about 2 percent per month by the mid-1990s, and they remained low until the Great Recession.

While suggestive, this aggregate relationship is confounded by other factors that affect the evolution of unemployment flows, including the aging of the workforce.<sup>13</sup> Thus, we turn to industry-specific movements in unemployment flows and their relationship to industry-specific movements in business variability and job destruction. Unlike previous research on unemployment flows, ours focuses on low-frequency relationships and interprets the evidence in light of steady-state properties of a frictional unemployment model.

The industry-level data provide strong evidence that job destruction and business variability measures can explain large changes in the incidence of unemployment. For example, we estimate that a decline of 100 basis points in an industry's quarterly job destruction rate lowers its monthly unemployment inflow rate by 28 basis points with a standard error of 4

basis points. This estimate reflects a specification that controls for industry and time fixed effects. Ignoring time aggregation, the estimate indicates that the response of unemployment inflows over one quarter is 84 percent (three months times 28 basis points per month), as large as the movement in the number of jobs destroyed.

To put this result in perspective, the quarterly job destruction rate for the private sector fell 174 basis points from 1990 to 2005. Multiplying this fall by its estimated effect in the industry-level analysis yields a decline of 48 basis points in the unemployment inflow rate. This response amounts to 55 percent of the drop in the unemployment inflow rate from 1990 to 2005 and 22 percent of its average value. Analogous estimates and calculations based on a different data source imply that falling job destruction rates account for 28 percent of the larger drop in unemployment inflow rates from 1982 to 2005. In short, secular declines in job destruction rates were a major factor behind the long-term drop in unemployment inflows.

What do these results say about the determinants of long-term movements in the rate of unemployment? The average unemployment rate fell by 43 log points from the period 1976–1985 to 1996–2005. Simple accounting shows that this decline is almost entirely attributable to a drop in the inflow rate. This accounting result, when combined with our estimates, implies that the secular fall in job destruction explains about a quarter to one half of the long-term decline in the aggregate unemployment rate. In terms of the canonical equilibrium model of search and matching, this result is consistent with a significant downward trend in the intensity of idiosyncratic labor demand shocks in the quarter century before the Great Recession.

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<sup>1</sup> See S.J. Davis, R.J. Faberman, and J. Haltiwanger, "The Flow Approach to Labor Markets: New Evidence and Micro-Macro Links," NBER Working Paper No. 12167, April 2006, and *Journal of*

*Economic Perspectives*, 20(3) (Summer 2006) pp. 3–24; and S.J. Davis and J. Haltiwanger, "Measuring Gross Worker and Job Flows," NBER Working Paper No. 5133, May 1995, and *Labor Statistics Measurement Issues*, J. Haltiwanger, M. Manser, and R. Topel, eds., University of Chicago Press, 1999.

<sup>2</sup> Figure 1 is reproduced from S.J. Davis, R.J. Faberman, J. Haltiwanger, R. Jarmin, and J. Miranda, "Business Volatility, Job Destruction, and Unemployment," NBER Working Paper No. 14300, September 2008, and *American Economic Journal: Macroeconomics*, 2(2) (April 2010), pp. 259–87.

<sup>3</sup> See the discussion on pages 7–8 of Davis, Faberman, and Haltiwanger (2006).

<sup>4</sup> See, for example, S.J. Davis and J. Haltiwanger, "Gross Job Creation, Gross Job Destruction and Employment Reallocation," NBER Working Paper No. 3728, June 1991, and *Quarterly Journal of Economics*, 107(3) (August, 1992), pp. 819–63; and S.J. Davis et al., "Measuring the Dynamics of Young and Small Businesses," NBER Working Paper No. 13226, July 2007, published in *Producer Dynamics: New Evidence from Micro Data*, T. Dunne, J.B. Jensen, and M.J. Roberts, eds., University of Chicago Press, 2009.

<sup>5</sup> S.J. Davis, R.J. Faberman, J. Haltiwanger, and I. Rucker, "Adjusted Estimates of Worker Flows and Job Openings in JOLTS," NBER Working Paper No. 14137, June 2008, forthcoming in *Labor in the New Economy*, K. Abraham, M. Harper, and J. Spletzer, eds.

<sup>6</sup> *American Economic Review: Papers and Proceedings*, 98(2) (May 2008), pp. 263–67. See also Figures 2 and 3 of Davis, Faberman, and Haltiwanger, 2006; Figure 4 of R. Shimer, "Reassessing the Ins and Outs of Unemployment," NBER Working Paper No. 13421, September 2007; Figure 2 of M. Elsby, R. Michaels, and G. Solon, "The Ins and Outs of Cyclical Unemployment," NBER Working Paper No. 12853, January 2007, and *American Economic Journal: Macroeconomics* 1(1) (January 2009), pp. 84–110.

<sup>7</sup> See Davis, Faberman, and Haltiwanger (2006); Davis et al., “Business Volatility, Job Destruction, and Unemployment”; and R.J. Faberman, “Job Flows, Jobless Recoveries, and the Great Moderation,” Federal Reserve Bank of Philadelphia Working Paper No. 08–11 (June 2008).

<sup>8</sup> See, for example, J.Y. Campbell et al., “Have Individual Stocks Become More Volatile?” NBER Working Paper No. 7590, March 2000, and Journal of Finance 56(1) (February 2001), pp. 1–43; and D. Comin and S. Mulani, “A Theory of Growth and Volatility at the Aggregate and Firm Level,” NBER Working Paper No. 11503, August 2005,

and Review of Economics and Statistics 88(2) (May 2006), pp. 374–83.

<sup>9</sup> S.J. Davis, J. Haltiwanger, R. Jarmin, and J. Miranda, “Volatility and Dispersion in Business Growth Rates: Publicly Traded versus Privately Held Firms,” NBER Working Paper No. 12354, July 2006, and NBER Macroeconomics Annual 2006, Volume 21 2007.

<sup>10</sup> See, for example, E. Fama and K. French, “New Lists: Fundamentals and Survival Rates,” Journal of Financial Economics, 73(2) (August 2004), pp. 229–69; and G. Brown and N. Kapadia, “Firm-Specific Risk and Equity Market Development,” Journal of Financial

Economics, 84(2) (May 2007), pp. 358–88.

<sup>11</sup> The literature is vast. A seminal contribution is D.T. Mortensen and C.A. Pissarides, “Job Creation and Job Destruction in the Theory of Unemployment,” Review of Economic Studies 61(3) (July 1994), pp. 397–415.

<sup>12</sup> S. J. Davis et al., “Business Volatility, Job Destruction, and Unemployment,” *op. cit.*

<sup>13</sup> See R. Shimer, “Why Is the U.S. Unemployment Rate So Much Lower?” NBER Macroeconomics Annual 1998, Volume 13, 1999.

## The Great Society, Food and Nutrition Programs, and Family Well Being

Hilary Hoynes \*

Food and nutrition assistance programs are an important part of the U.S. safety net. In 2009, the Food Stamp Program (FSP) served about 34 million persons at a total cost of \$56 billion and the Supplemental Program for Women, Infants and Children (WIC) served 9 million people at a cost of \$6.5 billion dollars.<sup>1</sup> The goal of these two programs is to improve the nutritional well-being and health of low-income families. In the post-welfare-reform era, the FSP increasingly has become the central safety net program in the United States. It is the only program that is universal—provided to all ages and family types whose income and assets make them eligible—and, unlike

other cash or near-cash assistance programs, it is adjusted each year for changes in the cost of food. From 2008 to 2009, food stamp caseloads increased almost 20 percent.<sup>2</sup>

Both FSP and WIC were developed in the Great Society period of the 1960s and 1970s. They were introduced in direct response to policy recommendations highlighting health deficits among low-income individuals that might be reduced by improved access to food. It was further recognized that by providing food at “critical times” to pregnant and lactating women and young children, it might be possible to prevent a variety of health problems.<sup>3</sup>

Throughout the history of the FSP and WIC, the program parameters were set by the U.S. Department of Agriculture; they are uniform across states. This is unusual, because U.S. states play an important role in setting the generosity of most means-tested transfer programs. Without the state-level variations that economists often use to evaluate transfer programs,

the earlier research on FSP and WIC typically relied in some way on comparing program participants to non-participants.<sup>4</sup> Recently, this approach has come under question. For example, a number of researchers have pointed out that if pregnant women who participate in WIC are healthier, more motivated, or have better access to health care than other eligible women, comparisons between the children of WIC participants and non-participants could produce positive estimates for the program’s results, even if there were none. Conversely, if WIC participants are more disadvantaged than other mothers, then such comparisons may understate the program’s impact.<sup>5</sup> Similar arguments apply to the FSP; in fact several studies find that food stamp participation leads to a *reduction* in nutritional intake. These unexpected results are almost certainly driven by negative selection into the program.<sup>6</sup>

In a series of studies, my coauthors and I have estimated the impact of these food and nutrition programs by exploit-

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