

# Hiring, Job Loss, and the Severity of Recessions\*

BY R. JASON FABERMAN

**T**he hiring and firing decisions of individual businesses are one of the drivers behind movements in the unemployment rate during expansions and recessions. Whether a recession is driven by large job losses or weak hiring will greatly affect the composition and consequences of the unemployed and can have important policy implications. The extent to which recessions are times of weak hiring or high job loss depends in large part on the severity of the downturn. A recession is a time when the fraction of businesses that are expanding goes down and the fraction of businesses that are contracting goes up. A severe recession is one in which the shift in this distribution is more dramatic. In this article, Jason Faberman discusses how the severity of a recession determines whether high job loss or weak hiring will be the more important source of declining employment and rising unemployment through disproportionate changes in the distribution of business-level employment growth.

What drives movements in the unemployment rate during expansions and recessions? Obviously, much of it



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is driven by the hiring and firing decisions of individual businesses. When businesses hire more workers than they lose (whether those workers leave voluntarily or involuntarily), employment expands and the unemployment rate tends to go down. When businesses lose more workers than they

\*The views expressed here are those of the author and do not necessarily represent the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

hire, employment contracts and the unemployment rate rises. This does not mean, though, that boom times are driven entirely by hiring and recessions are driven entirely by job losses. For example, if firms cut back sharply on their hiring with little change in the number of workers they lose, the unemployment rate would rise because people would find it harder to find new work.

Whether a recession is driven by large job losses or weak hiring will greatly affect the composition and consequences of the unemployed and can therefore have important policy implications. Laid-off workers can come from a variety of backgrounds. Oftentimes, these workers lose valuable human capital in the process, especially if the laid-off employees are older, more experienced workers with a lot of job-specific skills. Weak hiring affects all individuals looking for work: those who were recently laid off, those just entering the workforce (e.g., recent graduates), and those who are currently employed but want a new job. Weak hiring implies that there are fewer jobs to apply for, which makes it more difficult for the unemployed to find work.

The recessions of the 1970s and 1980s, as well as the most recent downturn, saw steep declines in employment and sharp increases in unemployment. At the same time, the pace of layoffs was very high but relatively short-lived. In comparison, the fall in employment and the rise in unemployment during the 1990-91 and 2001 recessions were much less severe. During these recessions, there was a moderate rise in job losses but a rela-

tively steep drop in hiring, particularly during the 2001 recession. Furthermore, the 1990-91 and 2001 recessions had declines that persisted well after the official end of the recession.<sup>1</sup>

In academic circles, the contrast in behavior has led to two diverging views on recessions and the labor market. Some economists, such as Robert Hall and Robert Shimer, focus on the more recent downturns and take the view that rising unemployment during recessions is driven by weak hiring and hence a low probability that the unemployed will find a job. Others, such as Shigeru Fujita and Garey Ramey, and Michael Elsby, Ryan Michaels, and Gary Solon, cite the historical evidence and argue that rising unemployment is driven by high rates of job loss.

In reality, the extent to which recessions are times of weak hiring or high job loss depends on the severity of the downturn. Severe recessions are typically characterized by a sharp drop in output and large amounts of job loss, while moderate recessions are characterized by smaller declines in output and relatively weak hiring. These results come about because, at any point in time, there is a *distribution* of businesses that are expanding, contracting, or keeping their employment steady. A recession is a time when the fraction of businesses that are expanding goes down and the fraction of businesses that are contracting goes up. A severe recession is one in which the shift in this distribution is more dramatic. Furthermore, when businesses expand or contract by a certain amount, they tend to do so with a fairly consistent mix of hiring, quits (voluntary worker separations), and layoffs (involuntary worker separa-

tions). Fast-growing businesses tend to have mostly hires, fast-declining businesses tend to have mostly layoffs, and businesses with smaller employment changes tend to have a mix of hiring, quits, and layoffs that occur simultaneously. During a severe recession, the number of businesses with large contractions increases sharply. As a result, the layoff rate at the national level increases drastically. In contrast, a mild recession generally has a smaller increase in the number of contracting businesses, so the resulting drop in hiring at the national level can outweigh the more modest rise in the layoff rate.

## HIRES, SEPARATIONS, AND BUSINESS GROWTH

**The Difference Between Gross and Net Employment Changes.** To understand how the above findings come about, we need to start with the basic fact that the *net* change in employment that we observe from the Employment Situation Report of the Bureau of Labor Statistics (BLS) each month is the result of literally millions of workers either starting or leaving a job at thousands of businesses.<sup>2</sup>

We can examine *gross* changes in employment in two ways: by tracking the movements of the workers or by tracking the employment behavior of the businesses that employ them. Shigeru Fujita details the first approach in an earlier *Business Review* article, and he shows that following the *flow* of workers between employment, unemployment, and nonparticipation in the labor force provides much more information on the state of the

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<sup>2</sup>The statistics in the Employment Situation Report come from two surveys: a monthly payroll survey, Current Employment Statistics, which surveys businesses about their employment, and a monthly household survey, the Current Population Survey, which queries households about the employment behavior of their members.

labor market than looking at, say, the unemployment rate or employment growth alone.

The second approach provides more insights as well, and it turns out to be more useful for our purposes. Using it allows us to relate what are often called *worker flows*, which are the gross amount of hires or separations occurring in the economy, to the employment growth (or decline) at individual businesses. Separations are the sum of all quits, layoffs, and any other type of separation, such as a retirement, and the change in a business's employment is simply the difference between its total hires and total separations. For example, if a business hired three people and had one separation, its employment will have expanded by two jobs. Given that businesses can have hires while contracting and separations while expanding, one can have complex interactions between worker flows and business-level employment growth.

**Movements in National-Level Worker Flows over Time.** Next, we need to know what the national-level patterns of the worker flows look like. The Job Openings and Labor Turnover Survey (JOLTS) of the BLS reports the total amount of hiring, quits, and layoffs at all businesses in the economy each period. The data measure the monthly rates of total hiring and total separations as a percent of total employment, with the latter broken out into quits (those who leave their jobs voluntarily), layoffs (those who are separated involuntarily), and other separations (e.g., retirements).<sup>3</sup> The JOLTS time series begins only in December 2000 but now covers two recessions.

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<sup>3</sup>Other separations are a very small fraction of total separations and vary little with the business cycle, so I ignore them in this article.

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<sup>1</sup>Here, "official" dates refer to the business cycle peaks and troughs as designated by the National Bureau of Economic Research (NBER).

Figure 1 illustrates how the JOLTS aggregate estimates behave over time. The 2001 recession officially started in March and ended in November of that year, but employment losses (as measured by the BLS payroll survey) continued until August 2003. The current recession began in December 2007. Figure 1 shows a clear decline in both hiring and quits during these downturns, suggesting that these two flows are *procyclical*; that is, they rise and fall in sync with economic activity. It also shows a very modest rise in layoffs during the 2001-03 period and a more noticeable increase in the 2008-09 period, suggesting that layoffs are at least somewhat *countercyclical*: Layoffs go up when economic growth goes down.

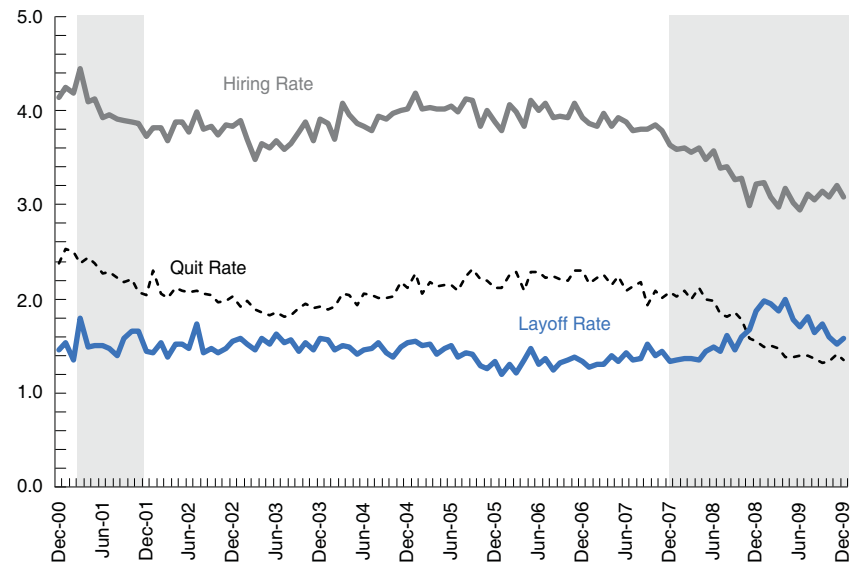
Figure 2 illustrates that other measures of job loss, such as the job destruction rate (a summary measure of employment losses at all contracting businesses) for manufacturing employment reported in the BLS Business Employment Dynamics (BED) data, and the Department of Labor's data on initial unemployment insurance (UI) claims by the recently laid-off, provide stronger evidence of the countercyclical nature of job loss. They also show that the rate of job loss spikes sharply during the deep recessions of the 1970s, 1980s, and the current downturn relative to the rises in the 1990-91 and 2001-03 periods.

**How Business-Level Changes Relate to the National-Level Data.** Finally, we need to know how the hires and separations at the business level aggregate to the national-level statistics observed in Figures 1 and 2. To do so, it is useful to think of the national-level worker flow statistics in Figure 1 as weighted averages of each worker flow rate across individual businesses. The key insight from the weighted average approach will be that movements in worker flows at the

**FIGURE 1**

**Hiring, Quits and Layoffs, 2000-2009, JOLTS Data**

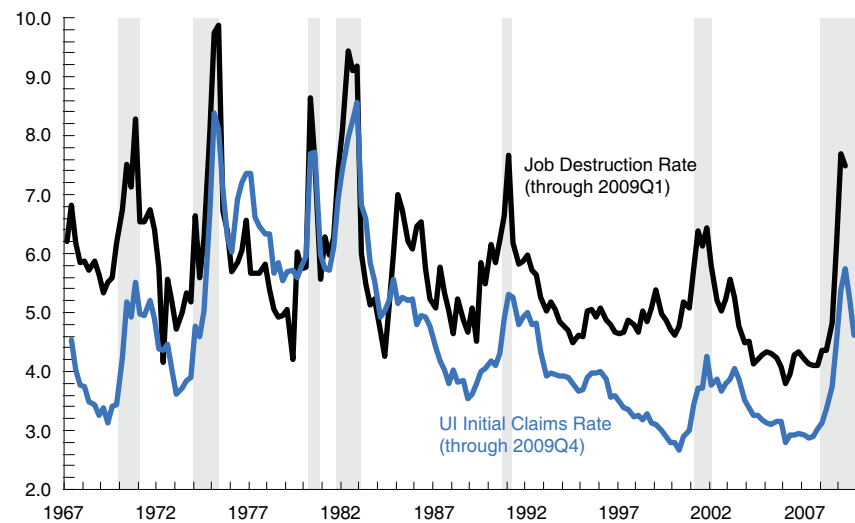
Percent of Employment



Source: Author's tabulations from published JOLTS statistics

**FIGURE 2**

**Quarterly Job Destruction and Unemployment Insurance Initial Claims, 1967-2009**



Source: Job destruction rates are estimates for manufacturing from my working paper, updated through 2009 with published BED data. The UI claims rate is total weekly claims (in all sectors) during the quarter as a percent of total employment, from published UI claims statistics.

national level can come from one of two sources: changes in business-level worker flow rates or changes in the

*distribution* of business-level activity.

For our purposes, we want to relate the worker flows to the business-

level employment growth rates, and the example below illustrates the relationship. It splits all businesses into contracting, stable, and expanding businesses and then calculates the average worker flow rates and employment shares for each group. Suppose that, for a given period, estimates from the business-level micro-data provided us with the employment shares and worker flow rates shown in Table 1.

In Table 1, 25 percent of businesses are losing workers on net, 45 percent have no change in their employment, and 30 percent are adding workers on net. All three groups have some amount of both hiring and separations (defined as the sum of quits and layoffs here). At the contracting businesses, the average separation rate must be higher than the average hiring rate (both measured as percentages of the businesses' employment); otherwise, they would not be contracting. The opposite is true of the expanding businesses. At the stable businesses, the hiring and separation rates exactly offset each other. As we will see below, the numbers in this example are similar to what we observe in an average month in the U.S. data. Stable businesses have the lowest average hiring and separation rates because many of them have no employment changes at all in a given month.

Putting the data in our example together, we get the following formulas for deriving what the national-level hiring and separation rates will be in this case:

$$\text{National-Level Rate} = \left( \begin{array}{c} \text{Share of} \\ \text{Contracting} \\ \text{Businesses} \end{array} \right) \left( \begin{array}{c} \text{Avg. Rate at} \\ \text{Contracting} \\ \text{Businesses} \end{array} \right) + \left( \begin{array}{c} \text{Share of} \\ \text{Stable} \\ \text{Businesses} \end{array} \right) \left( \begin{array}{c} \text{Avg. Rate at} \\ \text{Stable} \\ \text{Businesses} \end{array} \right) + \left( \begin{array}{c} \text{Share of} \\ \text{Expanding} \\ \text{Businesses} \end{array} \right) \left( \begin{array}{c} \text{Avg. Rate at} \\ \text{Expanding} \\ \text{Businesses} \end{array} \right)$$

$$\begin{aligned} \text{National-Level Hiring Rate} &= \\ &(0.25)(2.0) + (0.45)(1.0) + (0.30)(12.0) \\ &= 4.550 \text{ percent} \end{aligned}$$

$$\begin{aligned} \text{National-Level Quit Rate} &= \\ &(0.25)(4.0) + (0.45)(0.5) + (0.30)(2.0) \\ &= 1.825 \text{ percent} \end{aligned}$$

$$\begin{aligned} \text{National-Level Layoff Rate} &= \\ &(0.25)(7.0) + (0.45)(0.5) + (0.30)(1.0) \\ &= 2.275 \text{ percent} \end{aligned}$$

In each case, we see that the national-level estimates average across the hiring or separation rates of the three groups using their share of total employment as a weight. The difference between the national-level hiring rate (4.55 percent) and the national-level quit and layoff rates (1.825+2.275 = 4.10 percent) implies that total employment grew, *on net*, by 0.45 percent. Just as it is in the actual JOLTS data, this is a much smaller number than the 4.55 percent of workers who were just hired this month.

Now, if we were to expand our example to include finer growth rate intervals (e.g., businesses that grow or contract less than 1 percent, 1 to 2 percent, etc.), we would get the following formula:

$$WF_t = \sum_g s_{gt} wf_{gt}$$

where  $WF_t$  is the national-level worker flow rate (i.e., hiring, quits, or layoffs) in period  $t$ ,  $s_{gt}$  is the share of employment at businesses with a growth rate of  $g$  in period  $t$ , and  $wf_{gt}$  is the average worker flow rate for businesses with a growth rate of  $g$  in period  $t$ . Thus, the weighted average expression shows that movements in worker flows at the national level can come from either changes in business-level worker flows (i.e., changes in  $wf_{gt}$ ) or changes in the distribution of business-level employment growth (i.e., changes in the business-level weights,  $s_{gt}$ ).

### THE EVIDENCE ON BUSINESS-LEVEL EMPLOYMENT BEHAVIOR

Figures 3 and 4 illustrate what the “real-world” equivalents of the business-level worker flow rates, the  $wf_{gt}$ , look like. The figures show estimates of the average hiring, quit, and layoff rates as a function of the business-level employment growth rate built from the JOLTS business-level micro-data in my paper with Steven Davis and John Haltiwanger. Figure 3 shows that the hiring rate rises proportionately with the growth rate when growth is positive and

**TABLE 1**

	Contracting Businesses	Stable Businesses	Expanding Businesses
Share of Employment (Employment in Group/ Total Employment)	25.0	45.0	30.0
Average Hiring Rate (Hires/Employment)	2.0	1.0	12.0
Average Quit Rate (Quits/Employment)	4.0	0.5	2.0
Average Layoff Rate (Layoffs/Employment)	7.0	0.5	1.0

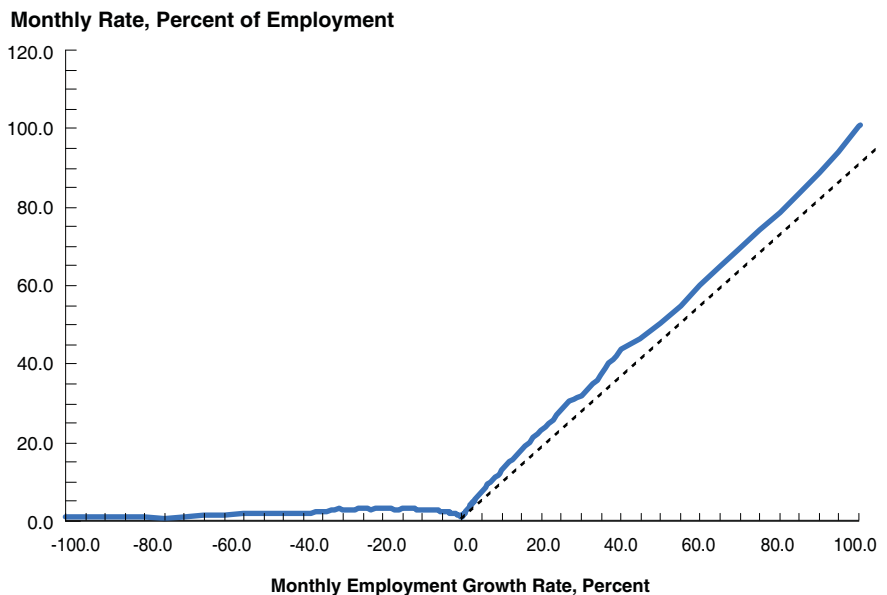
is essentially flat when growth is negative. Figure 4 shows that the layoff rate increases proportionately with the size of a contraction when growth is negative but layoffs are essentially flat when growth is positive. It also shows that the quit rate increases when a contraction is relatively small and that quits are essentially constant (albeit at a higher rate) during larger contractions. Like the layoff rate, the quit rate is essentially flat when growth is positive. Comparing Figures 3 and 4, we see that the hiring and layoff rates at the business level exhibit opposing “hockey-stick” patterned relationships to business-level growth.

The two figures tell us that when a business expands employment by, say, 10 percent, it tends to do so with a hiring rate of 13.5 percent because, on average, 2.5 percent of its workforce will quit and another 1 percent will be either laid off or discharged as it tries to expand. Similarly, when a business wants to contract by, say, 10 percent, it will lay off only 5 percent of its workforce because, on average, 7.9 percent will leave, of which the business will replace 2.9 percent, on average, to counteract some of the turnover.

Figure 5 shows how the shares of employment at businesses with different growth rates, the  $s_{gt}$  terms, change over time by showing the business-level employment growth rate distribution at two points: one for a period of high national-level employment growth (i.e., an expansion) and one for a period of low national-level employment growth (i.e., a recession). As the economy moves from expansion to recession, the distribution shifts to the left, meaning that the  $s_{gt}$  shares for growing establishments go down and the  $s_{gt}$  shares for contracting establishments go up. While the shift may appear subtle, the statistics listed in the figure

**FIGURE 3**

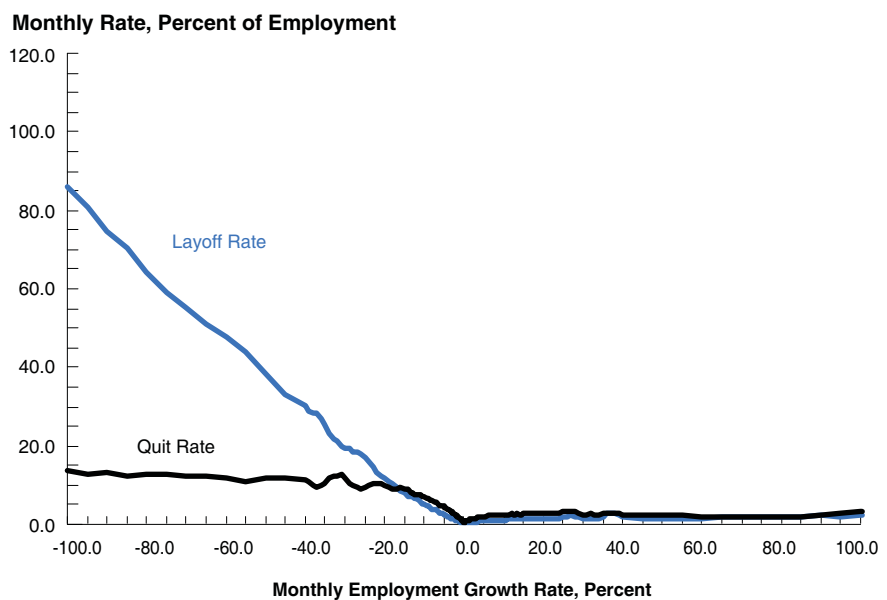
**Hiring vs. Business-Level Growth**



Source: Estimates from my study with Steven Davis and John Haltiwanger, which uses establishment micro-data from JOLTS pooled over 2001-2006. The dashed line represents a 45-degree line emanating from the origin.

**FIGURE 4**

**Separations (by Type) vs. Business-Level Growth**



Source: Estimates from my study with Steven Davis and John Haltiwanger, which uses establishment micro-data from JOLTS pooled over 2001-2006.



show that the changes for businesses with high growth or large contractions are substantial. Moving from an expansion period to a recession period reduces the share of employment at businesses with high growth (greater than 10 percent of employment) from 18.7 percent to 14.1 percent. This reduction corresponds to changes that affect roughly 6.2 million workers.

Figure 5 also shows that the shift in the distribution is *asymmetric*: The shift skews the distribution of employment away from a small range of expanding businesses and toward a broad range of contracting businesses. Figure 5 shows that when moving from expansion to recession, the fraction of employment at high-growth businesses falls 4.6 percent, while the fraction of employment at businesses with a large contraction rises 6.3 percent.

Finally, it turns out that the worker flow rates depicted in Figures 3 and 4 barely change over time, as my research with Steven Davis and John Haltiwanger shows.<sup>4</sup> Therefore, the movements in the national-level worker flows observed in Figure 1 occur primarily through the shifts in the growth rate distribution depicted in Figure 5.

### IMPLICATIONS FOR CYCLICAL EMPLOYMENT CHANGES

The fact that the growth rate distribution tends to have an asymmetric shift when moving into a recession is an important reason some recessions are driven by relatively high job loss, while others are driven by relatively weak hiring. The example in Table 2 shows how an asymmetric shift toward contracting businesses can produce a modest drop in the national-level hir-

ing rate but a considerable increase in the national-level separation rate.

Suppose the economy from the previous example falls into recession, causing the growth rate distribution to shift to the left. Assume that the shift is asymmetric, just as it is in Figure 5.

In the example in Table 2, the fraction of employment at declining businesses rises by 10 percentage points, while the fraction of employment at growing businesses falls by 5 percentage points. The difference is made up by a 5-percentage-point fall in the fraction of employment at stable businesses. We assume that the business-level hiring and separation rates are the same as before, consistent with what we find in the data. Recall that the previous shares of employment at contracting, stable, and expanding businesses produced a hiring rate of 4.55 percent, a quit rate of 1.825

percent, and a layoff rate of 2.275 percent at the national level. With the new employment shares, national-level hiring and separation rates are now:

$$\begin{aligned} \text{National-Level Hiring Rate} &= \\ &= (0.35)(2.0) + (0.40)(1.0) + (0.25)(12.0) \\ &= 4.10 \text{ percent} \end{aligned}$$

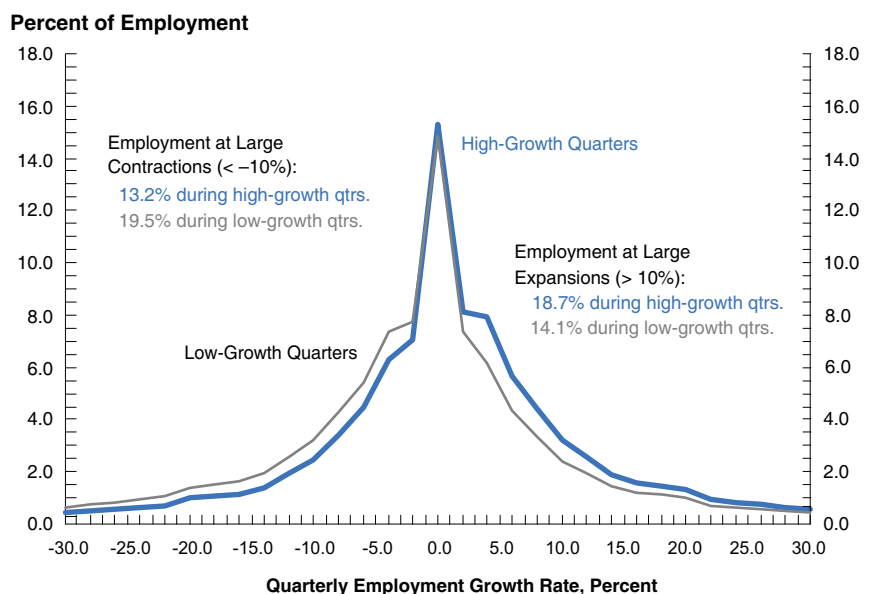
$$\begin{aligned} \text{National-Level Quit Rate} &= \\ &= (0.35)(4.0) + (0.40)(0.5) + (0.25)(2.0) \\ &= 2.10 \text{ percent} \end{aligned}$$

$$\begin{aligned} \text{National-Level Layoff Rate} &= \\ &= (0.35)(7.0) + (0.40)(0.5) + (0.25)(1.0) \\ &= 2.90 \text{ percent} \end{aligned}$$

As the economy moves from expansion to recession, the hiring rate falls from 4.55 to 4.10 percent and the separation rate rises from 4.10 to 5.00 percent. As a result, the national-level employment growth rate moves from +0.45 to -0.90 percent. The labor market is now contracting rather

**FIGURE 5**

### The Distribution of Business-Level Employment Growth



Source: Estimates from my study with Steven Davis, John Haltiwanger, and Ian Rucker, which uses quarterly establishment-level growth rates from BED micro-data from 2001-2006.

<sup>4</sup>In the data, the exception is the quit rate relationship in Figure 4, which shifts down during recessions.

**TABLE 2**

	<b>Contracting Businesses</b>	<b>Stable Businesses</b>	<b>Expanding Businesses</b>
Old Share of Employment (Expansion)	25.0	45.0	30.0
New Share of Employment (Recession)	35.0	40.0	25.0

sharply. Moreover, the change is driven more by the rise in the separation rate (+0.90 percent), particularly the layoff rate (+0.63 percent), than by the fall in the hiring rate (-0.45 percent).<sup>5</sup> Thus, our example produces the same result we find in the data: Severe recessions have relatively high layoff rates, more so than low hiring rates, at the national level.

Besides the asymmetric shift, the other reason our example is able to generate large layoffs during a deep recession is that it assumes that the hiring and layoff rates exhibit the “hockey-stick” relationships we observe in Figures 3 and 4. Since the layoff rate rises sharply with the size of a business’s contraction, larger leftward shifts in the growth rate distribution, that is, larger increases in the share of businesses experiencing a large contraction, will drive the national-level layoff rate even higher. Figure 6 illustrates this phenomenon

<sup>5</sup>The quit rate rises in this example, contradicting its behavior in Figure 1, because, for simplicity, I have assumed away the fact that the quit relationship in Figure 4 is the only one of the three that changes (by shifting down) during a recession. This does not affect the main point of the example, though.

with a hypothetical interaction of the business-level layoff rate with movements in the growth rate distribution. The further the growth rate distribution shifts to the left, the greater is the share of employment at businesses with very high layoff rates. This causes the national-level layoff rate to increase sharply. Since the shift in the growth rate distribution is asymmetric, the rise in the layoff rate is greater than the decline in the hiring rate. In contrast, a mild recession has a relatively small shift to the left, meaning that there is only a small increase in the share of businesses with very high layoff rates, and consequently, the asymmetry plays less of a role. In this case a rise in the national-level layoff rate may be similar to, or even smaller than, the decline in the hiring rate.

Intuitively, a mild recession means that there is a relatively large share of businesses cutting their workforces modestly. Figure 4 shows that such businesses generally do so with an equal mix of quits and layoffs. Since the contraction is small, a business can use regular attrition to shrink its employment and will have to lay off only a few additional workers, on average. At the same time, however, these businesses are not hiring, so

those workers that do lose their jobs find it difficult to find new work and remain unemployed for some time. A deep recession involves an increase in the share of businesses undergoing large contractions. Figure 4 shows that, in these cases, attrition is not enough to get businesses to their new desired employment levels, so they must let sizable fractions of their workforces go, adding to the unemployment rolls through these layoffs.

The recessions of the 1970s and 1980s had sharp, deep declines in employment. While we do not have data on business-level growth distributions that go back that far, our exercise and the large spikes in job destruction and UI claims observed during these periods (Figure 2) suggest that these periods likely involved large leftward shifts of the distribution.<sup>6</sup> The rise in unemployment during these periods was driven by the large number of workers who lost their jobs as a result of these layoffs. The 1990-91 recession and the 2001 recession had relatively modest declines in employment, suggesting that these periods involved much smaller shifts in the growth rate distribution. As our exercise would imply, these periods saw only modest rises in the layoff rate. In relative terms, there was a decline in hiring that was just as important during these periods. Without a large spike in layoffs, the unemployment rate did not rise as much as it did in the 1970s and 1980s. Both recessions, however, were followed by “jobless recoveries,” during which hiring remained depressed for an extended period. During this time, it was difficult for those who did lose their jobs to find new work, and consequently, the unemployment rate

<sup>6</sup>The two studies by Steven Davis and John Haltiwanger find similar spikes in job destruction during these periods.

remained elevated for some time.

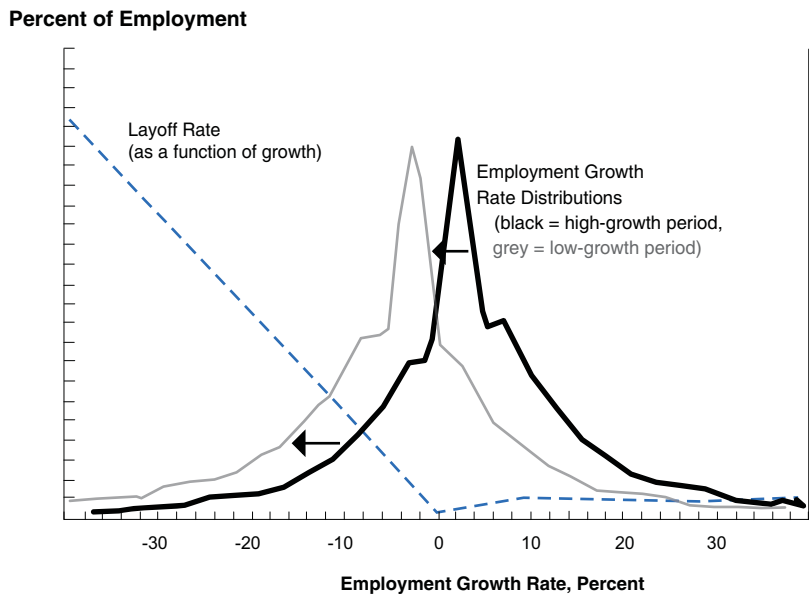
By historical standards, the current recession is very deep, and the pace of layoffs is comparable to that seen in the 1970s and 1980s. Consequently, it likely represents a large leftward shift of the growth rate distribution. Through the end of 2009, a high layoff rate led to a sharp increase in the unemployment rate, but as Figure 1 shows, there has also been a sharp drop in hiring.

The exercise in this article, though, speaks only to the severity of a recession, not to its *length*, which is generally determined by the nature of the macroeconomic shocks to the economy that cause a recession. Historically, deep recessions have been relatively brief (i.e., have a “V-shaped” recovery), implying that the growth rate distribution shifts to the left for a short period of time and then quickly begins shifting back toward the right, while the more shallow recessions have extended periods of job loss (i.e., have an “L-shaped” recovery), implying that the distribution shifts to the left and remains there for a while.

As of this writing, the current recession could have either a V-shaped or L-shaped recovery. Under the first scenario, the growth rate distribution would shift sharply to the left but then revert relatively quickly, creating a large but brief spike in layoffs and a subsequent sharp, but similarly brief, rise in the unemployment rate. Under the second and more troubling scenario, the growth rate distribution would shift to the left and remain there for some time. Layoff rates

**FIGURE 6**

**An Illustration of the Interaction Between Growth Distribution and Employer Flow Functions**




Note: Figure is a hypothetical illustration of the interaction between the business-level employment growth rate distribution (Figure 5) and the layoff rate (Figure 4). The shift in the distribution is exaggerated for illustrative purposes.

would remain high and hiring would remain depressed, leading to very high unemployment rates that persist for some time.

**CONCLUSION**

A weak labor market is the outcome of two different types of employment adjustment: weaker hiring and greater job loss. This article has shown that the severity of a recession determines whether high job loss or weak hiring will be the more important source of declining employment and

rising unemployment through asymmetric shifts in the distribution of business-level employment growth. These shifts interact with kinked “hockey stick” relationships between hiring, layoffs, and business-level growth to generate this result. Therefore, an important part of understanding the behavior of employment and the primary causes of unemployment during an economic downturn is understanding how the employment behavior of individual businesses changes over the business cycle. 



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