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How does labor adjustment in this recession compare with the past?

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The authors examine how firms are adjusting their work force during the current recession in comparison with other recessions over the past 40 years.

While recent labor adjustment has been more pronounced than on average over the past 40 years, it has been pretty typical of the average response during recessions over this period.

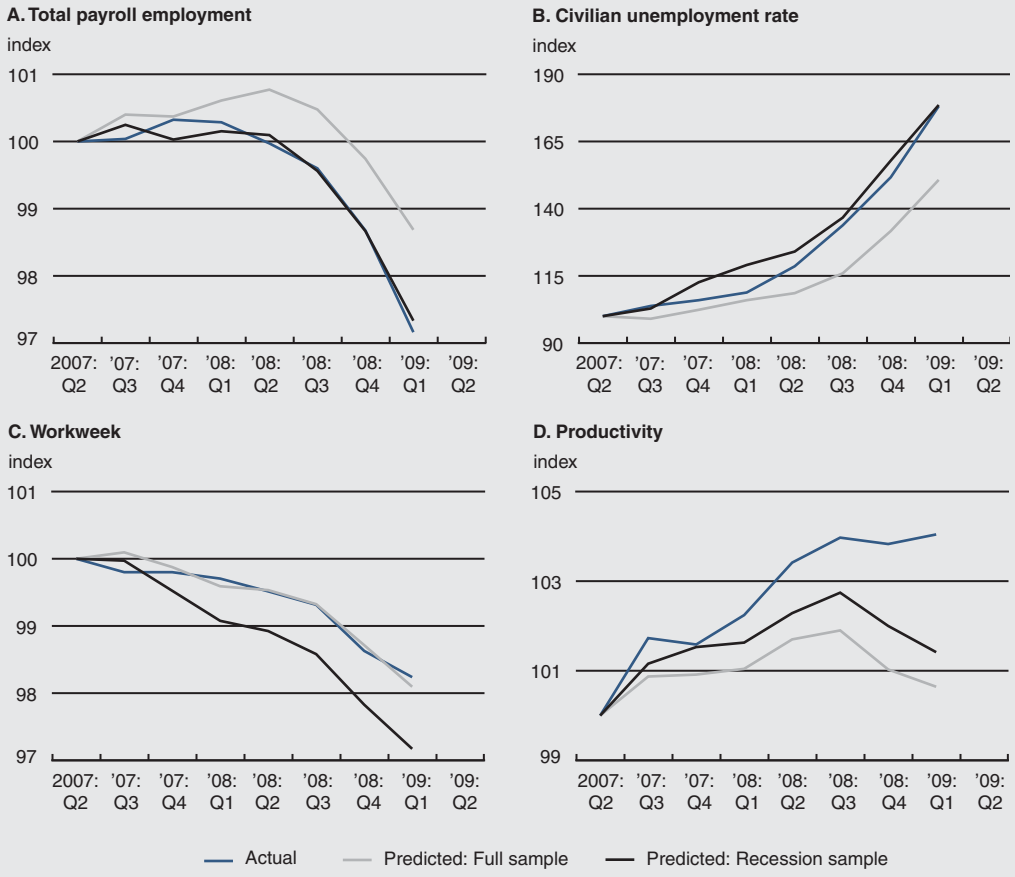
Common labor market measures paint a decidedly gloomy picture of current conditions for U.S. workers. Some of these measures, such as payroll employment and the civilian unemployment rate, have declined more during the first 17 months of the current recession, which began in December 2007, than in any similar period after World War II. Firms appear to be aggressively adjusting their work force given the sharp drop in economic activity. As a result, productivity growth has remained steady throughout the downturn so far.

During past periods of very low economic activity, in particular the recessions of the mid-1970s and early 1980s, labor productivity declined with output, suggesting that firms retained more employees than their short-term business needs might have warranted. This can arise when firms decide it would be too difficult to replace some of their workers when business picks up because of the highly valued skills they possess. It also explains why employment declines typically lag economic activity. Instead of letting these workers go, firms will aggressively cut work hours to lower their labor costs in line with the decline in their revenues—a process that is sometimes referred to as "labor hoarding."[1]

In this *Chicago Fed Letter*, we examine how typical the speed and mix of labor adjustment have been during this downturn. We use statistical relationships between economic activity and labor market performance over the past 40 years, and exclusively from past recessions during this period, to predict what we would have expected to see across a variety of labor market measures during this recession; then we compare our predictions with the actual outcomes. This allows us to answer the question of whether firms are adjusting their work force more quickly in this recession than they have in the past and whether the methods they are using to do so differ from those used in the past.

We find that recent labor adjustment has been more pronounced than the average over the past 40 years. However, this adjustment resembles very closely what we would expect given the average experiences of past recessions. Work force adjustment has been particularly rapid in industries at the heart of the current downturn, such as construction, financial activities, and leisure and hospitality, and more typical of the average recession for industries such trade, transportation, and utilities and manufacturing. Low-skill workers have been particularly hard hit by this recession, while high-skill workers have also not escaped unscathed. Our results are not typical of labor hoarding, although we do find some tentative evidence that firms are possibly trying to retain their most highly skilled workers through lower pay and longer hours.

1. Out-of-sample forecasts of labor market variables



Notes: All variables have been indexed to 100 in 2007:Q2. The workweek measure includes only production and nonsupervisory workers, which cover about 80% of employees. Productivity covers the nonfarm businesses sector.

Sources: Authors' calculations based on data from the U.S. Bureau of Labor Statistics, payroll survey; U.S. Census Bureau, *Current Population Survey*; and U.S. Bureau of Economic Analysis, productivity report.

We find that measures of employment have looked significantly worse during this recession (blue lines) than our full sample statistical models (gray lines) predict. Specifically, roughly 1.5% (or 2 million) more jobs have been lost (panel A), and the unemployment rate (panel B) has increased by nearly 27% more than the forecast (8.1% vs. 6.4%). This is not being offset by unusual changes in the workweek (panel C). In fact, the decline in the workweek has been nearly completely anticipated by the model. With labor market activity declining faster than expected, productivity has been higher than predicted (panel D).

However, if we measure the pace of labor adjustment based solely on historical patterns during NBER recession periods (i.e., the black lines), we find that employment and unemployment have fallen almost exactly in line with what the simple statistical models predict. The similarity of the timing and depth of employment losses are particularly striking. Furthermore, the workweek, if anything, looks to be holding up more strongly than experience in past recessions would suggest.

Therefore, while labor adjustment has been more pronounced than on average over the past 40 years, it has been pretty typical of the average response during recessions over this period.

How do we measure labor adjustment?

To evaluate the pace of work force adjustment, we estimate regressions that associate four key labor market measures—total nonfarm payroll employment, the civilian unemployment rate, the workweek (or average weekly hours), and labor productivity—with their own past values, as well as the past and contemporaneous values of real gross domestic product (GDP).[2]

We estimate the models on two quarterly samples, with both encompassing data from 1967:Q1 through 2007:Q2. In one case, we include all quarters in the regressions (full sample), but in the second case we only include quarters when the economy is in a recession (recession sample) as defined by the National Bureau of Economic Research (NBER). The first sample gives us an idea of how firms have adjusted their work force on average over the past 40 years given changes in economic activity. The latter sample accounts for the possibility that firms may behave differently during recessions than during times when activity is expanding.[3]

With the estimates from these regressions, we arrive at predictions for each labor market measure, using the path of real GDP growth from 2007:Q3 through 2009:Q1. This allows us to compare the actual behavior of the labor market against what historical patterns would have predicted. Then, we repeat this exercise with data broken down by industry and education level so that we can also evaluate the adjustment mix.

Overall findings

Figure 1 plots the actual and predicted values for the four labor market measures.

Findings by industry and education level

Figure 2 displays our results by industry and education level for both the full period and recession samples.[4] Due to space constraints, we report only the cumulative difference between actual and predicted labor market outcomes through 2009:Q1. A negative number

2. Cumulative difference between actual and predicted labor market performance

	Employment growth (percent)		Workweek (change in hours)		Real wage growth (percent)	
Sample period	Full	Recession	Full	Recession	Full	Recession
By industry						
Goods-producing industries	–13.1	–1.2	–0.6	–0.1	5.0	9.2
Construction	–25.2	–19.5	–1.3	–1.1	7.4	7.7
Manufacturing	–9.0	2.2	–0.7	0.0	5.4	10.1
Service-providing industries	–6.0	–3.6	0.0	0.4	7.6	9.1
Trade, transportation, and utilities	–8.4	–2.3	0.0	0.1	6.7	9.5
Information	0.0	4.3	1.1	1.1	7.8	11.3
Financial activities	–8.2	–9.3	0.4	0.5	2.0	–1.0
Professional and business services	–14.4	–5.5	0.2	0.5	14.1	17.9
Leisure and hospitality	–13.1	–9.3	–0.3	0.1	–1.3	4.7
By education level						
High school dropouts	–16.4	–16.5	–0.4	–0.3	6.6	–
High school graduates, no college	–7.5	–11.4	–0.2	1.0	–6.1	–
Some college	–13.7	–14.3	–0.2	0.5	4.7	–
College graduates	–25.7	–9.2	0.8	0.8	8.1	–
Postgraduate education	–5.3	–7.6	0.7	1.7	–4.0	–

NOTES: Calculated for the period 2007:Q3–2009:Q1. A negative number indicates that firms are cutting jobs, the workweek, or wages faster than the statistical model predicts. The employment and workweek models by education level are estimated on data back to 1976. The wage model by education level is estimated on data back to 1982; we do not report recession sample estimates for this model because of the small sample size. Education levels prior to 1992 are based on years of completed schooling. Self-employed workers are excluded from the sample, and the workweek is calculated on the basis of all jobs held. In addition, all *Current Population Survey* data were seasonally adjusted using the U.S. Census Bureau's X12 procedure.

SOURCES: Authors' calculations based on data from the U.S. Bureau of Labor Statistics, payroll survey; and U.S. Census Bureau, *Current Population Survey*.

indicates that firms are cutting jobs, the workweek, or wages faster than the statistical model predicts.

The full sample results by industry indicate broad-based labor market contractions above and beyond those expected by the statistical models, particularly in construction, professional and business services, and leisure and hospitality. Changes in the workweek have been more uneven, however, with work hours declining fastest in construction, manufacturing, and leisure and hospitality. Notably, the labor indicators in the information services industry have held up relatively well.

In comparison to the full sample results, the recession sample results are muted. Nevertheless, the construction, financial activities, and leisure and hospitality industries still appear to have adjusted much more quickly to this downturn than to those in the past. Much of this reflects the nature of this recession, with the decline in residential housing happening early on, followed by the credit crisis and the fall in consumer demand. Labor market performance in other industries has looked fairly typical for a recession of this size. That said, work force adjustment continues and is not fully reflected in the data through 2009:Q1. For instance, some more recent anecdotal evidence has noted further efforts to reduce hours in order to avoid additional layoffs in manufacturing.[5]

Consistent with our aggregate productivity results, real wages have been higher than predicted with two exceptions. The first exception is the leisure and hospitality industry in the full sample. If this were indeed an indicator of labor hoarding, it should be accompanied by a faster decline in hours and a slower decline in employment. This is the case for the workweek, but not so for employment. The second exception is the financial activities industry based on the recession sample. However, here too the behavior of hours and employment are not commensurate with labor hoarding.

We also repeated the analysis by worker education level, using the U.S. Census Bureau's *Current Population Survey*, often referred to as the household survey.[6] Across education groups, we still find larger declines in employment for the full sample. In terms of the workweek, our results demonstrate an interesting dichotomy between those who have completed college and those who have not, with slower declines in the workweek for the latter and faster for the former during the current recession. The most significant declines in the workweek have been felt by high school dropouts, who also happen to be one of the groups experiencing the highest rates of job loss.

For the recession sample, a pattern emerges with employment declines generally decreasing by education level. In particular, while employers are shrinking the highly educated part of their work force at a faster pace than is typical, it is at a slower pace than for other education groups. Moreover, the average workweek of college graduates has been relatively well maintained, albeit perhaps for less pay among those with a postgraduate education. This latter fact may indicate some effort by firms to contain labor costs and yet retain their most highly skilled workers through lower pay and longer hours.

Conclusion

Labor adjustment during the current recession has been well predicted by the typical experiences of previous recessions. However, unlike the downturns of the mid-1970s and early 1980s, productivity growth has remained positive, suggesting little evidence of widespread labor hoarding. Firms in industries at

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the heart of the current downturn have aggressively reduced payrolls and work hours, while others have been less quick to do so in comparison with previous recessions. Low-skill workers have been particularly hard hit by this recession, while high-skill workers have also not escaped unscathed.

[1] Some recent anecdotes support this "labor hoarding" story. See, e.g., Brian Blackstone, 2009, "Productivity trend weighing on jobs," *Wall Street Journal*, March 6, and Cari Tuna, 2009, "Weighing furlough vs. layoff," *Wall Street Journal*, April 13, p. B6.

[2] The number of past values is chosen individually for each labor market measure and real GDP based on minimization of the Bayesian information criterion, but it is capped at four lags. We first-differenced the unemployment rate and the workweek and log first-differenced real GDP, productivity, and payroll employment to induce stationarity in each time series. These transformations were tested using augmented Dickey-Fuller tests and matched many of the transformations used in the construction of the Chicago Fed National Activity Index (www.chicagofed.org/cfnai).

[3] There is a long tradition of empirically treating the business cycle in an asymmetric fashion. For one prominent example, see J. D. Hamilton, 1989, "A new approach to the economic analysis of nonstationary time series and the business cycle," *Econometrica*, Vol. 57, No. 2, March, pp. 357–384.

[4] Figure 2 omits some industries that either have not witnessed employment declines during the current recession or form a small portion of their respective sectors. We focus on real wages given a lack of available detailed industry productivity data. All wage variables were deflated by the total Personal Consumption Expenditures Price Index and log first-differenced to obtain stationary time series.

[5] See the Seventh Federal Reserve District's April Beige Book report, available at www.federalreserve.gov/fomc/beigebook/2009/default.htm, and Timothy Aeppel and Justin Lahart, 2009, "Lean factories find it hard to cut jobs even in a slump," *Wall Street Journal*, March 9, p. A1.

[6] Because of the different data sets and different time periods, the average response by education group will not match the average response by industry group.