

Response to recession: reduce hours or jobs?

Workweek cuts are a reliable leading indicator of recession, because they are the firm's initial response to sagging product demand; thereafter, numerous business and individual decisions determine the point at which workers will be laid off

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During a recession, attention is focused on the most obvious victims—those people who have lost their jobs. Particularly hard hit by the downturns of the last three decades was the manufacturing sector, which accounted for 90 percent of all job losses. These employment reductions were concentrated largely in the durable goods industries and almost exclusively among production workers.

But layoffs are not the first response by manufacturers to sagging product demand; traditionally, firms have cut hours of work before reducing employment. This response has been so cyclically consistent that average weekly hours of production workers in manufacturing is designated as one of the Nation's 12 major leading economic indicators—those which precede business cycle movements—by the National Bureau of Economic Research.

The focus of this article is the timing and relative importance of workweek and employment cutbacks in durable goods manufacturing during the last six major business contractions.¹ Many of the costs and benefits of each method of reducing output are compared, and the

critical roles of such factors as collective bargaining and unemployment insurance on a firm's decisions are outlined. Discussion of determinants of the choice to cut employment or shorten workweeks constitutes a very brief overview of the literature, and is intended to provide a framework for interpretation of patterns observed in aggregated data.²

A methodological foreword

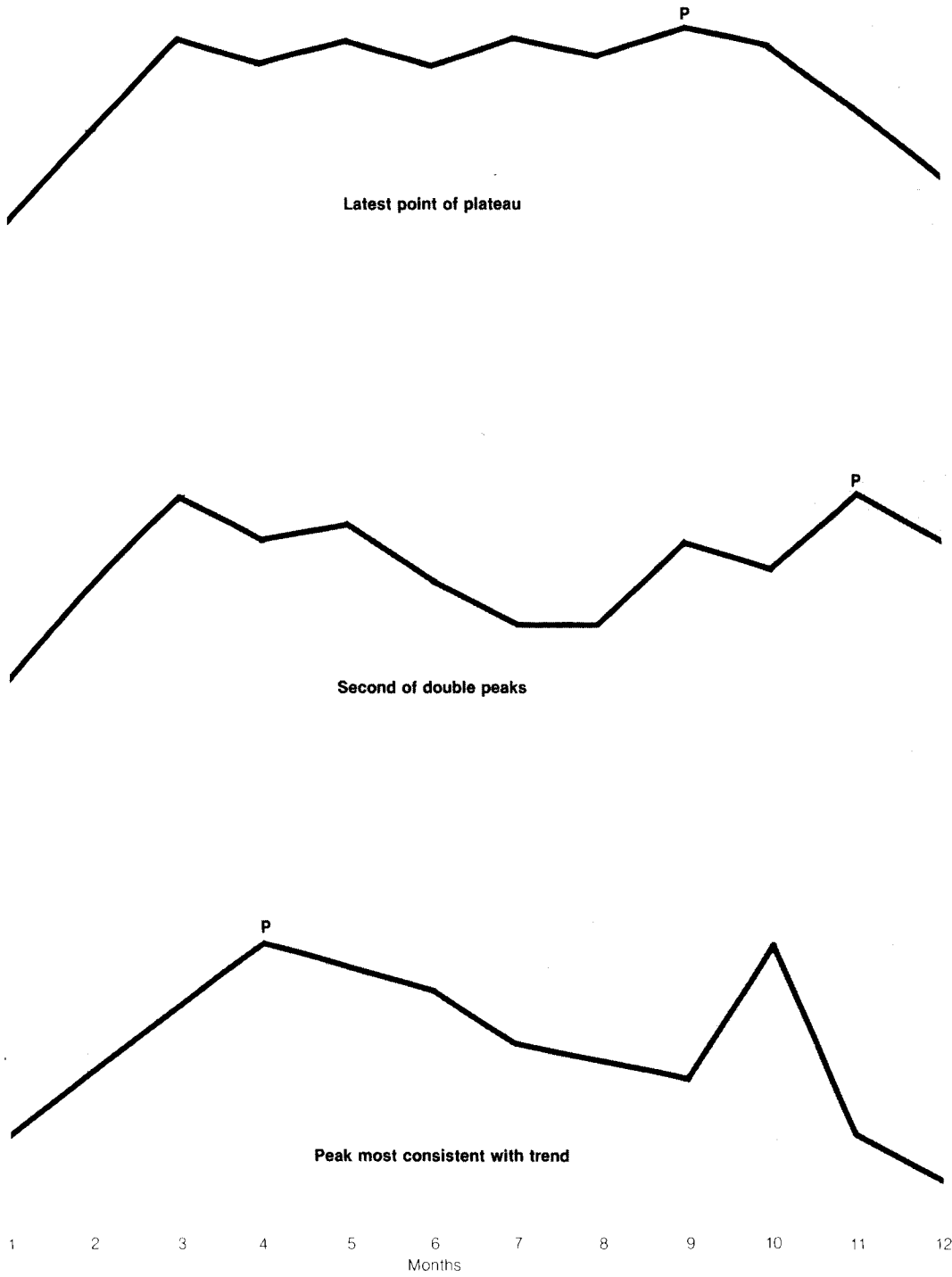
Because the following analysis of the cyclical leads of one time series over another will depend on the timing of peaks and troughs, the reader should be acquainted with the methods used to pinpoint cyclical turns. Basically, the methodology follows procedures outlined by Gerhard Bry and Charlott Boschman in their report, *Cyclical Analysis of Time Series: Selected Procedures and Computer Programs*.³ Determinations were based on the author's own analysis of the seasonally adjusted series, with consistent application of a few basic guidelines.

The highest pre-recession level was selected unless the series offered another viable and more indicative peak. In the case of a plateau, with more than one possible peak, the latest month was designated. (See chart 1.) If the series was double peaked, the latter peak before a sustained downturn was chosen. And when the series exhibited a 1- or possibly 2-month aberration, the peak most in line with the overall trend of the series was se-

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Chart 1. Methods for determining series peak (P) illustrated

Hours of employment



lected. (In other words, uncharacteristic “blips” in the series were ignored.)

Where the ax falls first

When faced with the prospect of declining orders and a general slowdown in the economy, why do manufacturers choose to cut the workweek before jobs? The primary consideration is the savings to the firm, both in the short and the long term.

A major short-run cost advantage of hours reductions is avoidance of the immediate turnover costs of layoffs. In addition to processing the paperwork involved, firms often must make severance payments or pay supplemental unemployment benefits, and may also face increased contributions to State unemployment insurance systems. It should also be noted here that union contracts often require worksharing in the short run, before a company resorts to layoffs; 38 percent of unionized workers in manufacturing were covered by such provisions in 1970–71, the most recent period for which data are available.⁴ (However, unions may curtail the long-run use of worksharing, a subject which will be discussed later in this article.)

In conjunction with the short-run savings of hours reductions, firms must also consider the longer term costs of layoffs, particularly those related to labor turnover. If laid-off workers are unavailable for recall when demand recovers, the company will incur substantial cost in recruiting, selecting, and training new employees. And because these costs appear to be rising,⁵ employers try to avoid them by reducing hours as long as they can.

Of primary importance to the firm’s decisions is the probability that a worker will be available for recall—the greater that probability, the less costly layoffs become. This issue has been addressed by several researchers. Even allowing for some methodological shortcomings pointed out by Thomas Bradshaw and Janet Scholl, Martin Feldstein’s research still yields a high recall rate for those on temporary layoff—in the neighborhood of 65 to 70 percent.⁶ David Lillien reaches a similar estimate on the probability of recall.⁷ However, he stresses that temporary layoffs are not the major source of cyclical unemployment: he estimates that roughly 35 percent of the increase in job loser unemployment during the 1975 recession was due to temporary layoffs; much of the remaining increase represented long-term unemployment, particularly among those who later became job changers.

Martin Baily proposes an additional cost to the firm using layoffs to reduce output—higher wage rates.⁸ He asserts that a firm (or an industry) develops a reputation from past layoffs. A potential employee will view a high probability of being laid off as a risk of employ-

ment for which he or she should be compensated. This is particularly important for the relatively small segment of the economy which experiences a high level of either seasonal, or, in the case of durable goods manufacturing, cyclical employment cuts. Another cost of layoffs, which will be discussed in more detail later, is the possibility that the firm will have to pay higher unemployment insurance premiums in the future, based on its experience rating.

The firm, then, must respond cautiously to changes in demand. Initial cutbacks are generally made in expensive overtime hours, which make up the majority of workweek declines during cyclical downturns. If, because of a shortage of specialized labor or scheduling inflexibilities, elimination of overtime cannot provide all of the needed reductions, some less expensive, straight-time hours are also cut. The following tabulation indicates that, over the last five recessions, durable goods firms appeared to “target” overtime more and more when they needed to slash the workweek:

<i>Recession period</i> ⁹	<i>Fall in hours (peak to trough)</i>	<i>Fall in overtime hours (peak to trough)</i>	<i>Overtime as percent of total hours decline</i>
1956–58	2.9	1.7	58.6
1960–61	2.4	1.2	50.0
1969–70	1.8	1.3	72.2
1973–75	2.3	2.0	87.0
1979–80	1.9	1.6	84.2

Much of this targeting, however, was possible only because overtime has been used more extensively during recent years. Prior to the onset of each of the first two recessions shown, durable goods overtime averaged about 3 hours per week. Since 1969, the prerecession levels have been about 4 hours. Of course, there are costs involved in hours reductions. In particular, firms continue to accrue liabilities for fringe benefits in maintaining workers on the payroll. Also, they may face union animosity toward hours cuts and may incur planning costs associated with changes in work schedules. But the benefits of early hours reduction in terms of payroll savings and the avoidance of turnover seem, most often, to outweigh the costs.

The timing of job cuts

Not only are companies hesitant to lay off workers at a business cycle peak, but employment may level off or even continue to rise after hours have begun to fall. What causes this anomaly in hours and employment policies? New hiring does actually peak before hours, and layoffs may edge upward, but as workers sense a tightening job market, quits also fall.¹⁰ Thus, the new turnover rate is not negative—that is, employment does not fall—until the firm steps up its use of layoffs.

Are there other reasons why firms are sluggish in laying off workers? Walter Oi's explanation entails viewing labor as a quasi-fixed factor of production, as opposed to the classical concept of labor as a purely variable factor.¹¹ The extent of this "fixity," as he calls it, depends on the investment in firm-specific training, which increases the worker's productivity only for his or her current employer. Thus, the decision to lay off a worker would not simply be a function of the worker's marginal product and his wage. Instead, the firm may retain an employee whose marginal product is below his or her wage rather than risk high future costs of training new workers in skills unique to the company. Donald Parsons demonstrates that both the average quit and layoff rates are lowest in industries where both worker- and firm-financed investment in specific training is greatest.¹²

Gerhard Bry, in his study of the workweek, suggests that the lag in job cuts may be the result of conflicting policies within the firm. "Changes in weekly hours come about as the result of fluctuations of current workloads" (decided at the foreman level), but "cyclical changes in employment are the result of policy decisions based on anticipated workloads" (decided at the management level). Conflicting policies concerning hours and employment may, therefore, be determined independently.¹³ Robert J. Gordon also assumes a lag in management decisionmaking in his report on the "end-of-expansion" drop in productivity caused by overhiring. According to Gordon, companies "may gradually recognize an overstaffing condition but be unable to correct it rapidly because of both the high costs of more frequent decisionmaking and the inevitable time it takes to reduce the work force purely by attrition when layoffs are costly."¹⁴ Apparently firms are slow to cut employment not only because of the cost, but also because of a policymaking lag at the management level.

But at some point, the nature of the production process or union agreements no longer allow the company to continue to reduce hours without laying off workers. Firms must then increase their layoff rate or incur the continuing costs of underutilized labor or unacceptably large inventories.

The nature of the company and its products will help determine how extensive its use of hours reductions can be.¹⁵ For instance, a high capital-to-labor ratio would imply that the firm's variable costs are relatively low. Thus, other things equal, it is less likely that payroll savings through layoffs would provide sufficient cost reductions. In other cases, the nature of the production process may dictate layoffs. For example, the continuous operations characteristic of steel production cannot be economically run at less than full capacity. Thus, as demand declines, it is more likely that an operation will be closed down completely and the workers laid off.

Another factor is the cost of maintaining high inventories, which depends in part on the characteristics of the output. For instance, a producer of a perishable product would be more likely to shut down operations in the face of declining demand than would the maker of a product that could be easily stored.

Beyond the nature of the firm's product and production process, employee preferences help determine the point at which layoffs begin. Baily, in a theoretical model of layoff behavior, asserts that a firm will reduce hours to a minimum level acceptable to workers and must then begin layoffs.¹⁶ That level is reached when the opportunity costs of workers' time is higher than the net value of the job at reduced hours. At this point, Baily proposes, no additional hours reduction will occur. BLS establishment data show that in durable goods manufacturing about 25 percent of all of the eventual hours reductions in each industry had occurred by the time that employment started to decline.

Of course, Baily was theorizing on a firm's behavior; analysis at that level could easily provide different results than industry aggregates. (Certainly, all firms within an industry do not reduce hours or employment simultaneously.) But while hours do continue to decline in the aggregate, even after employment levels begin to fall, the employee's preference between work at reduced hours and a subsidized period of layoff seems to be a key to the decision of the employer. As we will see, the more attractive the layoff alternative (in terms of the combination of replacement income and leisure time), the more likely the worker will accept layoff, and, more importantly, the more likely he or she will be available for recall.

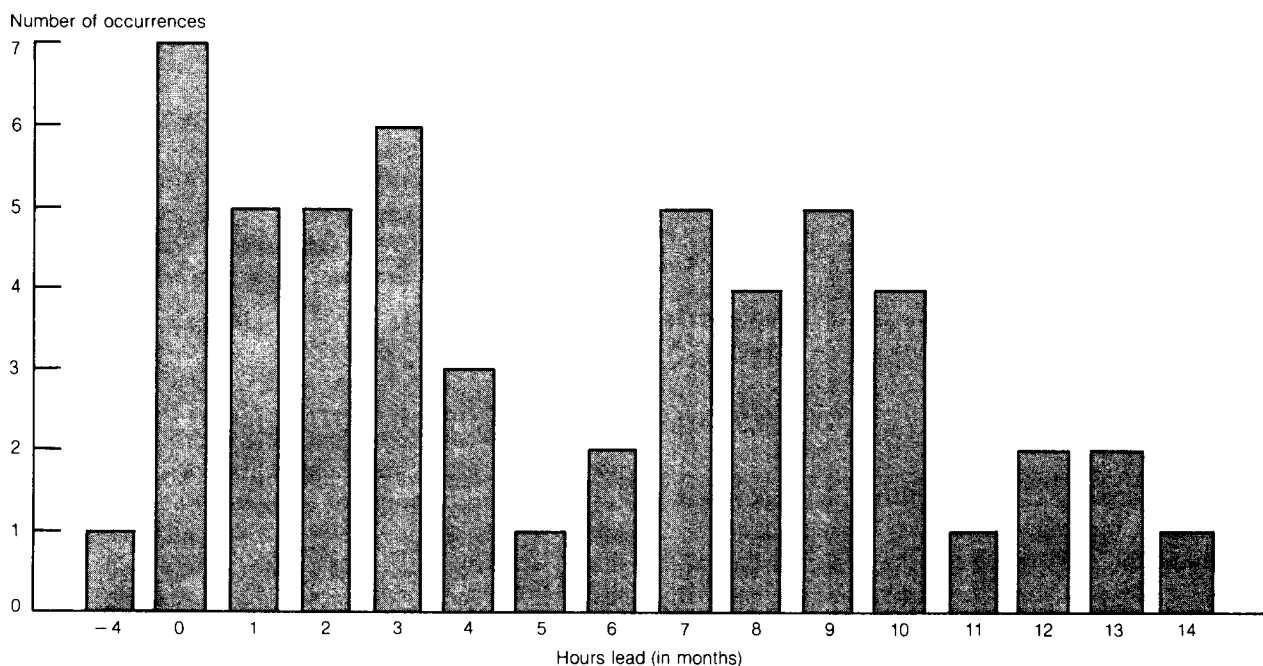
How long is the hours lead?

As previously indicated, the manufacturing workweek is such an effective cyclical indicator because its movements consistently lead those in employment. During the last six business cycles, the downturn in average weekly hours preceded that in employment for the nine major durable goods industries more than 80 percent of

Table 1. Lead of hours peak over employment peak during business downturns, selected industries, 1953-80

Industry	Lead (in months)					
	1953-54	1956-58	1960-61	1969-70	1973-75	1979-80
Lumber and wood products	1	2	0	5	7	0
Furniture and fixtures	0	8	4	3	9	10
Stone, clay, and glass products	0	2	9	7	3	0
Primary metals industries	4	9	9	0	1	3
Fabricated metals industries	3	2	1	8	10	3
Machinery, except electrical	14	13	8	6	13	7
Electric and electronic equipment	4	0	8	3	10	10
Transportation equipment	9	2	1	11	2	1
Instruments and related products	7	12	7	-4	6	12

Chart 2. Frequency distribution of hours leads presented in table 1



the time. (See table 1.) The average length of time between the downturns in hours and employment (referred to as "hours lead") for these 54 observations was 5.4 months. A similar tendency exists at the trough of a business cycle; in general, manufacturing hours begin to increase before employment. In the durable goods industries, the hours lead out of recession occurred in 39 of the 54 possible observations. However, its average length was less than half the lead at the peak of the cycle.¹⁷ (During the 1980 business cycle, the upturns in hours and employment were coincident in 7 of the 9 durable goods industries.)

The tabulation below shows the length of the lead of the production workweek peak over the employment peak for each of the nine industries, averaged over the last six recessions. The industry data are presented in descending order of average lead time:

	<i>Lead in months</i>
All industries	5.1
Machinery, except electrical	10.2
Instruments and related products	6.7
Electrical and electronic equipment	5.8
Furniture and fixtures	5.7
Fabricated metal products	4.5
Transportation equipment	4.3
Primary metal industries	4.3
Stone, glass, and clay products	3.5
Lumber and wood products	2.2

Except for the extremely long-leading machinery industry and the shortest leading industries (lumber, and stone, clay, and glass products), the average leads hover near the 5-month mark. But when each recession is examined separately by industry, a widely and apparently random set of relationships appears, ranging from a 14-month lead to a 4-month lag. In fact, the "average" lead of 5 months occurs only once, 6 months occurs only twice, and 4 months only three times. (See chart 2.)

Given the variance of these individual leads, consistent patterns within and between industries become impossible to identify. But when average leads across recessions are considered, the industries do seem to fall into two groups: Those which produce finished products, such as machinery, furniture, electronics, and instruments, have longer leads, on average, than those which produce intermediate products.

Does any relationship exist between the length of the hours lead and the relative use of layoffs and hours cutbacks to reduce production? That is, do industries with long leads generally make more intensive use of hours reductions during a cyclical downturn? To examine this possibility, a ratio was created which compares the employment drop for a given industry and recession with the corresponding hours decline. For each industry, the percentage change in employment from its peak to

trough is divided by the peak-to-trough percentage change in hours.

This ratio measures an industry's preference for the use of employment or hours cutbacks to reduce output when demand sags; a high ratio indicates a heavy employment effect, and a low ratio means that hours reductions play a greater role. The averages of these ratios for the nine major durable goods industries over the six recessions, ranked in order of magnitude, are:

All industries	2.8
Machinery, except electrical	3.4
Electrical and electronic equipment	3.4
Lumber and wood products	3.3
Transportation equipment	2.8
Fabricated metal products	2.8
Instruments and related products	2.7
Stone, glass, and clay products	2.5
Primary metal industries	2.2
Furniture and fixtures	1.8

Though not entirely consistent, these rankings resemble the lead rankings. However, when data are disaggregated for each recession, the expected link between high ratio and low hours lead does not hold. In fact, when the individual observations for the employment-to-hours ratios are regressed over the length of the corresponding lead, no statistically significant relationship emerges. This probably reflects the fact that, while the employment-to-hours ratios are fairly consistent, the leads tend to be widely dispersed. A mean lead of 5 months for a particular industry over the six recessions results from the averaging of extreme observations, such as 1 month and 9 months. (See chart 2.) Thus, because the disaggregated leads do not demonstrate a consistent pattern, the apparent connection between lead length and the ratio disappears in the disaggregation.

When the ratio is made dependent on the depth of recession in a given industry, a significant positive relationship appears; the deeper the recession, the higher the ratio.¹⁸ This follows from the observation that employment cuts become more important as a recession progresses. As producers perceive and experience a real and deep recession, they resort to layoffs more frequently and their employment-to-hours ratio rises.

For reasons cited earlier, a plateau in employment is typical at the beginning of a downturn; this is the period after firms first detect a weakness in demand for their product (and, often, begin hours cuts) but before the situation becomes certain enough, or serious enough, to start significant layoffs. The length of the hours lead, then, is largely determined by the point of this "plateau" where employment actually peaks. This is shown graphically in chart 3.

It would be unlikely for employment to peak in the middle of the plateau period and thus result in an "av-

erage" lead length. This is because, once the need for output reduction is noted, significant new hiring probably would not occur while hours are being cut back. Thus, given the way businesses make hours and layoff decisions, and methods used to identify series peaks, hours leads tend to be long or short, but rarely in between.

Each recession tends to exhibit certain unique characteristics (for example, in 1973-75, there were protracted employment stalls and thus relatively long leads), and no trend is apparent over time. The average leads (in months) for the nine durable goods manufacturing industries combined are shown below for each recession:

1953-54	4.7	1969-70	4.1
1956-58	5.6	1973-75	6.8
1960-61	5.2	1979-80	5.1

Some have suggested that recent developments in economic forecasting and communications give manufacturers advance warning of a recession and the ability to initiate policy changes before a substantial decline in demand actually occurs. Or the government, through fiscal and monetary policies, may, to some extent, forestall a downturn. But, if these hypotheses are true, the expected trend toward shorter leads is not clearly observed in the data.

Two structural determinants

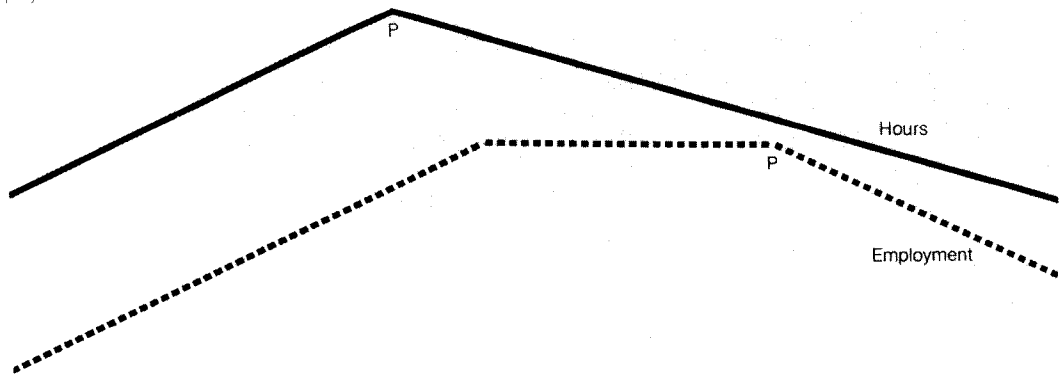
Both unemployment insurance and collective bargaining provisions influence the ability and willingness of the firm to use, and the worker to accept layoffs. As mentioned earlier, the timing of layoffs is, in part, a function of the opportunity costs of working reduced hours. The experienced worker becomes more likely to sit out a period of unemployment, and be available for recall, when the value of the nonwork option increases.

This, of course, is the effect of the increased availability and levels of unemployment insurance on decisions. The (often) nontaxable status of this benefit acts as an additional incentive to layoffs, because it increases the real value of benefit payments relative to taxable earned income. The higher the income supplement, the lower the probability of job search by the worker, and hence, the lower the possible future costs of layoffs to employees in terms of hiring and training new employees.

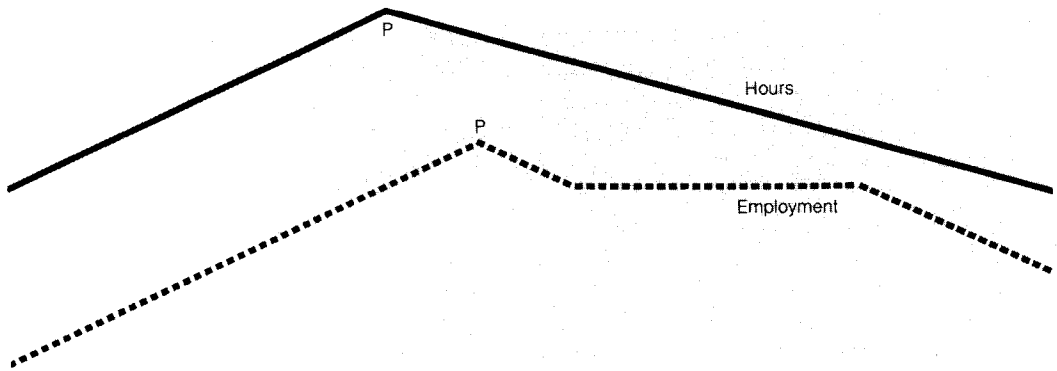
The firm must also consider costs associated with its unemployment insurance taxes. Under typical policies, a firm maintains a funding reserve with the State on which it can draw when layoffs increase. (Each State has its own regulations and funding policies.) If unemployment insurance taxes were perfectly experience-rated, the firm would face a future hike in premiums whenever layoffs rose above a "normal" level. However, because States generally have a maximum tax rate,

Chart 3. Effect of employment plateau on length of "hours lead" over employment peaks

Hours and employment



Long hours lead



Short hours lead

1 2 3 4 5 6 7 8 9 10 11 12
Months

Note: "P" indicates peak.

many high-turnover firms are already taxed at the maximum level, and operate with a zero or negative reserve balance. For these companies, the marginal cost of future premiums associated with increased layoffs is also zero. Some States have a high minimum tax rate, whereby some firms would regularly maintain an account surplus. Again, the marginal cost of layoffs to these firms is zero until the surplus is used up. Thus, the unemployment insurance program serves both to decrease the cost of layoffs to workers and to make employment cuts more attractive to employers.

Union representation of workers may also have a profound effect on the firm's choice of hours or employment reductions. James L. Medoff, who has studied this influence, finds evidence of a positive correlation between unionization and layoffs.

Medoff asserts that a union, sensitive to the concerns of its more senior members, can often negotiate contracts which benefit this relatively small group. Workers with extensive seniority would tend to prefer layoffs to across-the-board hours reductions because their own jobs would be unaffected. Sumner Slichter, James Healy, and Robert Livernash noted as early as 1960 that "the trend of union preference is more and more toward the restriction of work-sharing arrangements."¹⁹ Medoff's study of union effects on layoff rates supports this finding. He observes that, while the proportion of manufacturing workers covered by collective bargaining agreements asking for a reduced workweek prior to layoff remained nearly unchanged from 1954 to 1971, the nature of the agreements did change.²⁰ The principal difference was an increase in the percentage of contracts which limited the length of time that reduced workweeks could forestall layoffs. Many of the revised contractual clauses provided for "union participation in procedures involving reductions in hours per employee."

Collective bargaining may contribute to a higher layoff rate for other reasons. The attractive benefits often

negotiated through labor-management agreements tend to encourage workers to accept layoffs rather than seek alternative employment. For example, a unionized firm is more likely to provide its laid-off workers with supplemental unemployment benefits; in 1978, nearly 61 percent of organized workers in durable goods industries were eligible for such benefits.²¹ The relatively high returns to the employee for extended service in unionized companies also act as a deterrent to job change, as does the accrual of (largely) nonportable pension benefits. And, to the extent that unions are able to maintain high and increasing wage levels, particularly through multiyear agreements and cost-of-living clauses, the firm loses the option of wage flexibility as a response to sagging demand.²² Union agreements are often so restrictive that they encourage firms' use of enhanced early retirement benefits as an alternative means of reducing the work force.

Medoff found that, between 1958 and 1971, the probability of layoff in a unionized manufacturing firm was more than twice that in a nonunionized establishment, and that about 30 percent of this difference could be explained by the existence of supplemental unemployment benefits.²³

THE WORKWEEK OF PRODUCTION WORKERS in manufacturing, and more specifically, in durable goods industries, remains a reliable economic indicator. It has consistently risen and fallen before employment during the past 30 years. But the length of time by which changes in hours lead those in employment remains unpredictable, and there is no clear and explainable trend in the hours lead which would indicate that it is shrinking or growing over time. The decisions of individual firms and workers are obviously important to job and hour developments, but reliable tools for measuring and predicting the effects of these individual factors on lead length have yet to be constructed. □

— FOOTNOTES —

¹ Employment levels are used in this analysis, rather than some measure of labor turnover, such as layoff rates, because the former are a superior measure of true job loss. Increases in layoff rates tend to precede employment declines as the former are often accompanied by offsetting declines in the quit rate.

² Data are derived from a BLS survey of business establishments. Employment and hours series are published monthly in *Employment and Earnings*. We have limited our focus to durable goods industries for a number of reasons. First, with the occasional exception of transportation and public utilities, the service-producing sector of the economy has not consistently experienced significant cyclical declines in employment and hours. Second, within the goods-producing sector, mining is generally non-cyclical and, while there are employment cutbacks in construction during recessions, the hours series reveals no dependable, cyclical pattern; therefore, an hours lead cannot be determined. And third, durable goods was chosen over all manufacturing because it is responsible for 80 percent of manufacturing job losses.

While the non-durable sector, in aggregate, exhibits cyclical patterns in both employment and hours, many of its component industries do not.

Also, because the hours data exist only for production or non-supervisory workers, all the employment data used pertain only to those workers. Production workers account for more than 95 percent of the jobs lost during a recession, and this more narrow definition of employment should thus enhance rather than detract from the analysis. Miscellaneous durable goods manufacturing is omitted from the analysis because it is a collection of largely unrelated products and production processes.

³ Gerhard Bry and Charlott Boschan, *Cyclical Analysis of Time Series: Selected Procedures and Computer Programs* (New York, Columbia University Press, 1971), pp. 10-14.

⁴ *Layoff, Recall, and Worksharing Procedures*, Bulletin 1425-13 (Bureau of Labor Statistics, 1972). The 1971 data are the latest available. For a recent discussion of worksharing, see Robert W.

Bednarzik, "Worksharing in the U.S.: its prevalence and duration," *Monthly Labor Review*, July 1980, pp. 3-12.

⁵ Robert M. MacDonald, "The Fringe Barrier Hypothesis and Overtime Behavior," *Industrial and Labor Relations Review*, July 1966, pp. 565-66.

⁶ Martin S. Feldstein, "The Importance of Temporary Layoff: An Empirical Analysis," *Brookings Papers on Economic Activity*, 3, 1975, pp. 725-77; and Thomas F. Bradshaw and Janet L. Scholl, "The Extent of Job Search During Layoff," *Brookings Papers on Economic Activity*, 2, 1976, pp. 515-23.

⁷ David M. Lillien, "The Cyclical Pattern of Temporary Layoffs in United States Manufacturing," *The Review of Economics and Statistics*, February 1980, pp. 24-31.

⁸ Martin Neil Baily, "On the Theory of Layoffs and Unemployment," *Econometrica*, July 1977, pp. 1043-63.

⁹ Overtime data were not available for the 1953-54 business cycle.

¹⁰ Labor turnover data for manufacturing industries are available in *Employment and Earnings*, Bulletin 1312-11 (Bureau of Labor Statistics, 1979), and subsequent monthly issues of *Employment and Earnings*.

¹¹ Walter Y. Oi, "Labor as a Quasi-Fixed Factor," *Journal of Political Economy*, November 1962, pp. 538-55.

¹² Donald O. Parsons, "Specific Human Capital: An Application to Quit Rates and Layoff Rates," *Journal of Political Economy*, July-August 1972, pp. 1120-43.

¹³ Gerhard Bry, *The Average Workweek as an Economic Indicator*, Occasional Paper 69 (National Bureau of Economic Research, 1959), p. 97.

¹⁴ Robert J. Gordon, "The End-of-Expansion Phenomenon in Short-

run Productivity Behavior," *Brookings Papers on Economic Activity*, 2, 1979, p. 460.

¹⁵ James L. Medoff, "Layoffs and Alternatives Under Trade Unions in United States Manufacturing," *Studies in Demand for Labor*, prepared under Research Grant J9M6 0094 (U.S. Department of Labor, 1977), p. 272. A revised version appeared under the same title in the June 1979 *Journal of Economic Literature*, pp. 380-95.

¹⁶ Baily, "Theory of Layoffs," p. 1051.

¹⁷ To some extent, the establishment data produce a bias towards the hours effect of business cycle downturns. If a person is laid off in the middle of the reference week, for example, he or she will appear in the data as employed, but at reduced hours. Although this bias could be important in our understanding of businesses' response to declining demand, the nature of available data does not allow us to measure its magnitude.

¹⁸ The depth of a recession is measured by the index of aggregate weekly hours, which is the product of average hours multiplied by total employment. The index uses a 1967 base. Data are published monthly in *Employment and Earnings*. Regression results are available on request.

¹⁹ Sumner H. Slichter, James J. Healy, and Robert E. Livernash, *The Impact of Collective Bargaining on Management* (The Brookings Institution, 1960), p. 152.

²⁰ See footnote 4.

²¹ *Characteristics of Major Collective Bargaining Agreements, January 1, 1978*, Bulletin 2065 (Bureau of Labor Statistics, 1980), p. 101.

²² An interesting discussion of wage rigidity can be found in Robert E. Hall, "Employment Fluctuations and Wage Rigidity," *Brookings Papers on Economic Activity*, 1, 1980, pp. 91-123.

²³ Medoff, "Layoffs and Alternatives," pp. 278-81.