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Was There a Golden Age of Flexible Wages? Evidence from Ohio Manufacturing, 1892–1910

WILLIAM A. SUNDSTROM

Several macroeconomic studies have found evidence of diminishing cyclical wage flexibility in the United States since the turn of the century. But the importance of wage reductions during downturns must be questioned even for the era of allegedly flexible wages. This article shows that during the severe contractions of 1893 and 1908 only a small minority of Ohio manufacturing workers experienced cuts in their wage rates. The apparent downward flexibility of average earnings in these data was largely the consequence of changes in the occupational composition of the employed work force rather than pay cuts for individual workers.

The notion that the average hourly earnings of workers may be thought of as the price of something called labor has been the fiction—or more optimistically “useful abstraction”—underlying a number of exercises in historical macroeconomics. If the abstraction is to be useful, we must learn how it responds to changing demand conditions over the business cycle. If our abstraction falls only sluggishly when demand falls, then the familiar static analysis of partial equilibrium theory suggests that excess supply, or unemployment, will be the result. As John Maynard Keynes and others have argued, however, we cannot be sure that full employment will be restored by a falling wage if other prices in the economy are also slow to adjust.

Economic theory and common sense remind us that no fully integrated labor market actually exists, at least in the short run: the combined effect of industry- and occupation-specific skills, informational asymmetries, adjustment costs, and institutional structure is that there are many labor markets, not all of which will necessarily behave like the spot market of static analysis. What has not been sufficiently appreciated, however, is the extent to which empirical findings based on macroeconomic aggregates can foster misleading impressions about the microeconomic functioning of labor markets over the business cycle.

One assertion commonly made about American labor markets is that nominal wages have become less “flexible” in responding to aggregate demand conditions over the past century or so. Flexibility is usually

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measured as the responsiveness of average hourly earnings to changes in aggregate output or unemployment. Robert Gordon, for example, finds that the elasticity of nominal wages with respect to nominal GNP has declined substantially in the United States since the turn of the century. Related work by Jeffrey Sachs finds that the slope of the short-run Phillips curve has declined in the United States since 1890.¹ These findings conform to the diagnosis that the U.S. labor market has suffered from a progressive case of institutional arteriosclerosis, with union contracts and government regulations restricting the capacity of wages to respond rapidly to demand downturns.²

In this article I use disaggregated data from Ohio at the turn of the century to argue that labor markets already exhibited considerable wage rigidity by that time. For example, only a small minority of manufacturing workers in my samples experienced nominal wage reductions during the contractions of 1893 and 1908, even when output, employment, and days worked fell substantially. During the 1908 recession aggregate average hourly earnings did fall, but not because the average employed worker experienced a pay cut. Rather, average wages fell because employment fell by a much larger percentage in those industries that tended to pay higher wages. Hence the apparent downward wage flexibility was a consequence of a compositional effect, not occupation-specific wage-rate adjustments.

Because it is difficult to compare these results with more modern data, the hypothesis that wage flexibility has diminished over time is not firmly rejected here. The conclusion I wish to draw is simply that as early as the 1890s, Ohio employers were much more likely to respond to downward demand fluctuations by reducing employment, days worked, and hours than by reducing wage rates. And although Ohio is only one state, studies of other locations tend to confirm this general observation.³ Certainly, wage hikes were likely to be put on hold during

¹ Robert J. Gordon, "Why U.S. Wage and Employment Behaviour Differs from That in Britain and Japan," *Economic Journal*, 92 (Mar. 1982), pp. 13-44; and Jeffrey Sachs, "The Changing Cyclical Behavior of Wages and Prices: 1890-1976," *American Economic Review*, 70 (Mar. 1980), pp. 78-90.

² In this spirit, a number of studies have pointed to the perverse effects of New Deal legislation in maintaining above-trend real wages and ignoring the root causes of high unemployment; see especially Michael M. Weinstein, "Some Macroeconomic Impacts of the National Industrial Recovery Act, 1933-1935," in Karl Brunner, ed., *The Great Depression Revisited* (Boston, 1981), pp. 262-81; and Richard J. Jensen, "The Causes of Unemployment in the Great Depression," *Journal of Interdisciplinary History*, 19 (Spring 1989), pp. 553-83. Such views have been challenged by other researchers; see Martin Neil Baily, "The Labor Market in the 1930s," in James Tobin, ed., *Macroeconomics, Prices, and Quantities: Essays in Memory of Arthur M. Okun* (Washington, DC, 1983), pp. 21-61; and Stanley Lebergott, "Wage Rigidity: Concept or Phrase?" (unpublished manuscript, Wesleyan University, Mar. 1989).

³ Susan B. Carter and Richard Sutch, "The Labor Market in the 1890s: Evidence from Connecticut Manufacturing" (draft of paper prepared for presentation at the International Economic History Association meetings, Leuven, Belgium, 1990); and Peter R. Shergold, "Wage

bad times, and thus wage inflation decelerated; but the notion that participants in labor markets responded to excess supply by cutting the money price must be considered a very poor description of what usually occurred.

WAGE-RATE ADJUSTMENTS IN OHIO DURING TWO ECONOMIC CONTRACTIONS

From the early 1890s until 1910 the Ohio State Bureau of Labor Statistics (BLS) conducted extensive annual surveys of manufacturing establishments in the state to obtain information on wages, hours, and employment for various occupations and industries. It also collected data on wage changes by occupation. Detailed summaries of the data were published in the bureau's annual reports during the period. These data offer unusual insights into the micro-level adjustments of the labor market to macroeconomic conditions. Here I focus on evidence of wage adjustments during two very contractionary years: 1893 and 1908.

The coverage of the Ohio BLS survey seems to have changed over time, with a bias toward larger establishments during the earlier years. Beginning in 1901, however, the bureau undertook to collect responses from as many establishments as possible; moreover, amendments to the law governing the bureau's activities provided for penalties to employers who did not respond to the survey.⁴ Because of this improvement in coverage, I believe examination of the time-series behavior of these data is best restricted to the period 1901 to 1910. Given the poorer coverage of the survey during earlier years, it seems safer to emphasize broad trends and cross-sectional variation rather than year-to-year changes before 1901.

Perhaps the most interesting and unusual question asked was by how much wages were increased or decreased for each occupation in an establishment during the calendar year covered by the survey. The responses were not always tabulated in a very usable form, but for 1893 and 1901-1910 one can calculate the percentage of employees who received pay cuts or raises. If the survey responses are accurate, such data provide a good approach to measuring nominal wage flexibility, since they indicate actual rate adjustments and are thus immune to problems arising from compositional effects.

The most serious issue one must confront in using such data is whether the wage changes might have been grossly underreported.⁵

Rates in Pittsburgh during the Depression of 1908," *Journal of American Studies*, 9 (Aug. 1975), pp. 163-88.

⁴ More complete discussions of these sources are available from the author.

⁵ In examining evidence of a similar type Mitchell expressed strong concern about underreporting: see Daniel J. B. Mitchell, "Wage Flexibility: Then and Now," *Industrial Relations*, 24 (Spring 1985), pp. 266-79.

Underreporting, which would bias the results in the direction of finding wage "rigidity," could have arisen because of ambiguities in the form of the survey question or because of careless, ignorant, or dissembling responses. The former problem seems unlikely here, because the questionnaires specifically required that the respondent write "no change" in the wage-change column next to occupations in which wages did not change. Problems of the latter type are more difficult to assess. It seems likely that the questionnaires were filled out by the factory owner or a central manager. In large plants wage setting may have been delegated to foremen, in which case higher officials would have had only limited knowledge of the details of wages and especially of changes having taken place during the year. It is conceivable that respondents attempted to conceal wage changes, but not likely because the published report did not reveal the names of employers and most industries in the reports consisted of a number of anonymous firms.

Although these remarks should serve as a caveat when interpreting my results, I think underreporting is not a serious problem. For one thing, probit analysis of the Cincinnati wage changes in 1893 shows that larger establishments were significantly more likely to report wage changes than were smaller ones. Furthermore, as I note below, the aggregate effect of the reported wage changes accounts for a large fraction of the overall change in average hourly earnings during periods of fairly stable employment (such as 1906–1907). Assuming even the worst possible underreporting, I show that wage cuts were rare, especially after 1900.

I begin with a look at the experience of Cincinnati workers during 1893. This year was severely contractionary: overall, manufacturing employment in the city fell by over 16 percent between January and December 1893; bank clearings also show a large drop. Employment statistics indicate that male workers suffered more employment loss than females, reflecting their greater concentration in durables manufacturing, with its greater cyclicalities. In addition to the employment reduction, plants reduced their operating time: total days worked fell by 9.2 percent between 1892 and 1893.⁶

In spite of the large decline in activity and labor demand, relatively few Cincinnati workers experienced a cut in wages during 1893. As the first column of Table 1 shows, only 22 percent of employees experienced nominal wage reductions within their occupations. Nearly all the rest experienced no wage adjustment at all. It should be reiterated that the use of occupations as the unit of analysis implies that the data capture only changes in the wage *rates* paid for particular occupations—

⁶ These figures are derived from data published in Ohio State Bureau of Labor Statistics, *Eighteenth Annual Report* (Columbus, 1895).

TABLE 1
WAGE CHANGES DURING 1893, CINCINNATI MANUFACTURING

Wage Change	All	Males	Females
Increase	1.0%	1.2%	0.04%
No Change	77.1	72.9	95.3
Decrease	22.0	25.9	4.7

Note: The wage changes occurred during the year ending Dec. 31, 1893.

Source: Ohio State Bureau of Labor Statistics, *Eighteenth Annual Report* (Columbus, 1895), pp. 143-91.

not earnings adjustments experienced by employees who were shifted between occupations.

The data suggest short-run downward wage-rate inflexibility for most workers.⁷ One of the most interesting features is that women were extremely unlikely to experience a wage cut in 1893; as the third column of Table 1 shows, over 95 percent had no change in wages. Probit analysis of wage cuts by occupation and establishment indicates that the apparent gender difference reflects the fact that the establishments employing women tended to make fewer wage adjustments for both their male and female employees than did all-male establishments; there was no significant difference between the wage flexibility of men and women in plants that employed both sexes. This difference between all-male and other establishments remains even after controlling for the size of employment adjustments.⁸

The collapse of the economy in 1893 was followed by the depression of the 1890s. It would be desirable to see if there was a lagged effect on compensation, especially because economic agents might have delayed wage cuts in anticipation of price inflation during much of 1893, given uncertainties about the gold standard.⁹ Unfortunately, the published reports for 1894 and 1895 do not give the number of workers experiencing wage cuts; the number of establishments reporting cuts is given, and it is very small in both years. For more complete comparability between years, however, it is better to turn to the reports from the first decade of the twentieth century, which allow us to examine wage movements during another serious contraction, that of 1908.

The first column of Table 2 summarizes changes in employment during 1901-1910 for the state of Ohio and separately for Cincinnati and

⁷ During the calendar year of 1931, when the United States experienced large employment losses, only 22.8 percent of workers experienced wage changes, a figure not drastically different from that reported in Table 1. See Mitchell, "Wage Flexibility."

⁸ The probit results are presented in William A. Sundstrom, "Wage Flexibility and Labor-Market Adjustments in the Contraction of 1893: The Case of Cincinnati" (unpublished manuscript, Santa Clara University, Apr. 1989).

⁹ Nominal interest rates soared during early 1893, suggesting inflationary expectations. I am grateful to Charles Calomiris for calling this to my attention.

TABLE 2
PERCENTAGE OF WORKERS EXPERIENCING WAGE CHANGES, 1901-1910

Year	Percentage Change in Employment	Percentage Experiencing Wage Increase	Percentage Experiencing Wage Decrease	Ratio of Decreases to All Changes
State of Ohio				
1901		16.30%	0.44%	2.63%
1902	9.85%	30.71	0.29	0.92
1903	9.26	18.19	1.24	6.39
1904	-6.48	6.94	6.62	48.80
1905	12.13	15.42	0.71	4.43
1906	15.40	26.63	2.05	7.15
1907	3.31	22.36	1.94	7.97
1908	-16.50	6.37	7.36	53.59
1909	11.92	17.60	1.86	9.54
1910	10.12	21.20	0.83	3.77
Cincinnati				
1901		13.49	0.14	1.01
1902	9.45	20.58	0.00	0.00
1903	6.92	14.11	0.15	1.05
1904	-3.83	5.77	0.37	5.96
1905	8.80	11.66	0.45	3.70
1906	5.37	30.27	0.22	0.73
1907	0.22	17.13	1.14	6.22
1908	-14.88	6.17	4.44	41.84
1909	6.52	14.94	2.75	15.56
1910	4.40	15.40	0.88	5.41
Cleveland				
1901		23.84	0.18	0.75
1902	-1.82	29.13	0.11	0.39
1903	17.33	19.25	0.76	3.82
1904	-6.76	6.92	5.05	42.18
1905	11.17	11.84	1.21	9.31
1906	17.54	30.36	1.34	4.23
1907	1.61	18.04	1.82	9.16
1908	-18.45	4.21	7.37	63.66
1909	14.26	19.46	1.64	7.79
1910	16.83	23.86	1.24	4.92

Notes: Percentage changes are calculated as differences of the natural log values for the preceding and current year.

Sources: Ohio State Bureau of Labor Statistics, 26th through 35th Annual Reports (Springfield, OH, 1903-1912).

Cleveland, as reported by the Ohio BLS reports for those years.¹⁰ The severity of the 1907-1908 contraction is evident. Between those years the value of manufacturing output fell by 24.8 percent in the state, 13.9 percent in Cincinnati, and 21.4 percent in Cleveland. Bank clearings at the Cincinnati Clearing House fell by about 10 percent between 1907 and 1908, with the most dramatic decline coinciding with the financial crisis of October and November 1907.

¹⁰ In 1906 Cincinnati and Cleveland together employed about 35 percent of the total workers reported for the state.

In spite of the severity of the contraction, very few wage cuts were reported. Although cuts were more common during the depressed years of 1904 and 1908 than other years, decreases were reported for less than 8 percent of workers for every year and location. Even in the most contractionary year, 1908, wage cuts make up only about half of the reported wage changes. The absence of nominal wage reductions cannot be attributed to "stagflationary" price movements, since price indices for these years generally show deflation.

As can be seen in Table 2 the highest proportion of workers receiving reported wage increases in any year is low, on the order of 30 percent, which may reflect underreporting. An upper-bound estimate of underreporting can be made by supposing that during the years with the most reported increases every worker actually received an increase, but only a third of the changes were reported. If we then inflate the wage-decrease column by a factor of three to remove the largest conceivable effect of underreporting, we still find that at no time or place did the percentage of workers experiencing a cut exceed about 25 percent. The underreporting problem is certainly not that severe, but even if it were, it would seem that wage rates were sticky downward for the large majority of workers during this severe contraction.

Comparing Tables 1 and 2, there was much less wage cutting during 1908 than during 1893. In retrospect, the 1893 contraction was more long-lived and perhaps deeper, but at least in Cincinnati the initial employment loss seems to have been no worse in 1893 than in 1908. A finding of diminished wage flexibility during those 15 years would be consistent with some other findings, but further analysis of price expectations and the occupational composition of the samples is needed before any firm conclusion may be reached.¹¹

AVERAGE HOURLY EARNINGS IN THE CONTRACTION OF 1907-1908

Average hourly earnings, the usual wage measure used in macroeconomic studies, can exhibit cyclical movements for a variety of reasons. Of course, individual workers may experience changes in the rate of pay on any given occupation; such changes would be captured by the wage-change question in the Ohio surveys. In addition, workers may be promoted or demoted within the firm, with less senior workers being "bumped down" the job ladder during contractions.¹² Worker mobility over the cycle may also result in workers changing employers and industries and thus pay; they may even be rehired by their old

¹¹ See Shergold, "Wage Rates in Pittsburgh"; and Christopher Hanes, "The Cyclical Movement of American Manufacturing Wages in the Gilded Age, 1870-1912" (unpublished manuscript, Harvard University, Mar. 1989).

¹² M. W. Reder, "The Theory of Occupational Wage Differentials," *American Economic Review*, 45 (Dec. 1955), pp. 833-52.

employers at lower wages. Finally, the composition of the employed work force may change as some subgroup of workers becomes unemployed.

These effects have very complex implications for the movement of average earnings. If one is interested in how the wage rate of a given worker of given skills changes over the cycle—which after all is really the best measure of whether the labor market is making spot-type adjustments—the changing composition of the employed work force must be carefully controlled for. The selection effect introduced by the unrepresentativeness of unemployed workers has received the most attention by researchers. Analysis using data for a recent period finds that in the economy as a whole, workers with observable characteristics associated with low pay are more likely to become unemployed during a downturn, but that workers with a large positive transitory component of pay for unobserved reasons also are selected out of the employed sample, the latter effect being stronger. In this case the combined effect of selectivity biases ordinary least squares estimates of wage changes in a procyclical direction. However, for manufacturing alone, the net bias is countercyclical; on average, that is, the lower-paid workers tend to leave manufacturing employment during downturns.¹³

As I do not have observations on individual characteristics, these sorts of controls for selectivity bias cannot be used with my data. However, the observations on wages by industry, sex, and occupation provide the raw material for a decomposition of observed changes in average hourly earnings into the effects of wage adjustments by occupation and changes in the occupational composition of the employed work force. It turns out that such a decomposition provides considerable insight into how the average hourly earnings of workers seem to have declined during the 1908 contraction when so few workers experienced wage cuts.

To see how wage changes may be decomposed, consider the change in average hourly earnings for a sample of workers between two points in time. Let w_{it} be the average hourly earnings of workers in occupation i at time t . Similarly, let p_{it} be the proportion of all employed workers at time t who hold occupation i . Then the change in average hourly earnings for all employed workers between time $t-1$ and time t is:

$$\Delta \bar{w} = \sum_i p_{it} w_{it} - \sum_i p_{i,t-1} w_{i,t-1}$$

It is easy to show that the change in average hourly earnings can be decomposed into the sum of three effects: $\Delta \bar{w} = C + E + R$, where C

¹³ See Michael Keane, Robert Moffitt, and David Runkle, "Real Wages over the Business Cycle: Estimating the Impact of Heterogeneity with Micro Data," *Journal of Political Economy*, 96 (Dec. 1988), pp. 1232–66.

TABLE 3
 PERCENTAGE CHANGES IN EMPLOYMENT, DAYS, HOURS, AND EARNINGS:
 TEN LARGEST CINCINNATI MANUFACTURING INDUSTRIES, 1906-1910

Period	Percentage Change In			
	Employment	Days Worked	Daily Hours	Average Hourly Earnings
All Workers				
1906-1907	-1.01%	-1.02%	0.04%	2.98%
1907-1908	-17.46	-6.50	-3.21	-0.99
1908-1909	7.71	4.93	1.70	2.30
1909-1910	7.33	0.20	0.49	2.94
Males Only				
1906-1907	0.99	-1.23	-0.02	2.68
1907-1908	-22.57	-6.69	-3.28	0.58
1908-1909	9.51	4.60	2.55	0.91
1909-1910	8.64	0.93	0.54	2.26
Females Only				
1906-1907	-5.51	-0.56	0.10	0.20
1907-1908	-6.52	-6.13	-2.94	2.58
1908-1909	4.05	5.63	-0.14	4.40
1909-1910	4.54	-1.32	0.28	3.29

Notes: Percentage changes are differences of the natural log values of the variables. All figures are employment-weighted. The 10 industries included are boots and shoes; clothing; printing and binding; machinery; furniture; cigars; carriages and wagons; tools; soaps, candles, and tallow; and foundry and machine-shop products.

Sources: Ohio State Bureau of Labor Statistics, 31st through 35th Annual Reports (Springfield, OH, 1908-1912).

is a pure composition effect that holds wages at their $t-1$ values and allows the weights (proportions p) to change, E is a composition-constant pure wage-change effect that holds the weights at their $t-1$ values and allows the wage rates to change, and R is a residual effect that is a function of the time-covariance of p and w . Specifically, R would be positive if those occupations that gained representation (weight) in the sample were also occupations that tended to receive wage increases.¹⁴

Using the Ohio BLS reports for 1906 to 1910, I created a sample consisting of all data reported for occupations in Cincinnati's 10 largest manufacturing industries in 1906.¹⁵ The data set is essentially a panel with a total of 2,567 separate entries disaggregated by industry, occupation, sex, and year. Table 3 shows percentage changes in employment, days worked, daily hours, and average hourly earnings for 1906 to 1910 for all occupations in the sample and separately by sex. Between 1907 and 1908 firms reduced employment dramatically; smaller but still substantial reductions were also made in the working time of those who

¹⁴ Further details on these calculations are available from the author.

¹⁵ The top 10 employing industries in Cincinnati in 1906, according to the Ohio Bureau of Labor Statistics, were boots and shoes; clothing; printing and binding; machinery; furniture; cigars; carriages and wagons; tools; soaps, candles, and tallow; and foundry and machine shop products. These industries employed just over half the manufacturing workers in Cincinnati in 1906.

remained employed, as indicated by total days worked and average daily hours. Employment losses were much larger for males than females, largely reflecting the fact that it was male-dominated industries, particularly producer durables, that experienced the most severe employment losses.

Overall, nominal average hourly earnings fell by about 1 percent between 1907 and 1908. Certainly, that does not seem to be a huge reduction in light of the quantity adjustments, but it does show a wage response nonetheless, and a substantial deceleration from the preceding year's 3 percent rate of increase. However, one's confidence that individual workers were experiencing reductions is eroded by the evidence on average hourly earnings by sex. The average earnings of males and females were increasing! The reason for this pattern is precisely the composition effect introduced by the differential employment adjustment by industry. Women, whose pay was on average only half that of men, comprised a growing proportion of the sample of employed workers, as they were concentrated in consumer-goods industries with much more cyclically stable employment.

Wage-change decompositions for samples of all workers and for males and females separately are presented in Table 4 for three periods: 1906-1907, 1907-1908, and 1908-1909. The sources of change are represented as percentages of the mean average hourly earnings for the two years and should add to the total percentage change in average hourly earnings. I have included the decomposition for 1906-1907 because it is indicative of a period when there was very little net total employment change.¹⁶ The 1908-1909 change picks up the lagged effects of the contraction. The fifth column of the table shows the percentage change in average wages implied by aggregating the effects of the *reported* wage changes, holding employment composition fixed.

For the 1907-1908 decomposition it is clear that the composition effect *C* is responsible for the reduction in average wages. It is negative for the sample as a whole and for the separate male and female subsamples. In other words, the employment decline was greater in the higher-paying occupations. The wage effect, on the other hand, is positive: wages were rising in the average occupation. This contrasts with the net effect of the reported wage changes, which is small but negative. The difference between the wage effect of the decomposition and the net effect of reported changes could arise for a number of reasons. First, it may be that increases were underreported relative to decreases. Second, it may be that the distribution of wages within occupations was shifting, even though few individual workers experienced changes in wage rates. For example, the evidence is consistent

¹⁶ Reported employment in these industries fell by about one percent between 1906 and 1907, reflecting the onset of the contraction by late 1907.

TABLE 4
 DECOMPOSITION OF CHANGE IN AVERAGE HOURLY EARNINGS:
 TEN LARGEST CINCINNATI MANUFACTURING INDUSTRIES, 1906-1909

Year	Percentage Change in Average Hourly Earnings	Source of Change			Effect of Reported Change
		C	E	R	
1906-1907					
All	2.28%	0.69%	1.87%	-0.28%	1.23%
Males	2.21	0.39	2.22	-0.40	1.37
Females	0.07	-0.51	0.44	0.14	0.67
1907-1908					
All	-0.91	-2.94	1.66	0.36	-0.11
Males	0.56	-1.08	1.17	0.47	-0.15
Producer Durables	-0.02	-0.18	-0.13	0.29	-0.95
Consumer Goods	0.59	-1.94	2.05	0.48	0.31
Females	2.26	-1.34	3.78	-0.19	0.11
1908-1909					
All	1.94	0.24	1.49	0.21	1.68
Males	0.74	-0.03	0.74	0.03	1.79
Females	5.05	-0.23	4.31	0.97	1.29

Notes: Percentage change in average hourly earnings is the total change divided by the arithmetic average for the two years. *C* is the composition effect, *E* the composition-constant wage effect, and *R* the residual, all expressed as percents of the average hourly earnings for the two years (for explanation, see text). $C + E + R$ should add to the number in the first column to within rounding error. The effect of the reported changes is the composition-constant weighted effect on average wages of the wage changes reported by employers. Producer durables industries are machinery, tools, and foundry and machine-shop products. Consumer-goods industries are boots and shoes, clothing, and cigars.

Sources: See Table 3.

with the idea that the less senior and therefore lower-paid employees in any given occupation were more likely to be laid off; their leaving could cause the occupation's average wage to rise even if those who remained on that job experienced a small reduction in pay.

By comparison with 1907-1908, the 1906-1907 and 1908-1909 changes are dominated by large positive wage effects, with the composition effects generally small for both sexes. The period 1906-1907 preceded the large employment adjustments of the recession, with employment and days worked in Cincinnati manufacturing both falling by only one percent between the two years. The reported wage changes have a larger net effect for this period and are about two-thirds the size of the wage effect. Again, this discrepancy may be attributable to underreporting of increases or composition effects within occupations. Certainly there is little reason to believe that the unreported proportion of wage changes exceeded a third.

Apparently the greater cyclicity of employment in durables manufacturing was an important factor in the decline of average hourly earnings during 1907-1908. To see if the composition effect was important within manufacturing sectors I performed the 1907-1908 decomposition on two subsamples of the male employees: first, the three

producer durables industries (machinery, tools, and foundry and machine-shop products), and second, the three lighter consumer-goods manufacturing industries that employed the most women (boots and shoes, clothing, and cigars). The results are included in Table 4 with the results for 1907–1908.

The difference in the experience of male workers between the two industry groups shows the hazard of overgeneralization when describing labor-market adjustments over the cycle. In neither industry was there much change in average hourly earnings. But the similarity of this statistic masks important differences. In the producer-durables industries, despite a total employment loss of 50.8 percent, neither the composition nor wage effects were much different from zero. By contrast, there seems to have been more adjustment along both margins for men in the consumer-goods sector: the composition effect indicates that employment losses were greater for higher-paid men; but the wage effect shows that the average male worker who remained employed was experiencing a 2 percent increase in pay even as male employment in these industries fell by 9.2 percent.

Overall, the evidence from Ohio portrays manufacturing labor markets in which substantial reductions in employment, days worked, and hours were accompanied by very minimal reductions in compensation for individual workers. The most direct evidence comes from reported wage changes by occupation; to the extent that these are tainted by potential underreporting, one may have more confidence in the decomposition of changes in average hourly earnings. These indicate that nominal wages were rising during the contraction of 1908 for the average occupation. These results favor a research agenda for historical macroeconomics that focuses carefully on the micro-level responses of the labor market along various margins of adjustment without presuming spot-market fluctuations of the wage.