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industry designations. For these 9, monthly movements in wage rates and in average hourly earnings can be compared (Table 1 and Charts 1-2). The deficiencies of samples in individual industries are probably less serious when the 25 industries are combined into a single series for all manufacturing, although the manufacture of food products, clothing, and construction materials seems under-represented. In the absence of a more satisfactory series, we compare average hourly earnings for all manufacturing compiled by the NICB with the index of wage rates for all manufacturing based on the industry samples of the BLS, which has a broader coverage.

Because our interest is centered in cyclical behavior these series must be adjusted to eliminate possible seasonal movements; i.e., seasonally adjusted average hourly earnings are compared with the unadjusted index of wage rates since the latter does not seem to require adjustment.

3 *Wage Rates turn later than Business Activity and Employment in Manufacturing Industries, United States*

Let us examine first the movement of wage rates. Among the first impressions we get from Charts 1 and 2 is that wage rates declined sharply from 1920 to 1922, made a substantial but partial recovery by 1923, and continued at the 1923 level with minor variations until 1930 or thereabouts when the impact of the Great Depression began to affect their level. On closer inspection, however, we find that the minor movements during this period of relative stability, 1923-30, have a cyclical character. This is illustrated by Chart 3 which shows the movement for these years for all manufactures computed to 2 decimal places and plotted on a generous scale.[8] The amplitudes of the cyclical phases are so very small that we are compelled to distinguish between the major and minor cyclical movements in wage rates. The former are the movements that correspond to the contraction of business activity from January 1920 to July 1921, the succeeding expansion from July 1921 to May 1923, and the contraction initiated in June 1929. The minor cyclical move-

[8] Cycles appear during this period in 5 of the 9 individual industries when the data are computed to 2 decimal places and plotted on a generous scale: automobile, iron and steel, paper and pulp, silk and rayon, and woolen and worsted manufactures (Table 1).

TABLE 1

Cyclical Turning Points in Business Activity, Employment, Wage Rates, and Average Hourly Earnings
All Manufactures, 1919-1938, and Nine Manufacturing Industries, United States, 1919-1930

LEVEL OF BUS. ACT.	DATE OF TURNING POINT IN: Bus. act.[a]	Empl.[b]	Wage rates SM	Wage rates A	Average hourly earn. SM	Average hourly earn. A	LEAD (—), LAG (+), OR COINCIDENCE (0), MONTHS: Rates & bus. act. SM	Rates & bus. act. A	Earn. & bus. act. SM	Earn. & bus. act. A	Rates & empl. SM	Rates & empl. A	Rates & earn. A
					ALL MANUFACTURES								
Trough	4/19	3/19			c	c			c	c			
Peak	1/20	1/20	10/20	10/20	10/20	10/20	+9	+9	+9	+9	+9	+9	0
Trough	7/21	7/21	4/22	4/22	c	c	+9	+9	c	c	+9	+9	c
Peak	5/23	6/23	1/24	1/24	11/24	12/23	+8	+8	+18	+7	+7	+7	+1
Trough	7/24	7/24	12/25	12/25	9/25	9/25	+17	+17	+14	+14	+17	+17	+3
Peak	10/26	1/26	1/27		8/27		+3		+10		+12		
Trough	11/27	1/28	1/29		2/28		+14		+3		+12		
Peak	6/29	8/29	1/30	6/30	4/30	8/30	+7	+12	+10	+14	+5	+10	−2
Trough	3/33	7/32	5/33	5/33	6/33	6/33	+2	+2	+3	+3	+10	+10	−1
Peak	5/37	7/37	c	c	3/38	10/37	c	c	+8	+5	c	c	c
Trough	6/38	6/38	c	c	2/39	2/39	c	c	+8	+8	c	c	c
Average							+8.6	+9.5	+9.6[d]	+9.4[d]	+10.1	+10.3	+0.2
					AUTOMOBILES								
Trough	4/19	5/19			c				c				
Peak	1/20	1/20	9/20	9/20	7/20		+8	+8	+6		+8	+8	+2
Trough	7/21	1/21	4/22	4/22	c		+9	+9	c		+15	+15	c
Peak	5/23	1/24	9/23	5/23	2/24		+4	0	+9		−4	−8	−9
Trough	7/24	7/24	12/24		9/24		+5		+2		+5		
Peak	10/26	11/25											
Trough	11/27	10/27											
Peak	6/29	2/29	6/30	7/30	7/30		+12	+13	+13		+16	+17	0
Average							+7.6	+7.5	+7.5		+8.0	+8.0	

Table 1 (cont.)

Level of bus. act.	Date of turning point in: Bus. act.[a]	Empl.[b]	Wage rates SM	Wage rates A	Average hourly earn. SM	Average hourly earn. A	Lead (−), lag (+), or coincidence (0), months: Rates & bus. act. SM	Rates & bus. act. A	Earn. & bus. act. SM	Earn. & bus. act. A	Rates & empl. SM	Rates & empl. A	Rates & earn. A
					BOOTS AND SHOES								
Trough	4/19	3/19			c				c				
Peak	1/20	12/19	12/20	12/20	2/21		+11	+11	+13		+12	+12	−2
Trough	7/21	1/21			c		+13[e]	+13[e]	c				c
		9/21											
		4/22	8/22[e]	8/22[e]							+4	+4	
Peak	5/23	4/23	1/24	11/23	3/24		+8	+6	+10		+9	+7	−4
Trough	7/24	7/24			11/25[f]				+16[f]				
		3/25											
		4/26											
Peak	10/26	12/26			7/26				−3				
Trough	11/27	8/28			4/27				−7				
Peak	6/29	11/29		2/30	1/30			+8	+7			+3	+1
Average							+10.7	+9.5	+6.0		+8.3	+6.5	
					ELECTRICAL GOODS								
Peak	1/20	10/20	c	c	10/20		c	c	+9				c
Trough	7/21	10/21	c	c	c		c	c	c				c
Peak	5/23	8/23		6/23				+1				−2	
Trough	7/24	11/24											
					5/25								
					1/26								
Peak	10/26	1/26											
Trough	11/27	5/27											
Peak	6/29	7/29	9/30	11/30	6/30		+15	+17	+12		+14	+16	+5
Average[g]													

LEVEL OF BUS. ACT.	DATE OF TURNING POINT IN						LEAD (−), LAG (+), OR COINCIDENCE (0), MONTHS						
			Wage rates		Average hourly earn.		Rates & bus. act.		Earn. & bus. act.		Rates & empl.		Rates & earn.
	Bus. act.[a]	Empl.[b]	SM	A	SM	A	SM	A	SM	A	SM	A	A
IRON AND STEEL													
Trough	4/19	5/19	8/19	8/19	c		+4	+4	c		+3	+3	c
Peak	1/20	3/20	11/20	11/20	11/20		+10	+10	+10		+8	+8	0
Trough	7/21	7/21	4/22	4/22	c		+9	+9	c		+9	+9	c
Peak	5/23	8/23	3/24	10/23	11/23		+10	+5	+6		+7	+2	−1
Trough	7/24	8/24	1/26	1/26	12/24		+18	+18	+5		+17	+17	+13
Peak	10/26	2/26	2/27				+4				+12		
Trough	11/27	12/27	6/28				+7				+6		
Peak	6/29	8/29	12/29	5/30	8/30		+6	+11	+14		+4	+9	−3
Average							+8.5	+9.5	+8.8		+8.2	+8.0	
PAPER AND PULP													
Peak	1/20	7/20	11/20	11/20	12/20	12/20	+10	+10	+11	+11	+4	+4	−1
Trough	7/21	6/21	6/22	6/22	c	c	+11	+11	c	c	+12	+12	c
Peak	5/23	4/23	12/23	6/23		8/23	+7	+1		+3	+8	+2	−2
Trough	7/24	7/24	11/24				+4				+4		
Peak	10/26	2/26											
Trough	11/27	2/28											
Peak	6/29	1/30	11/29	12/30	11/30	11/30	+5	+18	+17	+17	−2	+11	+1
Average							+7.4	+10.0		+10.3	+5.2	+7.2	
RUBBER TIRES AND TUBES													
Trough	7/21	2/21	c	c	c		c	c	c		c	c	c
Peak	5/23	3/23	7/23	7/23	8/23		+2	+2	+3		+4	+4	−1
Trough	7/24	7/24		9/23	10/23			−10	−9			−10	−1
Peak	10/26	12/25			12/27[h]				h				
Trough	11/27	7/26			7/28[h]				h				
Peak	6/29	4/29		6/30	3/31			+12	+21			+14	−9
Average								+1.3	+5.0			+2.7	

TABLE 1 (concl.)

LEVEL OF BUS. ACT.	DATE OF TURNING POINT IN						LEAD (—), LAG (+), OR COINCIDENCE (0), MONTHS						
	Bus. act.[a]	Empl.[b]	Wage rates		Average hourly earn.		Rates & bus. act.		Earn. & bus. act.		Rates & empl.		Rates & earn.
			SM	A	SM	A	SM	A	SM	A	SM	A	A
SILK AND RAYON													
Trough	4/19	2/19			c				c				
Peak	1/20	5/20	10/20	10/20	9/20		+9	+9	+8		+5	+5	+1
Trough	7/21	1/21 9/21			c		+13[e]	+13[e]	c				c
		8/22	8/22[e]	8/22[e]							0	0	
Peak	5/23	5/23	4/24	6/23	12/23		+11	+1	+7		+11	+1	−6
Trough	7/24	7/24	9/24		12/24		+2		+5		+2		
Peak	10/26	1/26	11/26		1/27		+1		+3		+10		
Trough	11/27	6/26	2/28				+3				+20		
					9/29								
Peak	6/29	7/29	5/29	4/30	3/30[i]		−1	+10	i		−2	+9	+1[i]
Average							+5.4	+8.2	+5.8		+6.6	+3.8	
SLAUGHTERING AND MEAT PACKING													
Trough	7/21	12/21	c	c	c	c	c	c	c	c	c	c	c
Peak	5/23	9/23		5/23		6/23		0		+1		−4	−1
Trough	7/24	7/26											
Peak	10/26												
Trough	11/27												
Peak	6/29	10/29	11/29	3/30	3/30	3/30	+5	+9	+9	+9	+1	+5	0
Average[g]													
WOOLENS AND WORSTEDS													
Peak	1/20	c 1/21 9/21	10/20	10/20	c		+9	+9	c		c	c	c
Trough	7/21	7/22	8/22	8/22	8/22		+13	+13	+13		+1	+1	0

Peak	5/23	7/23	3/24	5/23	5/23	+10	0	0	+8	−2	0
Trough	7/24	7/24			6/24			−1			
		3/25		7/25	4/25						+3
		3/26		10/25	8/26						−10
Peak	10/26	1/27			12/27[h]			h			
Trough	11/27	9/28	4/29		12/29[i]	+17		i	+7		
Peak	6/29	10/29	11/29	6/30	7/30[i]	+5	+12	i	+1	+8	−1[i]
Average						+10.8	+8.5	+4.0	+4.2	+2.3	
AVERAGE FOR 9 INDUSTRIES											
Peak	1/20					+9.5	+9.5	+9.5	+7.4	+7.4	
Trough	7/21					+11.3	+11.3		+9.2	+9.2	
Peak	5/23					+7.4	+1.8	+5.8	+6.1	0	
Trough	7/24					+7.2		+3.0	+7.0		
Peak	10/26										
Trough	11/27					+9.0			+11.0		
Peak	6/29					+6.7	+12.2	+13.3	+4.6	+10.2	
Averages at all turning points in 9 industries						+8.0	+8.0	+7.2	+6.8	+5.6	−0.9

SM: standard method; A: alternate method.

[a] The turning points in business activity are NBER reference cycle dates.

[b] BLS employment indexes were used for all manufactures, automobiles, boots and shoes, iron and steel, silk and rayon, and slaughtering and meat packing; NICB employment indexes for rubber products, electrical goods, woolens and worsteds, and paper and pulp. All employment indexes were corrected for seasonal fluctuations.

[c] The data are insufficient or unavailable to determine turning points.

[d] The lags between the turning points in earnings and the 5/37 and 6/38 turning points in business activity are not included in the average.

[e] The 8/22 trough in wage rates corresponds to the 7/21 trough in business activity.

[f] The 11/25 trough in average hourly earnings corresponds to the 4/26 trough in employment.

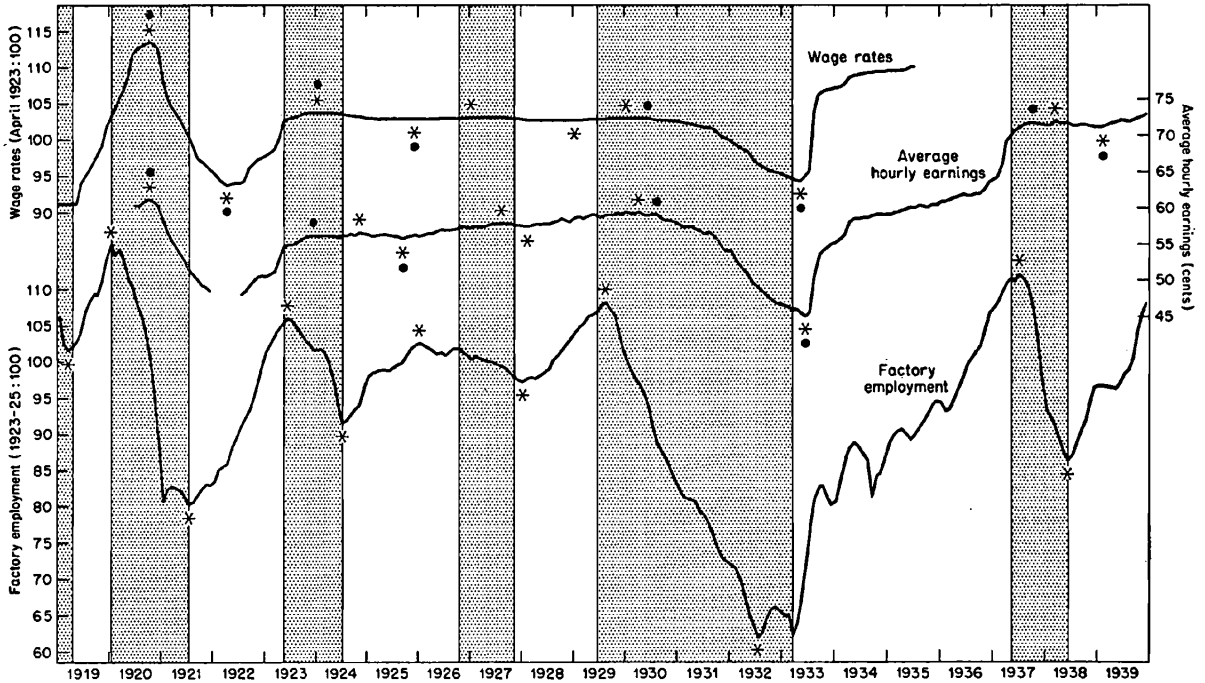
[g] Average omitted since it would be based on only two observations.

[h] No corresponding turn in business activity.

[i] Although the turning point in hourly earnings does not correspond to any turning point in business activity, it does correspond to a turning point in wage rates.

Chart 1

Indexes of Wage Rates and Factory Employment and Average Hourly Earnings All Manufactures, United States, 1919–1939



Shaded periods are contractions in business activity.
* Turning points according to standard method.
• Turning points according to alternate method.

ments are those that correspond to movements in business activity between May 1923, the end of the recovery from the postwar deflation of World War I, and June 1929, the inception of the Great Depression.

Recognition of the two orders of cycles in wage rates is the reason for introducing two dates for the beginning and end of certain cyclical movements. In the first instance the standard NBER procedure for marking off cyclical phases was applied to our indexes of wage rates (computed to 2 decimal places), average hourly earnings, and employment.[9] The dates of these turning points in all cycles, major and minor, mark the dates of reversal in the direction of the cyclical movements of each series. However, the strict application of the standard procedure to minor cycles in wage rates and average hourly earnings does not in all cases designate changes that are most significant for us since the cyclical movements prior and subsequent to the turning point may be of very slight amplitude because both wage rates and hourly earnings tend to fluctuate within a relatively narrow range and are subject to erratic movements. If the series were smoothed, the turning points might well differ from those based on the original data. The standard procedure, in effect, selects turning points in the unsmoothed series while the alternate procedure allows implicitly for smoothing by using the dates that terminate or initiate substantial changes in wage rates or hourly earnings. That is, we marked off the beginning and end of plateau-like movements that characterize some phases of minor cycles. Such points do not necessarily coincide with the turning points that mark reversals in direction (Table 1). The degree of parallelism of movement between wage rates and average hourly earnings can best be judged by using the alternate turning points.

This difference in method may be illustrated by our selection of turning points in the wage rate index for the iron and steel industry. The period that creates difficulties is 1923-30. When the index computed to 2 decimal places for these years is plotted on a generous scale, our standard method would select the following turning points: peak, March 1924; trough, January 1926; peak, February 1927; trough, June 1928; peak, December 1929. Accord-

[9] For a description of this procedure, see Burns and Mitchell, *Measuring Business Cycles* (NBER, 1946), Ch. 4, pp. 56-114.

Chart 2

Indexes of Wage Rates and Factory Employment and Average Hourly Earnings in Selected Manufacturing Industries United States, 1919–1931

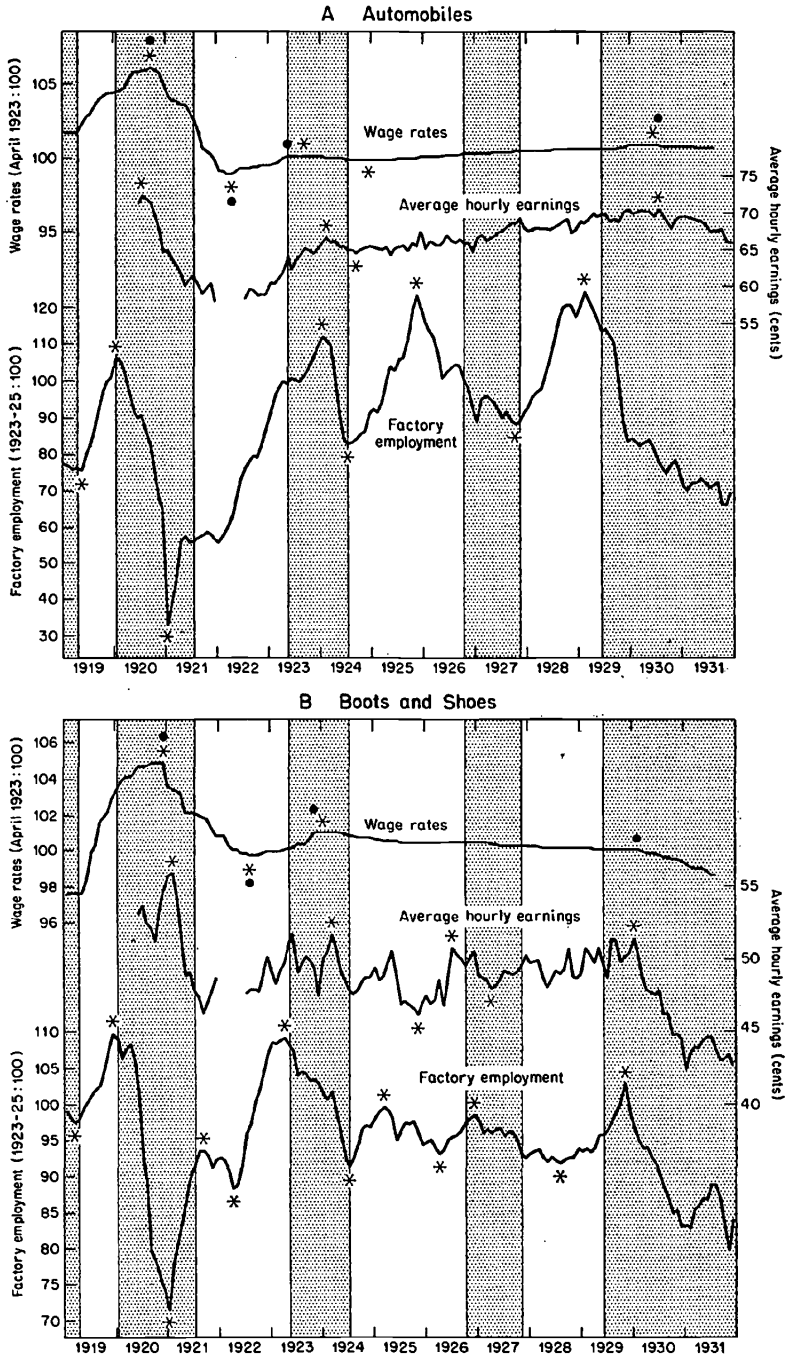
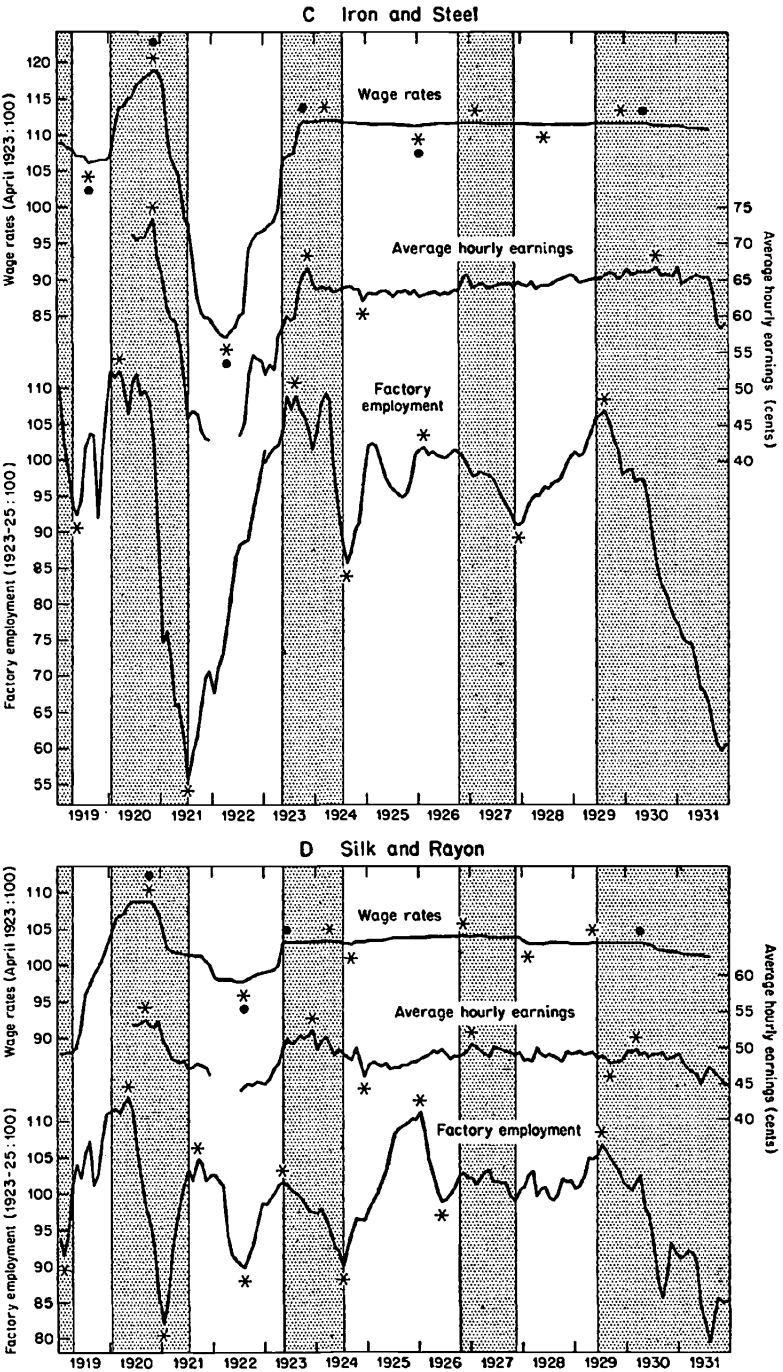
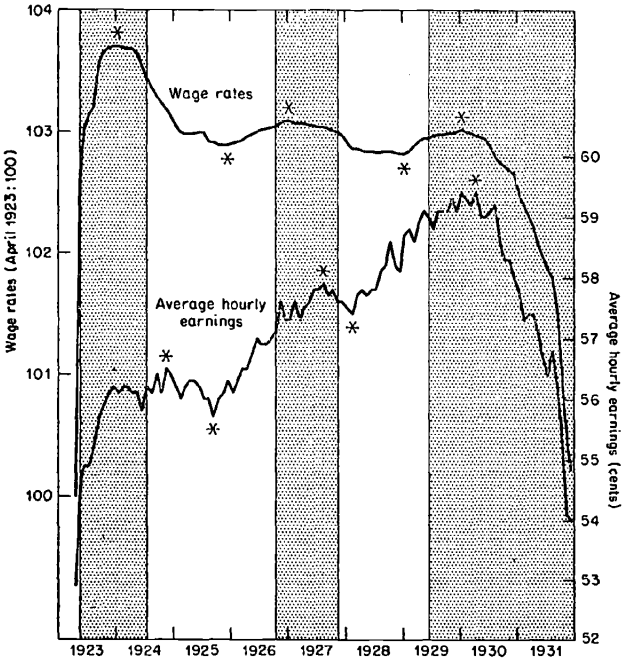


Chart 2 (concl.)



Shaded periods are contractions in business activity.
* Turning points according to standard method.
● Turning points according to alternate method.

Chart 3
Index of Wage Rates and Average Hourly Earnings
All Manufactures, United States, 1923--1931



Shaded periods are contractions in business activity.
* Turning points according to standard method.

ing to our alternate method we reason that the series entered upon a plateau in October 1923 and this date should replace the March 1924 peak. In support we call attention to the fact that the month to month change in the index between October 1923 and March 1924 did not exceed one-tenth of a point in the index whereas before October 1923 the month to month changes were relatively much larger (see App. Table A, Iron and Steel Industry). The subsequent turning points up to the beginning of the Great Depression are disregarded because the cyclical amplitudes (the difference in standings between peak and trough or between trough and peak) are very small. Using the alternate method, we date the be-

	CONTRACTION 3/24-1/26	EXPANSION 1/26-2/27	CONTRACTION 2/27-6/28	EXPANSION 6/28-12/29
Cyclical amplitude of phase as a % of initial standing	−0.71	+0.45	−0.18	+0.09

ginning of the downturn that corresponds with the Great Depression at May 1930 rather than December 1929 because the month

to month changes between the two dates were less than one-tenth of a point while after May 1930 they were at least one-tenth of a point and continued steadily downward.

As we have seen, wage rates in United States manufacturing industries turn later than business activity and employment. Moreover, at most turning points in both business activity and employment the lag has been substantial and the use of the alternate turning points does not substantially modify this general conclusion.[10] We shall confine our comments, therefore, to the results based on the standard dating of turning points, unless otherwise noted.

The wage rate index for all manufactures lagged behind business activity or factory employment at all turning points, major and minor, between 1920 and 1933. The lag behind business activity averaged 9 months, and at 6 of the 8 turns exceeded 6 months. The average lag at the major turning points was 7 months. At only one of the major turns in business activity was the lag so brief as to qualify as a rough coincidence—2 months at the trough of the 1929-33 depression. Not only did wage rates begin to rise only 2 months after the revival in business but they rose swiftly.[11] This exceptional recovery was caused by the negotiations under the terms of the National Recovery Act whereby the workweek was shortened without reducing weekly earnings. The rise in wage rates under the circumstances was automatic.

This direct intervention of the federal government in determining wage rates was an innovation that probably may be regarded as marking an institutional change in the economic environment in which wage rates change. General changes in wage rates at that point became the concern of the federal government, which has since conditioned the movement of wage rates either directly

[10] The main changes due to the alternate dating of turns are a reduction in the lag behind the peak of business activity in May 1923 in the individual industries and a lengthening of the lag at the June 1929 peak in all the series. Wage rates and employment are similarly affected.

[11] According to Chart 1 the 1929 level of wage rates was more than restored within 3 months after the low point in wage rates had been reached. This rate of recovery, however, is an exaggeration because the preceding declines are not fully reflected in the index while the rises of the recovery period are fully reported since they are due to federal legislation and public negotiation. The movements in average hourly earnings during this period probably represent the changes in wage rates more accurately.

through minimum wage legislation or indirectly through promotion of collective bargaining and social insurance (see Sec. 6).

Turning points in employment might be thought to have a more immediate effect on wage rates since they mark the point when the number of unemployed competing for jobs changes. This assumed relation is not supported by our index of wage rates for all manufactures. Wage rates turned on the average 10 months later than factory employment. At no turn was the lag less than 5 months, and the lags at the minor turns were longer than at the major turns.

The business contractions of 1920-21 and 1929-33, judged by amplitude of movement, were among the severest in our recent history. The former downturn stopped within a year and a half while the latter continued for nearly four years. Some have attributed the shorter duration of the earlier contraction to a speedier adjustment of price relationships. To appraise the validity of this thesis in general would go beyond the scope of this Paper. Our materials, however, do bear on one price series, the price of labor, and to see whether it supports or refutes the above thesis seems pertinent.

Business activity reached a peak in January 1920 but wage rates in all manufactures not until October (see Table 1). That is, industrial wage rates did not begin to decline until the recession in business activity had been under way for 9 months. The lag was of about the same length at the onset of the Great Depression. Business activity reached a peak in June 1929 and wage rates in January 1930, according to the standard procedure, or in June 1930, according to the alternate procedure, i.e., wage rates lagged 7 to 12 months. The inception of the wage rate adjustment may therefore be said to have been equally speedy or slow in both contractions.

Nonetheless, wage rates moved very differently in these two contractions. In the first, the downward adjustment, once begun, proceeded rapidly—at 1.0 percent a month. During the first half of the contraction the rate of decline per month was even higher, 1.3 percent. In the Great Depression, on the other hand, it was much less—0.2 percent from the peak in June 1930. Moreover, in the first half of this contraction the monthly rate of decrease was half of the average rate for the entire contraction.[12]

[12] As we shall see in Section 7, cyclical amplitudes and rates of change in wage rates are probably more accurately measured by average hourly earnings than by our index

This difference in the rates of decline in wage rates can be explained in large part by the differences in the movements during the months preceding the respective contractions. The peak in 1920 was the culmination of a very sharp rise initiated during World War I and continuing through the postwar inflation years. From May 1919 to October 1920, for example, wage rates increased 25 percent, and the subsequent deflation must be read against the background of this preceding upward spiral. The downturn in wage rates in 1930, in contrast, came after about 7 years of stability. The need for a realignment of wage rates, therefore, was much less obvious than in the earlier contraction. Moreover, the attitude of leading government officials and industrialists was different. At the outset of the Great Depression they exhorted employers to maintain wage rates and share employment. In the 1920-22 depression there seems to have been no such campaign.

The lagged movement of the wage rate index for all manufactures cannot be attributed to its composite character, for this delayed reaction of wage rates to changes in business activity is evident in all 9 industries. At all except 1 of the 36 corresponding turning points wage rates in each of the 9 manufacturing branches lagged behind business activity. The lags for the 9 industries averaged 8 months, almost the same as the average for the composite index: 5 or more months at all except 8 turning points; and 5 of the 8 relatively short lags were at the minor turns. The average lag ranged from 5 months in the silk and rayon industry to 11 in the manufacture of woolen and worsted goods and boots and shoes. In 3 industries— electrical goods, rubber tires and tubes, and slaughtering and meat packing—the lack of sensitivity of wage rates to changes in business activity is revealed in a failure to trace cycles instead of substantial lags. While business activity, for example, reversed its movement 5 times between 1923 and 1929, wage rates in each of these 3 industries reversed their movements only once.

Wage rates consistently lagged behind business activity on the average, at all the turning points in business activity as well as in all the industries in our sample. The lag ranged from nearly 7

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of wage rates. However, if we substitute the former, differences in movement during the two depressions are the same although somewhat less marked. For example, in the 1920-22 contraction the rate of change per month was —1.0 percent; for the first half —1.7. In the Great Depression the comparable figures were —0.7 and —0.5.

months behind the peak of business activity in June 1929 to 11 months behind the trough in July 1921. Our observations are too few, unfortunately, to tell whether it has been lengthening, shrinking, or has remained about the same, or whether its length differs significantly at peaks and troughs of business activity.

As in all manufactures, wage rates in all 9 industries lagged behind employment and by about the same interval on the average as behind business activity (see Table 1). This is true also for each of the 9 industries except woolen and worsted goods, in which the average lag was 4 months; the average lag behind turns in business activity was 11 months. The depressed state of the woolen and worsted goods industry during the 1920's probably accounts for its somewhat greater sensitivity; in addition, it has more cycles than business activity.

The lag of wage rates at peaks of employment suggests that the downward pressure of shrinking employment opportunities on wage rates does not take effect, on the average, until about 6 months after employment itself has begun to decline.

Some of the major reasons for this sluggish reaction of wage rates to altered conditions in business activity and employment seem clear. The chief one may well be that cyclical turning points are recognized only after the event; during the transition from one phase to another, an employer cannot know whether a change in the level of his business activity will prove to be a minor fluctuation or a sustained change. The diversity of dates at which activity in each firm changes would certainly contribute to the creation of lags in wage rates. Near the peak of prosperity, for example, the firms of a given industry whose activity has declined may be loath to reduce wage rates because they want to retain the goodwill of their employees and hope that the downturn is minor and temporary. On the other hand, firms continuing to expand their business may grant increases in wage rates, thereby causing the average wage rate for the industry to rise. In unionized manufacturing industries, of which there were few between 1919 and 1935,[13] negotiations for

[13] Factory workers organized in trade unions were estimated to constitute only 11 to 16 percent of all factory workers between 1923 and 1933, and by 1935 wage agreements covered only about a quarter of all factory workers. Only in the clothing industry, excluding boots and shoes, was as much as a half of the labor force unionized; in the printing and publishing trades, long regarded as a stronghold of union-

higher wage rates under contracts that expire before the peak may be initiated before the peak but not be concluded until after the downturn. If the wage contract expired after the peak, the downward adjustment of wage rates would automatically lag.

At cyclical troughs too, certain factors make wage rates lag behind business activity or employment. The upturn is usually not recognized as such when it occurs, and employers are still keenly conscious of the necessity of reducing costs because of the lively competition due to large unused capacity. Competition for jobs is equally keen because of widespread and, in many instances, prolonged unemployment. The continued decline in retail prices after employment begins to expand and the rise in 'take-home' pay due to a fuller workweek are other reasons why wage earners do not effectively resist further reductions in hourly rates.[14] Moreover, in

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ism, only 25 to 31 percent of the workers were members of unions. Leo Wolman, *Ebb and Flow in Trade Unionism* (NBER, 1936), pp. 128, 224, 226, and 227.

This is one of our reasons for not utilizing the BLS series on union wage rates. These data have other serious limitations for our purposes: in only two trades, building and printing, do they extend back of 1929. Thus their industrial coverage is narrow. Of more consequence is the fact that union wage rates are reported only once a year. For an analysis of cyclical timing annual data are much too crude. The nominal character of union wage rates also poses a problem. In the building trades, particularly, deviations from union rates have been notorious.

However, if one is willing to ignore all their defects, these two series confirm our findings on the lag of wage rates behind general business.

DATES OF CYCLICAL TURNING POINTS

LEVEL OF BUSINESS ACTIVITY		UNION HOURLY WAGE RATES: Building trades	UNION HOURLY WAGE RATES: Printing trades	LEVEL OF BUSINESS ACTIVITY		UNION HOURLY WAGE RATES: Building trades	UNION HOURLY WAGE RATES: Printing trades
Peak	1907		*	Trough	1921	1922	
Trough	1908		*	Peak	1923		
Peak	1910		*	Trough	1924		
Trough	1911		*	Peak	1926		
Peak	1913			Trough	1927		
Trough	1914			Peak	1929	1931	1931
Peak	1918			Trough	1932	1933	1933
Trough	1919			Peak	1937		
Peak	1920	1921		Trough	1938		

* Data not available.

Source: *Handbook of Labor Statistics, 1947* (Department of Labor), Table C-8, p. 100.

[14] The consumer price index usually lags behind cyclical turning points in business activity; e.g., at the 5 peaks in business activity between 1920 and 1937, the timing of its turning points was respectively +5, +9, −6, +2, and +5; and at the 5 troughs between 1921 and 1938, +14, +1, +17, +1, and +12 (a plus indicates a lag; a minus a lead; the unit of measurement is a month).

industries where wage rates are controlled by collective agreements it would be sheer coincidence if a contract expired exactly at the trough of employment or of business activity. And contracts expiring before the trough would hardly be renewed at higher rates.

4 *Similar Lags in the Railroad Industry*

Wage rates in the railroad industry too turn later than business activity or employment (Chart 4). Our index of wage rates for railroads was computed in much the same way as our index for manufactures. However, because railroad wage negotiations are so centralized and public the record of changes in wage rates on Class I railroads is more nearly complete (see App. B).

Wage rates in the railroad industry did not trace mild cycles in the middle 1920's or short phases such as the contraction of 1937-38. Nor did the wage rate index reflect the May 1923 peak. With these exceptions, wage rates turned at each major turn in business: January 1920, July 1921, June 1929, and March 1933 (Table 2). However, they turned 14-31 months later, the lag averaging sightly more than 19 months.[15] Indeed, the lags in 1920 and 1922 are so long that wage rates may be said to run counter to business activity. Compared with the turning points in railroad employment (manhours worked) the lags in wage rates were somewhat shorter but still substantial, ranging from 8 to 29 months.

The average lag in railroad wage rates was about twice that in manufacturing. At two peaks the downturn came 8 and 24 months

TABLE 2

Turning Points in Business, Manhours Worked and Wage Rates
Class I Railroads, United States, 1920-1938

BUSINESS ACTIVITY		TURNING POINTS IN R.R.		LAG OF WAGE RATES BEHIND	
	Turning	Manhours	Wage	Business activity	Manhours worked
Level	points	worked	rates	(months)	
Peak	1/20		6/21	17	
Trough	7/21	1/22	9/22	14	8
Peak	5/23	8/23			
Trough	7/24	6/24			
Peak	10/26	7/26			
Trough	11/27	4/28			
Peak	6/29	8/29	1/32	31	29
Trough	3/33	4/33	6/34	15	14

[15] If the beginning of the wage rate plateau in October 1937, which continued until the latter part of 1941, is taken as a peak, the lag would be 5 months behind the peak of business activity in May 1937.