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NOTES ON THE STRUCTURE OF WAGES

Sumner H. Slichter

I

NEITHER wage rates nor hourly earnings represent the price of labor — that is, the amount which the employer pays for a given amount and kind of service or the amount which employees receive for doing a given kind of work under given conditions.¹ Consequently, it is not surprising that there are large variations both in the rates paid by different plants within the same locality for jobs nominally at least within the same occupation, and in the hourly earnings of employees doing apparently similar work in different plants. A good illustration of the spread of rates within an occupation in a city is given by the hiring rates for common labor paid by 85 plants in Cleveland. In February 1947, these rates were as follows:²

50-69 cents an hour	4 plants
70-74 " " "	2 "
75-79 " " "	1 "
80-84 " " "	12 "
85-89 " " "	13 "
90-94 " " "	22 "
95-99 " " "	17 "
\$1.00-1.04 " " "	6 "
1.05-1.09 " " "	8 "

¹There are three principal reasons why neither wage rates nor hourly earnings measure the bids of various employers for a given type of labor. In the first place, jobs and occupations which bear the same name do not necessarily involve the same kinds of duties or the same degree of responsibility. Machinists first-class in a candy factory do not necessarily need the same knowledge of the trade as machinists first-class in an oil refinery. Loom fixers may have essentially the same duties in different mills, but the skill required of them may vary greatly depending upon the kind and quality of goods which the mill produces. In the second place, the speed of work varies — particularly between workers paid by the hour and those paid by results. The earnings of piece or bonus workers are likely to run from 15 to 30 per cent above the rates paid time workers on comparable jobs. This does not mean, however, that the variation in speed is the same as the variation in earnings. It may be more or less. In the third place, the quality of labor differs. The plants which pay the highest wages are likely to attract the best men in the occupation in the locality. Hence, it is even possible that the price of labor may be lowest where wages are highest.

There are several principal reasons why the wage rates or the hourly earnings in various plants do not accurately

Another illustration of the spread in wages within a locality is provided by a small wage survey made in metropolitan Boston in 1940. The survey covered the hourly earnings in sixteen occupations or occupational classifications in fifteen plants. The survey was made by the staff of the personnel department of one of the enterprises. The staff members were instructed to obtain earnings only from jobs which, in their judgment, corresponded closely in skill and responsibility to the several types of jobs in the plant making the survey. Where properly comparable jobs could not be found, rates were not collected. Consequently, this survey comes closer than most wage surveys to reporting earnings on comparable jobs.³ The

measure the willingness of a given type of labor to accept employment in the several plants. One reason, of course, is the one mentioned above — that jobs and occupations which have the same name in different plants may not in fact be the same and may not in fact use the same kind of labor. A second reason is that the attractiveness of jobs in different plants depends upon conditions other than wages. Hence, two jobs having the same duties, requiring the same skill and responsibility, may have different capacities to attract labor. An important difference between jobs is the steadiness of employment. Another is the length of the standard work week. Does \$1.10 an hour on a job with a 35-hour week represent a higher or lower price of labor than \$1.00 an hour on a job with a 40-hour week? The answer obviously depends upon the value attached to leisure after 35 hours of work. A third reason why wage rates or hourly earnings do not measure the supply price of labor is that the compensation of employees is not always fully reflected in wages. Vacations, sick benefits, and pension provisions vary in different plants. Usually these provisions are most liberal in the plants where hourly earnings are highest. To this extent, differences in hourly earnings understate the differences in the real price of labor.

²Special interest attaches to these figures because hiring rates for common labor have been compiled for over twenty years by the Cleveland Chamber of Commerce and distributed to various firms throughout the city. Consequently, each enterprise knows reasonably well how its rates compare with those paid by other concerns. The above figures are those compiled and distributed by the Cleveland Chamber of Commerce for February 1947.

³The wage survey, however, did not take account of the fact that there were some variations in the standard work week (one plant had a 35-hour work week but most of the others a 40-hour work week) or the fact that some plants paid on a straight-time basis and others used piece-work or bonus plans on some jobs. There were some plants in

spread between the highest and lowest hourly earnings in 16 occupations in these plants varied from 87.1 per cent of the average rate in the case of producing and processing employees to 14.9 per cent of the average rate in the case of sheet metal workers. The most usual spread was 40 to 45 per cent of the average hourly earnings in all plants. This was the magnitude of the spread in six out of 16 occupations.⁴

The wide variation in the rates or the hourly earnings within the same locality on jobs normally in the same occupations might lead one to expect to find little regularity in the structure of wage rates or hourly earnings. And yet a surprising amount of regularity can be found. The chaos which *seems* to prevail in the labor market conceals a pattern of order which can be explained and which sheds light on the influences that determine the inter-industry wage structure of the community. The purpose of this paper is to report on some of the regularities in the inter-industry wage structure, to discuss the light which these regularities shed on the influences determining wages, and to comment briefly on the implica-

tions of these influences for wage theory. The figures used in this paper are those of hourly earnings. It is probably a reasonably accurate assumption that at any given time hourly earnings and wage rates in different industries vary together.

II

The search for regularities in the wage structure was made by selecting a number of conditions with which hourly earnings might be expected to vary and computing coefficients of rank correlation between these conditions and the average hourly earnings of male unskilled labor. The conditions selected for study were:

1. Average hourly earnings of semi-skilled and skilled workers in the industry;
2. Proportion of women in the industry;
3. Value added by manufacturing per manhour;
4. Value of product per manhour;
5. Ratio of payrolls to income from sales;
6. Ratio of net income after taxes to sales.

Most of the comparisons are for the years 1939 or 1940 — the years for which data are available from the census of manufactures or the decennial census. The use of these years, though required by the availability of the data, has two advantages. One is that it avoids the effect of the war upon the wage structure.

which hourly earnings tended to be high in all occupational classifications. One company, for example, was the highest in 11 out of the 14 categories in which it had employees and was the second highest in two others. Another company was low in 6 of the 16 categories and next to the lowest in 2 others — although highest in one category.

⁴ The following table shows the unweighted average of hourly earnings in each of the 16 occupations in these 15 plants and the spread between the plants with the highest and lowest hourly earnings in each category:

	Average Hourly Earnings in All Plants (cents)	Average Hourly Earnings in Lowest Plant (cents)	Average Hourly Earnings in Highest Plant (cents)	Spread between High and Low Plants (cents)	Per Cent of Spread to Average
Common labor	57.9	44.8	74.1	29.3	50.6
Janitor	55.3	41.0	70.5	29.5	53.3
Watchman	59.6	45.2	74.0	28.8	48.3
Producing and processing laborers	64.2	44.8	100.7	55.9	87.1
Producing and processing operators	72.0	57.8	88.6	30.8	42.8
Receiving and shipping clerks	68.0	50.0	89.6	39.6	58.2
Machinists	87.5	70.0	105.0	35.0	40.0
Steamfitter	86.4	70.0	105.0	35.0	40.5
Electrician	88.0	67.9	105.0	37.1	42.2
Carpenter	81.5	65.0	99.5	34.5	42.3
Sheet metal workers	85.4	77.8	90.5	12.7	14.9
Millwright	86.1	82.5	95.5	13.0	15.1
Maintenance helper	67.1	50.7	82.0	31.3	46.6
Female producing laborers	45.1	33.8	63.4	29.6	65.6
Female producing operators	47.9	37.7	58.3	20.6	43.0
Firemen	78.4	63.0	90.8	27.8	35.5

The high spread in the case of producing and processing laborers partly reflects the fact that these occupations in some plants were compensated under piece work or bonus plans. It probably also reflects the difficulty in defining jobs in these occupations.

Since wages were not allowed to move freely during the war, the postwar wage structure may not adequately reflect the influences which normally determine the inter-industry wage differences. (As a matter of fact, there is evidence that the war had surprisingly little effect upon the inter-industry wage structure.) A second advantage in the use of figures for 1939 or 1940 is that the wage figures for these dates show the wage structure in manufacturing industries before unions and collective bargaining had had time greatly to affect it. Indeed, widespread union organization in manufacturing dates only from 1937. Among the industries included in this survey, only two, namely newspaper and magazine printing and book and job printing, had had a high proportion of union workers prior to 1937. As a basis for judging the effect of unions in the inter-industry wage structure, it is desirable to have a clear picture of the influences making wages before unions became pervasive and powerful.

The wage figures used were the hourly earnings of male unskilled labor. These figures were used because male unskilled labor is the only occupational category for which figures are available in a number of industries. Comparisons of the average hourly earnings of all employees in the several industries could be made. Such comparisons, however, would be unsatisfactory because the proportion of men of a given degree of skill and responsibility varies from industry to industry. In order to show the desirability of studying the inter-industry wage structure in terms of more or less precise occupational categories, some analysis was made of the inter-industry wage structure for semi-skilled and skilled male labor. This category, of course, is a loose one and involves comparing very unlike kinds of jobs and persons in different industries. Hence it is not surprising that the regularities found in the inter-industry wage structure for semi-skilled and skilled male employees are less pronounced than those found in the wage structure for unskilled male labor.

Even male unskilled labor is not so precise a category as is desirable because there is considerable variation in the kind of common labor hired by different industries. Some firms or industries need in the main to hire strong

and vigorous common labor to do heavy work—they are virtually hiring athletes or near athletes. Some industries hire men for light work. The most desirable procedure, of course, would be to study the inter-industry wage structure in terms of a series of occupations, such as electrician, machinist, carpenter, steamfitter, shipping clerk. Unfortunately figures for occupations other than common labor are not available. It is reasonable to assume that the regularities found in the structure of earnings of male unskilled labor would be found in the structure of earnings of other more or less homogeneous groups. It would be desirable, however, to test this assumption as soon as data become available.

The wage figures are those collected by the National Industrial Conference Board. The Board did not take steps to assure that its data were representative of the several industries and there is reason to believe that the larger plants are more heavily represented than the smaller ones. This bias, however, applies to all industries. For that reason it probably does not seriously impair the validity of comparisons between the several industries. Data from plants which are properly representative of each industry would, of course, have been preferable, and it is to be hoped that they will some day become available.

Data on industries were used rather than data on enterprises because only data on industries are available. This also is a matter of regret because comparisons between enterprises would be of more interest and significance provided production and financial data for individual concerns were also available.

Attention in this study is focused upon the wage structure at a given time rather than changes over a period of time. Comparisons of wage movements through time are useful and interesting, and studies of this sort have been made by Dunlop, Ross, and Garbarino. Examination of the wage structure at a given time is also useful. At any moment the wage structure reflects the accumulated influence of various conditions over a considerable period of time. The conditions affecting the movement of wages in an industry during the last decade may not be the same as those affecting the movement in the previous decade. Hence, the

analysis of the wage structure at a given time may reveal some of the long-run influences playing upon wages more clearly than the study of changes in the wage structure between two dates. It has seemed desirable, however, to make comparisons of the stability of the inter-industry wage structure over periods of time, and this has been done.

III

The results of the study may be summarized as follows:

1. The average hourly earnings of male unskilled workers tend to vary with the average hourly earnings of semi-skilled and skilled workers—that is, where the average hourly earnings of semi-skilled and skilled workers are high, the average hourly earnings of common labor are high and vice versa.

2. Where the proportion of women in an industry is high, there is some tendency (not pronounced) for the hourly earnings of male unskilled labor to be low.

3. In industries where value added by manufacturing per wage-earner hour is high, the hourly earnings of male unskilled labor tend to be high.

4. In industries where the value product per wage-earner hour is high, the hourly earnings of male unskilled labor tend to be high.

5. In industries where payrolls are a low percentage of income from sales, the hourly earnings of male unskilled labor tend to be high.

6. In industries where income after taxes is a high percentage of sales, the hourly earnings of male unskilled labor tend to be high.

7. The wage structure changes over time, but the changes are fairly slow and the wage structure between industries within a period of twenty or thirty years exhibits only moderate changes. This conclusion, however, might not hold if the unit of observation were the individual firms in a local labor market.

Let us examine these results briefly.

IV

1. *The average hourly earnings of male unskilled labor tend to be high where the average hourly earnings of male semi-skilled and skilled labor are high.* The coefficient of rank correlation among twenty manufacturing industries in 1939 was .7098. Table 1 compares the average hourly earnings of male unskilled

TABLE 1. — COMPARISON OF AVERAGE HOURLY EARNINGS OF MALE SKILLED AND SEMI-SKILLED AND MALE UNSKILLED LABOR, 1939

Industry	Average Hourly Earnings, Male Semi- skilled and Skilled	Rank	Average Hourly Earnings, Male Unskilled	Rank	Deviation
Printing, newspaper and magazine	\$1.104	1	\$.623	10	9
Printing, book and job	1.024	2	.543	12	10
Automobile	.976	3	.797	1	2
Rubber	.967	4	.673	3	1
Iron and steel	.876	5	.638	6	1
Electrical manufacturing	.873	6	.669	4	2
Agricultural implements	.829	7	.654	5	2
Chemicals	.823	8	.694	2	6
Paint and varnish	.786	9	.627	8	1
Foundry and machine shops	.781	10	.629	7	3
Meat packing	.774	11	.624	9	2
Lumber and millwork	.746	12	.479	18	6
Paper products	.735	13	.531	15	2
Hosiery and knit goods	.707	14	.458	19	5
Furniture	.706	15	.536	14	1
Wool	.703	16	.524	16	0
Paper and pulp	.698	17	.540	13	4
Leather tanning	.694	18	.557	11	7
Boot and shoe	.599	19	.434	20	1
Cotton	.566	20	.494	17	3

Source — National Industrial Conference Board, *The Conference Board Economic Record*, Vol. II, No. 10, March 28, 1940, pp. 120-34.

labor and male semi-skilled and skilled labor in these industries.

The internal wage structures of the several industries appear to be more or less entities — where for any reason the earnings of semi-skilled and skilled workers are high the earnings of the unskilled workers also tend to be high. In five cases, however (newspaper and magazine printing, book and job printing, leather tanning, chemicals, and lumber and millwork) the difference in rank is large — 6 or more.

Among the industries, it is interesting to compare the spread in the ratios between the average hourly earnings of the unskilled workers and the average hourly earnings of the semi-skilled and skilled workers. Since the degree of skill among the skilled and semi-skilled workers varies from industry to industry, one has no right to expect an approximate uniformity between industries in this spread. Nevertheless, the variation is not large. For 20 industries in 1939, the unweighted average of the average hourly earnings of common labor was 73.1 per cent of the unweighted average of the average hourly earnings of semi-skilled and skilled labor. There was a fairly close concentration around this ratio. In 17 of the 20 industries, the ratio between the average hourly earnings of common labor and the average hourly earnings of semi-skilled or skilled labor was within 10 per cent of the average for the 20 industries; and in 8 cases, within 5 per cent of the average.

The wage policies pursued during the war increased the wages of common labor relative to the earnings of semi-skilled and skilled workers. An unweighted average of the hourly earnings of male unskilled workers in the industries reporting to the National Industrial Conference Board shows that in 1923 the earnings of common labor were 71.6 per cent of the earnings of semi-skilled and skilled workers; in 1929, 72.8 per cent; in 1933, 72.9 per cent; in 1939, 73.1 per cent; in December 1946, 77.1 per cent.⁵ The wage policies of the

war, however, had little effect upon the tendency for the average hourly earnings of male unskilled labor to be high in those industries where the average hourly earnings of the semi-skilled and skilled are high. In December 1946, the coefficient of rank correlation among the same twenty industries that were compared for 1939 was .6702 — only a little less than in 1939.

Why should the earnings of common laborers be high where the earnings of semi-skilled and skilled workers are high? The explanation undoubtedly is that there are certain common influences, such as wage policies, which tend to affect the entire wage structures of plants and to give them a unity. The effect of common influences upon wages throughout the labor force would be shown more clearly if industries or plants could be classified by the average level of skill and responsibility required by the semi-skilled and skilled jobs. As it is, the differences in the average hourly earnings of semi-skilled and skilled workers reflect to considerable extent, not differences in wage policies, but differences in the quality of labor used on the semi-skilled and skilled jobs. Nevertheless, the tendency is quite pronounced for hourly earnings of common laborers to be high where the hourly earnings of semi-skilled and skilled workers are high.

2. *The hourly earnings of male common labor have some (not pronounced) tendency to be low where the percentage of women among the wage earners is high.* The coefficient of rank correlation among 19 industries in 1939 was .4491. Table 2 compares the two sets of data.

The tendency for the hourly earnings of common labor to be low where the proportion of women in the industry is high, was apparently weakened by the depression. For example, in 1929 the coefficient of rank correlation between the proportion of women among workers and the average hourly earnings of common laborers was .5224, the industries being ranked by the highness of the proportion of women among wage earners and the lowness of the average hourly earnings of male unskilled labor. Possibly the war has still further weakened the relationship, but data on this point are not yet available.

⁵ National Industrial Conference Board, *Wages, Hours, and Employment in the United States, 1914-1936*, computed from tables on pages 59-159; *Conference Board Record*, Vol. II, March 28, 1940, computed from tables on pages 115-33; *Management Record*, February 1947, pages 45, 46.

TABLE 2. — COMPARISON OF THE PERCENTAGE OF WOMEN AMONG WAGE EARNERS AND AVERAGE HOURLY EARNINGS OF MALE UNSKILLED LABOR, 1939

Industry	Percentage of Women Among Wage Earners (1)	Rank (2)	Average Hourly Earnings, Male Unskilled (3)	Rank (4)	Deviation (5)
Hosiery and knit goods	63.9	1	.458	2	1
Boot and shoe	43.9	2	.434	1	1
Paper products	42.7	3	.531	6	3
Cotton	39.0	4	.494	4	0
Wool	38.5	5	.524	5	0
Electrical manufacturing	33.9	6	.669	16	10
Rubber	24.6	7	.673	17	10
Printing, book and job	19.9	8	.543	9	1
Chemicals	19.7	9	.694	18	9
Meat packing	14.9	10	.624	12	2
Leather tanning	8.8	11	.557	10	1
Printing, news and magazine	8.0	12	.623	11	1
Paper and pulp	7.7	13	.540	8	5
Furniture	6.8	14	.536	7	7
Automobiles	6.6	15	.797	19	4
Paint and varnish	5.1	16	.627	13	3
Lumber and millwork	1.8	17	.479	3	14
Agricultural implements	1.0	18	.654	15	3
Iron and steel	.8	19	.638	14	5

Source — Col. 1: U. S. Bureau of the Census, 16th Census of the United States (1940), *Manufactures 1939*, Vol. I, pp. 70-87.Col. 3: National Industrial Conference Board, *The Conference Board Economic Record*, Vol. II, No. 10, March 28, 1940, pp. 120-32.

Why is there some tendency for the wages of male common labor to be low in industries where the proportion of women employed is high? Does the employment of women have some more or less direct effect upon either the wages which employers are willing to pay men or the wages which men are willing to accept? Or are the high proportion of women employed and the low wages of men partly the result of common causes?

I believe that each of these last two questions should be answered by "Yes." To some extent the wages of women probably do affect the wages of men. Women are available for lower wages than men. Where women are doing skilled or semi-skilled work, managements are probably reluctant to pay male employees, who are merely doing common labor, as much as or more than semi-skilled or skilled women workers. Under these conditions, employers may content themselves with rather inferior male common laborers in order to keep the common labor scale below the scale for semi-skilled and skilled women. Furthermore, some of the industries which employ a large proportion of women, such as the textile industry, also employ men and are able to offer jobs to both male and female members of families. In

such industries the fact that jobs are available for both men and women undoubtedly affects the supply price for male workers.

The industries where a high proportion of workers are women are usually light industries. Some persons are able to accept jobs in either light or heavy industries; others are not strong enough for the heavy industries and must work in the light industries. Consequently, the supply price of labor for the light industries is undoubtedly lower than the supply price for the heavy industries. As a result, the tendency for the hourly earnings of male common labor to be low where the proportion of women workers is high is probably in considerable degree explained by the fact that each of these two conditions is likely to be characteristic of industries turning out light products.

3. *Hourly earnings of male unskilled workers tend to be high where the value added by manufacturing per wage-earner hour is high.* The coefficient of rank correlation in 1939 was .9299. A comparison of the value added per wage-earner hour with the average hourly earnings of male unskilled workers is given in Table 3.

Some correlation between the value added

TABLE 3. — COMPARISON OF VALUE ADDED PER WAGE-EARNER HOUR AND AVERAGE HOURLY EARNINGS OF MALE UNSKILLED LABOR, 1939

Industry	Value Added per Wage-Earner Hour (1)	Rank (2)	Average Hourly Earnings, Male Unskilled (3)	Rank (4)	Deviation (5)
Chemicals	\$3.48	1	\$.694	2	1
Electrical manufacturing	2.00	2	.669	4	2
Automobiles	1.83	3.5	.797	1	2.5
Rubber	1.83	3.5	.673	3	.5
Iron and steel	1.71	5	.638	5	0
Paper and pulp	1.67	6	.540	8	2
Meat packing	1.64	7	.624	6	1
Leather tanning	1.24	8	.557	7	1
Wool	1.12	9	.524	10	1
Furniture	1.04	10	.536	9	1
Lumber and millwork	.88	11	.479	12	1
Hosiery and knit goods	.81	12	.458	13	1
Cotton	.75	13	.494	11	2

Source — Col. 1: U. S. Bureau of the Census and BLS, "Man-Hour Statistics for 171 Selected Industries," *Census of Manufactures: 1939* (March 1942), Table 1, pp. 3-7.
 Col. 3: National Industrial Conference Board, *The Conference Board Economic Record*, Vol. II, No. 10, March 28, 1940, pp. 120-32.

per wage-earner hour and the average hourly wage of male unskilled workers is to be expected because it is from value added that wages are paid. High wages per hour cannot be paid unless the value added per man hour is high. Of course, the value added per wage-earner hour is the average for *all* employees — not merely for common laborers. If a high value added tends to produce high hourly earnings, however, the unskilled laborers may be expected to feel its effects — and this seems to be the case. Although some correlation be-

tween the value added per wage-earner hour and hourly earnings of male unskilled labor is to be expected, a correlation of .9299 is so high that it requires explanation.

"Accepted" wage theory would lead one to expect a high correlation between wages and the *marginal* value added per wage-earner hour. The above high correlation, however, is between hourly earnings and the *average* value added per wage-earner hour. There are two principal explanations for the high figure. One, of course, is that it is correlation of ranks only;

TABLE 4. — COMPARISON OF VALUE OF PRODUCT PER WAGE-EARNER HOUR AND AVERAGE HOURLY EARNINGS OF MALE UNSKILLED LABOR, 1939

Industry	Value of Product per Wage-Earner Hour (1)	Rank (2)	Average Hourly Earnings, Male Unskilled (3)	Rank (4)	Deviation (5)
Meat packing	\$10.32	1	\$.624	6	5
Chemicals	5.73	2	.604	2	0
Automobiles	5.63	3	.797	1	2
Iron and steel	4.39	4	.638	5	1
Rubber	4.08	5	.673	3	2
Paper and pulp	4.02	6	.540	8	2
Leather tanning	3.61	7	.557	7	0
Electrical manufacturing	3.42	8	.669	4	4
Wool	2.65	9	.524	10	1
Furniture	1.94	10	.536	9	1
Lumber and millwork	1.60	11	.479	12	1
Hosiery and knit goods	1.58	12	.458	13	1
Cotton (north)	1.51	13	.494	11	2

Source — Col. 1: U. S. Bureau of the Census and BLS, "Man-Hour Statistics for 171 Selected Industries," *Census of Manufactures: 1939* (March 1942), Table 1, pp. 3-7.
 Col. 3: National Industrial Conference Board, *The Conference Board Economic Record*, Vol. II, No. 10, March 28, 1940, pp. 120-32.

it is quite possible that there is a tendency for the average value added to be high where the marginal value added is high. The second explanation is closely related to the first — a high average value added per man-hour tends to produce high wages (and high earnings) because it produces liberal wage policies. More specific evidence in support of this conclusion will be given when hourly earnings are compared with the ratio of payrolls to income from sales and to profits per dollar of sales.

4. *Hourly earnings of male unskilled workers tend to be high where the value product per wage-earner hour is high.* The coefficient of rank correlation in 1939 was .8297. The data are compared in Table 4.

The high coefficient of rank correlation between value product per wage-earner hour and the average hourly earnings of male unskilled workers may seem surprising. A high value of product per wage-earner hour may be the result of two very different causes — either the application of labor to expensive raw materials or a high productivity of labor. The first cause would not be expected to produce high hourly earnings. The meat packing industry, where the deviation between the two ranks is large, is

an example of an industry in which the value of product per wage-earner hour is high because labor in the industry is applied to expensive raw materials.

5. *Hourly earnings of male unskilled labor tend to be high where payrolls are a low percentage of income from sales.* The coefficient of rank correlation in 1939 was .7228. Table 5 shows the relevant comparisons.

The tendency for the average hourly earnings of male common labor to be high where payrolls are a small percentage of income from sales is quite understandable. Managements naturally are more concerned about the rates which they pay for labor when payrolls are large in relation to the receipts of the enterprise than when payrolls are small. The highness of the correlation is striking and suggests the importance of managerial policy as an influence upon hourly earnings.

There is also some tendency for the average hourly earnings of male semi-skilled and skilled workers to be high in those industries where payrolls are a small percentage of sales. Semi-skilled and skilled workers, however, are far from a well-defined group of occupations, and the proportion of workers of varying de-

TABLE 5. — COMPARISON OF WAGE PAYROLLS AS A PERCENTAGE OF SALES OR TOTAL RECEIPTS, AND AVERAGE HOURLY EARNINGS OF MALE UNSKILLED LABOR, 1939

Industry	Wage (non-salaried) Payrolls as Percentage of Sales or Total Compiled Receipts (1)	Rank (2)	Average Hourly Earnings, Male Unskilled (3)	Rank (4)	Deviation (5)
Meat packing	4.5	1	.624	8	7
Paint and varnish	7.1	2	.627	7	5
Chemicals	8.7	3	.694	2	1
Agricultural implements	14.5	4	.654	5	1
Rubber	15.2	5	.673	3	2
Printing, book and job	15.5	6	.543	11	5
Printing, newspapers and magazines	17.4	7	.623	9	2
Leather tanning	17.7	8	.557	10	2
Automobiles	18.2	9	.797	1	8
Electrical manufacturing	18.3	10	.669	4	6
Paper and pulp	21.0	11	.540	12	1
Iron and steel	22.3	12	.638	6	6
Wool	23.4	13	.524	15	2
Boot and shoe	25.6	14	.434	19	5
Cotton	25.9	15	.494	16	1
Furniture	26.3	16	.536	13	3
Hosiery and knit goods	29.6	17	.458	18	1
Lumber and mill work	34.5	18	.479	17	1
Paper products	41.6	19	.531	14	5

Source — Col 1: Computed from sales figures in National Industrial Conference Board, *The Conference Board Economic Record*, Vol. IV, No. 10, October, 1942, pp. 333-39, and from payrolls U. S. Bureau of the Census, "General Statistics for Industry Groups," *Census of Manufacturers: 1939* (October 1941), Tables 1 and 2.

Col. 3: National Industrial Conference Board, *The Conference Board Economic Record*, Vol. II, No. 10, March 28, 1940, pp. 120-32.

grees of skill within the entire group of semi-skilled and skilled workers may vary considerably between industries. For this group of workers in the same nineteen industries that were used to compare the payrolls as a percentage of sales and the average hourly earnings of male unskilled labor, the coefficient of rank correlation in 1939 was .4930.

6. *The average hourly earnings of male unskilled labor tend to be high where the net income after taxes is a high percentage of sales.* The coefficient of rank correlation in 1939 was .6969. Table 6 presents the comparisons.

The high correlation between sales margins and the average hourly earnings of common labor is not surprising. It reinforces the view that wages, within a considerable range, reflect managerial discretion, that where managements can easily pay high wages they tend to do so, and that where managements are barely breaking even, they tend to keep wages down. It is true that net income per dollar of sales does not indicate the rate of return per dollar of investment, and that an enterprise which has a small margin may have a high return on its capital. Nevertheless, if the margin on

sales is shown, a small rise in costs may wipe out a high return on invested capital. Hence, a small margin puts management under pressure to keep costs down.

Some correlation also exists between sales margins and the average hourly earnings of male semi-skilled and skilled workers, but for reasons already given, one must expect the correlation to be substantially less than the correlation between sales margins and the average hourly earnings of male unskilled workers. The correlation in the case of the semi-skilled and skilled male workers in 1939 was .5127.

7. *The inter-industry structure of wages has considerable stability during short or moderately short periods of time.* When the hourly earnings of male unskilled labor in twenty industries in 1923 and 1946 are compared, a coefficient of rank correlation of .7289 is obtained. When the comparison is between 1923 and 1939, the coefficient is .7154; between 1929 and 1939, .8902; and between 1929 and 1946, .8812.

Table 7 compares the average hourly earnings of male unskilled labor in various industries at the several dates.

TABLE 6. — COMPARISON OF NET INCOME AFTER TAXES AS A PERCENTAGE OF SALES OR TOTAL RECEIPTS, AND AVERAGE HOURLY EARNINGS OF MALE UNSKILLED LABOR, 1939

Industry	Net Income after Taxes as a Percentage of Sales or Total Compiled Receipts (1)	Rank (2)	Average Hourly Earnings, Male Unskilled (3)	Rank (4)	Deviation (5)
Chemicals	12.6	1	.694	2	1
Automobiles	8.6	2	.797	1	1
Electrical manufacturing	8.1	3	.669	4	1
Printing, newspapers and magazines	6.1	4	.623	9	5
Paint and varnish	5.1	5	.627	7	2
Rubber	4.9	6	.673	3	3
Paper products	4.6	7	.531	14	7
Paper and pulp	4.5	8	.540	12	4
Agricultural implements	4.2	9	.654	5	4
Wool	3.4	10	.524	15	5
Printing, book and job	3.3	11	.543	11	0
Leather tanning	2.9	12	.557	10	2
Iron and steel	2.8	13	.638	6	7
Cotton (north)	2.6	14	.494	16	2
Furniture	2.4	15.5	.536	13	2.5
Boot and shoe	2.4	15.5	.434	19	3.5
Hosiery and knit goods	1.8	17	.459	18	1
Lumber	1.3	18	.479	17	1
Meat packing	0.9	19	.624	8	11

Source — Col. 1: National Industrial Conference Board, *The Conference Board Economic Record*, Vol. IV, No. 10, October 1942, pp. 333-39.
Col. 3: *Ibid.*, Vol. II, No. 10, March 28, 1940, pp. 120-32.

TABLE 7. — COMPARISON OF AVERAGE HOURLY EARNINGS OF MALE UNSKILLED LABOR AT SELECTED DATES

Industry	Earnings						Deviation in Rank			
	1923 Rank	1929 Rank	1933 Rank	1939 Rank	July 1946 Rank		1923 — 1939	1929 — 1939	1942 — 1946	1929 — 1946
Printing, newspapers and magazines	.540 1	.486 7	.419 8	.623 10	1.005 9		9	3	8	2
Rubber	.522 2	.604 1	.475 2	.673 3	1.222 1		1	2	1	0
Automobile	.496 3	.576 2	.505 1	.797 1	1.161 2		2	1	1	0
Paint and varnish	.494 4	.476 10	.441 5	.627 8	.959 11		4	2	7	1
Iron and steel	.484 5	.511 5	.367 15	.638 6	1.080 4		1	1	1	1
Chemical	.477 6	.543 3	.469 3	.694 2	1.082 3		4	1	3	0
Wool	.470 7	.442 17	.373 14	.524 16	.956 12		9	1	5	5
Foundry and machine shops	.469 8	.507 6	.432 6	.629 7	1.068 5		1	1	3	1
Agricultural implements	.450 9	.512 4	.413 9	.654 5	1.055 6		4	1	3	2
Leather and tanning	.442 10	.485 8	.360 16	.557 11	.935 15		0	3	4	7
Paper and pulp	.442 11	.450 15	.375 13	.540 13	.939 14		2	2	3	1
Printing, book and job	.442 12	.479 9	.444 4	.543 12	.998 10		1	3	1	1
Paper products	.435 13	.452 14	.412 10	.531 15	.868 19		2	1	6	5
Electrical manufacturing	.428 14.5	.474 11	.430 7	.669 4	1.036 7		10.5	7	7.5	4
Meat packing	.428 14.5	.471 12	.391 12	.624 9	1.021 8		5.5	3	6.5	4
Cotton (north)	.403 16	.362 20	.341 19	.494 17	.890 17		1	3	1	3
Furniture	.390 17	.447 16	.325 20	.536 14	.900 16		3	2	1	0
Lumber and mill	.369 18	.454 13	.348 17	.479 18	.948 13		0	5	5	0
Boot and shoe	.367 19	.438 18	.397 11	.434 20	.577 20		1	2	1	2
Hosiery and knit goods	.356 20	.385 19	.342 18	.458 19	.872 18		1	0	2	1

Source — National Industrial Conference Board, *Wages and Employment in the United States, 1914-1936*, pp. 56-185; *The Conference Board Economic Record*, Vol. II, No. 10, March 28, 1940, pp. 120-32; *The Conference Board Management Record*, October 1946, p. 339.

V

What questions or conclusions of theoretical interest are suggested by the results of this examination of the inter-industry wage structure? One question is: "How important is managerial policy as a determinant of wages?" Others are: "What are the determinants of managerial wage policy?" "What relationship is there between hourly earnings and the price of labor?" "Do the several regularities found in the inter-industry wage structure require any significant modifications of 'accepted' wage theory?"

The results of this study give strong support to the proposition that managerial policy is important in determining inter-industry wage differences. The best evidence in support of this conclusion is supplied by the tendency for the hourly earnings of male unskilled labor to be high where the earnings of semi-skilled and skilled labor are high, where payroll costs are low in relation to gross income, and where profit margins per dollar of sales are high. The tendency for the earnings of male unskilled workers to be low in industries where the proportion of women in the labor force is high is

consistent with the view that managerial policy is an important determinant of the level of wages. It can hardly be regarded as strong independent proof, partly because the correlation is not high and partly because the correlation may indicate simply two results of a common cause. The very high correlation between value added per wage-earner hour and average hourly earnings of unskilled labor is best explained by the tendency for a high value added per wage-earner hour to produce liberal wage policies and a low value added to produce niggardly wage policies.

The study shows that two important determinants of wage policy are the size of payrolls relative to gross income and profits per dollar of sales. It is not surprising that managements should watch labor costs most carefully in those industries where payrolls are large relative to gross receipts and where profit margins per dollar of sales are low, and that hourly earnings should be lower in these industries than in others where labor costs are less important or where profit margins are higher. There are probably other important determinants of wage policies, but they are not indicated by the results of this study.

May the high correlation between profit margins and the average hourly earnings of unskilled male labor represent, not decisions of wage policy, but rather the varying efforts of different industries to expand? Must one not expect the greatest efforts to expand to be made by the industries with the largest profit margins? Must one not, therefore, expect wages to be highest in those industries which are seeking most vigorously to expand? No correlation, however, seems to exist between the increase in the average hourly earnings of male unskilled workers and the increase in employment. At any rate, in 20 manufacturing industries there was a small negative coefficient of rank correlation between these two series for the period 1923-39.

Had a high negative correlation been found between the average hourly earnings of all workers and the increase in employment, one might have argued that high hourly earnings were an obstacle to expansion. As a matter of fact, when a comparison is made between the increase in employment in the same 20 industries and the average hourly earnings of *all* employees for the period 1923-39, only a low correlation is found — namely, .2812. The conclusion is that the association of high hourly earnings of unskilled common labor with high margins per dollar of sales is explained, not by the efforts of enterprises to expand, but by wage policy. Furthermore, if margin per dollar of sales is compared with the increase of employment, only a very low correlation is found. Hence, the most satisfactory explanation of the high correlation between hourly earnings and profit margins is that high profit margins tend to make managements liberal and willing to pay more for labor than managements which are having trouble in making ends meet.

The investigation indicates the importance of ascertaining more definitely what relationship there is between hourly earnings and the price of labor. Does the price of labor vary in the same direction as hourly earnings though in smaller degree? If so, is the variation between the price of labor in different plants almost as large as the variation in hourly earnings, or is it considerably less? Or does the price of labor vary inversely with hourly earnings? Do enterprises which pay more-than-

average wages usually get a bargain? Are hourly earnings above the average so effective in attracting superior workers and in inducing men to do their best in order to hold desirable high-paying jobs that the price of labor is lowest where wage rates are highest? Are the firms in which hourly earnings (and hence presumably wage rates) are above the average really smart buyers of labor?

Until one knows the answer to these questions, one is not prepared to speculate concerning the effect of the wage structure upon the distribution of resources among places, firms, and industries. Are *firms* with small payrolls in relation to sales or with large profit margins per dollar of sales prevented by their high wage rates from becoming as large as they ought to be? Are the *industries* with small payrolls in relation to sales or with large profit margins prevented by high wages from growing as rapidly as they should?

The fact that the rates which yield the highest hourly earnings occur where labor is not an important item in costs or where profit margins are large indicates that most managements do not regard above-the-average wage rates as economical. Certainly, if most managements believed that a low price of labor is associated with high wage rates, there would not be a pronounced association of high wage rates with a low ratio of payrolls to gross receipts or with high profit margins. The firms in greatest need of low labor costs (those with large payrolls relative to sales or those with low profit margins) would aggressively strive to get themselves a low price for labor by putting up rates. Hence, the correlations would tend to be the opposite of the observed ones. Of course, it is possible that the majority view among the managers may be wrong. Perhaps the managers are misled, by the immediate effect of an increase in wages upon labor costs, into thinking that high labor costs are associated with high wage rates, and they may overlook the eventual effect of differences in rates or earnings upon the quality of labor attracted to the enterprise.

The need for determining the relationship between wage rates or hourly earnings and the price of labor is indicated again when it is asked whether the results of this inquiry show the

need for significant modifications in "accepted" wage theory. This study shows that the models used in accepted wage theory are too simple and need to be supplemented. This is not exactly news. The models used in accepted wage theory assume that wages represent the price of labor. This assumption is untenable. The importance of wage policies indicates the need of an analysis of their economic consequences. Such an analysis must be based upon a determination of the relationship between hourly earnings and the price of labor. If the variations in wages for which existing wage policies are responsible also produce similar but smaller variations in the price of labor, then several highly important consequences must be attributed to wage policies. It follows, for example, that existing wage policies limit to some extent the growth of the most efficient enterprises. It also follows that wage policies tend to raise wages at the expense of profits and, therefore, to produce a slightly higher propensity to consume than would otherwise exist. If the com-

putations of Lubell on the effect of redistribution of income upon consumer spending are correct, however, the effect of existing wage policies upon the marginal propensity to consume is quite limited.⁶ If wage policies cause wages to encroach upon net income, they diminish the volume of investment opportunities. If their favorable effect upon the marginal propensity to consume is very small and if they diminish the volume of profit opportunities, wage policies must be unfavorable to employment and expansion. All of these tentative conclusions, however, rest upon the assumption that the price of labor varies directly (though not proportionately) with wage rates, so that the price of labor is highest in those plants or industries where the wage rates for a given type of job are highest. If this assumption is not correct, these conclusions concerning the consequences of wage policies must be reversed.

⁶ See Harold Lubell, "Effects of Income Redistribution on Consumers' Expenditures," *American Economic Review*, Vol. 37, December 1947, p. 930.