

UNITED STATES DEPARTMENT OF LABOR

L. B. Schwellenbach, *Secretary*

BUREAU OF LABOR STATISTICS

A. F. Hinrichs, *Acting Commissioner*

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Wage Structure of the Machine-
Tool Accessories Industry
January 1945



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Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
BUREAU OF LABOR STATISTICS,
Washington, D. C., March 27, 1946.

THE SECRETARY OF LABOR:

I have the honor to transmit herewith a report on the wage structure of the machine-tool accessories industry, January 1945. This study was prepared by Lily Mary David, of the Bureau's Wage Analysis Branch. Edyth Bunn was responsible for the section on the labor force.

A. F. HINRICHS, *Acting Commissioner.*

HON. L. B. SCHWELLENBACH,
Secretary of Labor.

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Wage Structure of the Machine-Tool Accessories Industry, January 1945¹

Summary

In January 1945, the average plant worker in the machine-tool accessories industry earned \$1.19 an hour, excluding premium pay for overtime and night-shift work. Earnings of individual workers varied from less than 50 cents to more than \$2.30; 1 out of every 28 workers received less than 65 cents an hour.

Average hourly earnings were distinctly higher in tool and die jobbing shops than in establishments engaged in the manufacture of machine-tool accessories on a relatively large-scale production basis, the averages for the two branches of the industry being \$1.28 and \$1.08, respectively. This variation reflects differences in occupational composition in the two branches of the industry as well as differences in pay for some of the key jobs.

Women plant workers in production shops averaged 86 cents an hour and men \$1.14; in tool and die jobbing shops the corresponding figures were 82 cents and \$1.32. In both branches of the industry, a comparison based on similar occupations given identical weights showed a difference in pay of about one-seventh in favor of men.

Of the three most important regions in the industry, the Great Lakes region had the highest levels of pay in both types of shops. New England was the lowest in the jobbing branch; in production shops New England and Middle Atlantic were equally low. In general, average levels of pay were found to be higher in large than in small communities and in union as compared with nonunion plants. In production shops, where the incentive method of pay was relatively important, earnings of time workers were generally below those of incentive workers in the same job. No consistent relationship between level of pay and size of establishment was apparent.

Straight-time average hourly earnings of workers engaged in the manufacture of machine-tool accessories were augmented by premium overtime pay, shift differentials, and other supplementary wage benefits. Practically all establishments had a scheduled workweek of at least 48 hours in January 1945, with premium overtime pay for hours in excess of 40. About a fourth of the production-shop workers and 15 percent of the jobbing-shop employees were on late shifts; almost all of these workers in production shops received extra pay, while

¹ Detailed information on wages may be obtained from two mimeographed reports (Wage Structure: Machine-Tool Accessories, 1945; and Occupational Wage Relationships: Machine-Tool Accessories, 1945); wage statistics, by locality, are available in the Bureau's regional offices.

premium pay was provided by about three-fourths of the jobbing shops operating late shifts.

Nonproduction bonuses for plant workers were reported by about three-fifths of the production shops and half of the jobbing shops. Formal vacation plans for employees with a year's service were common in this industry in January 1945, but formal sick-leave plans were rare for plant workers and relatively uncommon even for the office staff. Insurance or pension plans were reported quite frequently in the industry, although they were less prevalent than vacation benefits.

Characteristics of the Industry

Machine-tool accessories are essential in the production of practically all metal products, including machinery, automobiles, airplanes, and other transportation equipment as well as ordnance. Accordingly, they played a key role in wartime production; employment in their manufacture increased about 300 percent between 1939 and December 1942, the wartime peak in the industry. This expansion may be traced in part to the fact that substitution of one type of machine-tool accessory for another permitted conversion of some metalworking machines from peacetime to wartime production. In addition, the high level of metalworking activity carried with it a large demand for replacements for accessories, many of which wear out rapidly with use. For the same reasons, the machine-tool accessories industry, despite its relatively small employment (approximately 130,000 in January 1945), is of strategic importance in the reconversion of metalworking machinery to peacetime production and in the maintenance of peacetime output. These considerations led the Bureau of Labor Statistics to include the industry in its Industry Wage Studies program for 1945.

As defined for purposes of the present study, the machine-tool accessories industry includes establishments primarily engaged in the manufacture of attachments and accessories for machine tools and other metalworking machinery, small power-driven cutting and shaping tools, and precision measuring tools. Among the products of these establishments are cutting tools (including drills, tool bits for lathes, milling cutters, and reamers); machine-tool attachments, such as collars and arbors for holding cutting tools; attachments for other metalworking machinery, such as dies for die-casting and drop-forging machines, and forming and shaping tools for sheet-metal machines; jigs, fixtures, and other attachments for holding work that is being machined or otherwise worked; and such precision measuring instruments as micrometers and gages used in measurement of metalworking products.²

Two major types of establishments may be distinguished in the industry: Those that manufacture more or less standardized accessories normally produced in large quantities to stock; and shops that are engaged primarily in the production of nonstandard machine-tool accessories on a jobbing basis to fill special orders. For convenience, this study refers to the former as production shops and the latter as jobbing shops. Production shops are engaged mainly in the manu-

² The products of the industry are listed in more detail in the Standard Industrial Classification Manual (issued by the Bureau of the Budget), Code No. 3543.

facture of precision measuring instruments, cutting tools, and collars and arbors for holding such tools. Jobbing shops produce a larger proportion of the dies for forging and die-casting machines, shaping tools for sheet-metal machines, and jigs and fixtures, since the latter types of accessories frequently must be made to fit individual specifications. Partly because of such product differences but mainly because of differences in size, production methods, and occupational structure, wage rates and related practices in each type of shop are discussed separately in this article.

Scope of Study

The data summarized here cover production shops with eight or more employees; for the tool and die jobbing branch, in which very small establishments are common, shops with as few as five workers were studied.³ The Bureau's survey included 156 production establishments with 32,600 workers, and 623 tool and die jobbing shops with 26,400 workers. This represented over two-fifths of all production establishments above the minimum size studied, employing about half of the employees in this branch of the industry, and about a third of all tool and die jobbing shops with five or more workers. About two-fifths of all workers in jobbing shops were covered. Some of the special analyses were based on smaller samples.

The establishments studied were selected to provide representation of the most important factors affecting wage rates. Data for most establishments were taken from a January 1945 pay roll, although in some cases an April period was utilized.

The Labor Force

Because the manufacture of machine-tool accessories involves a large amount of precision work, both branches of the industry employ a relatively high proportion of skilled workers. However, in jobbing shops, where the work consists of a variety of specialized jobs, the proportion of skilled workers is higher than in production shops. In the latter branch greater standardization of output has resulted in employment of a large number of workers per plant, permitted a finer division of labor, and limited the variety of tasks performed by individual workers.

Occupational groups.—The differences between the two types of establishments appear most clearly in the proportion of tool and die makers employed. In January 1945 these workers, who perform all or most of the operations necessary to the manufacture of finished tools or dies, constituted a fourth of the plant workers in tool and die jobbing shops (23 percent of all workers) as contrasted with about 3 percent of the workers in production shops.⁴

Jobbing shops also employed a higher proportion of production machinists and miscellaneous machine-tool operators who operate a

³ Despite the relatively high level of employment in January 1945, at least 4 out of every 5 jobbing shops employed fewer than 50 workers and many employed fewer than 10 workers. Although a large number of plants turning out more or less standardized lines of machine-tool accessories also employed fewer than 50 workers, the greater number of such production establishments had more than 50 employees. Thus, whereas only 1 out of 60 tool and die jobbing shops had more than 250 employees, about 1 out of 5 production plants employed 250 or more workers and about 1 out of 10 employed over 500 workers.

⁴ A related difference is the higher proportion of apprentices found in jobbing shops; they accounted for only 0.2 of 1 percent of the workers in production shops, compared with 4.5 percent in jobbing shops.

variety of machines instead of specializing on work of a single type of machine. Together these two groups accounted for less than 1 percent of the labor force in production shops, and about 7 percent in jobbing shops; in the latter, production machinists alone constituted more than 3 percent of the total employment. Production shops used comparatively more specialized machine-tool operators (notably grinding and milling-machine operators) and assemblers to perform parts of the work carried on by all-round tool and die makers, machinists, and miscellaneous machine-tool operators. Moreover, within these specialized occupational groups, larger proportions of the workers in jobbing shops were skilled and performed a greater variety of tasks involving less division of labor than was typical of production establishments.

Tool and die makers, machinists, machine-tool operators, and assemblers together comprised the greater part of the processing workers in the two branches of the industry. Both branches also employed workers in other metalworking processes such as stamping and forming, heat treating, polishing, and buffing. Some large production establishments also find it advantageous, because of their size and more standardized work, to make their own castings or forgings. Hence they employ patternmakers, molders, drop-hammer operators, and other forging and foundry workers. Even in these shops, however, aggregate employment in the latter processes in January 1945 was small. Very few tool and die jobbing shops were found to be carrying on foundry and forging operations.

Differences in the composition of the labor force between the two types of shops were also evidenced in the proportions of workers employed directly on processing work. Because production shops manufacture standard items in relatively large quantities, it was to be expected that a comparatively smaller part of their labor force as compared with the specialized jobbing shops, would be found in processing. Altogether, about half of the workers in production shops and between two-thirds and three-fourths of those in tool and die jobbing shops were employed directly in processing operations. These differences are related in part to size of plant. Workers engaged primarily in packing and handling material, in inspection, in maintenance of equipment, in office work, and in other nonprocessing functions were relatively more numerous in production than in jobbing shops. In the latter establishments, these operations were frequently performed by processing workers as part of their general work or were actually less important in terms of total man-hours required.

Women workers.—In January 1945 women accounted for about a fifth of the plant workers in the production branch of the industry; the small size of many of the units produced and the relatively high degree of division and standardization of work facilitated their employment. Conversely, the greater variety of work and the resulting greater need for persons with longer periods of training and experience limited the plant job opportunities for women in jobbing shops. At the time of the survey, only about 1 out of every 12 plant workers in tool and die jobbing shops was a woman. In both branches most of the women plant workers were employed as class C operators of machine tools (primarily on drilling, milling, and grinding machines) and as class C inspectors and assemblers.

Unionization.—In January 1945 about two-fifths of the production establishments, employing about 70 percent of the workers in this branch of the industry, were operating under union agreements covering at least half of the employees. Unionization was less prevalent in the relatively small tool and die jobbing shops; only about a fourth of these establishments, with about two-fifths of the workers, were unionized.

Wage Structure

The wage structure of machine-tool accessories establishments is summarized in this article in terms of hourly rates (straight-time average hourly earnings in the case of incentive workers) excluding premium pay for overtime and late-shift work. Incentive earnings are included in the data but nonincentive bonuses, such as Christmas and profit-sharing bonuses, are excluded. Cost-of-living bonuses are considered as part of the worker's regular pay.

Occupational averages are presented only for key plant and office jobs; no attempt has been made to present separate information for all occupations in the industry. However, all plant workers rather than only those in key occupations were included in the general averages and frequency distributions; administrative, executive, professional, and office employees were excluded from these averages. The wages of inexperienced beginners, apprentices and handicapped workers were omitted from the wage data for specific occupational groups but were included in the general averages and distributions.

The number of workers reported represents the approximate employment on all shifts in all establishments in the industry (excluding those below the minimum size covered by the study) rather than the employment in the establishments actually studied.

UNITED STATES AS A WHOLE

Average Hourly Earnings

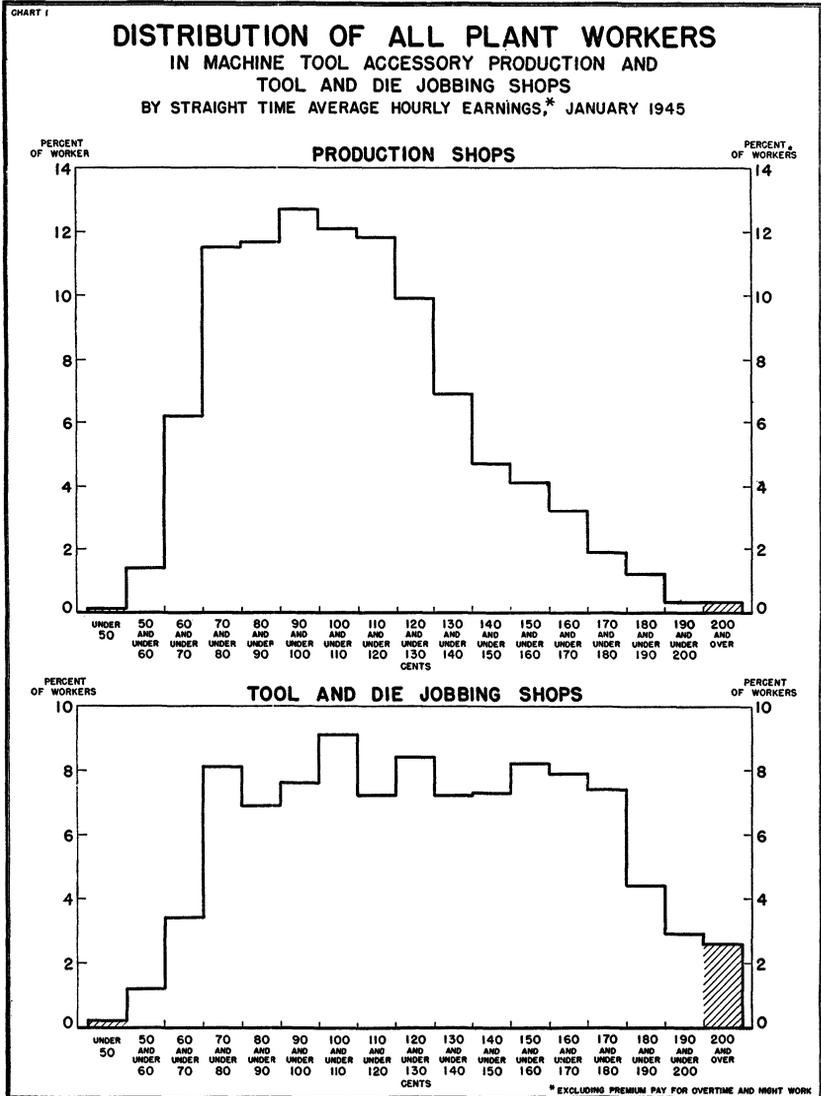
In January 1945, straight-time hourly earnings of plant workers in the machine-tool accessories industry averaged \$1.19 (table 1). There was a relatively wide spread in earnings among individual workers within the industry, from less than 50 cents to over \$2.30 an hour. Half of the workers received between 70 cents and \$1.25. About 1 out of every 28 workers received less than 65 cents an hour in January 1945.

Average hourly earnings were notably higher in jobbing than in production shops, the respective averages being \$1.28 and \$1.08. This difference reflects, in part, dissimilarities in the skill composition of the labor force and, in part, the higher rates of pay in jobbing shops for some occupations filled by large numbers of workers.

A graphic comparison of the distribution of average hourly earnings in the two branches of the industry is provided in chart 1. It indicates a somewhat narrower concentration of earnings in the production branch of the industry than in tool and die jobbing shops; earnings of over half of the workers in the former fell within a 50-cent range (from 70 cents to \$1.20) whereas the range for half of the tool and die jobbing-shop workers was 70 cents (from 70 cents to \$1.40). The greater dispersion of earnings in jobbing shops appears to be related to

the higher proportion of skilled workers and wider regional differences in rates in the latter branch of the industry.

About a fourth of the workers in production shops earned between 90 cents and \$1.10 an hour, whereas about the same proportion of jobbing-shop workers averaged between \$1.50 and \$1.80. This concentration of rates between \$1.50 and \$1.80 in jobbing shops reflected primarily the earnings of tool and die makers. Despite the generally higher level of earnings in tool and die jobbing shops, the proportion of



workers receiving less than 65 cents was about the same in both branches of the industry.

TABLE 1.—Percentage Distribution of Plant Workers in Machine-Tool Accessories Establishments, by Straight-Time Average Hourly Earnings¹ and Region, January 1945

Average hourly earnings	United States	New England	Middle Atlantic	Border States	South-east	Great Lakes	Middle West	South-west	Pacific
	Percent of workers in each classified earnings group								
Under 50.0 cents.....	0.2	0.3	0.4	0.7	4.4	0.1	0.7	2.5	-----
50.0-54.9 cents.....	.5	1.0	1.1	.5	3.3	.3	1.1	-----	-----
55.0-59.9 cents.....	.8	1.5	2.3	.5	1.1	1.2	2.5	-----	-----
60.0-64.9 cents.....	2.1	4.5	2.3	8.5	10.1	1.3	4.1	2.5	0.3
65.0-69.9 cents.....	2.6	5.0	4.1	5.3	7.8	1.3	9.0	.8	.3
70.0-74.9 cents.....	4.6	6.3	12.3	11.0	2.2	2.2	5.7	.8	1.9
75.0-79.6 cents.....	5.1	8.0	6.0	15.1	8.0	3.6	10.2	6.6	5.3
80.0-84.9 cents.....	4.9	7.9	4.8	4.1	6.7	3.6	8.7	5.8	7.0
85.0-89.9 cents.....	4.2	6.9	4.4	4.1	2.2	3.3	4.4	4.1	4.5
90.0-94.9 cents.....	5.5	7.9	4.4	3.0	6.7	4.7	8.1	4.1	8.5
95.0-99.9 cents.....	4.4	7.4	3.9	4.4	2.2	3.6	3.0	3.3	3.8
100.0-104.9 cents.....	6.0	6.9	6.1	7.3	12.3	5.5	12.1	3.3	5.7
105.0-109.9 cents.....	4.5	4.5	3.7	5.5	2.2	4.8	2.2	2.5	1.2
110.0-114.9 cents.....	5.5	4.5	5.2	8.5	8.0	6.0	3.5	4.1	3.1
115.0-119.9 cents.....	3.0	3.2	3.0	3.7	2.2	4.4	2.1	9.9	2.4
120.0-124.9 cents.....	4.4	3.1	3.4	2.5	3.3	5.2	1.8	5.8	3.0
125.0-129.9 cents.....	4.7	3.5	4.1	3.4	4.4	5.1	8.0	5.0	8.6
130.0-134.9 cents.....	3.4	2.3	4.1	2.8	-----	3.7	.3	9.9	3.1
135.0-139.9 cents.....	3.6	2.5	4.0	3.9	3.3	4.0	2.4	7.4	3.2
140.0-144.9 cents.....	3.6	2.1	2.4	1.8	7.8	4.5	1.4	12.4	4.2
145.0-149.9 cents.....	2.4	1.5	2.7	1.8	-----	2.8	.1	2.5	2.5
150.0-159.9 cents.....	6.3	3.3	5.3	1.4	-----	7.3	6.0	5.0	12.1
160.0-169.9 cents.....	5.8	2.7	3.6	.2	-----	7.4	2.2	1.7	8.3
170.0-179.9 cents.....	4.8	1.5	2.7	-----	-----	6.6	.3	-----	7.3
180.0-189.9 cents.....	3.0	.7	1.8	-----	-----	4.2	-----	-----	2.4
190.0-199.9 cents.....	1.7	.3	.8	-----	-----	2.5	-----	-----	1.0
200.0-209.9 cents.....	.8	.3	.7	-----	-----	1.1	.1	-----	.3
210.0-219.9 cents.....	.3	.2	.1	-----	-----	.4	-----	-----	-----
220.0-229.9 cents.....	.2	.1	.1	-----	-----	.3	-----	-----	-----
230.0 cents and over.....	.2	.1	.2	-----	-----	.2	-----	-----	-----
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total number of workers.....	107,910	22,310	15,800	440	90	64,490	1,510	120	3,150
Average hourly earnings.....	\$1.19	\$1.01	\$1.08	\$0.94	\$0.92	\$1.23	\$0.96	\$1.14	\$1.25

¹ Excluding premium pay for overtime and night work.

Occupational Wage Rates

National levels of pay for a group of selected occupations in both branches of the machine-tool accessory industry are presented in table 2. This table provides an interesting comparison of wage levels in the two types of shops and indicates that the average rates of pay provided for some of the most important skilled jobs in the industry were higher in tool and die jobbing shops than in production shops. Thus, tool and die makers and class A grinding-machine operators averaged \$1.55 in jobbing shops compared with \$1.42 in production shops; class A milling-machine operators averaged \$1.41 and \$1.34 respectively, in the two branches of the industry. This differential may be related at least in part to the greater versatility of work in tool and die jobbing shops. The reverse wage relationship was reported for some of the less-skilled jobs in which more workers were paid on an incentive basis in production than in jobbing shops. A comparison limited to time workers in the less-skilled jobs indicates, on the whole, a smaller difference in pay between the two branches of the industry than appears when incentive workers are included.

TABLE 2.—Average Hourly Wage Rates (Straight-Time Hourly Earnings)¹ for Selected Occupations in Machine-Tool Accessories Establishments, January 1945

Occupation, grade, and sex	Production shops		Jobbing shops	
	Number of workers	Average hourly rates	Number of workers	Average hourly rates
<i>Men</i>				
Plant workers:				
Assemblers, class A.....	595	\$1.24	331	\$1.25
Assemblers, class B.....	650	1.02	382	.99
Assemblers, class C.....	174	.81	210	.78
Carpenters, maintenance.....	115	1.18	80	1.11
Chippers and grinders.....	202	1.00	172	1.01
Drill-press operators, radial, class A.....	78	1.20	198	1.46
Drill-press operators, radial, class B.....	59	.93	66	1.12
Drill-press operators, radial, class C.....	16	.92	47	.86
Drill-press operators, single and multiple spindle, class A.....	85	1.15	70	1.21
Drill-press operators, single and multiple spindle, class B.....	369	1.12	253	.96
Drill-press operators, single and multiple spindle, class C.....	259	.91	516	.88
Electricians, maintenance.....	191	1.30	122	1.24
Engine-lathe operators, class A.....	1,015	1.35	2,638	1.43
Engine-lathe operators, class B.....	924	1.13	945	1.09
Engine-lathe operators, class C.....	453	1.00	359	.90
Grinding-machine operators, class A.....	2,926	1.42	2,876	1.55
Grinding-machine operators, class B.....	3,267	1.16	1,088	1.20
Grinding-machine operators, class C.....	1,141	1.10	508	.81
Guards.....	215	.86	192	.82
Heat treaters, class A.....	280	1.21	151	1.21
Heat treaters, class B.....	413	1.09	112	.85
Inspectors, class A.....	338	1.31	486	1.53
Inspectors, class B.....	709	1.06	231	1.12
Inspectors, class C.....	334	.86	80	1.00
Janitors.....	1,009	.81	1,101	.78
Machine-tool operators, miscellaneous machines.....	259	.97	2,338	1.08
Machinists, maintenance.....	332	1.21	122	1.24
Machinists, production.....	229	1.19	2,051	1.22
Maintenance men, general utility.....	220	1.09	229	1.15
Mechanics, maintenance.....	284	1.24	72	1.35
Milling-machine operators, class A.....	912	1.34	889	1.41
Milling-machine operators, class B.....	1,109	1.11	609	1.06
Milling-machine operators, class C.....	804	1.02	403	.87
Millwrights.....	98	1.11	143	1.05
Punch-press operators, class A.....	71	.95	132	.99
Punch-press operators, class B.....	40	.77	31	.82
Screw-machine operators, automatic, class A.....	109	1.17	21	1.00
Screw-machine operators, automatic, class B.....	144	1.17	20	1.24
Screw-machine operators, automatic, class C.....	139	1.32	7	(*)
Set-up men, machine tools.....	422	1.17	217	1.13
Stock clerks.....	225	.86	223	.90
Tool and die makers.....	1,703	1.42	14,698	1.55
Truck drivers.....	124	.98	287	.96
Truckers, hand.....	281	.79	57	.83
Turret-lathe operators, hand (including hand-screw machine), class A.....	459	1.31	460	1.30
Turret-lathe operators, hand (including hand-screw machine), class B.....	512	1.01	284	1.08
Turret-lathe operators, hand (including hand-screw machine), class C.....	259	1.01	291	1.00
Watchmen.....	171	.78	387	.73
Welders, hand, class A.....	50	1.27	278	1.45
Welders, hand, class B.....	50	.89	41	1.00
Welders, machine, class A.....	25	1.28	37	1.29
Welders, machine, class B.....	30	1.15	11	(*)
Working foremen, processing departments.....	1,012	1.33	1,525	1.62
Office workers:				
Clerks, accounting.....	33	1.33	6	(*)
<i>Women</i>				
Plant workers:				
Assemblers, class B.....	161	.74	96	.86
Assemblers, class C.....	331	.71	578	.73
Chippers and grinders.....	85	.73	106	.96
Drill-press operators, single and multiple spindle, class B.....	29	.89	118	.98
Drill-press operators, single and multiple spindle, class C.....	341	.86	447	.81

See footnotes at end of table.

TABLE 2.—Average Hourly Wage Rates (Straight-Time Hourly Earnings)¹ for Selected Occupations in Machine-Tool Accessories Establishments, January 1945—Con.

Occupation, grade, and sex	Production shops		Jobbing shops	
	Number of workers	Average hourly rates	Number of workers	Average hourly rates
<i>Women—Continued</i>				
<i>Plant workers—Continued.</i>				
Engine-lathe operators, class B.....	61	\$1.05	49	\$0.89
Engine-lathe operators, class C.....	425	.98	168	.87
Grinding-machine operators, class B.....	336	1.12	59	1.09
Grinding-machine operators, class C.....	1,341	.92	269	.80
Inspectors, class B.....	170	.91	65	.96
Inspectors, class C.....	1,581	.76	262	.82
Janitresses.....	101	.76	38	.74
Machine-tool operators, miscellaneous machines.....	24	.72	63	.88
Milling-machine operators, class B.....	184	1.05	13	.90
Milling-machine operators, class C.....	969	.94	259	.79
Stock clerks.....	131	.72	28	.74
Turret-lathe operators, hand (including hand-screw machine), class C.....	79	.86	65	.81
<i>Office workers:</i>				
Billing-machine operators.....	76	.77	46	.82
Bookkeepers, hand.....	138	1.04	637	.98
Bookkeeping-machine operators, class B.....	75	.72	25	.84
Calculating-machine operators, class A.....	67	.77	14	.84
Calculating-machine operators, class B.....	123	.72	6	(?)
Clerks, accounting.....	198	.79	148	.80
Clerks, file, class A.....	48	.73	5	(?)
Clerks, file, class B.....	202	.57	31	.63
Clerks, general.....	372	.62	293	.75
Clerks, order.....	184	.68	44	.85
Clerks, pay-roll.....	235	.73	220	.81
Clerk-typists.....	304	.65	323	.73
Office girls.....	52	.55	16	.57
Stenographers, class A.....	196	.88	237	.87
Stenographers, class B.....	240	.73	249	.78
Switchboard operator-receptionists.....	88	.74	145	.75
Typists, copy, class A.....	62	.74	13	.99
Typists, copy, class B.....	216	.61	45	.62

¹ Excluding premium pay for overtime and night work.

² Insufficient number of workers to justify presentation of an average.

Variation in Wages by Sex

Straight-time average hourly earnings of men plant workers in machine-tool accessories production shops averaged \$1.14 in January 1945 as contrasted with 86 cents for women plant workers. For tool and die jobbing shops the corresponding averages were \$1.32 and 82 cents. Half of the women in both branches of the industry earned between 60 cents and 85 cents, whereas half of the men in production shops earned between 85 cents and \$1.30 an hour and half of those in jobbing shops earned between \$1.25 and \$1.90.

These variations in general averages reflect not corresponding differences in pay for comparable work, but rather the fact that women were employed in greater degree than men in the less-skilled operations. Similarly, the wider spread between the averages for men and women in tool and die jobbing shops than in production shops does not imply necessarily a corresponding difference for workers in identical jobs; it is accounted for primarily by greater differences in the type of jobs performed by men and women employed in jobbing shops.

A special analysis, removing the influence of differences in the occupations filled by men and women, indicated that men's earnings

averaged about one-seventh more than those of women. Considering all establishments as a group, earnings of men, though not necessarily for identical work in identical establishments, appeared to be significantly above those for women. An analysis of rates for men and women paid on a time basis revealed an average difference of less than 5 percent in the production branch of the industry; in jobbing shops, incentive payment was uncommon.

REGIONAL VARIATIONS IN WAGE LEVELS ⁵

Both in production and jobbing shops, levels of pay were distinctly higher in the Great Lakes region than in the other important regions (New England and the Middle Atlantic States) in the industry. This variation was observed not only in average hourly earnings for all plant occupations combined but also in individual occupational wage rates and in minimum entrance and job rates. In production shops, earnings in the Pacific Coast region exceeded those in the Great Lakes region, but the former employed only a small number of workers in this branch of the industry.

Average hourly earnings in the three important regions in the production branch of the industry differed by 14 percent, the average being \$1.14 in the Great Lakes region and \$1.00 in both New England and the Middle Atlantic States. In jobbing shops, rates in the Great Lakes region were about 35 percent above those in New England, which also had distinctly lower levels of pay than the Middle Atlantic region. Still lower were rates in tool and die jobbing shops in the Border States and Southeast, where one-eighth and one-seventh, respectively, of the workers received less than 65 cents an hour, compared with 1.6 percent in the Great Lakes region; production shops were practically nonexistent in the two former regions.

In view of the importance of tool and die makers in jobbing shops, the interregional variation in rates in such shops for this occupation is of special interest. The rates for tool and die makers varied from an average of \$1.29 in the New England and Border States to \$1.62 in the Great Lakes and Pacific regions.

VARIATION OF OCCUPATIONAL WAGE LEVELS WITH SIZE OF ESTABLISHMENT, SIZE OF CITY, UNIONIZATION, AND METHOD OF WAGE PAYMENT

An examination of the data drawn from January 1945 pay rolls indicates that in both branches of the industry there was no consistent variation in pay levels with size of establishment. Levels of pay, however, tended to be higher in union than in nonunion plants and in large rather than in small communities, although there were exceptions in some jobs. In production shops, where incentive methods of

⁵ The regions used in this study are as follows: *New England*.—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. *Middle Atlantic*.—New Jersey, New York, and Pennsylvania. *Border States*.—Delaware, District of Columbia, Kentucky, Maryland, Virginia, and West Virginia. *Southeast*.—Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee. *Great Lakes*.—Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. *Middle West*.—Iowa, Kansas, Missouri, Nebraska, North Dakota, and South Dakota. *Southwest*.—Arkansas, Louisiana, Oklahoma, and Texas. *Mountain*.—Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming. *Pacific*.—California, Nevada, Oregon, and Washington.

The survey covered no production establishments in the Southeast or Mountain regions and no jobbing shops in the Southwest or Mountain regions.

wage payment were important, the average earnings of incentive workers were higher than those for time workers on the same job; this tendency was, however, less apparent in the Great Lakes than in other regions.

On the average, workers in production shops in wage areas containing cities of 100,000 population or more earned more than did workers in smaller communities. The differences varied widely; for a few jobs the differences exceeded 25 percent. In some occupations, on the other hand, rates were higher in the smaller communities. Variations on the basis of size of city tended to be greater in the Great Lakes region than in the country as a whole. They were distinctly more pronounced among skilled than among semiskilled and unskilled workers. Some of the unskilled jobs had higher average rates of pay in the smaller cities than in the large ones; this was particularly noticeable in New England.

Earnings of tool and die makers in jobbing shops in large wage areas showed a 15-percent margin over those in small cities; this difference was representative of the prevailing spread in rates for other jobs in these shops. A special tabulation based on a group of key jobs showed an average variation of 17 percent with size of city.

Union production establishments provided pay levels that averaged about 5 percent above those in nonunion plants, but in about a fourth of the occupations union wages were, on the average, below those in nonunion plants. The variation between union and nonunion plants was greater in the New England and Middle Atlantic regions than in the Great Lakes region. Among the tool and jobbing establishments, union shops paid, on the average, about 8 percent more than nonunion shops. The variation in favor of union plants was found more consistently in the jobbing than in the production shops. In the case of union tool and die makers the wage difference amounted to 10 percent for the country as a whole.

In the main, workers paid on an incentive basis in production shops received more per hour than did time workers on the same job. (Practically all work in tool and die jobbing shops was on a time basis.) The average difference in production shops amounted to about 7 percent but was as high as 30 percent in some jobs. In a few categories higher levels of pay were reported for time workers, primarily as a result of higher rates of pay for such workers in the Great Lakes region.

Wage and Related Practices

Wartime wage stabilization, because of its limitations on wage-rate changes, focused attention on so-called "fringe" issues involving methods of increasing real income without affecting basic rates of pay. The procedures by which rates of individual workers were determined also became a topic of current interest because of the stabilization program. Data on these practices in the machine-tool accessories industry were collected in the Bureau's study.

METHODS OF WAGE DETERMINATION

It was found that most of the establishments in both branches of the industry paid workers according to a formally established and

recognized scale of rates rather than on the basis of individual considerations.

Incentive methods of wage payment were important in the production branch of the industry but were used infrequently in tool and die jobbing shops. In the former, about one-fifth of all plant workers were paid on an incentive basis; the largest group was employed in New England, where a third of the workers received incentive pay. Only 2 percent of all plant workers in jobbing shops were paid in this manner; most of these were also found in New England, where 10 percent of the workers were paid piece rates or production bonuses.

HOURS OF WORK AND SHIFT OPERATIONS

Like other metalworking industries, the machine-tool accessories industry resorted to lengthened hours of work for individual workers and to extra shift operations to meet expanded wartime production needs. These measures, accompanied as they were by premium pay for extra-shift work and overtime, served to raise gross hourly earnings of the average worker in the industry well above the straight-time hourly pay summarized previously.

The range of scheduled workweeks in January 1945 was about the same in the two branches of the industry, but, on the average, hours were longer in jobbing shops. About nine-tenths of these latter plants operated on a scheduled workweek of 48 to 60 hours for men, the most common hours being 58, 55, and 48 in descending order of frequency. Two-thirds of the production shops had workweeks of 48 to 55 hours for men on the first shift; the two most common workweeks scheduled were 48 and 55 hours. No plants reported a week as short as 40 hours.

About four-fifths of the production establishments employing women and over half of the jobbing shops had established a workweek for women of 48 to 55 hours; only two production shops provided a 40-hour week.

Production shops operated extra shifts more frequently than did jobbing shops in January 1945. A fourth of all plant workers in the former, but only about 15 percent in the latter, were employed on late shifts. Of the production shops with extra shifts, almost all provided premium pay for this work.

A second-shift differential was provided in almost three-fourths of the jobbing shops operating this shift; over half of the plants with a third shift provided extra pay. The most common types of differentials in both branches of the industry were 5 cents for second-shift workers and 10 percent for those on a third shift.

SUPPLEMENTARY WAGE PRACTICES

Information was obtained on provision for paid lunch periods and bonuses not directly related to production, although their effect on earnings was excluded from the data presented earlier in this article. Paid lunch periods were found to be rare. Nonproduction bonuses (such as Christmas or profit-sharing bonuses) were common in both branches of the industry, but the amount of such payments was relatively small in production shops. Data on the extent to which

straight-time average hourly earnings were supplemented by these bonuses were not available for jobbing shops.

These nonincentive bonuses, when averaged over all workers in the production branch of the industry, amounted to about 1.7 cents an hour for plant workers and about 1.5 cents an hour for office workers. In some establishments they exceeded 10 cents an hour. Such bonuses were more important in the New England States than in other regions.

OTHER BENEFITS

Formal vacation plans were effective in a large proportion of the machine-tool accessories establishments studied; insurance plans were also fairly common. Sick-leave plans, on the other hand, were reported infrequently.

Vacation plans, though common in both branches of the industry, were less important in the smaller jobbing shops than in production establishments. About three-fourths of the latter had formal paid-vacation plans for plant workers with a year's service and about nine-tenths provided such vacations for office employees with equivalent service. Formal vacation plans for plant workers with a year's service were provided by about two-thirds of the jobbing shops; of the shops that employed an office force, four-fifths provided vacations.

A week's vacation was the most typical period for plant workers; half of the plants provided office workers with a comparable vacation. Two-week vacations were given by half of the production and a third of the jobbing shops.

Formal provisions for paid sick leave for plant workers with a year's service were reported in only 4 of the 156 production shops and 10 of the 623 jobbing shops surveyed, while a fifth of the former group of establishments and a tenth of the latter had such provisions for office employees. No information was obtained on informal provisions whereby individual workers who are sick continue to receive their pay at the discretion of the company.

Over two-fifths of the production and almost a third of the jobbing shops provided one or more types of insurance or pension plans for their employees; the proportion was about the same for plant as for office workers. Life insurance was the most common type of insurance; health-insurance plans were also frequently reported.