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## CHAPTER 2

### Trends in Employment

Labor is the only input for which we have relatively detailed data in the industries covered by indexes of output. Labor employment, however, is of decisive importance in economic policy, and it is easy to document also labor's great, indeed preponderant, quantitative role in the operation of the economic system. In 1919, midway through our period, in the six industries employee compensation plus entrepreneurial net income (almost all of which was in agriculture) amounted to 87 percent of the income originating in these industries; in the economy as a whole these labor returns were 76 percent of national income.

The employment of labor in industry is part of a broader economic problem. The time and energy a person has to spend on a multitude of desirable activities is limited, and he seeks to allocate these scarce resources efficiently among the competing ends. For purposes of social welfare, the economy's labor resources are its adult population. Conventional measures of the labor force therefore suffer from the same ambiguity as measures of output, which exclude productive activity within the household. Although it is not a matter of indifference whether men shave themselves or hire barbers, the crossing of the boundary between household and market leads to a much larger difference in commercial labor force and commercial output than it does in the welfare of the community. As we have observed, the index of output tends to rise too rapidly because it omits the declining share of household production; and similarly the index of the labor force rises too rapidly because it does not include the declining share of household laborers. Moreover, the increased leisure accruing to persons outside the labor force is not taken into account in indexes of output (or in-

put), although the increased leisure accruing to those in the labor force may be estimated roughly.

If we confine ourselves to the commercial labor force, the number of laborers may be measured by the number of persons employed or by the number both working and seeking work—in census terminology, the gainfully occupied. This category is not without its difficulties: does it include, in addition to the employed, those actively seeking work and those who would accept suitable jobs? To be in the labor force, must a person be seeking a job for which he is qualified, and if so, who is to determine his qualifications? Is the number seeking work strongly influenced—and if so, in what direction—by the level of wages? Fortunately or unfortunately, our answers to these and similar questions are irrelevant to the past; the unique number reported in the decennial census is the sum of millions of individuals' interpretations of questions such as,

Are you seeking work? [To be answered in the affirmative if registered at an employment agency, or a new worker in a mining town where there is unemployment, or if work was not sought because of illness, etc.]

Are you a professional football player, without another occupation [and hence outside the labor force]?

and the intriguing query, Do you choose not to work?

Let us hope, and assume, that our difficulties are unimportant or that they have been solved by a public continuously called upon to face hard issues. We may then form a notion of the relative importance of our six industries in the labor force (Table 8). Each industry except agriculture had about the same share of the labor force in 1940 as in 1900 (although the combination of transportation and public utilities conceals a sizable shift from the former to the latter). But as agriculture's share of the labor force was halved during these four decades, the fraction of the labor force in the six industries fell from two-thirds in 1900 to a half in 1940.

TABLE 8  
 Percentage Distribution of the Gainfully Occupied  
 by Industries, 1900-1940

	1900	1910	1920	1930	1940
Industries Covered by Indexes of Output					
Agriculture	37.9	31.6	27.4	22.1	18.0
Manufacturing	21.6	22.5	26.1	23.0	23.9
Mining	2.6	2.9	3.0	2.5	2.2
Transportation & public utilities	5.0	6.8	7.4	7.0	5.0
Total	67.1	63.8	63.9	54.6	49.1
Industries Not Covered					
Construction	5.6	6.3	5.3	6.4	6.9
Trade	8.9	9.6	9.9	12.7	14.4
Finance	1.0	1.4	1.9	3.0	3.1
Government	2.7	3.6	4.5	5.0	6.1
Private services	12.2	13.0	11.7	15.1	17.3
Other	2.4	2.2	2.8	3.2	3.0
Total	32.8	36.1	36.1	45.4	50.8
Population (millions)	76.1	92.4	106.5	123.1	132.0
Gainfully occupied (millions)	29.1	37.4	42.4	48.8	53.3

SOURCE: Based upon Daniel Carson's *Industrial Composition of Manpower in the United States, 1870-1940* (unpublished). The scope of the industries differs in minor respects from that in the production studies: manufacturing includes hand trades; transportation and public utilities is also broader than gas, electricity, and railroads. The persons whose industry was not reported (6.3 percent of all persons in 1940 but much less in earlier years) are distributed among the industries in proportion to reported numbers; this procedure overstates the relative number in agriculture.

#### *Employment in Six Industries*

The allocation of unemployed persons among industries is hazardous, and in an economy where labor is mobile it is also misleading. In any event, the number of persons actually employed is more relevant to the query, how much labor has been required to produce the outputs of the six industries? Before we turn to the answer, however, some gaps in the data on employment must be summarized.

In agriculture we do not have knowledge of employment proper and perforce substitute the number in the labor force (defined as farmers and adult male laborers on farms). In manufacturing continuous data are available only for wage earners (see Chart 5 and the Appendix), but tolerably accurate estimates can be made of all employees and proprietors (Table 9). In mining there are huge gaps in the record; we have a total for employees only since 1929. The

series on mining in Chart 5 is based upon man-hours of employment in the mining industries covered by output indexes (and omits 1903-28), while that in Table 9 includes only employees in coal mining.<sup>1</sup> The number of employees on steam railroads, in electric light and power, and gas (excluding natural gas before 1929) are reasonably complete and continuous. The omission of employees in mining other than coal miners from the aggregate in Table 9 imparts a small downward bias.

TABLE 9  
Employment in Six Industries, 1899-1939

	1899	1909	1919	1929	1939	NUMBER IN 1939 (1,000)
	INDEX OF EMPLOYMENT (1929: 100)					
Agriculture <sup>a</sup>	91	102	103	100	87	7,445
Manufacturing	51	73	100	100	92	9,178
Coal Mining	63	110	119	100	82	538 <sup>b</sup>
Electric light and power		21	41	100	93	271
Gas	33	60	80	100	95	133
Steam railroads	55	89	116	100	60	1,007
Index for Six Industries	67	86	103	100	87	
Number (1,000)	14,264	18,365	21,874	21,338	18,570	

<sup>a</sup>Data are for 1900, 1910, etc. The series refers to farmers and adult male laborers; that of all gainfully occupied is:

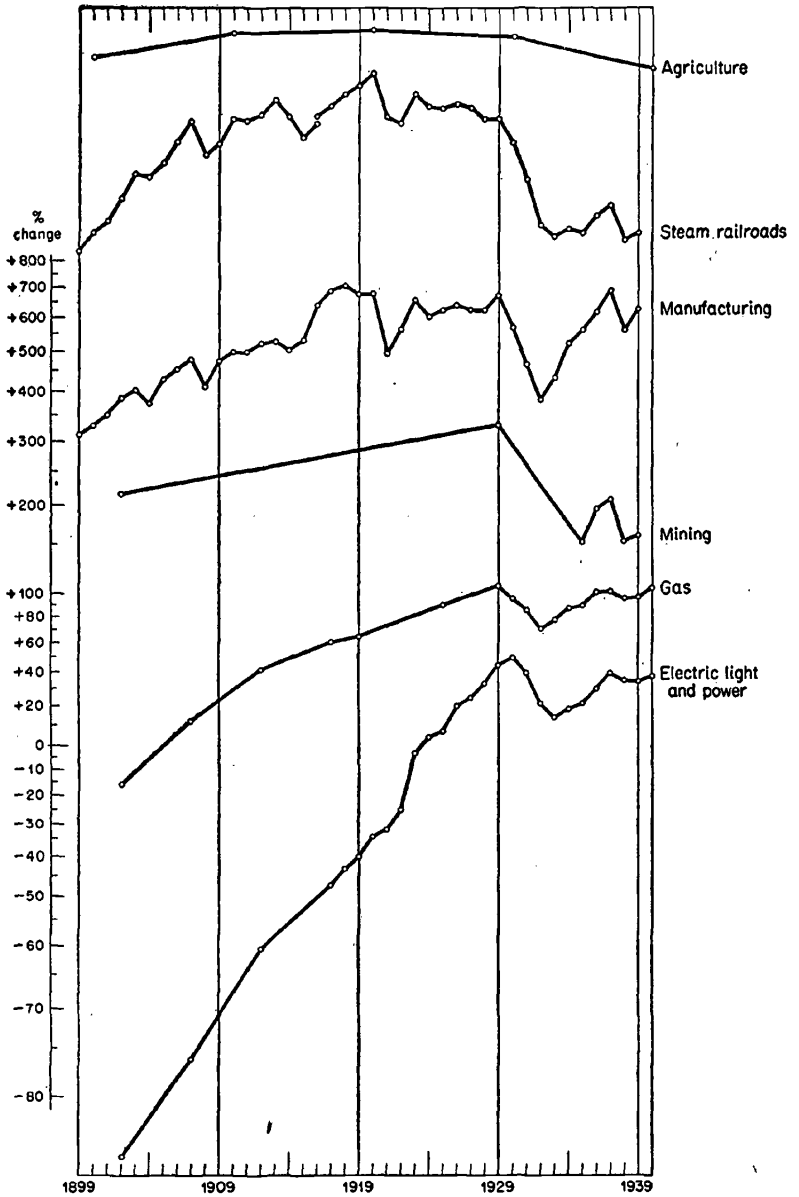
1900	1910	1920	1930	1940
104	111	109	100	88

<sup>b</sup>Employees and proprietors in all mining numbered 887 thousand in 1939.

Employment grew much more slowly than output in each of the six industries. Indeed employment in agriculture, manufacturing, coal mining (and probably all mining), and steam railroads had stopped growing by the 'twenties, and the gas and electric industries reached this stage by 1930. Aggregate employment in the six industries, which rose a third from 1899 to 1919, fell slightly in the 'twenties, and by 1939 had fallen almost a sixth from the 1919 peak in our decennial data. During the forty years employment in the

<sup>1</sup>Wage-earners in coal mining were 64 percent of all wage-earners in mining in both 1929 and 1939, and doubtless a considerably higher percentage before 1929. In 1939 they were 61 percent of wage-earners, salaried employees, and proprietors in mining.

CHART 5  
**Indexes of Employment in Six Industries**  
 1899 - 1940



six industries increased 28 percent while the aggregate labor force increased 83 percent (Tables 8 and 9).

The increase in the number employed in the various industries substantially overstates the increase in the input of labor time because hours of work were sharply reduced.

	AVERAGE HOURS WORKED	
	1900	1940
Manufacturing (per week)	60	40
Mining (per shift)	9.1	7.3
Manufactured gas (per week)	52 (1914)	41
Electric light and power (per week)	46 (1917)	40
Steam railroads (per week)	60.6 (1916)	46.6

#### SOURCES

Manufacturing: Fabricant, *Employment in Manufacturing*, p. 14.

Mining: Barger and Schurr, *op. cit.*, p. 72.

Manufactured gas and electric light and power: Gould, *op. cit.*, pp. 70-1, 120.

Steam railroads: *Statistics of Railways of the United States, 1920*, p. xix; 1940, p. 62.

The decrease in hours of work in agriculture was much less (perhaps 5 percent) than in the five groups in the tabulation, but even including this large group the average hours of work per week in all six industries fell about a fifth during the four decades. As this decrease nearly offsets the increase in the number employed, man-hours of employment in these industries were about equal in 1939 and 1899.

### *Employment in the Service Industries*

Since aggregate employment in the six industries reached its peak about 1920, the growing labor force must have been absorbed by the private service industries and government. These fields have not been explored sufficiently to be described in detail, but a summary of employment trends in selected service industries may be of interest.

The position of the private service industries in economic statistics is anomalous, for our knowledge of them is almost unbelievably small. We know from Census reports, the chief and often sole source in such fields, the employment in making and the output of fire extinguishers for 16 years from 1899 to 1939, when a peak of one thousand persons was

reached. We have very approximate figures for five years during this period on 'gainfully occupied' private family servants, who numbered more than two million in 1940.

It is easy to explain why the Census has provided more detail on a few factory employees than on two thousand times as many domestic servants. The smallness of the employing unit, the difficulty of defining output, the greater social concern with employment and output in manufacturing, the ubiquity of the service industries, and the absence of a dramatized industrial revolution—these and other factors readily explain, even if they do not justify, the difference in our empirical knowledge.

The same emphasis has ruled in economic analysis. Our general textbooks have dozens of references to manufacturing or utilities for one to the service industries; economics seems to be visualized as the study of hordes of men and women pouring into and out of 40-acre buildings. By implication, when not by explicit statement, manufacturing is the center of gravity of the economic system. Theories of monopoly probably owe their current popularity in considerable degree to this viewpoint.

Yet the public and private services (government, trade, finance, and service in Table 8) contained a quarter of the labor force in 1900 and about 40 percent in 1940. This sector of the economy is coming to be better appreciated and there is promise that it will receive more attention from economists. The service industries as a whole cannot be discussed here, but we briefly describe employment or labor force trends in three large service industries for which studies have been or are being made.

The service industries, for which estimates of employment or the labor force are given (Table 10), employed about half of the persons in the 'services' category in 1940, and were the only industries, besides eating and drinking places, to employ more than a million people. Only in the services is a million employees feasible as a criterion of bigness.



TABLE 10

## Persons in Domestic Service, Education and Trade, 1900-1940

	DOMESTIC SERVANTS <sup>a</sup>	TOTAL NUMBER	THOUSANDS EDUCATION <sup>b</sup>		Wholesale and Retail Trade <sup>c</sup>		
			ELEMENTARY AND SECONDARY	HIGHER	<i>Census of Occupations</i>	<i>Census of Dis- tribution</i>	
1900	1,509	509	480	29	2,161		
1910	1,867	639	594	45	3,389		
1920	1,485	835	773	62	4,115		
1929						6,808	
1930	2,025	1,085	985	105	5,828		
1935						5,930	
1939						6,898	
1940	2,098	1,162	1,015	147	6,756		
		INDEX (1900: 100)					
1900	100	100	100	100	100		
1910	124	126	124	155	157		
1920	98	164	161	214	190		
1930	134	213	205	302	270		
1940	139	228	211	507	313		

Data for domestic servants from Stigler, *op. cit.*, p. 4; those for education are from the Biennial Survey of Education; and those for trade are estimates based on the *Census of Occupations* and the *Census of Distribution*.

<sup>a</sup>This series is too low but it is comparable through time; it refers to persons attached to the industry, whether employed or unemployed.

<sup>b</sup>Academic personnel only; the number is for teaching positions in elementary and secondary schools in recent years, and a mixture of positions and employees in earlier years; the number in higher education is for employees.

<sup>c</sup>The totals include proprietors and, in the *Census of Distribution*, the average number of employees during the year.

The extreme paucity of our knowledge about these large fields of employment is well illustrated by the discordant series for trade. According to the censuses of retailing and wholesaling, the number in trade was stable between 1929 and 1939; according to the *Census of Occupations*, it rose almost a million.<sup>2</sup> Was one of the largest American industries stable or growing fairly rapidly?

The diversity of the growth of employment in these in-

<sup>2</sup>The two series are comparable in coverage, and the discrepancy is not diminished by allowing for unemployment, difference in dates, part-time workers, etc. It is possible to give reasons for distrusting both sources. The *Census of Distribution* has one defect the importance of which is not commonly recognized: as it is taken at the end of the year, after a fair fraction of retailers operating during the year have closed shop, employees of these stores are not included in the year's average. The undercount may easily be 5 percent, varying with the stage of the business cycle.

dustries is perhaps an unnecessary reminder of the heterogeneity within the service group. Domestic service had reached a plateau at the outbreak of the war; education grew at a high and increasing rate until 1930, but thereafter its rate of growth was less than that of the labor force; and trade (necessarily measured by the *Census of Occupations*) grew more than twice as rapidly as the labor force until 1930 and continued to grow in relative importance, though at a decreasing rate, until 1940.

#### *The Measurement of Employment*

Figures on employment are simply sums of numbers of men or man-hours; they disregard changes in the quality of the labor force. No one can doubt their utility for many problems, the chief of which are concerned with unemployment. But such figures do not accurately measure the draft on the productive resources of the nation: for this purpose it is as wrong to add different types of laborers as it is to add (without weighting) wood and mechanical pencils in making an index of output—as wrong in principle and often as wrong quantitatively.

No definite conclusion can be drawn about changes in the average quality of the entire labor force. Some factors have been working in the direction of improved quality:

1) A smaller percentage of the labor force now consists of very young workers (Table 11).

TABLE 11  
Percentage of the Labor Force Consisting of Young People  
1900, 1930, and 1940

AGE	1900	1930	1940
		AGRICULTURE	
10-13	6.0	2.0	
14-15	4.4	2.5	1.7
16-19	11.5*	10.5	9.2
		NONAGRICULTURE	
10-13	1.0	.1	
14-15	2.7	.4	.2
16-19	10.0*	7.6	5.2

Based on Census reports on occupations: the 1940 data are not wholly comparable because of the change from 'gainfully occupied' to 'labor force'.

\*Estimated.

2) The reduction in working hours (by perhaps a fifth on the average), the mechanization of the heaviest kinds of work, and the decreased incidence and improved treatment of industrial diseases must have tended to increase the productivity of labor. So many chapters in the chronicle of health and vigor of the labor force remain to be written, however, that no generalization can safely be drawn.

3) Educational training has substantially increased. In 1900 there was only one technician (engineer, chemist, etc.) for every 400 workers; in 1940, there was one for every 130. Alba Edwards estimates that semi-skilled workers rose from 14.7 to 21.0 percent of the labor force between 1910 and 1940, and unskilled workers fell from 36 to 25.9.<sup>3</sup> The great increase in the formal schooling of the population is generally believed to have increased labor productivity.

In addition, there are such intangible and unexplored factors as discipline, morale, and enterprise. A fascinating and important story begs to be written on the quality of the labor force.

Changes in the quality of the entire labor force must necessarily be very gradual under normal conditions. In individual trades the situation is quite different. The glassblowers are the textbook example: in the late nineteenth century this craft was among the aristocracy of the labor force in terms of skill or earnings, but mechanization largely replaced them with ordinary semi-skilled laborers. A proper index of labor input in the glass container industry would discount the nominal increase in employment. The recognition of changes in labor quality in particular industries may often change radically the picture of trends in the quantities of labor employed in production.

<sup>3</sup>*Comparative Occupation Statistics for the United States, 1870 to 1940* (Washington, D. C. 1943), p. 187.