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Part Seven

SOME PROBLEMS IN MEASURING
PER CAPITA LABOR INCOME

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SOME PROBLEMS IN MEASURING PER CAPITA LABOR INCOME

SOLOMON KUZNETS

NUMEROUS problems are connected with the estimation of labor income as such. In recent years particular interest has been aroused by work relief wages and in years to come some attention must be devoted to taxes and benefits under the social security system. These issues are, however, beyond the scope of this paper. Here we shall attempt to discuss per capita labor income figures mainly in the light of the employment estimates by which total income figures are divided.

For purposes of the following discussion we shall assume that the total labor income figures are as perfect as they can be and that moreover they include only those items which correspond to items included in the employment estimate. Thus we shall not concern ourselves with the validity of the theoretical grounds for the inclusion, in total labor income for a particular year, of retirement pensions, compensation for injuries and similar incomes received in that year.¹ Obviously much the greater portion of such items is not paid to people who have been employed or have any claim to employment in the year in which the payment is made. To simplify the argument we shall assume therefore that per capita labor income includes only wages and/or salaries.

Furthermore in most of this paper we shall be dealing with labor income figures as they are compiled and estimated in this country. Income may be measured at the point at which it is paid out or received. In measuring income paid out we also get some measure of the service for which income is paid. A by-product

¹ On this point see M. A. Copeland, Part One, Sec. V, 3.

of measuring income received is a count of the number of income recipients and their distribution with reference to certain characteristics. Obviously the questions raised in connection with per capita income in the two cases will be different. For income paid out the fundamental problem is to get at the number of individuals who receive it; the composition of the income figure is automatically given by the method of estimation. For income received the emphasis will fall on the attempt to separate receipts into income and non-income and to segregate within income what may properly be called labor income. In this country the data so far available practically compel estimating most of the labor income at the point at which it is paid. This approach is assumed in our discussion.

With these limitations in mind it is clear that the significance of a particular per capita labor income figure is conditioned by the nature of the divisor used in connection with total labor income. Three different divisors are conceivable: (1) a figure measuring the amount of work performed in exchange for the income received, probably expressed in labor time units; (2) the number of individuals who worked to obtain the income; (3) a figure measuring the normal labor supply of the industry that paid out the labor income. The corresponding per capita quotients would then represent an average wage rate, average annual earnings of persons employed and average annual earnings of employees attached to the industry.

I Average Wage Rate

Each of the above sets of divisors and ratios has a significance of its own. The amount of work performed is a measure in physical terms of the contribution of labor to the production of income for a particular year. It is as important in connection with income as a physical quantity measure of the capital equipment utilized in a particular year or as a physical quantity measure of the net production of goods and services. When compared with the available supply of labor it indicates the degree of utilization of this most important productive resource. Figures of this type have also

been widely used in analyses of productivity and in discussions of proposals for shorter hours.

The average wage rate measures, of course, the price of labor. It is doubtful, however, whether for broad industry groups of the kind used in national income estimates and for annual periods a wage rate is of much value. The limitations of a wage rate as an index of income, even for a particular occupation, are well known. It tends to rigidity. With an adverse change in business conditions the income of employee groups is reduced by under-employment and unemployment long before wage rates are cut; and the converse is usually true of revivals. Moreover a wage rate tends to be inversely correlated with the expected duration of the job and the security of its tenure. A weighted average of occupational wage rates for an industry is even less reliable. It may and does change with a shift in weights due to heavier relative employment or unemployment in the lower paid occupations.

The per capita labor income figures in the Department of Commerce estimate of national income for 1929-35, described as annual rates of pay, represent approximations to the average wage rates. This is true with one important qualification, viz., that the standard for a full time job is set in terms of the particular industry group and year in question. Therefore the wage rates are not comparable. For instance, it is of some relevance to the 27 per cent decline of the per capita wage in manufacturing from 1929 to 1934 that the length of a full time week also dropped from about 48 to 40 hours. Similarly it may be important to know that whereas the average annual compensation in manufacturing and trade in 1929 was about the same, the difference in normal full time hours may have been as much as 15 per cent.

The lack of comparability in the full time standard between industry groups and between years is even more important for the employment figure used as a divisor. For example, it is believed that one reason for the lag between the increase in production and in employment in 1934-36 is the lengthening of scheduled full time hours in certain industries. Would it not be proper to have this change in hours (as well as the reduction in hours introduced in 1933) reflected in a figure that purports to

measure full time employment? The change in full time weekly hours is as much a characteristic of the industrial history of the last six years as the change in the distribution of employment over the twelve months of each year. Why allow the latter to influence the employment figure and neglect the effect of the former? If the full time equivalent number of employees reflected even indirectly the actual number of employees there would be good reason for adjusting it to changing industrial practice. The figure, however, is not meant to and does not serve this purpose.

Certainly no justification for a varying full time standard is to be found in the assumption that the resulting per capita figure approximates the income of a more or less regular employee of the industry. For of the total employees only a portion, varying from year to year and from industry to industry, would, on the most generous assumption concerning mobility, have an opportunity for full time employment. Thus while the average wage in construction and the average compensation on street railroads in 1929 were about the same (\$1763 and \$1718) the relation of the lowest to the highest number employed in 1929 in the two industries was very different, 56 and 95 per cent respectively. Similarly, if we compare two manufacturing groups, such as food and tobacco on the one hand, with furniture and construction materials on the other, we find that the average wage in 1929 was about \$1150 in both, but that the relation of minimum to maximum employment was 76 per cent in the first and 89 per cent in the second. Similarly the decline in the average wage from 1929 to 1933 of about 25 per cent in the chemicals manufacturing group does not tell the whole story; for at the same time the opportunity for full time employment for those employed declined about 14 per cent.

II Average Annual Earnings

Let us pass now to the second type of per capita figure—the average annual earnings of the individuals employed during a year. The number would include, of course, not only those who worked the full twelve months but also others with a shorter employment

record. The presence of the latter is due to fluctuations in the employment offered by the industry as well as to turnover. It is obviously important to know not only the average number of jobs in an industry but also their distribution over time and their association with individual persons. In terms of per capita income received from the industry, two industries with the same outlay for wages and salaries and the same average number of jobs may present a remarkable contrast depending upon the seasonal regularity of employment and the rate of turnover.

The significance of the average annual earnings derived in this manner would naturally depend upon the closeness of the figure to the total income of the persons involved. The individuals in question may derive additional income, first, from property or from self-employment, and second, from employment during the same year in another industry. Such material as is available from family budget studies indicates that the first source of supplementary income may be safely ignored for purposes of the present discussion. The importance of employment in more than one industry depends to an appreciable extent upon how fine an industrial classification is used; the broader the industry or industry group, the smaller in general the relative number of such cases. More will be said on this point later.

There is also some question about the significance of the average as related to the range of income distribution that it represents or disguises. By introducing into the distribution individuals who were employed only a short time the range is of course enlarged. Whether under these conditions two averages should be calculated, one for the more or less full time employees and the other for short time employees, is just as legitimate a question as whether to separate wage earners into skilled, semiskilled and unskilled. The answer depends largely upon the availability of data. In any case the average is not an effective substitute for an income distribution. It is but a rough measure of the welfare of persons employed in an industry. Whether the remedy for low annual earnings lies in eliminating seasonal irregularity or high turnover or in raising wage rates no average can disclose.

Can average annual earnings or the number of individuals employed be estimated with a reasonable degree of accuracy on the basis of available data? The most important single source for both

labor income and the divisor is what might be broadly termed employment and payroll statistics either of the census or the current reporting type. Next in importance is the heterogeneous collection of estimates that give some approximation to the employment statistics. They usually involve an employment figure or figures covering a portion of the field, a raising factor and some index of activity used for interpolation and extrapolation. A review of the Department of Commerce figures shows that roughly 90 per cent of the employment for 1929 is estimated by using these two types of data. The rest is measured by two other methods—estimates based on the amount of work performed and estimates obtained by dividing the amount of payroll by a full time wage arrived at independently.

An important feature of employment statistics is that they measure only the number of persons employed either on a particular day or, more commonly, during a particular pay period—in most cases a week, in some, two weeks or half a month and only in relatively few cases as long as a month. They do not show how many different persons were employed during a period that involves two or more time units used in the measurement, say two months, a quarter or a year. They do not indicate whether a series showing an unchanging employment of 100 from January through December relates to 100 individuals or 1200 individuals. This is one reason why it is easier to calculate full time equivalent employment—essentially a hypothetical number of full time jobs—than to estimate the number of individual persons employed.

This aspect of employment statistics usually attracts little attention because they are used mainly to measure employment in a particular month. Thus in order to establish the recovery in employment from the trough of the depression to the present all we need know is the number of persons employed say in March 1933 and at present. The employment statistics tell us this; but they do not provide sufficient information for the assertion, for example, that one of every two persons unemployed in March 1933 has been reemployed. It is possible that all those unemployed in March 1933 have been reemployed. In other words employment statistics cannot be used directly to measure the duration of unemployment.

In connection with annual earnings we are interested not in the average number employed month by month but in the number employed in the course of the year. If we confine attention to a single industry it is obvious that the number cannot be less than the highest number employed at any time during the year, or the highest reading of the monthly employment index for the year. This, however, is only a minimum. The maximum would be the sum of the number employed in each pay period comprised in the year. Where the true number falls between these limits depends upon the amount of job-to-job shifting.

A vivid illustration of the difference between annual earnings based on average employment and on actual employment is offered by a study of fourteen railroads made by the Federal Coordinator of Transportation.² For 1924, 1929 and 1933 annual earnings calculated on the basis of records for individual employees were compared with the quotient of the total payroll by the average of the mid-monthly counts of employees. Although the earnings figures used in this study have a distinct upward bias because they are calculated from records kept for income tax purposes and exclude new entrants as well as final separations, they were 3.3 per cent lower than the payroll-employment quotient (for all employees excluding executives) in 1924, 4.6 per cent in 1929 and 9.0 per cent in 1933.

A study of the automobile industry for 1934 made by the Bureau of Labor Statistics³ exemplifies the fact that the highest reading of the employment index offers only a minimum estimate of the actual number of individuals employed in the course of a year. The material obtained in this study is used in the construction of Table 1, where we compare the employment record of individuals employed in the peak month of 1934 with a hypothetical employment record calculated from the employment index on the assumption that the index covered an unchanging group of individuals over the year.

² *Annual Earnings of Railroad Employees, 1924-1933* (Federal Coordinator of Transportation, Section of Labor Relations, May 1935), particularly p. 92.

³ *Monthly Labor Review*, March 1936, particularly pp. 529, 535 and 542.

TABLE I
CUMULATIVE PERCENTAGE DISTRIBUTION OF PERSONS EMPLOYED
IN THE PEAK MONTH BY DURATION OF EMPLOYMENT

<i>Duration of employment in 1934</i>	AUTOMOBILE PLANTS		AUTOMOBILE PARTS PLANTS	
	<i>Based on employment index</i>	<i>actual records</i>	<i>Based on employment index</i>	<i>actual records</i>
3 months or more	94.0	94.1	88.3	92.5
6 months or more	84.2	78.0	75.1	72.0
9 months or more	69.3	60.4	67.6	55.6
10 months or more	61.4	53.6	62.9	49.2
11 months or more	54.4	44.9	57.2	42.6
12 months	52.5	35.5	56.2	34.2

Table I shows that if the duration of employment of individuals who constitute the labor force of the industry could be judged by the length of time jobs are filled, 525 of every 1,000 persons would have been employed throughout the entire year in the automobile manufacturing plants, and 562 of every 1,000 in automobile parts plants. In actual fact only 355 and 342 respectively were so employed. Upon whom did the industry draw to fill the remaining jobs? In part upon the very same individuals included in the table, some of whom were apparently employed longer than the employment series would indicate (see the first line of the table). A large number, however, must have come from the outside, that is, from among persons who were not employed even in the month when employment was highest.

The table is illustrative only. The year 1934 was unusual in the irregularity of employment in the industry. The calculation based on records for individual employees covers only a sample of the industry and is limited to their employment in the plants studied. There is, however, reason to believe that the employment obtained by them in other plants of the industry was relatively insignificant. Moreover an artificial element of stability is introduced by the inclusion of office employees in the sample group; these are excluded from the employment index underlying the first and third columns.

As stated above, the difference between the number of persons employed in the course of the year and the highest reading of the monthly employment index in that year is directly related to the amount of job-to-job shifting by the individuals concerned. This

shifting may for present purposes be described as due to: (1) change in character of job; (2) change in location of job; (3) personal reasons.

By the first we refer to the intermittent character of certain work, such as inventory taking and repairs, even in a plant operating at a constant rate from week to week. The variation will naturally be greater in plants with even a moderate seasonal cycle in production. In these, some jobs will be filled during the slack season that are not filled during the active season. Consequently, the number of different jobs filled during the year will be greater than the highest number of jobs filled on any one day.

The most extreme illustration is what happens in the construction of a building. The various phases of the work following one another in a regular sequence with some overlapping in time—excavation, erection of the structure, roofing, flooring, plumbing, interior finishing, etc.—require the employment of persons with different skills using different equipment. The highest number of jobs filled at any one time is far less than the sum of the maxima of separately identifiable jobs. Thus in a United States Bureau of Labor Statistics study⁴ of the labor engaged in the construction of an apartment house in Washington, D. C. that was begun in September 1931 and completed by the end of March 1932, employment was found to be as follows:

Average employment per day (excluding Sundays and holidays)	107.5 ⁵
Highest employment on any day	230
Average employment in weeks ending nearest 15 of month	126
Average employment when classes of work are kept distinct	335
Highest employment when classes of work are kept distinct	504 ⁶

Employment on the basis of full time equivalents was less than 110 when calculated by a daily record, and about 125 when derived from reports for so-called representative weeks. This is only half of the largest number of jobs filled on any one day and therefore of the highest reading of the employment series, which was 230. But even the latter minimizes the actual number employed

⁴ See *Handbook of Labor Statistics* (1936), pp. 229-34.

⁵ This figure works out to about 113 if Saturdays are excluded in addition to Sundays and holidays.

⁶ Calculated from man-hour data on the assumption of a 48-hour week for all classes of work. Because the work-week for some crafts is shorter and because of the inclusion of incomplete weeks, this figure is clearly an underestimate.

during the duration of the construction project which was at least 500.

Except in construction and perhaps a few manufacturing industries this phenomenon is probably of little importance. Jobs of the sort that are available only for a very limited time are likely to be filled by the employees temporarily taken off their regular tasks. In some cases casual labor is hired. When such jobs demand considerable skill they may be contracted out, as they undoubtedly were in the case of the apartment house.

By change in location of the job we refer to the fact that while the number of jobs in an industry may remain fairly constant the apparent stability may be the result of an increase in the number of jobs in some plants accompanied by a decline in others. For many reasons usually grouped as imperfect mobility of labor not all the individuals separated from the payroll in the plants that contract employment are transferred to plants that expand employment. Imperfect mobility is particularly important in an industry with pronounced regional differences in structure and seasonal fluctuations in employment.⁷

For statistical purposes the significance of this factor is great or small depending upon the homogeneity of the industry for which the employment index is compiled. For instance, the index for the iron and steel industry is a much safer basis for estimating the number of individuals employed than the index for the cotton goods industry, which shows marked differences between New England and the South, or the index for sawmills which in effect covers two or three distinct industries. Certainly the index of employment for all manufacturing industries combined is a poor guide to the number employed more than one month; for it offsets the losses in one industry by gains in another. Thus, according to J. Parker Bursk⁸ the true range of seasonal variation in manufacturing employment before 1929, if the experience of each industry is kept distinct, was 14 per cent rather than the 4 per cent indicated by the composite seasonal index of the Federal Reserve Board.

⁷ For an extended discussion of this point, with reference primarily to production series, see Simon Kuznets, *Seasonal Variations in Industry and Trade* (National Bureau of Economic Research, 1933), Ch. VIII and IX.

⁸ *Seasonal Variations in Employment in Manufacturing Industries, 1931* (University of Pennsylvania Press, 1931), Ch. VII.

Shifting due to causes other than changes in the character or location of jobs may best be presented by mentioning the reasons usually given in connection with the quitting or discharge of a worker: dissatisfaction with working conditions, opportunity to get a better position, desire not to work, invalidity or death, incompetence, insubordination, dishonesty, etc. A shift of this type may occur also in the case of a lay-off if with the resumption of the job it is filled by some one other than its former occupant.

The magnitude of the phenomenon of job-to-job shifting cannot be measured by the turnover rate even in those few industries where data on turnover are compiled. The fundamental limitation of the turnover figures for our purposes is that, like employment, they are reported on a monthly rather than an annual basis. If the sample of turnover reports is not too heavily weighted by plants with a progressive personnel and employment policy, the turnover figure for a particular month, after adjustment for the change in the number of jobs, would indicate the difference between the number of individuals employed and the number of jobs filled. It would be impossible however to ascertain whether and to what extent a similar figure calculated for the following month relates to the same individuals. In manufacturing, for example, in January 1935, for every 10,000 wage earners 304 were separated from the payroll and 633 hired. The difference between these two figures represents a gain in the number of jobs and should be reflected in the employment index. But each of the 304 out of the 10,000 jobs was apparently held in the course of the month by two individuals, whereas in the employment index these jobs were counted as if they had been held by a single person.⁹ The question is how many of these 304 individuals are included in the comparable figure for February 1935, which happens to be 279? Since it is known that voluntary or involuntary shifts from job to job are more likely during the first few months of an individual's service with a particular employer¹⁰ the

⁹ Unless the job was held by two individuals in the course of the same pay period; if this was the case, two employed persons are included in the employment and payroll report.

¹⁰ See, for example, the Bureau of Labor Statistics study for 1930, 'Hiring and Separation Methods in American Factories', *Monthly Labor Review*, vol. 35 (1932), pp. 1005-17, particularly Table 11; or a study of 3,800 hirings by the Atlantic

chances are excellent that a goodly proportion of the 304 individuals will also enter into the turnover rate in February or the following few months. Once again we know only that a monthly figure represents an underestimate of the magnitude of the phenomenon while the sum of the twelve monthly figures undoubtedly overshoots the mark.

So far the discussion has related to one industry, however broadly or narrowly defined. As soon as we take more than one industry into account the minimum limit fixed above loses its significance. Although the number employed in one industry in the course of a year cannot be less than the largest number employed during a particular pay period, the number employed in two or more industries may be less than the sum of the highest readings of the corresponding employment indexes. The reason is the possibility of industry-to-industry shifting.

Offhand it would seem that industry-to-industry shifts would not be unusual. An analysis of the occupational composition of the working population shows that it includes a large proportion of unskilled occupations and of occupations entering in some measure into nearly every industry. Thus, according to the Census of Occupations for 1930, nearly 16 per cent of the non-agricultural employees consist of unskilled laborers. Persons in clerical occupations, for many of whom there is little industrial specialization, constitute another 16 per cent.¹¹ Such shifting is made easier by the geographic concentration of industrial activity. According to the Census of Manufactures about 55 per cent of the wage jobs in manufacturing are in 95 counties out of a total of over 3,000.¹² The concentration of wholesale distribution and financial activities in cities of 500,000 population or over is also a generally accepted fact.¹³

Refining Company, reproduced in J. D. Hackett, *Labor Management* (New York, 1929), p. 305.

¹¹ For a definition of the unskilled and clerical occupational groups and a retabulation of the Census figures relating to them, see W. S. Woytinsky, *The Labor Supply in the United States* (Committee on Social Security, 1936), pp. 28, 30, 42.

¹² See Daniel B. Creamer, *Is Industry Decentralizing?* (University of Pennsylvania Press, 1935), p. 10.

¹³ For a comprehensive picture of the geographic concentration of employment in private business see U. S. Bureau of the Census, *Census of Business: 1935, Personnel and Pay Roll in Industry and Business, and Farm Personnel by Counties* (June, 1937).

The information available on actual shifts is limited. There are in the first place census data indicating major trends in the shifting of broad industrial-occupational groups, such as the decline in basic industries including agriculture, mining, manufacturing and construction, and the increase in the distribution and service industries, such as trade, transportation, finance, the professions and domestic and personal service. It is not clear, however, to what extent these changes are brought about by the transfer of individuals as compared with a change in the industrial attachment of persons first entering a gainful occupation.

We know also of the rise of new industries, such as automobile, aircraft, radio, air conditioning. These draw for their labor in part upon the related industries, some of which they have been displacing, and in part upon an undifferentiated labor supply much of which comes from agriculture.

Our data are most abundant with reference to agriculture, partly because we are able to identify shifts to and from agriculture with migration to and from farms. According to Department of Agriculture estimates, about three and a quarter million persons moved annually from farms to cities or cities to farms in 1920-32; in the following years (to and including 1936) such movements have involved less than 2,000,000 persons annually. After those not in gainful occupations have been eliminated, apparently something like 1,300,000 persons in 1920-32 and 750,000 in the following years were shifting annually from or to employment in agriculture.

There is finally fragmentary information on shifting by individuals. A study of applicants for jobs with private firms in Philadelphia,¹⁴ made in 1929 and covering mainly their experience for the preceding three years, shows that about 65 per cent had more than one job and that about 46 per cent had jobs in more than one industry. The industries involved in the shifts bear no apparent relation or similarity to one another. Another study,¹⁵ covering approximately the year 1928, of separations

¹⁴ Burton R. Morley, *Occupational Experience of Applicants for Work in Philadelphia* (Philadelphia, 1930), p. 150.

¹⁵ Isador Lubin, *The Absorption of the Unemployed by American Industry* (Brookings Institution, 1929). It is interesting to observe that occupational shifts are less frequent than industrial, according to data assembled by both Lubin and Morley.

from about 20 industries in Baltimore, Chicago and Worcester, Massachusetts, shows that of those who found steady jobs only about one-third did not shift their industrial affiliation. A study of the highly skilled cutters in the men's clothing industry in Chicago in 1926-28¹⁶ is less significant for our purposes because the conditions for retaining their industrial attachment were highly unfavorable; about 70 per cent of those covered shifted to other industries.

Related to the subject of shifting is what might be called dual industry affiliation, that is, the regular combination of jobs in two industries held by the same individual year after year. Here again information of a mass character is scanty. The latest two Censuses of Agriculture have furnished data on work off farms by farm operators; in the Census covering 1934 an attempt was made to separate agricultural from non-agricultural work. This shows that nearly 2,100,000 farm operators spent some time off their farms in working for pay or income, of whom at least 70 per cent were engaged mainly in non-agricultural pursuits. Some of this work may have been of a temporary emergency nature, but if so, emergency employment was largely a substitute for regular employment available in normal years, for the 1934 ratios check fairly well with the 1929. These censuses do not disclose how prevalent such a combination of agriculture with other industries is for family labor or for wage workers attached primarily to agriculture. From other sources, however, it is evident that such a combination must be fairly common, particularly in rural industries such as lumbering and wood working, food processing, the manufacture of fertilizer, road building.¹⁷

On the other hand, for many seasonal industries, primarily urban in character, the dovetailing of employment appears to be impracticable. Workers in the apparel trades or in building construction do not as a rule find employment in other industries in the slack seasons, partly because of the coincidence of seasonal peaks and partly because it would appear to detract from their chance of reemployment at their primary occupation. Students

¹⁶ Robert, J. Myers, 'Occupational Readjustment of Displaced Skilled Workmen', *Journal of Political Economy*, Vol. XXXVII (1929), pp. 473-89.

¹⁷ Interesting evidence of recent date on the dovetailing of seasonal rural industries with agriculture is found in Blair Stewart, *Seasonal Employment and Unemployment Compensation in Oregon* (Reed College, January 1937), pp. 38-9.

of seasonal unemployment in the 1920's, when this was the important aspect of unemployment, used to place much more emphasis on the necessity for regularization of employment in the seasonal industries than on the possibility of adjustment through systematic combination of jobs in two industries.¹⁸ That a worker in a seasonal industry can get along with employment only in that industry is partly explained by the fact that industries in which the season is very short, such as canning and summer hotels, or industries with a sharp seasonal peak, such as retail trade with its November and December peak, draw usually upon the secondary labor supply—persons who are not entirely dependent upon employment, such as housewives and students in school, and who do not pursue a gainful occupation for more than two or three months in the year.

An overall assessment of the quantitative importance of all these limitations of employment statistics for our purposes cannot be made on the basis of the available data. It would have been feasible were it possible to compare the Census of Occupations, which classifies the gainfully occupied population by their usual occupation and industry, with employment statistics for the preceding year. Such a comparison is extremely difficult. One reason is the lack of comparability in the industrial classifications, explained in part by the inevitable differences in procedure between enumerations in one of which the unit is a person and in the other a business establishment.¹⁹ Another difficulty arises because not all types of economic activity are covered by industrial censuses or current employment series; this limits the possibility of combining classifications to ensure greater comparability.

The limitations of employment statistics stressed above make it necessary to resort to all kinds of detailed adjustments industry by industry, on the basis of a vast collection of miscellaneous data plus the unavoidably arbitrary use of judgment. The aim of this estimating job would be an approximate segregation of those counting upon full employment from the voluntary part-timers and the allocation of the former by industries. Even for years of

¹⁸ See, for example, H. Feldman, *The Regularization of Employment* (Harper, 1925), Ch. XIV, Sec. II.

¹⁹ For an attempt to compare the Census of Occupations data for 1930 with the reports of the Census of Manufactures for 1929 see W. S. Woytinsky, *op. cit.*, pp. 18-23.

high employment the results would be of varying reliability depending upon the information it is possible to uncover. For depression years, when a large labor reserve is piled up in every important industry, adjustments of this sort would necessarily become more difficult and more speculative.

III Average Annual Earnings of Persons Attached to Industry

It is for the depression years that the concept of attachment to industry, mentioned at the beginning of this paper, acquires a special significance. When business is good and employment is at a normal level there is in general no appreciable difference between the number attached and the number regularly employed in the course of a year. For in such periods cyclical unemployment is not large. On the other hand unemployment of a seasonal nature, unemployment connected with the shift of jobs, and unemployment due to sickness and similar causes, have already been included in the number employed; it is this 'normal unemployment' that accounts for the difference between the number employed and the average of a monthly employment series.

The primary source for data on attachment is the Census of Occupations which, as mentioned before, presents classification difficulties if its information is to be used in connection with labor income series derived primarily from industry censuses or sample enumerations. In intercensal years the estimate would of course rely upon the occupations census merely as a starting point. The method used in the best known estimate of attachment in this country, the one by W. I. King adopted with some modifications by M. B. Givens and covering the period 1920-27, is best described as follows:

"Substantially his (King's) estimates of the numbers attached to industry are made wherever possible by discovering the highest month of employment for each year of prosperity and by inflating this figure by an arbitrary percentage to allow for illness and other known factors. As the number of persons required in any group declines, as evidenced by lower maximum employment during a given year than in some preceding year,

the estimated number attached to such a group is decreased only when increases in other groups may be made, sufficient to account for the estimated total gainfully occupied population.”²⁰

Of the problems peculiar to an estimate of attachment one of most general interest is as follows: Are first-job seekers, re-entry seekers or unemployed with a long duration of unemployment to be regarded as attached to industry? These persons have not developed an attachment to any industry, even such a loose one as would be evidenced by short-time employment; or their attachment to industry may have been broken long ago by marriage, voluntary retirement on savings or involuntary prolonged unemployment. On the other hand, they are apparently indistinguishable from any other unemployed in that their economic circumstances are such that they must work and their physical and mental make-up presumably qualify them for work of some kind.

No guidance on this problem is to be derived from census experience. The practice of the Census of Occupations has been to rule out persons who do not have a gainful occupation, that is, “an occupation by which the person who pursues it earns money or a money equivalent, or in which he assists in the production of marketable goods”.²¹ This practice, which tends to eliminate from the category of gainful workers, or those attached to industry, most of the persons falling into the groups enumerated above,²² is understandable in the light of two considerations: (1) the primarily occupational orientation of the Census of Occupations; (2) the numerical insignificance of the above groups before April 1930 when plans were perfected for taking the Census. On the other hand, the several employment and occupation censuses taken since 1931 have departed from this tradition. They have counted as ‘employable persons’ or ‘workers’ all persons

²⁰ American Statistical Association, *Proceedings*, March 1929, pp. 34-5.

²¹ U. S. Bureau of the Census, Fifteenth Census of the United States: 1930, *Population*, Vol. V, p. 29.

²² Thus, according to the Massachusetts Unemployment Census as of January 2, 1934, at most only one-third of the first-job seekers had any vocational training and could be said therefore to have a gainful occupation; see Massachusetts Department of Labor and Industries, *Report on the Census of Unemployment ...* (Labor Bulletin 171), pp. 26 and 29.

within certain age limits who were either employed or able to work and seeking work, although the crucial tests of 'ability to work' and 'search for employment' were of course applied differently in the different censuses.²³

The answer to the problem of first-job and re-entry seekers depends upon the purpose for which a figure of labor income per person attached is calculated. Does it purport to measure the average compensation of an employee in industry, taking account of unemployment that industry forces on him? In that case the King-Givens method of accepting the highest employment figure reached in a month of prosperity as the figure of attachment should be adequate. According to all conservative estimates employment in no major industry group, with the possible exception of agriculture and government, has as yet exceeded 1929 levels. By the King-Givens method, consequently, the number attached to industry has remained practically unchanged since 1929, despite the increase in population. By implication, the net addition to the employable population since 1929, which is currently estimated at a minimum of 3,500,000 persons, is barred by technological changes, lowering of the plane of living and other forces from becoming attached to industry.

The above solution of the problem is not satisfactory if the figure of labor income per person attached is used as a measure of

²³ Cf. the definitions in the following censuses: (1) Massachusetts. "*Employable persons*"—Included all persons 14 years of age or over who were employed or who were able to work and seeking employment" (see Massachusetts Department of Labor and Industries, *op. cit.*, p. 6). (2) Michigan. "*Employable persons*"—It includes all persons 15 years of age or over who were working or were able to work and seeking employment on the census date. . . Persons without previous work experience were considered gainful workers only if they had made verbal or written application for employment within the past month" (see Michigan, State Emergency Welfare Relief Commission, *Michigan Census of Population and Unemployment*, First Series, nos. 1-10, Lansing, Michigan, July 1936-April 1937). (3) Census of Relief Employables. "*Worker*"—Any person, 16 through 64 years of age, inclusive, who at the time of this census was a member of a relief household and who was working or seeking work, except an adult . . . needed at home to care for dependents under 16 years of age. . . Persons seeking work who performed no gainful work of any kind during the 10 years preceding this census are reported as 'inexperienced' " (see U. S. Works Progress Administration, Division of Social Research, *Workers on Relief in the U. S., March 1935: A Census of Usual Occupations*, January 1937). For a similar definition see also Pennsylvania, State Emergency Relief Administration, *Census of Employable Workers in Urban and Rural Non-Farm Areas of Pennsylvania: 1934* (Harrisburg, Pa., 1936), p. V.

the welfare of the population attached to industry in the capacity of employees; for any measure of welfare, however crude, must reflect the fact that under present conditions the same income is made to support a larger number of dependents. The 3,500,000 or more persons who under other circumstances would have been partially or fully self-supporting (and conceivably supporting their own dependents) are now in the status of dependents. Therefore if the figure of labor income per person attached is to be used as a measure of welfare the divisor underlying it must be calculated as a more or less constant proportion of the total population. First-job seekers, re-entry seekers and unemployed of long duration must for this purpose be regarded as attached to industry, provided care is taken to exclude the exaggeration in these figures due to the unemployment of the regular family bread-winners.

This easy solution cannot, of course, be made to apply to any single industry or industry group. With the absorption of first-job and re-entry seekers in an industry while its total employment is contracting,²⁴ the total labor force of an industry (including its reserve of unemployed) may be greatly in excess of its prosperity employment or of its labor requirements in the foreseeable future. Under these conditions it is not quite certain whether all persons with recent employment experience in an industry should necessarily be regarded as attached to it; for many of them there may be no hope of reemployment in this industry. It is clear, moreover, that the use of prosperity employment figures may seriously misrepresent the relation between the numbers attached to different industries.

This brief review of the problems presented by per capita labor income figures cannot be complete without mention of the new type of data that may become available as the social security system begins to operate. Since both old age and unemployment benefits are calculated on the basis of income earned, and the funds for both purposes are accumulated by taxation of wages and salaries, it appears that for administrative purposes it would

²⁴ It may be estimated that between 1930 and 1935 at least 6,000,000 first-job seekers entered the labor market. In 1935, with unemployment hovering about the 10,000,000 mark, at most only 2,000,000 of the first-job seekers were still unemployed.

be necessary to obtain data on the earnings of individual employees as well as on total payrolls. The social security system thus furnishes for the lower income groups a device for obtaining information similar to that which would become available for the higher income groups through the systematic tabulation of personal income tax returns. In fact it would seem that the social security data should be more readily usable to estimate per capita labor income. The reason is that the information will be furnished by employers so that the classification of individual employees by industry and of their earnings by industrial source should be more accurate than is possible under the income tax system. There will, of course, be many difficulties due to exclusions from the Social Security Act of certain industries, occupations and incomes above a certain maximum as well as to possible changes in the scope of the system.²⁵ These difficulties, however, appear to be minor indeed when compared with those encountered in using statistics available at present.

²⁵ For a discussion of these and other difficulties see Ewan Clague, 'Statistical Problems in the Administration of Social Security', *Journal of the American Statistical Association*, vol. 32 (1937), pp. 509-16.