Volume Title: National Income and Its Composition, 1919-1938, Volume I

Volume Author/Editor: Simon Kuznets, assisted by Lillian Epstein and Elizabeth Jenks

Volume Publisher: NBER

Volume ISBN: 0-87014-039-6

Volume URL: http://www.nber.org/books/kuzn41-1

Publication Date: 1941

Chapter Title: Methods of Measurement

Chapter Author: Simon Kuznets, Lillian Epstein, Elizabeth Jenks

Chapter URL: http://www.nber.org/chapters/c5539

Chapter pages in book: (p. 96 - 132)

CHAPTER 3

Methods of Measurement

ALTHOUGH repeatedly deploring the limitations imposed by lack of data, we have not explained how the stock of data affects our estimates. It is decisive, since a national income investigator must rely on adequate and fairly accurate information in assigning magnitudes to the categories he sets up; and such information is a matter of laborious accumulation by many agencies rather than the work of an individual.

The general characteristics of continuous data serve to determine the approach. But even after the approach has been chosen in conformity with the data that are most plentiful and continuous, approximations must be made when data are lacking. In attempting to bridge gaps, in estimating one cell after another, the investigator must have at hand some controlling figures to test whether he has attained the countrywide total or whether parts are missing. In trying to make continuous annual estimates he finds that some parts of the total are recorded for some years and not for others.

We therefore discuss briefly the approach, the approximation of parts, the controlling totals, and the preparation of continuous annual estimates. In a sense this chapter is a summary of the description of sources and procedures given in detail in Volume II, emphasizing only the salient points at which the stock of data conditioned our estimates.

1 The Approach

The primary data needed to measure national income may be reported by enterprises or by individuals and families. Information from enterprises may be submitted by producing or proprietorship units, with effects on the distribution by industrial origin already discussed. If it is in terms of the gross value of products without classification of products by type, and of the cost of goods consumed in the production process, net value originating in an industrial division can be estimated by subtracting the cost of goods consumed from the gross value of products; national income is then the sum of these net values. If such net values are reported directly by type of payment and the net savings that comprise them, national income can be distributed not only by industrial origin but also between withholdings and disbursements and by type of payment. If the flow of commodities and services is reported in considerable detail, national income can be divided between consumers' outlay and net capital formation and both can be distributed by type of commodity and service. Indeed, of the classifications discussed in the preceding chapter, the only one that cannot readily be derived from reports by enterprises is that of payments by size among individuals or families.

A distribution of payments by size could be most easily derived from an estimate of national income based on reports by individuals or families, for the first item of information requested would be total payments received by each. If, in addition, the industrial characteristics of the paying enterprises, the type of payment, the division of receipts between expenditures and savings, and the apportionment of expenditures among commodities and services of diverse types were covered, most of the breakdowns mentioned in the preceding chapter could be carried through. But two important items would be missing. First, net savings of enterprises could not be estimated, since they are revealed solely by the accounting of enterprises themselves. Second, the commodity and service counter-

parts of individuals' net savings, the larger portion of which is expended by enterprises rather than by individuals, could not be ascertained.

In this country, as in many others, primary data sufficiently comprehensive to estimate national income are reported by enterprises. The censuses of agriculture, mining, manufacturing, electrical and communication industries, and for recent years, of construction, trade, and service cover at not too infrequent intervals the major part of the country's productive system. In addition, the Interstate Commerce Commission publishes continuous and complete reports on steam railroads and most other public utilities; the federal income tax authorities publish summaries of the annual reports of business corporations; and there is continuous information on various activities of government and many semi-public agencies. Continuous information reported by individuals or families, in contrast, has been exceedingly meager and incomplete, at least until very recent years.

Continuous and complete primary data solely from enterprises do not in themselves determine how to estimate national income and to classify its components. As already indicated, they may give us any one approach or all three: (1) the gross-net product, (2) the industrial payments, (3) the finished products. By means of the first, from the value of the gross product of enterprises in various industries and of the materials and products consumed by them in the production process we can estimate national income and gross product totals distributed by industrial source; by means of the second, from income payments and net savings originating in various industries, we can estimate national income (but not necessarily a gross product total) distributed by both industrial source and type of income; by means of the third, from detailed data on the products of enterprises, we can estimate national income, divided into consumers' outlay and capital formation, with these two broad components further subdivided by various categories of goods.

Could we use all three approaches we could check the accuracy of our estimates of national income as well as make distributions that would be complementary and constitute a useful blueprint of the workings of the national economy. However, the second approach alone is feasible for the period under study. Information on gross product, especially on products consumed in the production process, is still lacking for most industries. Data on the finished products of various industries have become relatively abundant since 1929, and it would be feasible to approximate national income for recent years by the finished products method. Even so, the margin of error would be greater than in estimates derived by the industry payments approach; and the relatively better supply of data for the latter approach becomes more decisive for the years before 1929.

Therefore, we used the industry payments approach. We began with agriculture and attempted to estimate wages, salaries, other compensation of employees, dividends, interest, entrepreneurial withdrawals or income, and net savings of enterprises. The combined total of these items is net income originating in agriculture. Then we proceeded similarly for mining, manufacturing, construction, and all other industries that can be singled out, until the contents of the country's economic system had been covered. National income is the sum of all the parts, adjusted for the flow of property income payments into and out of the country.

Abundant as the data are for this method, formidable difficulties must be overcome before we arrive at complete and continuous annual estimates of national income distributed by industrial origin and type of income.

2 *The Approximation of Parts*

A DIFFICULTIES OF MEASUREMENT ENCOUNTERED IN MOST INDUSTRIES

Data are most abundant for industrial divisions concerned with the extraction, fabrication, and transportation of commodities

or the provision of publicly regulated services, and characterized by the corporate form of organization—mining, manufacturing, steam railroads, electrical industries (electric light and power, electric railroads), and communication (telephone and telegraph). With occasional lapses (such as the omission of petroleum mining by the *Census of Mines* in 1929), the industrial censuses and Interstate Commerce Commission reports cover these divisions fairly adequately, showing the number and compensation of employees and the proportion of incorporated and unincorporated enterprises. Since the corporation predominates in these industries, their property income and net savings are reported rather fully on federal corporate income tax returns. In addition, special governmental agencies (such as the Bureau of Mines and the Interstate Commerce Commission) report supplementary information that can be used in deriving estimates of gross income or of net income for some industry type of income cells.

But difficulties arise even in these industrial divisions. First, there are few data on receipts by employees of incomes other than monetary wages and salaries: perquisites and other payments in kind, gratuities, compensation for injury, pensions. For some industries, such as steam railroads, the items are reported; for others it is almost impossible to obtain them. Whenever feasible, these payments were estimated. Since they are small, discretion seemed the better part of statistical valor for industries for which great effort would have to be expended to achieve even rough approximations. For these industries 'other' payments to employees were omitted; and to that extent employee compensation is incompletely estimated.

Second, while in all industries discussed here corporations predominate, some activity in mining and manufacturing is still carried on by unincorporated establishments. The industrial censuses report the wages and salaries paid by such establishments but not the incomes of the proprietors. Nor are they given adequately in *Statistics of Income,* the annual statistical compendium of information reported on federal income tax

returns by individuals and corporations. The various means devised to estimate the total net income of these entrepreneurs and to divide it between entrepreneurial withdrawals and net savings, based largely upon some use of corporate data, are described in the notes to the tables in Part Four. The resulting estimates are crude, but the totals for these unincorporated firms are very small compared with the totals for the corporate, and any error in the former is not likely to affect the total for each industry greatly.

Third, *Statistics of Income* reports for the various industrial divisions total annual dividends and interest paid, but the payments are to other enterprises as well as to individuals. These inter-enterprise payments must be excluded if duplication is to be avoided. For dividends the adjustment can readily be made because *Statistics of Income* reports also dividends received by corporations. The difference between dividend receipts and payments is the net amount contributed by each industrial division to total dividends received by individuals, but it is the amount of net dividends *originating* rather than the amount actually *paid* by the industry *directly to individuals.*

The adjustment of interest is harder because the only long term interest receipts reported separately by corporations to the federal income tax authorities and published by the latter are those on government bonds; and total interest paid as reported in *Statistics of Income* is not divided between interest on short and long term debt. Our solution is based upon rather heroic assumptions; namely, that all interest on short term debt by corporations other than those representing aggregations of individuals (savings banks, insurance companies, etc.) is paid to enterprises, and that interest on long term debt is paid to individuals; and that, therefore, total interest paid on bonds minus interest received on government bonds is a good approximation to net interest originating and paid to individuals. Accordingly, we estimated interest on long term debt by applying an average rate of return derived from an extensive cor-

porate sample to the total corporate long term debt outstanding shown by *Statistics of Income,* revised for a minor shortage in coverage. From these payments we subtracted receipts on government bonds held by corporations. Our estimate of interest payments to individuals is undoubtedly an approximation much cruder than our estimate of net dividend disbursements.

Fourth, the reported industrial classifications of employee income (and the less important entrepreneurial income) are not comparable with those of property income and corporate net savings. The former are from industrial censuses, the latter from *Statistics of Income,* and the two are not identical. This difficulty is, however, minor, especially when we discuss the broad industrial divisions. More important is the fact that payments to employees are based on primary information classified by producing establishments, i.e., plants at specified locations, while property income and corporate net savings are reported by corporations which, until 1934, were permitted by federal tax authorities to file consolidated statements for the parent corporation and its affiliates. Even single corporations having no affiliates frequently control several producing establishments engaged in diverse productive activities and classified in the industrial censuses in more than one industrial division. Among consolidated corporations this is the rule rather than the exception. Federal tax authorities classify each reporting unit in the industrial division from which it derived the major part of its income. This means that a corporation devoting a considerable part of its resources to oil mining or distribution in one year may be classified under chemical manufactures; in another year, with a slight increase in the relative importance of its mining or distributive operations, it may be classified under mining or trade.

A national income investigator cannot unscramble this mixture. It is an onerous task even for the management of an enterprise to determine accurately what part of its net revenue can be attributed to the various activities pursued or the different products turned out. Such a calculation is impossible from

totals by industrial divisions in which reports of individual corporations are consolidated and from primary data for each corporation already combined for the various industrial activities represented. All we can do is to admit that property income and net savings of enterprises cannot be distributed by industrial divisions with the same thoroughness as payments to employees; and that consequently too much reliance cannot be placed on small differences among industrial divisions in the relative shares of property and service incomes or in the apportionment between aggregate payments to individuals and net savings of enterprises.[1]

The four types of difficulty in estimating income originating in mining, manufacturing, electrical industries and communication, and steam railroads (including Pullman and express), all industrial divisions for which data are relatively complete, are met also in most other industrial branches. The first, that relating to 'other' income of employees, is solved in these other industries along the lines already indicated: whenever possible we attempted to include these items, but we could not always attain complete coverage. However, when the payments are really substantial (e.g., relief disbursements, or subsistence for army and navy employees) the information is usually available

[1] The effect of the consolidation of reports on the industrial classification is revealed by a comparison made possible for 1934 by a change in the law restricting the right to file consolidated returns for income tax purposes (see *Statistics of Income* for 1934, Part 2, Tables 2, 10, and 13). The 1934 information is given for corporations classified by industrial divisions based on consolidated returns in 1933 and by industrial divisions based on separate returns in 1934. For net dividends originating (i.e., dividends paid minus dividends received) by major industrial groups, agriculture, manufacturing, and construction show minor changes from one classification to the other. But in dividends originating in mining, transportation and public utilities, and trade there is a significant decline (over 20 per cent) from the consolidated classification to the non-consolidated; and there is a striking increase in net dividends originating in finance. The apparent reason is that holding companies, formerly classified in the industrial division of their affiliates, are now segregated in finance and their dividend disbursements swell the item for that group. Of course, there may have been other substantial shifts not revealed in a classification by broad industrial groups.

and the items can be estimated. The omissions are therefore relatively minor. The third, estimating net interest payments to individuals, is also encountered in all other industries except government and those that represent transitional stages in the flow of property income to ultimate recipients, and is treated similarly. The last difficulty, fitting property income and net savings of enterprises into the moulds of the industrial classification in the same way as service income, is also present in the other industries; and there also little can be done beyond admitting it as a qualification of our estimates. The second difficulty, estimating entrepreneurial net income and its breakdown, assumes much greater proportions in most of the other industries than in those discussed and is aggravated by new problems.

B ADDITIONAL PROBLEMS IN AGRICULTURE, CONSTRUCTION, AND TRADE

The substantial part of activity in agriculture, construction, and trade carried on by unincorporated firms makes it especially necessary to estimate entrepreneurial net income more precisely than for industries in which unincorporated firms are relatively few; but for these three industries, to attain comprehensive coverage of any aspect of activity and of any type of income is far from easy.

This question of comprehensiveness might have been raised about the industrial divisions discussed first. Can it be assumed that the industrial censuses cover exhaustively the industries they purport to describe? Or that all active business corporations report to the federal income tax authorities as they are required to by law? Obviously some shortage in coverage may be expected, greater in some industries than in others. For example, while the reporting for steam railroads, electrical, and communication industries may be assumed to be complete, not all manufacturing and mining enterprises are covered; the censuses themselves expressly exempt establishments with a gross value of product under a low minimum. Also, there may

be some evasion in reporting by corporations. But the magnitudes involved probably have so slight an effect on the estimates of income originating that it did not seem worth while to strive for more complete coverage.

The situation is quite different in agriculture, construction, and trade. Even when census surveys have been made we cannot be sure that the coverage is reasonably complete or consistent. In agriculture, for which a census has been taken at regular intervals for several decades, grounds for suspicion lie first in the difficulty of distinguishing between a *bona fide* farm, i.e., a productive unit devoted exclusively or preponderantly to agricultural activity, and a farm that is the country residence of people whose major activity is elsewhere or a place of refuge from urban centers during depressions. Furthermore, coverage may vary from one census year to the next because of differences in the time it is taken, the money spent, and the enumerator's method. Finally, there is the ever present difference between information reported to enumerators by farmers and that submitted to authorities by business corporations. The former is in large degree a matter of rough calculations on the part of the farmer; and sometimes, as in the case of a new tenant reporting on activity for the preceding year, i.e., before he took over the given farm, hearsay evidence.[2] Fortunately, the Department of Agriculture, especially the Bureau of Agricultural Economics, supplements the censuses by special studies and attempts to provide continuous series of comparable scope. It is this Bureau's estimates of income originating in agriculture that, with slight changes, we present here.

The deficiencies of coverage in construction and trade are much more serious. Unlike farms, many firms in contract construction and not a few in trade have no clearly recognizable,

2 For the difficulties of defining a farm unit see J. D. Black and R. H. Allen, 'The Counting of Farms in the United States', *Journal of the American Statistical Association,* Sept. 1937; and Karl Brandt, 'Fallacious Census Terminology and its Consequences in Agriculture', *Social Research,* Feb. 1938. On the whole subject of estimating income from agriculture see the Social Science Research Council monograph, *Research in Agricultural Income* (June 1933).

identifiable location, and can easily be overlooked in any countrywide survey. A contractor or a broker who has his office 'in his hat', or a tradesman who has a stand in the lobby of an apartment hotel, is operating a genuine business that is perhaps his sole source of income as well as that of one or two employees. But the Census Bureau or any other agency can scarcely be expected to comb these fields so finely as to turn up all these elusive units. Complete coverage would be especially improbable in a first census, without the benefit of experience, or in a survey that had no legal power to compel the giving of information—characteristics of the more recent censuses of construction and trade. Furthermore, high mortality, both secular and seasonal, is common among construction and trade units. Consequently, a census for a given year would necessarily miss the activity of the units that were seasonally idle when it was taken or no longer in existence. Finally, in view of the primitive methods of accounting prevailing among small tradesmen and construction contractors, the trustworthiness of the information collected is subject to considerable doubt.

Although the business units omitted are small, their number may be large, and the consequent deficiency in the coverage of income and expense items rather substantial. Since the censuses collect the basic information on employee income, as well as on the gross volume of activity (used subsequently to estimate entrepreneurial incomes), we attempted to adjust for the shortage in coverage in contract construction and retail trade. In construction it was substantial and we raised the wage, salary, and other items reported in the Census for 1929, the basic figures in our estimates. The shortage for retail trade was much smaller, and because the approximation was rough, we decided to adhere to the Census totals of the number and compensation of employees. Whatever shortage there may be in our estimates for trade proper is, at least in some degree, caught in 'miscellaneous industries', the division in which we attempt to make up for the shortcomings of our approximations by parts and

which is thus a patent measure of our failure to carry out the classification adopted.

Entrepreneurial income, the major type in agriculture and the preponderant one in construction and trade, is not reported in any industrial census and must be approximated. We have already suggested that the approximation based on corporate data—the means we used to estimate this item in mining and manufacturing—is too crude for industries in which unincorporated firms predominate. For instance, it would be nonsensical to try to approximate incomes of individual farmers from data for agricultural corporations. But can other information be found for estimating entrepreneurial income and its division between withdrawals and net savings?

The answer varies from industry to industry. The Census reports salaries paid to proprietors in many large construction firms. The salaries of executive officers may be used to approximate entrepreneurial withdrawals in wholesale trade. Besides, in 1929 corporate activity accounted for about 50 per cent of construction and of retail trade; 80 per cent of wholesale trade. We used corporate data to approximate total entrepreneurial net income in these three branches; and the reported salaries, salaries of corporation executives, or average salaries and wages, to approximate entrepreneurial withdrawals.

The expenses incurred by farmers in the conduct of their business are usually collected on a voluntary basis, and reported in terms of percentages of gross receipts. These reports are based on a sample of units that have fairly good accounting methods; such units are likely to be among the more successful and the larger units in the industry. The samples thus tend to exaggerate incomes and minimize losses; and their application to the countrywide totals leads to an exaggerated estimate of entrepreneurial net income. Nevertheless since with them a better approximation to the total net income of entrepreneurs in agriculture can be made than with the corporate reports in *Statistics of Income,* they were used by the Department of Agriculture, whose estimates we adopted. Entrepreneurial in-

come totals have been further divided into withdrawals and net savings by estimating the former on the basis of farm workers' wages raised to represent the higher standard of living of independent farmers.

C SPECIAL PROBLEMS OF THE SERVICE INDUSTRIES

The industrial divisions discussed under Sections A and B comprise almost all the commodity producing, transporting, and distributing industries. The other industries in the country's productive system, except a few branches of transportation (pipe lines, water transportation, motor trucking, local cartage), are concerned with the provision of services: government, finance (banking, insurance, real estate), and service industries proper (professional, amusement, personal, domestic, business, etc.). Finally there is always the miscellaneous group which supplements the parts approximated specifically.

These diverse industries can be divided roughly into two large groups: those in which corporations or some other nonpersonal form of organization are common—water transportation, motor trucking, cartage, aviation, pipe lines, banking, insurance, government, educational service, and some parts of real estate, personal, amusement, and other service; and those characterized by the prevalence of individually owned enterprises—some small subdivisions under banking (private investment banks, brokerage houses, etc.), the part of real estate represented by net rent received by individuals, professional, domestic, and parts of personal, amusement, and other service industries.

For practically all industries in both groups a comprehensive and reliable estimate of net income originating is difficult. Educational institutions alone have been covered by a census at fairly regular intervals; and even its information on employee compensation is incomplete. Census surveys for other industries have either not been made or were made too early (e.g., for water transportation in 1916) or too late (for several service industries in 1935), contain insufficient information, and are

inadequate in coverage. The 1935 *Census of Business* is especially deficient for those branches in which there are a multitude of small business units even more elusive than in contract construction and retail trade.

Thus for both groups, considerable difficulty is encountered in estimating employee, entrepreneurial, and property incomes. In the first group, that in which corporations and nonpersonal organizations predominate, little trouble is encountered in estimating property income originating: it is reported in *Statistics of Income* or elsewhere (as in the case of government debt and interest), or need not be considered at all since property income payments are interpreted as transfers of payments originating elsewhere in the productive system (e.g., in savings banks and life insurance companies). And since there are practically no unincorporated establishments, the main task is to estimate employee compensation. In the industries of the second group the main task is to estimate entrepreneurial net income. Employee income is a smaller though still considerable magnitude, and segregable property income is usually negligible.

We cannot describe adequately here the means by which we bridged gaps in information. Varying greatly according to the data used and in complexity, they yield final approximations of diverse reliability. But some general indications that suggest the main characteristics of the estimates can be given.

The estimates of payments to employees in the first group of industries utilize all or some of the following data: questionnaires sent to enterprises on the number and compensation of employees, the resulting sample raised to cover the total for the country; actual count of employees in a sample of enterprises, often reported in directories and manuals, raised to cover the entire industry, and multiplied by a sample average compensation; sample studies showing income paid to employees as a percentage of all operating expenses or all gross revenue; number of employees attached to the industry (according to the *Census of Population*), reduced by estimated

unemployment, and multiplied by average compensation derived on the basis of samples or assumed to be equal to average compensation in a related industrial branch; estimates of the capital equipment of the industry, multiplied by the complement or crew of employees needed to man the equipment and their compensation. In general we estimated income originating for divisions as narrow as possible. Wide as the margin of error may be within them, to estimate for narrow divisions is the one way to arrive at a more reliable estimate for larger divisions, the one approach that assures estimates whose validity can be appraised by a critical student.

For the second group of industries measurement is more complicated and the estimates even cruder. Not only employee compensation but also the more important item, entrepreneurial net income, must be estimated. And adequate samples cannot be taken of the numerous small, unincorporated enterprises. Questionnaires become expensive if a large sample is attempted and yield treacherous results if a small sample is used. The absence of big, non-personal organizations means the absence of information that such organizations usually collect and publish incident to the discharge of public obligations; and that, while not relating directly to income, does afford some basis for approximating its size. Finally, the great differences in net income known to exist among entrepreneurs in the industries in this group, or among enterprises in this and other groups, bar an acceptance of averages for the industries covered by available data as valid for industries for which no direct information exists.

Consequently, only crude approximations could be made for industries in the second group. Estimates of total entrepreneurial income were usually computed by multiplying the number of entrepreneurs, obtained either from the *Census of Population* or from directories, by average net income, derived from sample studies of widely diverse coverage. The procedure followed for net rent receipts by individuals was to estimate as comprehensively as we could total gross rent pay-

ments, subtract gross rent received by corporations, and reduce gross rent received by individuals to net rent on the basis of sample studies. Finally, employee compensation was determined partly on the basis of census information, partly on the basis of sample returns from individual employers, partly on the crude basis of estimating the number attached (from the *Census of Population*), reducing it to the number employed, and multiplying the latter by an average compensation derived either from a sample for the specific industry or from information for related or similar industrial branches.

This description conveys an inadequate notion of the devices used to compensate for the paucity of data. The main point is that ingenuity cannot fully or effectively compensate for lack of basic information. Most of the estimates for this group of industries are susceptible to a wide margin of error. And for many industrial branches in it a specific estimate had to be given up as hopeless. These were thrown into the miscellaneous group. Because the industries that had to be treated in this manner were large and because we had controlling totals for most of the service industries proper, a division of 'miscellaneous service' was established for all service industries for which we could not make separate estimates.

The 'miscellaneous service' as well as the general 'miscellaneous' division could more properly be designated 'all other service' and 'all other industries'. They comprise the segments of national income obtained by subtracting net income originating in the industrial branches for which specific estimates proved feasible from the totals that constitute the most comprehensive estimate of income in the field of service or of the total national product. The characteristics of these controlling totals and their effect on the scope of national income estimates are now considered.

3 *The Controlling Totals*

A THE NATURE OF THE TOTALS

The device of controlling totals is used commonly to approximate totals for industry type of income cells. Whenever detailed and complete information can be had for only a portion of the area under study, it is usual to find some other attribute by which the area of partial coverage can be compared with the entire area. The total of this attribute for the entire area becomes the controlling magnitude; and all totals derived from data covering a portion of the area are adjusted to correspond with it.

However, we are concerned here with countrywide controlling totals, not with those for any specific industrial division or industry type of income cell. Since the approximation by parts proceeds from one industrial division to the next, i.e., each category of payments and net savings of enterprises is estimated first in one industry, then in another, the countrywide controlling totals must, if possible, be given separately for each type of payment and for the net savings of enterprises. From a controlling total for employee income for the country as a whole and the payments accounted for in each industry we derived the payments to employees in the miscellaneous industrial group; and proceeded likewise for the other types of income.[3]

The controlling total for payments to employees was the number of gainfully occupied persons, exclusive of individual proprietors, reported in the *Census of Population*. A gainfully occupied person is one who, though he may not be employed or otherwise engaged in a gainful pursuit at the time the Census is taken, is ordinarily so engaged. The number of gainfully occupied employees reported by the Census, if the Census is at all

[3] The discussion that follows relates to the countrywide controlling totals used to derive the estimates for the miscellaneous industries group. The controlling totals for the service industry, used to derive 'miscellaneous service' and thus complete the estimate for the service group, are similar and need not be discussed here. They are described in detail in Part Four, in the notes appended to the tables that give estimates for miscellaneous service.

complete, thus represents the maximum number likely to receive wages and salaries; maximum since it includes persons ordinarily employed but who may have been inactive, either voluntarily or involuntarily, at the time the Census was taken.[4]

Consequently, the total must be adjusted for unemployment, even before it can be used to control the *number* receiving employee compensation. We attempted this adjustment as follows. For each industry covered in the approximation by parts, we estimated the number employed. The sum of these totals was subtracted from total gainfully occupied employees reduced by the number fully unemployed: the remainder is the number employed in the miscellaneous group. Since it still included some partly unemployed, it was reduced to equivalent full-time employment on the basis of ratios for other industries.

Total entrepreneurs were also estimated from the *Census of Population* but somewhat differently from employees. It was not feasible to compare the overall total of proprietors reported in the Census with the number accounted for in the industrial branches for which specific estimates had been made, because for some branches the estimates of entrepreneurs were the crudest of approximations. But since the latest *Census of Population* reports occupations by industries, we could obtain the number of proprietors in the industrial divisions for which no specific estimates of entrepreneurial income had been made. This number, unadjusted, is given as the number of entrepreneurs in the miscellaneous group. Total unemployment is infrequent among entrepreneurs so long as they remain entrepreneurs; and partial unemployment has little meaning in this type of gainful pursuit.

The number of equivalent full-time employees and of entrepreneurs in the miscellaneous group determined, the estimates

[4] Actually the Census is not complete in that it omits at least recipients of casual and part-time incomes, who would not classify themselves as gainfully occupied. For a brief discussion of this and other omissions see Section 3 C below and Chapter 9.

of employee compensation and entrepreneurial income originating in this residual group were dependent upon an average compensation per employee and an average net income per entrepreneur. Direct data from which such averages could be computed are not available; if they were, there would be no need for a miscellaneous division. Any averages that could be used would necessarily be arbitrary. Such arbitrariness was lessened by examining the nature of the industries included in this miscellaneous group, by finding similarities between them and other industries for which fairly acceptable estimates of service income had been made, and by using for some industries scattered data for 1929 and later years. Separate averages were applied to the number of employees and of entrepreneurs. Since those averages were at best merely reasonable guesses, we pressed the approximation by parts as far as we could, thereby reducing to a minimum the area covered by the residual miscellaneous industrial division.

The controlling total for net rent received by individuals was derived chiefly from (a) rent paid by corporations (*Statistics of Income* for recent years), raised whenever possible to cover unincorporated establishments; (b) rent paid by all enterprises in trade (*Census of Distribution*); (c) total residential rent (derived from the *Census of Population,* 1929); (d) rent originating in agriculture and paid to non-farmers as estimated by the Bureau of Agricultural Economics. From this total of gross rent (excluding rent from agriculture) we subtracted rent received by corporations (*Statistics of Income*); and to the residual gross rent received by or imputed to individuals we applied a ratio of net to gross rent, derived from samples of operating and maintenance expenditures for real estate, to obtain net non-farm rent. To the latter we added net farm rent.

Comprehensive totals of dividends and corporate net savings are given in *Statistics of Income* but we preferred to use for public utilities information reported by the Bureau of the Census and the Interstate Commerce Commission; conse-

quently, the derivation of dividends and net savings in the residual miscellaneous division by subtraction yields in several years patently absurd results. We therefore estimated dividends and net savings for this miscellaneous division directly, by using data from *Statistics of Income* on the industries specifically included. In that sense there is no single controlling total for either dividends or corporate savings. For both, the countrywide totals consist of *Statistics of Income* totals for all except the public utilities covered by the Bureau of the Census and the Interstate Commerce Commission, and the latter totals for them. In addition, net savings are estimated for unincorporated firms, for which the controlling total is essentially the number of entrepreneurs; and for governments, for which the controlling totals are, on the one hand, net public construction and, on the other, the net public debt of all governments.

The countrywide total of interest includes: (1) interest on long term debt for all corporations except public utilities, reported in *Statistics of Income* and raised to allow for a slight shortage in coverage, multiplied by a rate of interest derived from an extensive corporate sample, minus interest received by corporations on government bonds; (2) long term interest paid by public utilities, as reported by the Interstate Commerce Commission and the *Census of Electrical Industries,* minus all long term interest received; (3) interest payments originating in agriculture and real estate; (4) interest payments by governmental agencies. Interest payments in miscellaneous industries are estimated from *Statistics of Income* data for industries specifically covered, not by subtraction from a single controlling total.

The totals of interest and of net savings are, perhaps, the least comprehensive. The former explicitly omits interest paid by unincorporated firms to individuals—a presumably small item that cannot be gauged with the existing data. Estimates of net savings of enterprises are probably deficient for unincorporated firms.

B EFFECT ON TERRITORIAL COVERAGE

The controlling totals determine the territorial coverage of national income estimates. While the industrial and other censuses record some service income that may flow to people residing outside this country, the controlling total for this type of payment is the number of persons gainfully occupied reported in the *Census of Population*. Since this Census, as well as all the industrial censuses, cover only people residing in the continental United States (i.e., the forty-eight states and the District of Columbia), and exclude such outlying territorial possessions as Alaska, Hawaii, the Virgin Islands, and Puerto Rico, the service income total is for this territorial area. If the service income in the various industrial branches except miscellaneous does cover some people residing outside the continental United States, there will be an offsetting reduction in the service income originating in the residual, the miscellaneous division. Full coverage of the number of employees drawing wages and salaries, the number of entrepreneurs, and the activity of unincorporated enterprises, is also for the continental United States.

At first sight, net rent received by individuals seems to have the same coverage, since the global totals are derived largely from the *Census of Population* and the industrial censuses. But it must be remembered that rent, though *paid* by individuals and business organizations domiciled in the continental United States, may flow to people residing abroad; conversely, residents of this country may receive rent from abroad. This is possible so far as we conceive of net rent as purely property income, not calling for participation by the recipient in activity within the country. Since the flow of net rent across international boundaries is relatively minor and can be neglected, we accept the total originating in the continental United States as identical with the total received by its residents, although this treatment results in greater error than a similar procedure for employee compensation or entrepreneurial income.

The basic totals for dividends, interest, and corporate net

savings are from *Statistics of Income,* which covers Alaska and Hawaii in addition to the continental United States. The corporations are classified by the states and territories in which the principal place of business or principal office or agency is located. Adjustment for the inclusion of Alaska and Hawaii to assure strict identity of territorial coverage with that of service income is both difficult and relatively unimportant. In the case of dividends and interest we wish to know how much individuals residing in the United States receive; and the fact that the principal agency, office, or place of business of a corporation is in Alaska or Hawaii is no assurance that its dividends and interest are received largely by individuals residing outside the continental United States. A better case can be made for the exclusion of the net savings of corporations in Alaska and Hawaii. But the corporations classified under these two territories are such a small fraction of the total (for 1936 their net income and net deficit combined accounted for less than one-half of one per cent of a similar total for the continental United States), and their exclusion would entail so many minor and arbitrary reductions in the industrial divisions that it did not seem worth while. Consequently, the totals of corporate net savings include corporations domiciled in the continental United States, Alaska, and Hawaii.

The totals of dividends and interest received by individuals discussed so far *originate* in enterprises domiciled in the continental United States, Hawaii, and Alaska. But some of these payments are received by residents of foreign countries; conversely, residents of this country receive some interest and dividends from abroad. Our definition of national income demands an estimate of dividends and interest received by the residents of this country, preferably residents of the continental United States. Figures for the adjustment, that for the flow of property income into and out of the country, are from the study of the balance of international payments, in the course of which the Department of Commerce estimates the returns on investments in this country by foreigners and by Americans

abroad. These investments are largely in securities; and while direct investments (in such properties as real estate) are also estimated by the Department of Commerce, they are small and the estimates do not cover the entire period. The final adjustment was to subtract from total dividends and interest originating the payments flowing to foreigners and to add the payments received from abroad by residents of this country.

However, the territorial area, for purposes of this adjustment, is even wider than that covered in *Statistics of Income.* "In addition to continental United States, our balance-of-payments area includes Alaska, Hawaii, Puerto Rico and the Virgin Islands. The Philippine Islands and the Panama Canal Zone fall outside this area and are therefore considered foreign countries" (*Foreign Investment in the United States,* prepared under the direction of A. E. Taylor, Department of Commerce, Washington, 1937, p. 3, note 1). It would be difficult to modify this adjustment to reduce the area it covers, and the change would be too slight to affect the totals significantly.

To sum up: In view of the dominance of employee compensation and entrepreneurial income, total national income is almost exclusively for the continental United States. Dividends, interest, and corporate net savings cover a somewhat larger area; but the additional coverage probably amounts to less than one-half of one per cent of the respective type of income totals.

C RESULTING EXCESSES AND OMISSIONS

The national income estimates, as described in the approximation by parts and delimited by the controlling totals, include some items that should be omitted and omit others that should be included. Their excesses and omissions are not to be confused with under- or overvaluations in the estimates themselves. We do not deal here with such questions as whether wages and salaries for various industrial divisions are larger or smaller than they should be. We are concerned with the pos-

sible omission of some group of employees, a certain type of income, some industry; or the inclusion of items that definitely do not belong in national income.

Activities whose compensation should be omitted are likely to be included because people engaged in pursuits upon which society frowns cannot be expected to report them under their real name. Peddlers of pernicious and prohibited drugs, panders, professional assassins are loathe to admit their true occupations to Census enumerators; and if recorded, they will appear under some occupation that meets with social approval or tolerance. Similarly, many people, corporations, or individual firms engaged in occupations that are innocuous, or at least not prohibited, but are recognized by society at large as not contributing to the positive contents of national income, may try, sometimes in vain, to evade Census surveys as they do the vigilance of authorities. Hence, the controlling totals undoubtedly include some activities whose compensation should be excluded from national income. This over-inclusion cannot be even roughly approximated, but it can be assumed to be minor relative to the total.

The omissions due to lack of data are more numerous and the items are larger. Reasonably complete coverage of goods that do not appear on the market is attained only for products retained by farmers for their own consumption and the services of houses inhabited by their owners. Payments in kind to employees are covered for only a few industries, and have to be omitted for most. None of the other activities whose products do not appear on the market (listed in Ch. 1) is included in national income. The size of these omissions depends mainly upon which of these non-market goods one thinks belong in national income. If a most inclusive viewpoint is adopted, the shortage in our total is relatively large.[5]

Some significant groups of monetary income payments are omitted. We have already noted that 'other' income of employees cannot be fully estimated except for a few industries.

[5] For a suggestion of the magnitudes involved see Chapter 9.

A much larger omission is income from casual or secondary occupations, either combined with a full-time pursuit or engaged in by persons not usually gainfully occupied and of a type not sufficiently important to place their performers in the category of gainfully occupied. For example, a full-time worker in a factory may earn some occasional income by doing repair work for a householder. The net value of his activity is recorded in our estimates in connection with his full-time job. But his additional earnings, derived from occasional repair jobs, stand little chance of being recorded anywhere. They cannot be retrieved through comparison of the number gainfully occupied and employed: the household does not report its expenditure on this job, and the worker is unlikely to be subject to an income tax or to report his earnings. Other not uncommon instances are those of professional salaried people deriving fees from lecturing, writing, and other free lance jobs; proceeds from the sale of products by people to whom gardening, flower raising, or owning a milch cow is a secondary pursuit, etc.

Illustrations of incomes earned by people not classified as gainfully occupied are also plentiful. Many minors in urban communities deriving small incomes from occasional jobs (bootblacking, newspaper selling, fruit gathering, etc.) also stand little chance of being recorded among the gainfully occupied in the *Census of Population*. Many a housewife, especially among the lower income families, takes in a boarder or two without thereby converting the household into a professional boarding house and considering herself, or being considered by statistical authorities, as gainfully occupied; the same is true of occasional charring, laundry work, and similar domestic jobs. Finally, a gainfully occupied person, entirely or partly unemployed, may find an occasional job that yields a small income. He does not thereby fall out of the unemployed classification, and his income is not recorded anywhere. Each of these omissions, which are partly employee compensation and partly entrepreneurial income, is fairly small, but they are numerous and may well add up to a substantial sum. Un-

certain as the amount is, it is probably not large relative to total recorded payments to employees and entrepreneurial income.

Some items are omitted from property income. As indicated in Chapter 2 (Sec. 3 A), royalties cannot be estimated. The item is reported by individuals who file federal income tax returns, but the authorities combine it with net rent receipts in their publications. We noted also that interest paid to individuals by unincorporated firms cannot be estimated. But it is not a large amount, relatively. The chief shortcoming of our estimates of property income arises because we cannot trace its flow through institutions such as banks and insurance companies. In it we include all dividends and long term interest received by these institutions and interpret their receipt as an accrual to the account of the ultimate recipient. However, we cannot ascertain whether the actual net disbursement to the ultimate recipients by these institutions is larger or smaller than the flow of dividends and long term interest to them.

Finally, all our estimates may have a shortage over and above that due to the items we are aware we omit, for the controlling totals, no matter how comprehensive, may fail to cover some parts of the country's economic activity. Some residents and gainfully occupied persons may elude the Census enumerator; some corporations may not be recorded in *Statistics of Income*. The bias is toward omission rather than overinclusion, for the obvious reason that it is easier for a census, as for any statistical survey, to miss units than to count those that do not exist.

Most of the omissions are vague or unknown quantities, and one cannot do more than conjecture what they amount to. They are noted here primarily to indicate the scope of our national income total, and to emphasize that we can estimate recordable, 'professional' economic activities alone. Products of activities so far removed from the market as to have an uncertain market value, products of casual and secondary pursuits, and the margin of unknown that always remains, even after assiduous effort at completeness, are perforce excluded.

4 *Continuous Annual Estimates*

A THE NEED

Estimating national income for a single hypothetical year, assumed to be most advantageous from the viewpoint of the supply of basic data, is easy compared with preparing reliable totals covering each year in a period. Do we really need continuous annual estimates? Since they are necessarily approximate and only rough guides in a study of short term changes in the economic scene, would it not be sufficient to estimate national income for single years at substantial intervals, preferably those for which censuses are taken—1909, 1919, 1929?

Several reasons may be suggested for declaring such an intermittent series unsatisfactory and for estimating national income continuously on an annual and perhaps even shorter time unit basis. First and foremost is that estimates for any single year are inevitably affected by the economic conditions peculiar to it: the phase of the business cycle through which the country was passing and the conjuncture of events. For example, from estimates for 1919 and 1929, the character of the changes during the decade could scarcely be inferred; and from estimates for a single year, it would be impossible to infer which magnitudes and relations are persistent and which contingent upon conditions peculiar to it. To differentiate between transient and persistent elements we must have estimates for several time units.

Consequently, whether one is content with annual estimates at decennial, quinquennial, or biennial intervals or strives for a continuous annual series depends primarily upon the period for which one wishes to establish significant changes or differences in national income and its components. From decennial estimates we can establish tendencies free from cyclical and casual disturbances only for sixty years or more, and must treat the entire period as a unit, since we cannot isolate the secular changes peculiar to any part. With quinquennial estimates we can study the non-cyclical, persistent movements

during a shorter period, say thirty to forty years; from annual estimates we can approximate secular movements for still shorter periods. In other words, cyclical and other transient changes can be the better distinguished and the persistent movements for shorter periods studied with greater accuracy the shorter (up to a certain limit) the intervals separating the estimates. The same holds *pari passu* for comparisons among countries or regions, since the impact of cyclical and other transient disturbances varies with the area. Here again a series composed of estimates for not too infrequent time units is needed in order to separate the persistent from the transient differences and study the former closely during relatively brief intervals.

Second, we may be interested in these transient changes or differences themselves. If so, we may consider national income estimates as attempts to synthesize diverse movements occurring at any given time in the various parts of the economic system. While approximate and too broad for a proper measurement of cyclical and other short term changes in economic conditions, still, in the absence of more comprehensive estimates for briefer time units, annual estimates are of some use for the study of short term changes or differences. For such purposes continuous estimates are indispensable.

This aspect of national income estimates accounts for the powerful incentive to bridge long intervals in any series. When a series contains an estimate for a year close to the present, the incentive is dormant. But if the estimate is for some year in the past, we are impelled to bring it up to date, to ascertain what happened in the years immediately preceding and what is happening at present. For example, were we to estimate national income for 1940, by 1942 or 1943 we would want to know what had happened meanwhile. This desire will be the stronger the more accurately the estimates reflect the conditions during the one year they cover and the greater the apparent changes since. Both factors, the accuracy of the estimates and the sensitivity of the economic system to short term disturbances, have

during recent years made more desirable national income estimates at close intervals.

Finally, there is the purely practical consideration that any interval longer than a year, combined with any choice of dates, would not be the best for all parts of the economic system. For example, if decennial intervals and the years 1909, 1919, 1929 were chosen, it would be unfortunate for estimates of electrical industries and communication, the censuses of which are for 1917, 1922, 1927, 1932, etc.; of water transportation, the census of which, when taken, covers the sixth year of the decade; and for any information on wealth, the census of which (*Wealth, Debt, and Taxation*) is taken decennially in the second year of the decade. Continuous annual estimates free us from the quandary of what intervals and dates to select.

B THE PREPARATION

The difficulties arising in the preparation of continuous series for this country apply exclusively to employee compensation, entrepreneurial income, and rent. Dividends, interest, and corporate net savings can be derived, for almost the entire period covered by us, from *Statistics of Income* and other reports published annually; and their measurement on a continuous annual basis involves few additional difficulties. The only point to be noted is that while our estimates are for calendar years, some corporations report for fiscal years. However, the proportion is small (for 1933 about 10 per cent of all corporations, accounting for about 12 per cent of combined net income and net deficit). The consequent blurring of the temporal limits of the year is not material.

To prepare continuous annual estimates of other income types is not simple, because censuses are taken at decennial, quinquennial, or biennial intervals. We must either bridge the temporal gaps between the census years, when several fall within the period, or extrapolate a census figure for a single year backward and/or forward until the entire period is covered. Either choice reduces itself to the acceptance of the

census figure, adjusted or unadjusted, as the basic quantity; finding a related series, usually of much narrower coverage but continuous, and using it as an index of changes which, when applied to the census figures for one year or several, yields the continuous annual estimate of that particular group of income payments.

Our first task is to choose a continuous series which, when converted to an index, can be taken to represent annual changes in the total. The choice is seldom among several continuous series for the same group of wages, salaries, or entrepreneurial income. It is more often a matter of deciding what, in the absence of continuous series relating directly to the industry in question, we should choose to construct the interpolating or extrapolating index. In this choice we resorted to various expedients. If continuous direct series were reported for wages but not for salaries in a given industry, we used a ratio of salaries to wages in a related industry. If there were no indexes for total payments to employees but we could estimate annual gross sales in a given industry, as well as in a related one for which employee compensation could be estimated annually, we based the interpolation index on the ratio of employee compensation to gross sales. When continuous series were reported for the number employed but not for their compensation, we estimated the change in the per capita figure on the basis of a sample narrower in coverage than that for the number employed or of changes in the per capita figure for a related industry. For entrepreneurial income there were also either sample series relating directly to the industry concerned or estimates of the number based on the number of unincorporated firms, the latter interpolated between Census dates by an index based on the number of failures; and estimates of withdrawals per entrepreneur based largely on the movement of per capita salaries. In general we used all sample data that applied specifically to the industrial division or type of payment to be estimated, and only in their absence, sample information for

related industries, converting it to some ratio basis before using it as an index.

The supply of such continuous series is governed by the factors that determine the availability of basic information. Primarily for enterprises rather than for individuals and households, they are most plentiful for the industrial divisions for which the basic information is best, i.e., mining, manufacturing, and public utilities, and for the same reasons. The factors limiting the supply of comprehensive, basic data in such industries as contract construction and trade also affect the supply of continuous annual series and are aggravated by the lack of a census for these two industries before 1929. Again the absence of data is most acute in the service industries, in which unincorporated enterprises predominate. This similarity of the stocks of continuous sample series to that of intermittent Census data is to be expected not only because the same factors are operative, but also because regular censuses in themselves constitute an incentive to collect sample data. In industries for which censuses are not taken, or are recent, there is little incentive to collect continuous samples, since there are no basic totals in conjunction with which sample data could be used or by which they could be tested and improved.

Our second task was to decide how to treat industry type of income cells for which a crude but tolerable approximation could be made for a single year but for which data were insufficient for acceptable annual series. Such cells or branches were usually transferred to 'miscellaneous', a fate that befell fisheries, motor transportation, and aviation. The alternative, to make estimates for the more recent years for which they are feasible and change the industrial classifications for the various parts of the period under study, would increase the cumbersomeness of the classification and the difficulties of temporal comparison. It would be worth while only if the period covered by the specific estimates were substantial and the estimates themselves fully trustworthy.

This consideration indicates one reason why our estimates

begin in 1919. The decennial census is for 1919, which is also the year when new continuous sample data on employment began to be collected on a large scale. *Statistics of Income* tabulations start in 1916. If one were to go beyond 1919, especially to the somewhat abnormal war years, numerous series would cease to be available and the breakdown of national income could not be as detailed. On the other hand, there would be small gain in the amount of data continuously available had we begun after 1919, unless we had shifted all the way to 1929, another year that serves as the initial date for an appreciable amount of additional information.

Once we had chosen the continuous series to be used in extending the basic magnitudes over time, we had to decide upon the method of interpolation and extrapolation. The theoretically possible variety of methods is wide. In extrapolating, one can make various assumptions concerning the way in which changes in the area to be estimated are reflected in the sample series used as an index. We might assume that the sample is strictly proportional, the simplest possible hypothesis; or that it is too sensitive or not sufficiently sensitive to short term oscillations, so that its oscillations would be damped or intensified when we transfer them to the estimated area; or that it has an upward or downward bias as compared with the basic area studied, and allow for it in using the sample as an index. Similar assumptions may be made to modify the application of the continuous sample in interpolation, i.e., estimating the totals between two given magnitudes; and various interpolation formulae, expressive of different assumptions concerning the underlying line of movement and the relation between the sample series and the successive basic magnitudes, may be used.

But the choice presupposes more exact knowledge of the relation between the sample and the total area to be estimated than is possessed by the national income investigator. Even when the continuous series are based on data relating directly to the industry or type of income to be estimated, it is difficult to know precisely in what way the sample may not record the

relative changes in the magnitudes to be extrapolated or interpolated. When the index is based on data from other industries or types of income, no precise judgment is possible. For these reasons the simplest methods of extrapolation and interpolation were followed: for the former we assumed that the relative changes in the sample series describe exactly the relative changes in the basic figure; for the latter, that the average relative error of the index, as compared with the two basic totals, is distributed equally over the intervening years. Only in the interpolation between biennial Census totals was another method of interpolation sometimes used.

5 *Concluding Comments*

For an adequate account of how the supply of data conditioned our estimates of national income and of its components, a critical reader should consult the comments on the characteristics of the industrial and type of income classifications followed (Ch. 8), review the tentative magnitudes suggested for the various items omitted (Ch. 9), compare our estimates with those published by the National Bureau in the past and by the Department of Commerce at present (Ch. 10), inspect critically our classification of underlying data and the analysis of the interpolation and extrapolation procedures (Ch. 11), observe the relative margins of error we set for the various industry type of income cells that comprise national income in each year (Ch. 12), refer to the tables and notes in Part Four, and finally glance at the supplementary materials in Part Five.

Obviously, not much would be gained by trying to summarize this chapter, already a summary of Part Four. Instead, we speculate briefly upon the factors that determine the supply of income data in this country. The decisions it imposes have been stressed. Statistical information for so comprehensive a total cannot be collected by one investigator or research agency, but is the cumulative product of continuous and extensive collection largely by governmental agencies, which have the power to demand information and are impelled to do so by

considerations of public policy and administrative needs. Why are income data in this country so much more plentiful from enterprises than from individuals and households? Why are those from enterprises primarily suitable for the industry payments approach rather than for the gross-net product or finished product approaches?

In answer to the first question, several, necessarily tentative, suggestions can be advanced. First, there is the greater ease with which reports can be obtained from enterprises than from individuals or families, partly a matter of sheer numbers, partly of how well informed the reporter is. In recent years about 450,000 corporations reported to the federal income tax authorities. The families whose livelihoods were derived from these corporations must have numbered over fifteen million. In 1929 the *Census of Manufactures* reported about 211,000 manufacturing establishments. In April 1930 the *Census of Population* reported over eleven million persons usually engaged in manufacturing. Moreover, enterprises are in direct contact with production processes, sales, and payments, and have systems of accounting and control that place them in a much better position to provide accurate information than are individuals as ultimate consumers and members of households.

Second, much of governmental regulation is aimed directly at enterprises, rather than at individuals or families; and a large part of our statistical information on economic matters is a byproduct of such administrative efforts. This is especially true for public utilities, foreign trade, and business corporations subject to taxation. On the other hand, not until recent years have governments even tried to collect information on the incomes of individuals and households or the ways in which they disposed of payments received from enterprises, except when the incomes were above the taxable minimum. As they became more concerned with the temporal stability and the sufficiency of individuals' incomes, they began, through their social security administration, to collect comprehensive in-

formation on incomes. Even now, for technical reasons, they prefer to obtain it from enterprises.

Finally, both the public at large and students of economic problems have tended, and perhaps still tend, to emphasize production, neglecting distribution and consumption. With the rapid extensive and intensive progress that characterized this country through most of its history, the existence of frontiers to be conquered and the need to raise the industrial arts to the level of the more advanced countries, the pressing problems seemed to be in production; and the problems created by the distribution of national income and its utilization by ultimate consumers seemed relatively minor and soluble in the upward rush of industrial production. This viewpoint put a premium on information on productive activity, on the achievements of the industrial system in terms of goods produced, men employed, values added, etc., rather than on goods consumed or the shares of inhabitants in the national total. Obviously, information on productive activity can be supplied only by the enterprises that organize and control it. The recent shift in viewpoint, toward greater concern over the distribution of national income among ultimate consumers and between consumption and savings, presages a change in the emphasis on what questions should be asked and an increase, already apparent, in information reported in terms of individuals and household units.

These suggestions serve to explain also why we know so much more about some industries than about others. Information is richest for industries in which corporations, especially of the type that are subject to more rigid control by public authority (public utilities), are most common; and poorest for industries in which the predominant unit is the unincorporated firm. Here again the difference is due to the smaller number of corporations, their better accounting systems, their more rigid control by governmental and administrative agencies. Information is more plentiful for enterprises that deal with commodities, especially extraction, fabrication,

and transportation (agriculture, mining, manufacturing, construction, steam railroads), than for enterprises engaged in the provision of services that have no material embodiment (trade, direct service, finance, government, etc.). Here again emphasis on the productive accomplishments of the economic system in a society which, at least in the past, tended to identify them with increase in material wealth, led to a greater interest in commodity production than in services.

These comments suggest the answer to the second question: why data on income type are more abundant than on the value of products consumed or on finished products. Public interest, whether social or administrative, naturally lies chiefly in the productive system as a source either of employment and occupational possibilities, thereby establishing a link between population as a productive factor and total output, or of taxable income. The industrial censuses record employment and employee compensation, and the population censuses, occupations; *Statistics of Income* and similar byproducts of administrative agencies record dividends, interest, and corporate savings. To require reports on gross product, especially on the full value of products of other enterprises consumed, would mean demanding more from economic units than many could easily give and would serve no clear social or administrative purpose. Similarly, detailed reports on finished products would require a more comprehensive coverage of interrelations among enterprises and of purely service activities than seems warranted in a society whose industrial production is growing rapidly and the welfare of whose inhabitants is apparently increasing. Only concern over the adequacy of ultimate consumption, greater attention to service activities closer to the passage of goods into households, greater concern over the adequacy of capital formation, and emphasis on the *utilization* rather than on the *production* of income render detailed reports on finished products of sufficient importance for public agencies to attempt to procure them and for enterprises and society at large to recognize that their value justifies the effort.

Our discussion of the factors that determine the stock of income data in this country, sketchy and speculative though it is, perhaps attempts to explain too much. But the main conclusion seems valid: the stock, which can be accumulated only at appreciable cost to society, is far from being due to chance. It is rather due to factors deeply seated in social organization and the outlook of society at large. Some determine the extent to which the final units in social life—ultimate consumers, business enterprises, public organizations—record in their operations and define in their everyday discourse the figures from which estimates can be made. Others determine the extent to which these final units, which are at the same time units of reporting and observation, recognize that the information desired is indispensable from the viewpoint of the body social, whether for purposes of administration, legislation, or any other form of action by society at large, and hence are willing to provide it. Finally, more specific factors come into play in actuating governmental agencies, the only ones that can gather the continuous and comprehensive information requisite to estimate national income.

Again we stress the dependence of the supply of economic data in general, and income data in particular, upon the organization of the units of observation; upon the viewpoint entertained by society at large as to the relative urgency of various economic problems and hence as to the need for various types of data; upon the responsiveness of governmental agencies to the demands of public administration and social policy. Just as in defining his concepts and classifications, the investigator operates within a frame of reference determined by the viewpoint of the society whose economic activities he measures, so his actual statistical work is conditioned by the social organization and viewpoint that are reflected in the statistics for the period with which he is concerned. There is an obvious interplay among the factors that determine both the conceptual framework and the statistical bricks of the national income estimates.