STATISTICS OF THE DISTRIBUTION OF FAMILY INCOMES BY SIZE

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STATISTICS of the size distribution of family incomes are an indispensable source of information for the proper treatment of many problems in the field of applied economics. Unfortunately, the difficulties encountered in the collection of these important data are so great, that only in a few countries have statistical inquiries been carried out. In this paper an attempt will be made to review the applications made of family-income statistics, and to indicate the problems arising in the collection of these data, including a discussion of the basic concepts. Attention will also be paid to the problem of international comparability, a subject in which the Statistical Commission of the United Nations is particularly interested.[2]

Statistics of the distribution of family incomes by size show how many families there are with an aggregate family income of a given size. Such statistics are usually presented in the form of a frequency table, showing how many families there are with an annual income, for example below $1,000, how many with an income between $1,000 and $2,000, between $2,000 and $3,000, etc. The size of these income brackets is usually chosen in such a way that the intervals are rather small for the lower and middle-sized incomes, where there are many families, whereas for the higher income brackets wider limits may be chosen. For example, the interval from $6,000 to $10,-000 may be chosen as one group, and all incomes of $10,000 and over may likewise constitute one group. We shall later see what factors determine the choice of the various income brackets.

Statistics of the frequency distribution of family incomes by size may, if available, prove very useful for various purposes. The following list is not supposed to be exhaustive.

1. An important group of applications is in the field of rationing. It is well known that the consumption of many commodities, such as butter, meat, sugar, textiles, fuel, varies with the size of the family income. In the lower income brackets consumption of certain commodities which are more or less luxuries, falls off rapidly with decreasing incomes. If a system of rationing is introduced the people in the higher income brackets will be much more affected than those in the low income groups. Consequently, it may very well happen that prevailing rations still surpass actual demand in the low-income brackets. This information is very useful in connection with the functioning of the rationing system. It may very well be that an unwanted black-market trade develops in coupons, supplied by people in the low-income groups. In times of increasing production the information may also be used to determine when rationing may be abolished without causing hardship to the majority of the population.

Very often consumption depends not only on size and income of the family, but also on age, occupation and other factors. Such detailed information, if available, may be brought into relationship with data on the distribution of family incomes by size and may help to refine the systems of rationing used. It may safely be said that a number of countries would have had fewer problems with their rationing systems if more detailed data on the income distributions had been available. In some cases, the experience obtained has worked the other way around. Through rationing, data became available on family incomes which otherwise would not have been collected. An example is offered by the rationing of cheap fats in the Netherlands in 1941. Coupons to obtain these fats were issued only to families with an income below a certain limit (dependent upon the size of the family). To be eligible for these ration cards, applicants had to fill in rather detailed data on the incomes of themselves and members of their families. Although the data naturally suffered from certain deficiencies, they have been used both by the Central Bureau of Statistics at The

Hague, and by the municipal bureaus of statistics in Amsterdam, The Hague, and Rotterdam, to obtain information on the frequency distribution of the low-income groups.

2. There are many applications of the size distribution of family incomes in the field of social welfare. Low-cost housing projects, social security or health insurance schemes, etc., are usually made available only for people with incomes below a certain limit. If such schemes are set up, it is important to know beforehand what the coverage will be, or in other words, how many people fall into the income groups concerned.

3. In the field of economic statistics, particularly statistics of consumption, statistics of family incomes are used in combination with family budget statistics to measure the total outlay on various consumers' goods and services. Family budget statistics provide information on the pattern of consumption of various income groups. But the income distribution of the sample of families used in compiling such statistics is usually not representative of the population as a whole. Therefore, the data must be reweighted on the basis of the actual number of families in each income bracket.[3]

4. Business economists who are interested in analysing the markets of the products of their firm, are likewise interested in statistics of family incomes as one of the factors determining the total volume of demand.

5. Statistics of family income by size offer important basic data in relation to such problems as the effect of a change in the income distribution upon the total volume of saving. In the interest of a greater economic stability, and as a basic element in the realization of a full employment policy, the government may wish to increase total consumers' outlay and to re-

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[3] It would exceed the limits of this paper to discuss the problems of the measurement of the aggregate consumption of various consumers' goods and services in detail. Sometimes this consumption is measured on the basis of the formula: consumption-production plus imports less exports less increase in stocks. In many cases, however, the method based on family budget statistics combined with data on the distribution of family incomes by size may also be used, either to check the aforementioned method, or as an independent method of estimating consumption.

duce total saving by affecting the income distribution through proper taxation policies.

In compiling statistics of family incomes, agreement must be reached on what constitutes a "family" and on the definition of income to be used. In the studies on *Income of Non-farm Families and Individuals,* issued by the United States Department of Commerce, Bureau of the Census, the term "family" refers to a group of two or more persons related by blood, marriage, or adoption and residing in the same household. (A "household" is defined as a group of persons living together in a dwelling unit, usually with common housekeeping arrangements, or a person living alone.)[4] Lodgers and servants not related to the head of the household are considered as additional families, and not as part of the head's family. In the Netherlands, "household" and "family" are defined in a similar way, except that households formed by two or more unrelated friends are considered as families, whereas the United States Bureau of the Census considers them as two (or more) "individuals not in a family."

Other differences may arise with respect to territorial coverage and the inclusion or exclusion of special groups. Whether members of the armed forces temporarily stationed abroad should be included or not may be decided differently. In the United States, military personnel living on post and inmates of institutions have been excluded, but in Holland they have been included. A technical detail is that persons who died or emigrated prior to the date of interview (April, 1947) are not reported in the United States Census inquiry.

Differences of minor importance may arise from the inclusion or exclusion of such small groups as resident employees and other non-inmate residents of institutions, persons living in large lodging-houses, residents of hotels, labor camps, ships, etc.

There is much less uniformity in the definitions of income

[4] Cf. *Current Population Reports, Consumer Income.* Series P-60, No. 1, 28 January 1948, "Income of Nonfarm Families and Individuals: 1946."

used. The income definition used in the sample surveys of the Bureau of the Census excludes from the net income from operation of farm or ranch the value of food produced and consumed at home, and inventory changes. The net income is overestimated in that depreciation charges are not deducted. The deviations are due not to conceptual discrepancies but to the difficulties of obtaining and of evaluating these items. In general, differences in defining or measuring income may be due to conceptual or statistical differences in treatment, for example, of:

1. Income in kind.
2. Net rental values of owner-occupied houses.
3. Imputation of interest to holders of savings accounts or bank deposits.
4. Premiums for life insurance.
5. Employees' contributions to social insurance and pension funds.
6. Allowances of the armed forces and their dependents, including mustering-out and discharge pay, bonuses, etc.
7. Gifts, inheritances.
8. Capital gains.
9. Proceeds from sale of assets and dissaving.

For the purpose of measuring family income all wages, salaries, interest, dividends, rents, profits and entrepreneurial incomes received by family members will be included, and also transfer incomes, such as for example pensions, terminal leave payments, social security payments, annuities, unemployment assistance; but not capital transfers. Items (7), (8) and (9) will have to be excluded.

The modern sampling techniques seem to offer the appropriate method for obtaining statistics on the distribution of family incomes by size. The method has been used on an extensive scale in the United States, and plans are being made to apply it also in other countries, *e.g.,* Italy.[5] The Sub-Commission on Sta-

[5] Fegis, P. Luzzato: *Family finances and the distribution of the national income in Italy,* Proceedings European meeting, Econometric Society, The Hague, September, 1948.

tistical Sampling of the Statistical Commission of the United Nations has given considerable attention to the subject in the framework of its recommendation for a wider use of modern sampling procedures. Details of the method will not be repeated at great length here, but attention may be drawn to the difficulties encountered in the Census Survey carried out in the United States. It is stated that the figures obtained are subject to errors of response and to nonreporting. "In most cases the schedule entries for income were based on memory rather than on records, and in the majority of instances on the memory or knowledge of some one person, usually the wife of the household head." "The memory factor in data derived from field surveys of income probably produces underestimates, because the tendency is to forget irregular sources of income."

"Nonreporting of income, *i.e.*, the failure to obtain any or all the income information because of the refusal, absence, or poor memory of the informant, may occur at any income level." "There is considerable evidence that nonreporting is more prevalent at the upper income levels."

Statistics of income tax usually refer to the incomes of *individuals*, with the possible exception of the returns of husband and wife, which in many countries are considered as one joint return for the purpose of assessment. Income tax statistics do not show relationships between the individual income recipients and therefore they cannot easily be used for the purpose of estimating the distribution of family incomes. Also, the concept of assessable income as defined by the law, may differ with respect to the inclusion or exclusion of such items as were listed above. People with income below the tax exemption limit are usually not included in such statistics. Sometimes incomes are shown before deductions granted by law— for example, for size of family or for life insurance premiums paid—and sometimes they are shown after such deductions.

On the other hand, income tax statistics have the advantage of covering a very large percentage of the population, particularly in those countries where the tax-exemption limit is low.

If in addition the tax returns give information on the number of children of the assessee, as is sometimes the case, and if it were possible to combine the returns for members of the family with those of the head of the family, it might be possible to obtain some information on the distribution of family incomes. The Statistical Office of the United Nations, in accordance with a recommendation of the Statistical Commission of the United Nations, is collecting data on income-tax statistics and hopes to secure a greater uniformity in the compilation and presentation of data in this field. Statistics of incomes subject to income tax for one or more years are available for the following countries: Australia, Canada, Czechoslovakia, Denmark, Eire, France, Germany, Netherlands, Netherlands Indies, New Zealand, Palestine, Sweden, Union of South Africa, the United Kingdom, and the United States.

In the Netherlands an attempt has been made to estimate the size distribution of family incomes on the basis of income tax statistics, combined with data on wages of young unmarried workers, wages of agricultural workmen, census data on the distribution of families by the size of the family, and certain data on the number of children per assessee in each income bracket, as shown in the income-tax statistics. The distribution of family incomes was derived from these data on the basis of certain assumptions regarding the distribution of earnings of children living in families which as a first approximation was assumed independent of the income of the head of the family.[6]

A greater international comparability of statistics of the size distribution of family incomes may be reached along the following lines:

It is probably not very difficult to obtain agreement on the definition of family to be used. With respect to the definition of income to be used, agreement may not be realized so easily. If agreement on the definition and the treatment of each of

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[6] Derksen, J. B. D.: *Statistische berekeningen over de verdeeling der gezinsinkomens*, Maandschrift, 1944, No. 5-12, 16 pages.

the items previously listed were reached, considerable progress would be made. However, it should be taken into account that statistics of the distribution of family incomes are related to other important elements in a country's statistical system:

1. There is a relationship between the data on income distributions and the national income statistics of the country concerned. If a greater uniformity of national income statictics were realized, the family income statistics probably would also be affected.

2. There is also a relationship with the family budget statistics, since data on the distribution of family incomes will often be used in connection with the family-budget data for the purpose of estimating total consumption of various goods and services. Therefore the income concepts underlying both statistics will preferably have to be the same, and it is also very convenient if the income brackets are the same in both kinds of statistics.