NOTES AND MEMORANDA

AN INTERCOUNTRY COMPARISON OF THE NATIONAL INCOME OF PLANNED ECONOMIES

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Within the framework of the CMEA, work is at present going on to compare the national income, and its components, of the planned economies of Eastern Europe.[1] It is the purpose of this note to report on some of the methodological problems encountered.

The chief aim of the study is to compare the national income of these countries. Starting from the expenditure side of the national income the comparison covers two basic aggregates: consumption (essentially private and government consumption expenditure, without non-material services), and accumulation (net capital formation and increase in stocks). Industrial and agricultural production, i.e., the two most important branches of production, are also compared, in some degree independently of the comparison of national income, but in essence by means of similar methods using several types of indicators.

In many respects the task is similar to that performed by Milton Gilbert and his associates for the countries of Western Europe and the United States.[2] However, a comparison of countries with centrally planned economies raises problems which were not met in the study of the market economies. Furthermore, the CMEA study in many respects goes into more detail than did the Gilbert study. Hence, numerous new problems of a methodological character are met and have to be settled. Experts in statistics, in planning, and in economics of the countries concerned are cooperating with staff members of the CMEA secretariat in finding the solutions.

The study is being carried out not only globally but also in detail. Thus the comparison covers about 15–20 items of consumption, the most important components of investment, the production of 16 branches of industry, and about 20 groups of agricultural products. The required degree of accuracy of the comparison is sought not only for the global volumes but also for their components.

A number of problems arise in attempting to make international comparisons. These can be divided into three groups:

1. The countries taking part in the study are Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, Rumania, and the Soviet Union. The study relates to 1966. A similar study was undertaken by the CMEA countries for the first time in the early 1960s (relating to 1959).

2. Milton Gilbert and Associates, *Comparative National Products and Price Levels* (Organisation for European Economic Cooperation, Paris, 1958).

a. The content of the aggregates is not uniform in the different countries, though the names are identical.

b. The data of the countries expressed in terms of their own currencies cannot be compared directly, and the official rates of exchange are inadequate for a proper conversion.

c. The composition of the aggregates to be compared varies from country to country due to structural differences in the economies.

The first group of tasks is therefore to secure *identity in the content.* Though each country participating in the comparison applies the same conception of the national accounts, this in itself does not ensure identity in all details. Therefore, as a first step the content of the indicators and of their components must be spelled out in detail. A common list developed in this way requires of course some rearrangement of the statistical data of the participating countries. The organization of the statistics of the countries, however, makes it possible to effect corrections of this type directly, though in some cases estimates are needed.

Conversion into the currency for comparison is, of course, one of the most difficult problems in making this type of comparison. The first task is to select the currency and the country to serve as a basis of comparison. There are several possibilities for settling this problem. One of the possibilities is to compare the countries by pairs, using the prices of the two countries selected in each bilateral comparison. But when a number of countries are involved, the amount of calculation required is large: in the case of n countries, n(n-1) comparisons by pairs have to be performed independently of each other. Furthermore, the results thus obtained do not necessarily constitute a consistent system. Since in each bilateral comparison only the prices of the two countries concerned are used, each comparison is performed at different prices. Thus even such contradictory results can be obtained as $A > B$, $B > C$, and $C > A$ (where A, B, and C represent either the national income of the individual countries or other indicators).

A second possibility is to use the prices of one country. This yields a consistent result, but it requires that some of the countries be compared with each other on the basis of a price system alien to both of them. Due to the well-known correlation between price and quantity, the quantities of the country whose prices are applied seem to be smaller than reality.

Between these two extreme solutions several types of combinations may be conceived of. A relatively simple solution is to compare each country directly with one selected country. For the CMEA countries the Soviet Union seems to provide the best basis for such bilateral comparisons, since this would simplify the solution of numerous technical problems. (The widest variety of goods, for example, can be found in the Soviet Union, which would make it easier to compare the Soviet Union with any country than to compare the other countries with each other.) The comparison of the other countries with each other takes place in this case indirectly, by relating the two results obtained with respect to the Soviet Union. Thus the currency used for bilateral comparisons would be the ruble, on the one hand, and the currency of the other country compared

directly with the Soviet Union, on the other. The only disadvantage of this method is that the proportions of the "intermediary" country influence more or less the results of all comparisons.

Experimental work and computations are now in progress designed to improve the methods for comparing any two countries on the basis of the price system of any country. On this basis a uniform system could be drawn up in which any country could be selected as the base, and the price and volume proportions of one of the countries would not influence the results of the computation to a greater extent than those of another country.

The conversion of the aggregates (expressed in terms of value) into the currency of another country requires, first of all, the proper disaggregation of the indicators. The more detailed the data, the higher the grade of disaggregation, and the more homogeneous the groups, the more accurate and more differentiated the computation. Disaggregation takes place, in general, in several stages (by main groups, groups, and sub-groups). For instance, in comparing industrial production for 1959 the number of groups used was 430, and for comparing consumption the number of groups was 280.

Two methods of conversion were explored. The field of application and the reliability of the two methods are different. According to the first method, the quantities of the products (expressed in physical terms) obtained through disaggregation are revalued on the basis of the unit prices of the other currency. Practically this means, in general, that the *average price* of the products belonging to the group in question must be determined in one of the countries, and the quantity of the same products in the other country must be multiplied by this average price.

According to the second method, the values of the products (expressed in terms of the national currency) are converted by means of price relatives. Since data for quantities and prices are not available in complete detail in national statistics, especially difficult methodological research is required in this case. But even if the necessary data were available, computations covering individual products would demand too much work. (The specification of the national income by individual products could not be performed theoretically either.) The comparison requires, therefore, a wide application of representative methods of statistics. Price relatives differentiated by groups can only be indices computed from the price relatives of selected products, that is, of the so-called product representatives. Though sample surveys are well-grounded in probability theory, their application in the field of international comparisons raises many problems. Also a number of special problems emerge which do not permit the unconditional application of the general principles and methods of sampling. Selection and stratification and the determination of the proper size of the sample, etc., are important, but they require the application of special methods.

Since the product representatives, or more exactly the price relatives computed for them, constitute the basic units of the comparison, the reliability of the computations depends greatly on the proper or improper selection of the representatives. The latter are mostly concrete individual products since this is the only way unambiguous price relatives can be determined. (Industrial

production was compared on the basis of about 1000 representatives.) It is well known, however, that the quality of the goods produced or consumed in various countries differs greatly. Therefore the price relatives should be corrected so as to reflect these quality differences. Correction for quality differences requires a many-sided study, with a careful consideration of all the factors causing differences. Different types of quality differences must be distinguished, since the ways and possibilities of expressing them are different. Quality differences whose extent, and in many cases whose direction, depends exclusively upon individual value judgements (for instance upon taste) cannot be applied at all. A further problem is the quantification of the quality differences, since similar products in different countries often differ from each other in more than one feature. With respect to quality corrections, studies have been made to deal with the systematization of the differences and with the guiding principles of the correction.

While the lack of complete uniformity in the content of the data and the differences in currency can be overcome by means of proper methods (if not entirely, still to a considerable extent), difference in the composition of the aggregates to be compared is an obstacle which results neither from the lack of proper basic data, nor from the inadequacy of the methods of conversion, but from the nature of the task itself. Distorting factors of this type cannot be eliminated; they can only be stated. The greater the difference in the economic structures of the countries, the greater the differences in the composition of their production, consumption, and price system, the less the countries can be compared with each other unambiguously. To reveal the structural differences is an important part of the task of international comparison, since the comparisons are made not only globally but also in detail. At the same time, the differences which are revealed in the structures also show the extent and limits of the comparability of the aggregates. Thus not all the details of the comparisons are of the same value. It follows from the nature of the task and from the character of the aggregates that, for instance, the results obtained in comparing consumption are more accurate than those comparing accumulation.

The results of these large scale computations based on a great quantity of data permit a many-sided comparative analysis of the countries. The main task is, of course, to determine the proportions of the aggregates studied and of the physical volumes of the components of the aggregates in the countries, i.e., to construct interregional indices of volume. In addition, the results obtained make it possible to show the most important characteristics of the production and consumption patterns of the countries. The comparison gives highly valuable information on the real purchasing power of the currencies. It offers a picture of the basic differences of the price systems, of the goods which are relatively cheap or dear in the individual countries as compared with other countries, and makes it possible also to examine the connection between price and volume proportions on an international level.

It is evident that such a detailed comparison is rather expensive and labor-intensive, and the performance of the computations requires a long time even if electronic computers are used. It is inexpedient, therefore, to repeat them at too frequent intervals. The question arises, therefore, whether information can be

obtained about changes which might have developed in the period between two major comparisons. A thorough study of this question shows that by using some rates of development and by assuming some proportions of the year of the detailed comparison to be unchanged, a simplified, continuous registration of the data is practicable. Computations of this type raise some methodological problems, especially regarding the grade of disaggregation. Besides, it should be taken into account that the results obtained are less accurate than those of a detailed comparison.

The present outline of the comparison of detailed value indices has of course not made any attempt to cover all the characteristics and interesting features which have arisen in the course of the work. The experts of the countries participating in the comparison have analysed the methodological questions in detail in numerous papers and have also worked out interesting solutions for future comparisons.

NEWS OF STATISTICAL ACTIVITIES

This section of the Review *will report each quarter on noteworthy developments in the field of national economic accounting. Newly available data, new methodological developments, and new applications of methodology of significance to members of the profession engaged either in the production of national economic accounting data or in the use of such data for analytical purposes will be briefly noted. In the preparation of material for this section, the secretary gratefully acknowledges the contributions of the Association's correspondents throughout the world, without whose continuing efforts such a news section could not be compiled.*

Argentina

The Second Conference of Argentine Economic Research Institutes was held in Buenos Aires during 1965. Among the papers presented were the following of interest to national accountants:

Fucaraccio, Angel. *Modelo de Previsión a Corto Plazo para la República Argentina* (A Short Term Forecasting Model for Argentina). Preliminary results obtained by the Instituto de Cálculo de la Facultad de Ciencias Exactas de la Universidad Nacional de Buenos Aires.

Herschel, F. y Santiere, J.J. *Metodología del Presupuesto Económico Nacional* (Methodology of the National Economic Budget). Detailed description of forecasting methodology, emphasizing special features of the Argentine Economic Budget relative to other similar efforts.

Altimir, Oscar. *Distribución del Ingreso por Niveles en Argentina* (Distribution of Income by Size in Argentina). A synthesis of the main results of the CONADE-CEPAL Research Program on "Distribution of Income in Argentina" (in print), together with a discussion of methodology and sources.

Belgium

Increasing interest in regional economic analysis in Belgium has been assisted by the publication of figures on the economic growth of provinces and regions from 1955 through 1963, in *Statistisch Tijdschrift*, No. 3, 1966 (or *Etudes Statistiques et Econometriques*, No. 12, 1966). Also, the Town and Country Planning Organization of the Department of Public Works of Belgium is making a study of the Scheldt-Dijle geographic region, based upon a regional input-output table for 1961.

Germany

A number of new statistical efforts in the national income accounting field have been undertaken in Germany in the recent period. Among these are the following:

Bartels, Hildegard; Hanisch, Günter; and Lauckner, Walter. Möglichkeiten und Grenzen der Berechnung von Input-Output-Tabellen für die Bundesrepublik Deutschland. (Possibilities and Limits for the Compilation of Input-Output Tables for the Federal Republic of Germany.) *Wirtschaft und Statistik*, 1965, Heft 2, S. 69–81. Input-output table for 1960, for 35 industry groups, based on national accounts and other industrial statistics compiled by the Statistisches Bundesamt. Also contains tables on final demand at market prices and a breakdown of gross investment in fixed assets by economic sectors.

Kerner, Wolfgang. *Ermittlung von Investitionsgrössenordnungen für Wirtschaftsbereiche. Eine Untersuchung im Auftrage des Bundesministers für Wirtschaft, Bonn.* (Estimation of Investment by Economic Sectors. An Investigation sponsored by the Federal Minister of Economics.) Deutsches Institut für Wirtschaftsforschung, Sonderhefte Nr. 71, Berlin 1965, 99 S. A coordination of the existing time series of gross investment in fixed assets by economic sectors, adding estimates for the sectors so far neglected. The structure of investment is presented in a matrix, and integrated into the national accounts compiled by the Statistisches Bundesamt. The appendix contains figures for 1950 to 1963.

Hoffman, Walther G., with Grumback, Franz, and Hesse, Helmut. *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts.* (The Growth of the German Economy Since the Middle of the 19th Century.) Enzyklopädie der Rechts- und Staatswissenschaft. Abteilung Staatswissenschaft. Berlin, Heidelberg, New York 1965. Data on the industrial origin, end use, and functional distribution of national income, in 1913 prices, for the periods 1850–1913, 1918–1939, and 1945–1959, together with sources and methods of estimation.

India

The Fifth Indian Conference on Research in National Income was held from April 12 through 14, 1966, at Ahmedabad, India. This was the first conference arranged by the Indian Association for Research in National Income and Wealth, which was constituted in November 1963 into an independent registered body of experts, both official and non-official, and research workers in the field of national income. Prof. V. K. R. V. Rao, the President of the Association, presided over all the sessions. The Secretariat of the Association is located in the Central Statistical Organisation, Yohana Bhavan, Parliament Street, New Delhi-1.

A number of research papers on estimates of national income and related aggregates at constant prices, capital formation in agriculture, and consumer expenditure were presented and discussed. There were eleven papers on the subject of real output, six papers on capital formation in agriculture, one on consumer expenditure, and one on treatment of consumer durables.

Puerto Rico

The official revisions of the national income and related estimates for Puerto Rico have recently been completed by the Bureau of Economics and

Statistics of the Planning Board of Puerto Rico. The principal bases for the revision were the data collected in the 1963 Censuses of Manufactures and Business, both of which were conducted by the U.S. Federal Government and the Commonwealth Government of Puerto Rico jointly. The revisions cover the period back to 1959. Divergences of the new estimates from the original estimates are in general small (under 5 per cent) for the major aggregates. But the percentage is large, as would be expected, in the case of a few smaller items, such as inventory change and the value added by minor industrial groups.

South Africa

The Technical Advisory Committee on National Accounts and Finance, which is composed of representatives of official bodies, manufacturing, mining, and commerce, held a meeting on April 29, and the following were among the matters discussed and noted.

The estimates of the gross domestic product of the Republic have been entirely revised on the basis of the SNA for the period 1960 to 1965, and comparable estimates for the years 1911 to 1959 will probably be completed within the next year or so. The work is directed by Professor J. J. Stadler, in close cooperation with the Bureau of Statistics, the Department of Agricultural Economics, and the South African Reserve Bank. The principles and methods used were set out by Professor Stadler in his paper on The Gross Domestic Product of South Africa, 1911–1959, in the September 1963 issue of the *South African Journal of Economics*. The product method was applied in the case of agriculture, mining, manufacturing, construction, and electricity, gas, and water supply, and the income method in all other industries.

Progress was reported on the following research projects: reclassification of gross domestic investment, reclassification of central government expenditure, direct estimation of personal saving and elaboration of the personal account, extension of quarterly estimates with a view to publication, and the finalising of a standard industrial classification for South Africa.